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12TH EUROPEAN CONFERENCE ON CREATIVITY AND INNOVATION

THE ULTIMATE EXPERIENCE IN COLLABORATION

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Since 1987, the European Association for Creativity & Innovation (EACI) (<http://www.eaci.net>) co-organizes the bi-annual European Conference on Creativity & Innovation (ECCI), together with a local creativity and innovation association in Europe, with the intention of providing a platform for practitioners and academics in the field of creativity and innovation. In 2011, the Portuguese Creativity and Innovation Association – APGICO (<http://www.apgico.pt>) organized the ECCI XII, with the purpose of providing an environment where participants learn with each other ways of developing collaborative activities which promote innovation.

The event takes place in the University of the Algarve in Faro, on 14 – 17 September 2011.

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In the following pages all the full texts received from the participants are published, reflecting the rich contributions and diversity that could be found in ECCI XII. Most of the papers give a contribution to the main discussion questions proposed for the Conference (How is it possible to devise ways of directing people with entirely different occupations, backgrounds and experiences, to agree on a common purpose to achieve unique solutions? How can we foster individual ownership of the solution within the context of a large decision making group?), or present a distinct collaborative method, which may be adapted to creativity, problem solving and innovation in organizations.

The texts are organized by story, rather than by theme, respecting the option of allowing the participants to team up and engage in deeper relationship while analysing the organizational problem from different backgrounds and points of view. Each author is responsible for the style and presentation of the paper inserted in these proceedings.

Conference Presidency

Fernando Sousa

Ileana Pardal Monteiro



ALICE IN WONDERLAND

THE FRAGILE PHENOMENON OF CREATIVITY: HOW IT INTERACTS WITH ORGANIZATIONAL NORMS, COMPETITIVE THREAT, AND SOCIALISATION?

André P. Walton, Ph.D.

Abstract

As scientists we love to measure things. In fact positivism has taken such a hold that what we cannot measure is often devalued to the point where we consider it of questionable significance. Thus, when studying creativity a popular working definition contains only those things that can be readily measured, or assessed. As a result we may lose important components of creativity and creative behavior. Starting with the problem of definition I discuss some of the foundations of creative behavior and go on to discuss research which illustrates how fragile a phenomenon creativity is in a contemporary organizational setting. Specifically I present results showing how organizational and leadership norms influence the motivation to create and innovate, and how stressors such as competition also have their impact. Finally I discuss how differences regarding people's socialization (i.e. between that of men and women) also influence how norms and stress influence creative performance.

IDEA MANAGEMENT FROM THE PRIVATE AND THE PUBLIC SECTOR TWO CASES: CORUS RD&T VERSUS THE DUTCH MINISTRY OF VROM

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Abstract

As creative processes become more important for organizations, idea management also becomes more important in the realm of innovation and implementation. In this article, two different idea management systems are examined: first, in a multinational, commercial, technical organization, and second, in a governmental bureaucracy. The authors compare current theories on idea management and apply them to their findings in the two case studies. By making an empirical comparison between idea management processes in two different organizational contexts, this paper makes an important contribution to the literature on idea management. The information presented here can be used as a stepping stone for future research.

Keywords: Idea management, creativity, organizational learning, innovation, interaction, co-creation

Introduction

As innovation becomes more important, there will be increasing stress on creative processes in organizations. Management of creativity must find a balance between approaches that are either too loose or too tight. The management of ideas is part of the management of creativity and offers opportunities to utilize the creativity of the participants.

In this paper, we present a theoretical framework for idea management that emphasizes a multilateral approach. Then, we present two cases of idea management: the first is in the private sector, on idea management at Corus Research Development and Technology (RD&T). The second is in the public sector, at the Dutch Ministry of Volkshuisvesting, Ruimtelijke Ordening en Milieu (VROM).¹ After discussing the similarities and differences between the two cases, we look at the theoretical and practical implications.

Theoretical framework

Managing ideas is a relatively new field in scientific research and has sprung from creativity management, innovation management, organizational science, and social psychology. The process of idea management is directed towards generating, catching, enriching, valuating,

¹ In Dutch, Volkshuisvesting, Ruimtelijke Ordening en Milieu can be translated as 'Housing, Planning and the Environment'. In 2010, the name was changed to the Ministry of Infrastructure and the Environment.

and implementing ideas (Gasperz, 2002). Koen et al. (2002) state that idea management is about the skills of organizations to generate, develop, and select ideas in order to implement them as concepts. It is striking that these two definitions use a top-down organizational perspective. The role of the ideator, the actor that comes up with the ideas (and enriches them), is not clearly defined.

There are different theories (Bakker, Boersma and Oreeel, 2006; Hellström and Hellström, 2002), however, that aim to integrate the role of the ideator and the bottom-up character of the process. In this theoretical framework, the focus is on the dynamics of Gaspersz's (2002) unilateral perspective on idea management and the multilateral perspective of Bakker et al. (2006) and Hellström and Hellström (2002).

This is in line with the British sociologist, Anthony Giddens, who developed a model in which individuals (or 'agents', in his terms) deploy actions that are both enabled and restrained by the surrounding structure. Giddens (1984) considers human beings as knowledgeable agents whose conduct is bounded by the unconscious, on the one hand, and by unacknowledged or unintended actions on the other. He calls this human action 'agency'. He formulated his theory on structuration in an attempt to dynamically integrate micro-level theories with those at the macro-level.

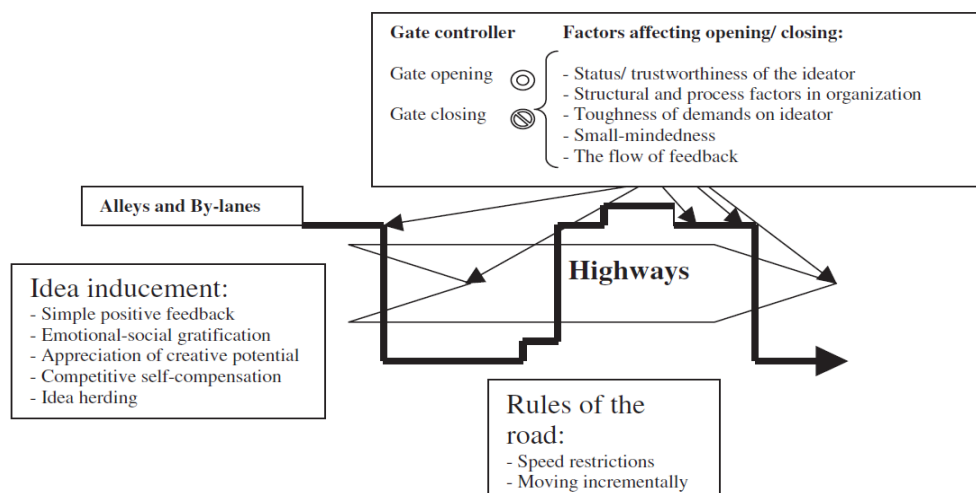
A unilateral approach to idea management

Gaspersz's (2002) model of idea management consists of four sequential phases through which ideas pass, from development to an implemented activity or approach: the selection phase, the evaluation phase, the enrichment phase, and the implementation phase. The selection of ideas is based on a number of formal criteria that are inherent to the organization, and the actors that make the decisions should have enough expertise to perform the selection of promising ideas. After selection, the idea moves to the evaluation phase, where the ideator will be acknowledged with either a material or non-material reward. This keeps the idea stream in the organization alive. The next phase is the enrichment phase, where the idea will be developed into a business approach that can be implemented. Ideas can be enriched—and this process can be stimulated—by using other ideas from the archive (Gaspersz, 2002), using creative thinking techniques, multidisciplinary teams or experts from other disciplines. The implementation of ideas is not a main concern within the field of idea management.

A multilateral approach, the ideator in the organization

In contrast with Gaspersz's (2002) unilateral approach, Hellström and Hellström (2002) and Bakker et al. (2006) use a multilateral perspective, which attempts are made to incorporate the dynamics between organizations and creative individuals. In the model in shown in figure

1, Hellström and Hellström have tried to describe the routes ideas take through the organization, focusing on the organizational processes, the individual processes, and their interrelated dynamics. They call this flow of ideas through the organization 'organizational ideation'. Idea flows can take formal and informal routes on their way towards implementation. Formal routes are called 'highways' and are crowded places formed by the organization's idea management process. Informal routes consist of the ideator's network and are far less crowded, but ideas traveling through informal routes risk getting lost. On their way, ideas experience three important moments: (1) idea inducement, (2) rules of the road, and (3) gate opening and closure.



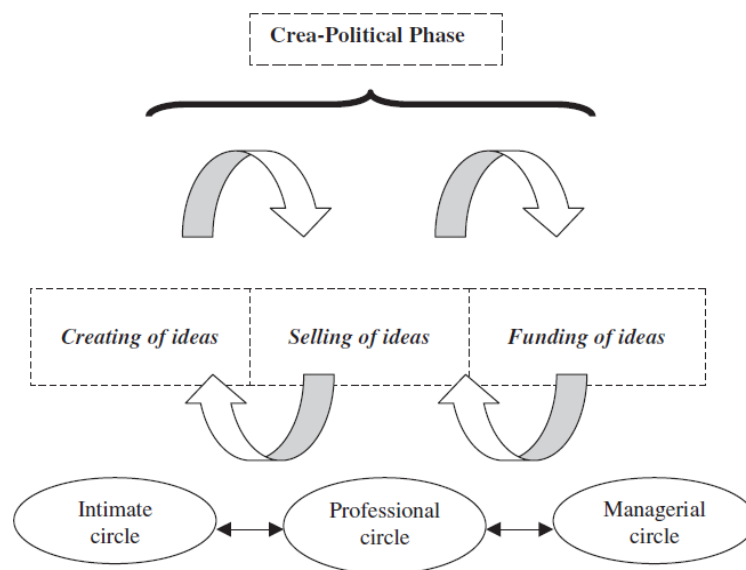
Source: Hellström and Hellström (2002).
Figure 1: Organizational ideation.

Idea inducement is understood as the conditions for idea facilitation; valuing and stimulating ideators are the core element here. This can be realized by giving positive feedback, providing emotional and social gratification, and by valuing the ideator's creative potential. Rivalry and the sublimation of ego-induced interests are also important to the creation of good ideas. Within this process, the ideator is the pusher and he or she is responsible for the routes the idea takes. It is of crucial interest to keep the ideator motivated during this quest and to help overcome problems. Therefore, organizational trust is important; a lack of trust can lead to idea herding, which is a reluctance to share new ideas.

During its course throughout the organization, there are several selection points for the idea that are guarded by gate keepers. The credibility and the reputation of the ideator play a crucial role in opening the gate. For the organization, stifling organizational processes and structures form important obstacles. Where these processes and structures are too stifling, gates can become 'temporarily' closed. The expertise and openness of the gate keeper play

an essential role in the decision-making process. When a decision has been made, it is important to prevent the pressure on and feedback to the ideator from becoming too heavy, in order not to discourage motivation.

In the crea-political model, figure 2, Bakker et al. (2006) describe other factors that influence the enrichment and implementation of ideas. They focus on the dynamics between the actor and the organization, which explain the multilateral character of the model.



Source: Bakker et al. (2006).
Figure 2: Crea-political model

The model consists of three interrelated phases: the first is where ideas emerge or are created. The actors look for feedback in their intimate circle (partner, friends, near colleagues) to determine whether their idea stands a chance. Feedback also helps them to enrich their ideas and to make them more robust.

When ideators are convinced of the quality of their idea, they will look for support in their environment. In order to generate support, it is important to have lobbying and communication skills in order to sell the idea in the professional circle, which plays an important role in incrementally enriching the idea. A pitfall in this phase can be a lack of expertise in the professional circle that can lead to dismissal of the idea.

In the next phase, management or decision makers have to be convinced of the value of the idea in order to get resources allocated for its implementation. In this phase, too, the ideator's communication skills and lobbying abilities are important, along with support from the professional circle, if the idea is to be accepted. After acceptance by management, the idea is ready for implementation.

The Cases

For this paper we have selected two different cases, one from the private sector, the case of Corus RD&T, and one from the public sector, *Idea VROM*.

Case 1: Idea management in the private sector—Corus RD&T

The first case is about the computer-based idea-management system at Corus RD&T, which is called *Eureka!*. An updated version, *Eureka 2010*, was recently introduced, but when this study was done, the older version, *Eureka!*, was still in use.

The Corus Group is a large multinational company dealing in metals. It was formed through the merger of the Dutch Koninklijke Hoogovens and British Steel in 1999. The headquarters are in London, but it has operations worldwide, with major plants in the UK, the Netherlands, Germany, France, and the USA. In 2007, the Corus Group was taken over by the Indian steel company, Tata Steel Ltd.

In addition to manufacturing, the Corus Group also provides design, technology and consultancy services. It is divided into four main divisions: strip products, long products, distribution & building systems, and aluminium. Each of these divisions contains several business units, 22 in total. In 2010, around 41,000 people worked for the Corus Group in over 40 countries, of which 11,300 were in the Netherlands.²

About 900 people work in the Corus Group's Department of Research, Development and Technology (RD&T), about 500 in the Netherlands (at IJmuiden) and 400 in the United Kingdom (at Teesside and Rotherham, near Sheffield). By supporting the business units, not only at the product level, but also in processes, RD&T plays an important and strategic role in the process of innovation at Corus.

Eureka! up close

The *Eureka!* model is based on existing notions about idea management.³ In the *Eureka!* manual, it states the following (Corus Research Development and Technology, 2002: 2): *We have to generate a continuous stream of market winners by developing new processes, products, product applications and new business concepts. The start will be building up our portfolio of Ideas.*

Figure 3, below, shows the formal structure of *Eureka!* with the different phases of idea evolution. Ideas, which can be submitted by any Corus RD&T employee, are received in the 'Ideas Capture' section. At this stage, a superficial description of the idea is enough. The area called 'Opportunities Capture' is there to stimulate the ideation process. Here, the

² See www.corusjobs.nl/corus-als-werkgever/het-bedrijf-corus.html (accessed 30 March 2010).

³ See, for example, Rickards (1990), Drazin et al. (1999), Van Dijk and Van den Ende (2002), Gaspersz (2002), Hellström and Hellström (2002) and Mauzy and Harriman (2003).

business units of the Corus Group can submit information about their needs in order to enhance the ideation process.

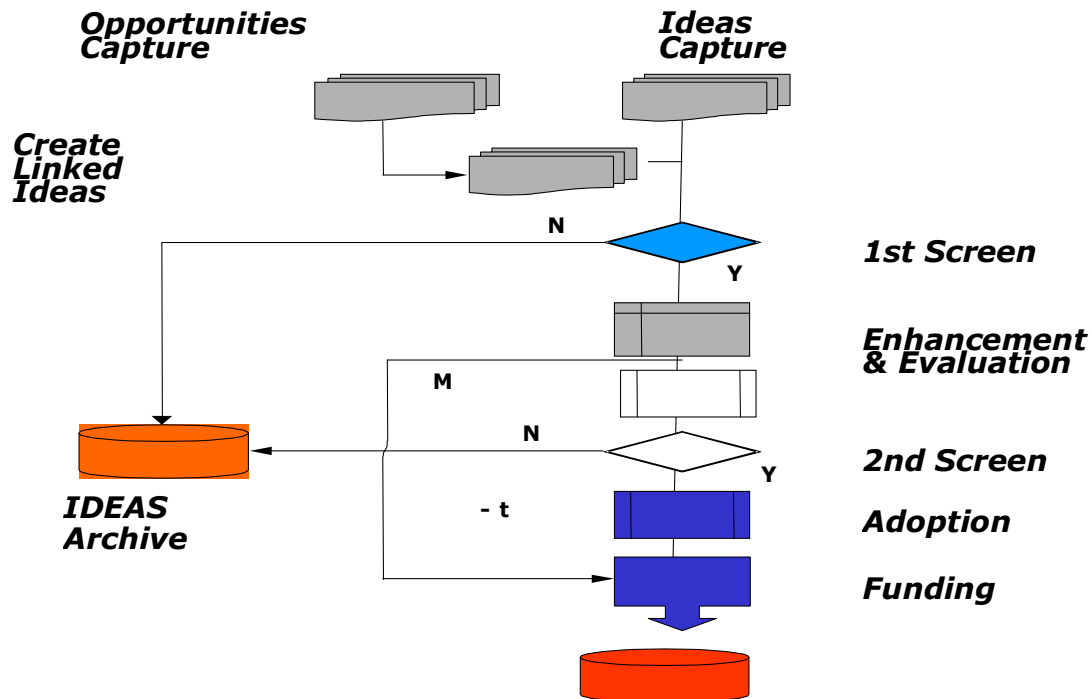


Figure 3: The formal structure of *Eureka!*

In 2004, about 250 ideas were submitted to *Eureka!*, and about 20% were funded. Since most of Corus's products are mass-produced, a single idea has the potential for enormous benefits or savings, and some of the *Eureka!* ideas in 2004 resulted in patentable outcomes. Because of the sensitivity of the ideas in terms of competition, we will not discuss them in detail here other than to mention that they cover the whole range of products and processes. In 2009, about 150 to 225 ideas were going through *Eureka!* per year. Of these ideas, around 35 to 50 (roughly 20% to 25%) were passed over to the STIR Programme, with around three to five patents resulting. The STIR fund is a stimulation fund for innovative ideas. In principle *Eureka!* and STIR are independent, but a large number of the accepted ideas from *Eureka!* are absorbed in the STIR fund. Other ideas result in projects or are absorbed into programmes.

The research on *Eureka!*⁴

The purpose of our study was to shed light on the way employees from Corus RD&T perceive creative processes in their organization and in what ways the idea-management system *Eureka!* enables or constrains these processes. Interviews were carried out

⁴ The research on Corus formed part of the first author's PhD dissertation on idea management.

throughout the organization, and later, 15 in-depth interviews were done with researchers in order to analyze in detail how the processes of idea evolution work.

The interviews were semi-structured and centered around four sensitizing concepts: standing, trust, testimony and favourite interaction. The interviews were recorded and, after being transcribed, were evaluated with the researchers in order to prevent errors or misinterpretation. The interviews were analyzed in light of the sensitizing concepts, and the analysis was presented to the organization. The names have been changed for reasons of anonymity.

Example: Improving the corrosion behaviour of aluminium

The idea of improving the corrosion behaviour of aluminium alloys was made by John, an English metallurgist, who had been working for Corus for about seven years at the time, mainly at IJmuiden. The Aluminium Group at Corus RD&T is a tight-knit team of about 30 to 40 full-time people and another 200 who often work in projects involving aluminium. At the time of the study, John was coordinator of a group of eight to nine people, handling 11 projects with a budget of four million euro.

John's idea was to improve corrosion resistance, which was recognized by his colleagues as a fundamental problem. One of his colleagues, Damian, shared his opinions but felt that John's idea had more structure and was more detailed, and that John had more ideas about how the approach could be proven, so they combined their ideas. John says that it is a great advantage to work at Corus IJmuiden, because there are many software packages that help make simulations. Ten years ago it would have taken months to do sensitivity studies and now they can be done within hours. John says that, 'One afternoon I sat down at a computer and amazingly found an element [to slow down the corrosion process]. Strange thing was ... the element had a reputation of being worse for corrosion.'

As an unforeseen benefit, the idea also increased strength, which made the application of the material much wider. In 2007, one year after having had the idea, John says, 'I had a choice: go to the BU [business unit] and be laughed at, or go to STIR [*Eureka!*], to get hours.' Someone from the Aluminium Group was in STIR, namely Gunther, who said that one day John dropped by. In Gunther's words, 'He just walked in. I already knew that he is creative and has many ideas. Besides, it was an idea about metallurgy, which is my field, too. And he had made a smart use of models.'

According to Gunther, there are people who use models and there are people who do experiments. He emphasized that John's smart use of models was an extra plus for this idea. John submitted his idea and nominated Gunther, Damien, and his programme manager to evaluate it.

After his idea was evaluated in *Eureka!*, it was sent to STIR. John was asked to make a PowerPoint presentation to STIR of about 15 minutes, to legitimize his claim for time to work on the project. There was a committee of five people who were all supportive of the idea. He got the hours that he needed to perform a feasibility study. He did some testing and the results came through. About his idea John says, 'Even I am still surprised.'

At the end of this phase, John gave a final presentation in which he reported the findings of his feasibility study to the STIR committee.

After the *Eureka!* and the STIR phases, John had the experimental data he needed to take to the business unit to try to convince them of his findings. Damien explained that John's idea about adding a specific element to the aluminium is an idea that is 'outside the box' in the aluminium community. In the business unit (in Koblenz), they had had experience with this element and they had concluded that it would not work. So it was difficult for John to go in and say that they had not done it right, especially since high-placed employees had been involved. John went to the business unit himself. He asked for presentation time at one of their quarterly meetings and was given a slot of 20 minutes. There were about 50 people present at the first presentation. John said they were willing to listen because he has a reputation of giving good presentations and can explain results, and furthermore, because of his position and experience. John says that his estimation of his presentation was that about one-third of the audience understood his idea straight away and were optimistic about the results. Another third said that the idea might be interesting. And the last third did not understand and were not convinced.

John mentions the role of a particular person, Fleischer, in the audience, of whom he says, 'I knew I had to convince him. But he was not convinced. The idea went against his principles.' Fleischer had worked there for 30 years. He had a good reputation and could be understood to be a key figure. People listened to him. John felt that if he could convince this man, the others would follow. So after making the presentation, John did more experiments and worked on the theoretical explanation of his findings. During this time, John was in Koblenz once a month and had about three meetings with Fleischer. John gradually convinced Fleischer, who became a big supporter of John's idea. John thinks that he gained the trust of the Koblenz people because he had worked with them before. It still took some time, because it takes time to get accepted by the people in Koblenz. 'But once you are accepted, they are happy to work with you.'

After the idea was accepted by the Koblenz business unit, a programme could be written. At the moment, it is noteworthy that there are *three* projects running on the basis of John's idea: one in aerospace, one in the automotive sector, and one in the commercial sector, each consisting of several thousand hours. John received the STIR-NL prize 2008 for his idea, which is formally called 'Improving the corrosion behaviour of 5000 Aluminium Alloys'. He

says he feels rewarded, but that he did not do it for the money; he regards it as peer recognition.

***Eureka!* as idea manager**

The phases in *Eureka!* can be described as capture, selection, enrichment, and adoption. There is also an archive function. It is important to note that the STIR fund stimulates innovation and can easily be used as a follow-up to the *Eureka!* phase. When an idea is accepted, the researcher can gain hours to work further on it. This gaining of hours is important because it allows time for additional experiments or to probe more deeply into the theoretical basis of findings. The most difficult phase is to get an idea from STIR to a business unit.

From the interviews, it was found that convincing, lobbying, and networking play a role in the ideation process at Corus. A key observation is that respondents mentioned that there was no use submitting an idea once the yearly project plans had been set. This indicates that the *Eureka!* model is not just a platform for creative processes but that it is also an instrument for allocating funds, and is therefore political. Creative and political processes meet and mingle in a kind of grey area.

Finally, we can see that there are three separate phases in this continuum. There is an individual creative process, where intimates are involved. Then there is a 'selling' phase in which other professionals (such as peers, colleagues, and evaluators) are involved. And finally, there is the 'funding' phase in which managers decide about funding. There is no clear distinction between the creative phase and the political phase, but there is an intermediate phase in which elements of both processes intermingle and influence each other. We can call this the 'crea-political' process (Bakker et al., 2006).

Sensitizing concepts

In this example, we can see how important standing is in the various phases. John's standing plays a significant role in the trust he gets from Damian, Gunther, and Fleischer. It is also noteworthy that the winning of the STIR-NL award was seen as a sign of peer recognition. This shows clearly how important peer recognition and peer standing are.

Trust is mainly perceived in the same terms as standing but it can be difficult to define. Trust played an important role for John in gaining access to the Koblenz business unit. The trust he got from the people in Koblenz, especially Fleischer, was a factor in his success.

In regard to testimony, first, we noted that the idea was about a widely recognized problem, which needed a solution. Second, the idea was interesting because of John's clever use of models. Third, John mentioned several times that he was good at giving presentations, which was why he got the opportunity to present his idea in Koblenz. Finally, it is important to note

that the ideator knew exactly whom to convince in the business unit and he invested a lot of energy in doing this.

John's idea was well received by Gunther because he was already known as a creative man who had many ideas. He got attention in Koblenz because of his reputation as someone who gives interesting presentations. And, he was able to persuade Fleischer because he had worked with him before.

This indicates that the four sensitizing concepts—standing, trust, testimony, and favourite interaction—are important and also that they are interrelated.

Feedback and recent developments

We have noted that the *Eureka!* model is not just a platform for creative processes, but as an instrument to allocate funds, it is both a social process and a political platform. Creativity in Corus RD&T is more than just a matter of individual preferences and cognitive processes—it is creative processes in a social context, where ideas come up, are negotiated, and are transformed within the context of the organization. Strategic behaviour was observed around actor selection, taking initiative, and (creative) flexibility, which contradicts the more straightforward, goal-oriented creativity found in the literature. This means that actors use political strategies, which is exactly what was observed in the selection of evaluators, networking, convincing, and exposing a flexible attitude.

We can see that there are three separate phases in this continuum of idea evolution. There is an individual creative process, a 'selling' phase and the 'funding' phase. There is also an intermediate phase in which elements of the creative phase and the political phase intermingle and influence each other: the 'crea-political' process.

We have noted that some researchers were not very positive about *Eureka!*. At the time of this study, a newer version, *Eureka 2010*, was being developed to make the program more user-friendly and interactive, and to make it more accessible to employees. It was simplified by leaving the second screening phase out, so that there would be only one screening phase, and the process was streamlined by limiting the time for people to react to ideas to six weeks. If the selected people had not responded within that time, then they lost that opportunity and another solution would be chosen. Another suggested improvement was to combine *Eureka!* with other idea-management systems that are operational at Corus in other departments, although this was not done in the end.

Case 2: Idea management in the public sector—the Ministry of VROM

The second case looks at idea management within the public sector. In May 2008, the Dutch Ministry of VROM created the idea management process *Idea VROM* to facilitate new ideas coming from the public, from business, and from social organizations. The aim was to reduce

the gap between public administration and society and to use the knowledge from society to sharpen the Ministry's own policies.

Methodology

Our study took place from November 2009 to May 2010 and was focused on the challenges faced in tightening up *Idea VROM* in order to handle ideas more effectively and efficiently. There is currently little theoretical knowledge available on idea management in the public sector, so we chose an inductive approach for this case study, based on Van Thiel (2009).

Idea VROM served as the case. Four examples from it were selected as levels for analysis, and one of those is presented here. The processes of idea management were reconstructed through document analysis, observations, and semi-structured interviews. Fifteen interviews with ideators, officers, and other relevant actors were carried out. These interviews were focused on 19 critical success factors, which contributed to our conclusions about improving *Idea VROM*.

***Idea VROM* up close**

During its two years of operation, May 2008 to May 2010, *Idea VROM* received around 800 ideas. Changes to improve the process were also made during this period, with elements of the system abandoned or reorganized.

Idea VROM was taken from an existing idea management process that was used at another ministry. The original model was limited, however, because its focus was on business initiatives—‘unsolicited proposals’. It had to be adapted so that members of the public and social organizations could participate in it.

Idea VROM consisted of three phases:

- In the first, ideas were submitted through the website and checked for completeness by the *Idea VROM* secretariat. The quality of the idea was not evaluated at this stage. The initiative was then considered by the *Idea VROM* team, a multidisciplinary team of policy advisors, who evaluated it on the basis of seven criteria. If the idea met these seven criteria, it was approved and the ideator was invited for a first interview.
- This interview formed the second phase of the process. The ideator had an opportunity to explain the idea in a face-to-face situation with experts from the field. They then decided whether the idea would be rejected, if further enrichment was needed, or if the idea would be approved directly.

- In the third phase, the initiative was considered by the steering committee to see what role *Idea VROM* could have in the implementation process.

This original route was modified and sharpened over time for a number of reasons. At first the number of ideas submitted exceeded expectations, creating problems at the point where the *Idea VROM* team made the first selection. An attempt was made to enlarge the secretariat and to have it evaluate the ideas in order to reduce the pressure on the team. This resulted in loosening the formal criteria for selection. The effects of this will become clear when we look at how the system worked in practice.

The ideas

There was a big discrepancy in the stage of development of the submitted ideas: some were well thought through and well founded, while others were poorly developed. And they covered a wide range of topics—from environmental issues to suggestions to improve policies and from complaints to unsolicited proposals—which could be expected, considering the areas covered by this ministry. From over 800 ideas only 22 were selected for the second phase, and 16 were rejected after the interview. Of the final six ideas, only one was selected for the last round. Figure 4 illustrates the selection process.

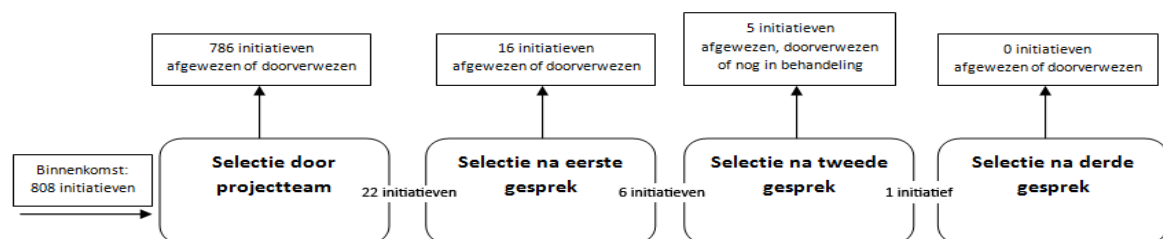


Figure 4: Idea routes through Idea VROM

Example: Low voltage in buildings

This idea involved a low-voltage network (12V/24V) for houses and only partially met the selection criteria. Before submitting the idea, the ideator had already shared it with acquaintances and colleagues, so it had already received some feedback. This is defined by Hellström and Hellström (2002) as moving step by step.

The experts showed some resistance when they had to evaluate this idea. One of the respondents called it a ‘not invented here syndrome’, but it was accepted and proceeded informally to an enrichment phase. Finally, a connection was made between this idea and another idea about decentralized generation of energy.

There was a promise from *Idea VROM* to establish contacts with other stakeholders. However, communication between the ideator and *Idea VROM* was poor at that time, and the

ideator was uncertain about the progress of his idea, which resulted in his fear that his idea might be stolen. The ideator describes his attitude at that time as 'distrust'. However, the idea was accepted for the second phase, in which the focus was on enriching the idea and taking clear steps for further development. The quality and foundation of the idea were evaluated, and there was an attempt to find support for it. There was a third interview, after which new supporters were found and some clear progress was made towards developing and implementing the idea. At this moment, there is a pilot project being implemented.

***Idea VROM* as idea manager**

Because of a lack of knowledge about processes of idea management in the public sector, *Idea VROM* had to invent its own wheel, so to speak. This led to a situation where the criteria for selection were abandoned in favour of the expertise in its formal and informal networks. The search for expertise was very time consuming and influenced the length of time needed to process the ideas.

This shift in priorities resulted in an inability to process the large number of initiatives submitted, which then resulted in long processing times, as well as issues of trust. The wide scope of *Idea VROM*'s goals made prioritizing even more difficult, and poor communication led to distrust, which affected the ideator's motivation.

Sensitizing concepts

The respondents tended to perceive *Idea VROM* as a bureaucratic organization that lacked power and whose expertise was sometimes in doubt. This often led to long run-times and low levels of communication and transparency. In addition, the ideators' high expectations about *Idea VROM*'s idea management system and their belief that its affiliation with the Ministry would back it with high levels of power and influence led to frustration and distrust about the system.

The project team also experienced problems due to the bureaucratic environment in which the project was situated, and high levels of resistance from within the organization led to a lack of decision making. This was partly due to the project's lack of visibility within the organization and partly to an absence of best practices for it to follow.

Feedback and recent developments

There is still potential for this project. By enlarging the formal network and applying the criteria for selection, ideas could be processed in a more efficient and effective way, and it would be easier to deal with large numbers of submissions. A larger and better connected network would be helpful during the enrichment phase and would shorten the run-time. A

transparent process with a good level of communication would help maintain trust. In the end, clear goals and 'commitment' from top management would give direction to *Idea VROM*.

Similarities and differences

We have presented empirical data from idea management processes in two different organizational contexts. Here, we discuss the similarities and differences of these two situations. When we compared the data, however, we found few similarities, but enormous differences.

Situation

First, there is a striking difference between the number and type of participants. At Corus, the system is used by their researchers in the RD&T department; it is an internal system. There are about one thousand people working there who are highly skilled. In contrast, *Idea VROM* was an open platform; it was an external system, which means that the participants could be anybody who lives in the Netherlands (about sixteen million people). They are not employees—they are citizens—which gave them a very different relationship with the idea management system.

As a result, there were very different kinds of ideas submitted. At Corus, the types of ideas that are submitted are closely related to the work the researchers do, but at VROM, the range of ideas was very wide, which made assessment difficult. Also, the development level of the submitted ideas was very different. Some ideas had been thought through, but others were in a very early stage of development, making it difficult for the assessors to interview the ideators. There was also the phenomenon at VROM that ideators submitted ideas that had already been rejected several times, which created a certain type of frustration that is not easy to deal with.

At Corus, the ideator can indicate which persons should evaluate the idea, as long as there is someone among them from a higher hierarchical level. At VROM, the ideas were evaluated by a multidisciplinary project team and later by the secretariat; it would not be easy for any team to evaluate such a wide range of ideas.

Whereas at Corus the evaluation is done by paid professionals, from the same department, that are selected because of their expertise, at VROM the experts were mostly from outside the organization, from the personal networks of the people involved in the system, working on a voluntary basis. There was generally little expertise at the first meeting, which made the gatekeepers' evaluations more difficult to accept. Ideators might wonder, 'What do they know? They are just public employees.'

The process at *Idea VROM* was not always completely documented, either. This would have involved information such as the decisions made, how detailed these decisions were, referrals, contacts, and so on.

Getting the idea accepted by the business unit is the main challenge at Corus. In order to accomplish this, the idea has to get through the idea management system and through STIR. At VROM there were different notions about how to get an idea through the process. While basically, the goal was actually to develop the idea, to share knowledge, and to get cross-fertilization of different fields, it was all rather fuzzy, which made implementation more difficult. It was an open situation: the stakeholder could be anybody. How to you find the right one?

It is also interesting to note that *Idea VROM* had different criteria for success. They felt that it was important to empower the person who had taken the initiative to submit an idea, and in some instances, the members of *Idea VROM* ignored their own criteria and continued working with ideas that, according to their criteria, should have been declared dead. We interpreted this as either eagerness to discover the pearls or a need to legitimize their own existence.

Another difference is the fact that at Corus, promising ideas can be directed to STIR, so that money or time can be allocated to enable the researcher to work on his or her idea. During this time, he or she can do additional empirical tests, try to improve the theoretical underpinning, or talk to important players in the field. The testimony of the idea can therefore be further improved, which increases the chances of getting the idea through. Unfortunately at VROM, there were no funds available for this. The value of the VROM system was in directing the idea to places where further development was possible, and this involved the expertise of the gatekeepers. However, again, the wide range of ideas made this difficult, and the dependence on external sources made planning more difficult and often caused delays.

Sensitizing concepts

There are also differences between Corus and VROM with regard to the sensitizing concepts. At Corus, it was found that the standing of the ideator influences the success of the idea. At VROM it was said that it is important 'if the person triggers us', but it was added that this 'does not influence our judgment'. We must admit that while we observed this, we do find it to believe. Of course it may well depend on the evaluator.

Trust was found to be very important at Corus. Trust was mentioned mainly with respect to the actors involved and to trust in the procedures of the idea management system *Eureka!*. At VROM, there was often the notion that the idea was the ideator's baby and there was fear that it might get stolen. There was the perception of the ideator as a mouse against the

Ministry as the elephant. There were issues of trust concerning both the procedures (i.e., time, transparency, and communication) and the competence of the evaluators. Who sees the idea? Where is it going? What is happening?

Good testimony was found to be very important at Corus, although, interestingly enough, testimony alone is not enough. It has to be accompanied by lobbying. We call this the crea-political process: creative processes are accompanied by political processes through certain phases. There is the creative process, which involves the intimate circle. Then there is the selling phase, in which ideators sell their idea to relevant actors. Third, there is a decision or funding phase in which decisions about the idea are made by people from higher levels in the organization. It was also found that it is important to know the people that have to be convinced. At VROM this was not the case. Evaluators said that the testimony on paper was crucial for decision making and that lobbying hardly played a role.

Favourite interaction—the way in which actors look at the idea—was not found to play a role at VROM. At Corus, on the other hand, it does play an important role in critical phases of the development of the idea. The STIR committee is regarded as ‘a warm bath’. And important decisions are only made when there is enough favourite interaction towards the ideator.

Number

Differences were also noted between Corus and VROM with regard to the volume of ideas and their decay curve. At Corus, in 2009, about 150 to 225 ideas were going through *Eureka!*. Of these ideas, around 35 to 50 were passed to STIR (roughly 20% to 25%), with around three to five patents resulting. Other ideas resulted in projects or were absorbed into programmes. At VROM, there had been 800 ideas submitted within 1.5 years. Twenty-two ideators were invited for a first meeting (2.5%), and of these less than 1% (six ideators) were invited for a second meeting. At VROM, more ideas were submitted, but more ideas were turned down and few were successful. At Corus, it appears that the unregulated influx of ideas is channelled by the allocation of means, so that a more or less stable flow of ideas is created.

The system

With regard to the idea management system, itself, at Corus, the system was introduced in 2002 and updated in 2010 with changes related to design, user-friendliness, interaction, and the ease with which it could be found by employees. *Eureka!* was simplified by keeping only one screening phase (leaving the second screening out), and the process was streamlined by limiting to six weeks the time people are allowed to react to ideas. At VROM, where the idea management system was only operational for 1.5 years, there was a desire to change, but this had not been done because of work pressures.

Discussion

It is tempting to attribute these differences to organizational differences because Corus and VROM are such different organizations. While this is true, we also think that many differences in the process can be related to the following: (1) the way the idea management system is used and (2) its place in the organization.

At Corus, the idea management system is internal, whereas at VROM, it was external, which explains differences in the number of participants, the range and quality of ideas, and difficulties in assessment.

At Corus RD&T, the idea management system *Eureka!* exists alongside other organizational activities and is embedded in the organization. For *Idea VROM*, this was not the case. *Idea VROM* appears to have lacked support at the top, and the submitted ideas did not get very deep into the organization. The place of *Idea VROM* in the organization was unclear and this lack of clarity resulted in slow processing and difficulties in communication.

As noted above, at *Idea VROM*, there were different goals. Bringing in ideas was not the only goal; it was also designed to stimulate public participation. Companies used the system to make unsolicited proposals. They would submit ideas that they would otherwise have had to present as contracts. Or, people would submit ideas about things they felt that the State was responsible for, but for which they had not found any other organization that could do them. This is understandable in such an open, external platform.

Conclusions

In this section, we present what we think are areas for improving the field of idea management—some topics for discussion.

The first point is that we think that there is no single approach for idea management that could work in all organizations. In other words, we would like to see diversity in idea management—diversity along different lines: the two idea management systems that are presented in this article are continuous systems; ideas can be submitted throughout the year. But would it be more practical in some instances to use event-based or case-based systems of idea management? This raises questions about the formulation of goals or targets, the accessibility of outputs, and the selection of participants (which is important in order to exclude unwanted participants and unsolicited proposals). The knowledge of the participants, themselves, can then be used not only for ideas, but also for the selection, evaluation, and enrichment, and maybe even the implementation of the ideas.

In a practical sense, we think that an idea management system is more interesting when it has incentives—either material or nonmaterial. A fund from which money can be allocated to

promising ideas has an enhancing effect. Trust in the knowledge and the decision-making process is also important, along with realistic ways of managing expectations.

Another way to stimulate ideas could be to make the steps easier; in other words, make it easier for ideators to communicate with relevant actors—to meet people in idea ‘breeding grounds’—to involve rapid prototyping, and to start pilot projects.

Neither of these two idea management systems enhances the kinds of interactions that could easily be stimulated with chatting, video conferencing, social media, and face-to-face contact.

In the Corus case, we saw how important peer recognition is, and we think that peer recognition could be built into idea management systems in order to make them more effective.

As part of idea management, we also think that there should be an effective ratio between effort and output, meaning that decay rates should reflect this ratio and that idea management should be integrated with implementation management.

At the level of the organization, legitimation is important. Who is paying for it? It is not possible to regard idea management systems as financially independent units—they are part of the larger organization. But there is the question of where the level of responsibility is. Here, too, we plea for variety: different idea management systems at different levels, integrated into the larger whole. The better integrated the idea management system, the more routes, like by-lanes and alleys, are possible, which enhances implementation.

On the theoretical level, we think that more research should be done on idea management. In addition, we believe that combining the literature on idea management with implementation literature could be an interesting first step.

Our research has also shown the importance of the sensitizing concepts (standing, trust, testimony, and favourite interaction). We think more research should be done on these concepts and how they are interrelated.

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THE AUDACITY OF CREATIVITY ASSESSMENT

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It is audacious and ambitious to attempt to measure a construct such as creativity, but it is the nature of human understanding to base our conceptions on samplings of information. Psychological constructs, which are concepts that cannot be directly observed but are theorized to exist, such as intelligence, creativity, motivation, or personality, are massive, multifaceted, and dynamic. However, we have found that we can take small samples of behaviors that can give us pretty accurate pictures of these constructs. As long as we remember that there are many things that are not in the pictures, that have changed since the pictures were shot, or are not able to be photographed, we may use the pictures to give us a good idea of the construct.

Caveats and Considerations:

Of course, as with all measurement, we must consider reliability and validity. These are some additional considerations.

1. There are false negatives. There are intelligent and creative individuals who do not get high scores on intelligence and creativity measures for many reasons.
2. There are not likely to be false positives. Given valid measures, it is not likely that a student will get a high score on an intelligence test and not be intelligent, or a high score on a creativity test without creative thinking.
3. All tests are not equal. So, one could get very different scores on two different measures of the same construct if the tests are based on different conceptions of the construct.
4. Assessments have a short shelf life. The content and form of the tests, as well as the norms, should be updated periodically to ensure that they are still relevant and representative of current populations.
5. Assessment results have a short shelf life, too. Constructs such as intelligence and creativity are now largely considered to be dynamic and developmental rather than fixed amounts at birth.
6. No assessments have pinpoint accuracy. They all have ranges of error that can occur randomly, so the standard error of measurement for the test should be considered.

Methods and Instruments for Assessing Creativity

Cognitive or Personality

One way to conceptualize the different views of creativity is the degree to which creativity is seen as a cognitive ability versus a personality trait. . The more modern, complex view of creativity is of a multi-faceted construct that incorporates such diverse components as genetic influences, cognitive processes, temperament, neuroanatomy, the field, and the domain in an all-encompassing dynamic, or system (c.f. Csikszentmihalyi, 1988; Feldman, 1988). A systems view would require a variety of measures such as creative thinking tests, personality checklists, judgments of real products, and observations of creative behaviors in different situations.

Eminent or Everyday

While some prefer to study the highest forms of human creativity, others have come to realize the shortcomings or pitfalls oftentimes associated with the biographical approach in studying deceased eminent creators. Hence, some contemporary psychologists have come to favor the empirical rigors of psychometric testing and measures to find everyday creativity.

Aptitude or Achievement

There is the issue of evaluating production (or achievement) versus potential (or aptitude.) Individuals who are producing artifacts that can be judged as creative often have had experiences and specialized training that allows them to produce at a high level of excellence as compared with others who have not had such training or experiences. An alternative is to provide children with the opportunities to create products and be trained to do so, such as with Maker's Project Discover (1992, 2009). However, Cropley (2000) argued that all creativity tests must be considered as measures of potential because creative achievement requires additional factors such as motivation, mental health, technical skill, and field knowledge.

Holistic, Subjective Judgments or Specific, Objective Criteria

In describing the consensual assessment technique, Amabile (1982) emphasized the importance of using a product-oriented measure that does not depend on objective criteria. She maintained that such objective criteria are impossible to develop. This is certainly the method by which most creative work is really judged. On the other hand, there are those who maintain that the best way to get valid and reliable judgments of the creativity of products is to use specified criteria that are clearly linked to theories of creativity as well as

real world assessments of products. Some criterion-based instruments that can measure creative products in various domains include the Creative Product Semantic Scale (CPSS, O'Quinn & Besemer, 1989) and Creative Product Analysis Matrix (CPAM, Besemer, 1998), as well as a similar system developed by Cropley and Cropley (2009). The Cropleys instrument differs in being more explanatory of the levels for each descriptor.

Child or Adult

A major consideration, which has strong implications for the choice of an instrument or assessment system is whether one will be assessing children or adults. Some instruments are very age specific whereas others can be geared toward children or adults.

Divergent or Convergent Thinking

Some have criticized divergent thinking tests as less than adequate in measuring creative ability, although the Torrance Tests of Creative Thinking have been found to have good predictive validity even after 50 years (Runco, Millar, Acar, & Cramond, 2010). On the other hand, convergent thinking tests such as the Remote Association Test (Mednick & Mednick, 1967) and standardized IQ tests (i.e. Wechsler's) do not reliably predict adult level creative achievements. If neither divergent nor convergent thinking ability by itself sufficiently captures the creative potential of an individual, and a confluence of both types of thinking abilities accounts for a larger variance of creative achievement or potential over either type of thinking alone, it is logical to infer that a complete creativity assessment model should take both factors into consideration.

Still others prefer to look at the phenomenon at the neurobiological level, hence, bypassing the fuzzy boundaries between divergent thinking and creative thinking abilities, although the actual assessment tools these researchers use on human subjects are still by and large psychometric. This is certainly a promising area for continued research. However, this research is too new, the relationships too tenuous, and the tools too imprecise for use in identification of creative individuals at this time.

In Context or Decontextualized

An area of debate for assessment in general is that of authentic assessment, which is measurement in a natural setting, versus testing that is decontextualized (cf. Messick, 1994). There is much to be said for the legitimacy of authentic assessment. Certainly, Maker's *Discover Method*, Amabile's *Consensual Assessment Technique*, and other observational methods or product evaluations are more likely to be situated in a learning or life context more than a paper and pencil test. This issue is important both for issues of motivation,

especially with children, and with the task specificity of the product or performance. So, if one is interested in performance in a particular field, it is logical to assess performance in the field.

General or Specific

This leads to a question which is one of the major tensions in the study of creativity—is creativity a generalized ability or is it task specific? One's belief about this issue will certainly impact the type of assessment chosen. General tests of creative thinking, such as the Guilford Tests, Torrance Tests, and personality measures, assume that creativity can be measured as a way of thinking or being that is generalizable, as conceptualized by the Root-Bernsteins (1999) and others. It may only be expressed in a certain area or areas, but it is a general way of thinking, similar to the idea for *g* as a general intellectual ability (Gottfredson, 1997). Others contend that creativity is domain-specific (c.f. Gardner, 1997). Clearly, measures of aptitude in specific areas or assessment of specific products are more appropriate for such assessment.

This question brings up the measurement concern of bandwidth versus fidelity raised by Cronbach (1970): The wider the area measured (bandwidth) the less precise the measurement (fidelity). So, a test of general creativity would have a wider bandwidth resulting in lower fidelity. A specific test will have greater fidelity, but less bandwidth.

Self or Other

Another concern is the source of information for the assessment. Tests and product evaluations involve an initial response by an individual that is then rated by one or more judges. Self-identification checklists, such as the *RIBS*, are completely dependent upon input by the individual. Other checklists, though dependent upon observations of an individual's behavior, emphasize the input of the person completing the checklist.

The Four Ps

One system for studying creativity that honors its multidimensionality is called the four Ps (Rhodes 1961): Person, Process, Product, and Press.

Person

In studies of the creative person, several common traits are evident regardless of the domain in which the individuals operate. Tardif and Sternberg (1988) compiled a list of such characteristics from research studies, and concluded that although there is no one personality trait that can differentiate creative people from those less creative, there are

constellations of traits that are commonly mentioned in studies of the personality of creative individuals (p. 435). These personality traits include, in order of the most commonly mentioned to the least commonly mentioned in the studies: psychological risk taking; perseverance; curiosity; openness to experiences; driving absorption; self-discipline, commitment, and task focus; high intrinsic motivation; freedom of spirit that rejects limits; self-organization; and a need for self-efficacy and challenge (p. 435-436). These personality traits can be measured through personality tests and observations.

Process

Although the detailed creative process for each individual is probably idiosyncratic, Wallas' (1926) four-stage process: preparation, incubation, illumination, and verification, provides an overarching model that has been found to apply to both the arts and the sciences (Langley & Jones, 1988). Yet, it was the operational processes of fluency, flexibility, originality and elaboration, as described by Guilford (1956) that enabled psychologists such as Guilford and Torrance to create assessments of creativity. In 1979, after studying creativity for over thirty years, Torrance released the Streamlined Scoring for the figural version of the Torrance Tests of Creative Thinking, which goes beyond the original FFOE system developed by Guilford to include additional psychological constructs and creative behaviors.

Product

Ultimately, what brings a creative person attention and what causes the process to be valued is the product, and evaluating creative products is considered the purview of each domain. However, history has shown us that the gatekeepers in a domain are not typically the most forward thinking. So, the problem of evaluating products in a domain becomes one of combining the wisdom of domain knowledge with the sensitivity to and appreciation of innovation. As discussed above, this is usually done by judges of some kind, but there are differences of opinion about whether the judges should be guided by established criteria or by their inherent standards and implicit understandings of creativity.

Press

The final P of the system is Press, which refers to the environmental factors that affect creativity. The press includes time and place as well as the people, culture, physical setting, political climate, resources available, etc. Researchers such as Amabile and her colleagues (KEYS, 1995) and Ekvall (Situational Outlook Questionnaire, [SIQ], 1996) have sought to determine the factors in an environment that are conducive to creativity.

Slightly different in focus, but also designed to assess organizational creativity, Basadur and Hausdorf (1996) developed a questionnaire to measure attitudes within an organization toward creativity and creative problem solving.

Conclusion

Yes, it is audacious to attempt to measure creativity, but the value of recognizing and nurturing creativity for the good of the individual and society is so great that we should not shirk from the task because it is challenging. Rather, we should use the best means available to identify creative abilities while continuing to refine existing measures and develop new and better ones. Such a task requires audacity, but rather than being daunted, we should remember the words of Disraeli (1833), "Success is the child of audacity" (p. 9).

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WILLIAM JAMES, AND WHAT IT MEANS TO BE AN EMOTIONAL GENIUS

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Abstract

The purpose of this paper is twofold: First, to explore how emotions can be creative and not just automatic, semi-reflexive reactions to emergency situations; and, second, to draw attention to James's provocative treatment of emotions in his *Varieties of Religious Experience* (1902), in contrast to the better known James-Lange theory. We take as a starting point for analysis one strain in James's thought, namely, what it means to be an emotional genius. We then review empirical support for the idea of emotional creativity, and we consider some objections, both that the idea is "absurd" and that it is "nothing new."

The primary purpose of this paper is to illustrate how creativity can occur in the emotional as well as in intellectual and artistic domains. A secondary purpose is to stimulate interest in William James's (1902/1961) *Varieties of Religious Experience*, which remains, in our opinion, one of the most provocative but least appreciated works on emotion available today.⁵ This is not, however, an exegesis of James's complex writings on emotion, nor do we pursue the many "neo-Jamesian" trends in contemporary psychology (e.g., Laird, 2007), philosophy (e.g. Prinz, 1904), and neurophysiology (e.g., Damasio, 1994).

To begin, consider the following two statements, one by William James near the beginning of the 20th century, and the other by Robert Zajonc near the end of the century. First, James (1902/1961): "When a person has an inborn genius for certain emotions, his life differs strangely from that of ordinary people, for none of their usual deterrents check him"(p. 215). Now, Zajonc (1998): "there are 'cognitive virtuosos' . . . but there are no 'emotional prodigies.' We can speak of an 'intellectual giant' but an 'emotional giant' is an absurdity" (p. 597). After nearly a century of psychological research, did Zajonc know something that James did not? Or did Zajonc overlook some facts that were salient to James?

Common sense, as well as much psychological theory and practice, suggest that Zajonc had the better argument. Everyone would agree that Einstein was an intellectual genius, and that Beethoven and Picasso were giants in music and art. But an emotional genius? Names do not come readily to mind. Even our ordinary language seems to conspire against James. Colloquially speaking, emotions are often described as "irrational,"

“impulsive,” “immature,” “rigid,” and even “brutish.” Such descriptors are seldom applied to creativity, which is typically ranked among the highest of the “higher” thought processes. It is easy to be excessively emotional, but to be excessively creative — to be an emotional genius — that seems a contradiction of terms.⁶

Lack of recognition and popular stereotypes do not imply, however, that James was talking nonsense when he spoke of emotional geniuses. To explore the sense behind James’s observation, we begin by examining the three main elements in his statement, quoted earlier, namely, (a) what it means to be an “*emotional genius*”; (b) the ways the life of an emotional genius “*differs strangely*” from that of ordinary people; (c) how the “*usual deterrents*” do and do not apply.

Emotional Genius

To be counted as a genius requires more than exceptional skill in an area; many contemporary mathematicians were more skilled than Einstein, but they did not achieve recognition as a genius. Whatever else it might entail, the term “genius” implies creativity. Creativity was a major theme in James’s philosophy. For example, in explaining his version of pragmatism, he observed that:

In our cognitive as well as in our active life we are creative. We *add*, both to the subject and to the predicate part of reality. The world stands really malleable, waiting to receive its final touches at our hands. Like the kingdom of heaven, it suffers human violence willingly. Man *engenders* truths upon it. (James, 1907/1955, p. 167, italics in original)

An emotional genius, then, is creative in the “active life,” in a manner and degree not usually experienced. This raises further questions, for example: How might we judge an emotional response as creative? Is emotional creativity restricted to a few geniuses, or is it distributed more broadly throughout the population? And what are some of the implications — theoretical and practical — of emotional creativity, to the extent that it exists? These are some of the questions we address during the course of this paper.

With regard to the first question (How we judge an emotional response as creative?), three criteria may be involved in judging a response — emotional or otherwise — as creative: (a) novelty, (b) effectiveness, and (c) authenticity.

Novelty is probably the most frequently mentioned criterion for assessing creativity. In practice, however, it is a difficult criterion to apply. Something can be novel only by comparison to that which is commonplace. The commonplace may refer to what is

customary for the individual or, more commonly, for a reference group. The larger or more prominent the reference group, the more likely the person is to be recognized as a genius.

Effectiveness is another commonly recognized criterion for creativity. A creative response should not only be different, it should also be of value, that is, of potential benefit to the individual or group. We refer to this criterion as “effectiveness” rather than the more commonly used term, “value,” for the former is more generic and neutral. As with novelty, effectiveness cannot be judged in the abstract, but always presumes a context: Effective with regard to what? To complicate matters further, what is judged effective in the short term may prove ineffective in the long run, and vice versa. Simply put, effectiveness is always relative to time and place.

Authenticity is less often mentioned as a criterion for creativity, perhaps because it is often conflated with novelty. Hence, we will explain what we mean by authenticity in some detail. Consider the following historical episode. Relatively few paintings exist by the seventeenth century Dutch artist, Vermeer. (*Girl with a Pearl Earring* is perhaps the best known, in part because of a best selling historical novel by the same name). Not well known outside of his home town of Delft during his lifetime, Vermeer’s genius as a painter became widely recognized toward the end of the nineteenth century. However, since his known works were relatively few, it was widely expected that more masterpieces by him would be found — hanging unacknowledged on someone’s wall or forgotten somewhere in an attic. A talented forger, Han van Meegeren, saw an opportunity. He produced paintings in the style of Vermeer which were subsequently “discovered” and authenticated by some of the leading experts in the field. It was a lucrative business, and van Meegeren became one of the wealthiest painters in Europe.

After the second world war, van Meegeren was arrested as a Nazi sympathizer. To escape punishment on that charge, he confessed to his forgeries and described how he had pawned off a fake Vermeer on Herman Goering, commander in chief of the German Luftwaffe, whose carpet bombing of central Rotterdam had forced the surrender of Holland during the early days of the war. Charming and charismatic, van Meegeren was able to forge a new identity for himself. Rather than a collaborator, he became a folk-hero, a Dutchman who had duped the hated Goering. He was tried and convicted for his admitted forgeries but not for collaboration, and he died of natural causes before even a light sentence for the former crime could be carried out. (J. Lopez, 2009).

This episode illustrates the importance of authenticity in judgments of creativity. The “Vermeers” painted by van Meegeren were not copies of existing paintings; rather, they were of scenes that Vermeer might have painted but had not. Each painting was as unique (novel) as any that Vermeer had actually painted and as aesthetically pleasing (effective). However,

when it was learned that they were not authentic Vermeers, they were no longer considered creative, and they lost much of their value.

What we are calling authenticity might also be called originality. In its root meaning, originality refers to the origin of something. In the above example, we prize original paintings by Vermeer because their origin is a manifestation of the artist's own "genius." A forgery, by contrast, is dictated from without, a sophisticated version of "painting by the numbers," so to speak.

Originality is often conflated with novelty, which is why we prefer the term "authenticity." Rudolf Arnheim (1966) has captured the difference between novelty and what we are calling authenticity in the following way:

The creative individual has no desire to get away from what is normal and ordinary for the purpose of being different. He is not striving to relinquish the object but to penetrate it according to his own criterion of what looks true. . . . The desire to be different for the sake of difference is harmful, and the urge to evade the given condition derives from a pathological state of affairs inherent either in the situation . . . or in the person, as in the "escape mechanism" of neurotics, attributed to artists by the Freudians. Faced with the pregnant sight of reality, the truly creative person does not move away from it but toward and into it. (p. 299)

Authenticity, in Arnheim's picturesque phrase, involves "the pregnant sight of reality"; pursuing this metaphor, it might be said that a copy or forgery is a miscarriage, stillborn and lifeless.⁷

Authenticity faces inward toward the individual self and outward toward the culture (Bessant, 2011). In the West, with its cultural emphasis on individuality, an authentic response also tends to be idiosyncratic to the self and hence novel; in East Asian cultures, by contrast, where identification with the collective and its traditions is prized over individualism, authenticity is more easily distinguished from novelty (Averill, Chon, & Haan; 2001; Sundararajan & Averill, 2007). It might be objected that emotions are ipso facto authentic, but that is not always the case, as any experienced clinician can testify. For a thorough discussion of authenticity as it applies to emotions, see Salmela (2005).

The criteria of novelty, effectiveness, and authenticity are compensatory (e.g., greater effectiveness may compensate for less novelty; and authenticity, some might argue, can trump both). The important point relevant to our present discussion is that a genius displays the three qualities in his or her work, albeit in various degrees and combination. In the remainder of this article we often will speak of emotional creativity rather than emotional

genius: The latter implies the former, but not necessarily vice versa — creativity is ubiquitous, genius is exceptional.

Let us turn now to the second element in James's characterization of emotional genius.

Lives That Differ Strangely

According to James, the life of an emotional genius "differs strangely from that of ordinary people." On one interpretation, this assertion is a near tautology. Almost by definition, the life of a genius in any field differs strangely from that of ordinary people, otherwise the person would not be considered a genius. But James had more in mind than this.

When set free of the usual deterrents, James asserted that "we float and soar and sing. This auroral openness and uplift gives to all creative ideal levels a bright and caroling quality, which is nowhere more marked than where the controlling emotion is religious" (p. 216).⁸ James cites as one example among many the experience of Blanche Gamond, a Huguenot persecuted under Louis XIV. Stripped naked from the waist up, she was tied to a beam and beaten by six women using willow rods. Rather than cruel punishment, Gamond perceived the whippings to be an honor for her faith. Recounting the event, she later wrote that the women who were beating her exclaimed in exasperation, "We must double our blows; she does not feel them, for she neither speaks nor cries." To which Gamond commented, "And how should I have cried, since I was swooning with happiness within" (quoted by James, p. 233).

Religious zealots are not the only ones who have experiences that differ strangely from the ordinary. Another class of emotions that James frequently drew on for examples was "susceptibility to wrath, the fighting temper" (p. 213). For example, he quoted the Russian General Skobeleff, who claimed that "the risk of life fills me with an exaggerated rapture. . . . a danger into which I can throw myself head-foremost, attracts me, moves me intoxicates me. I am crazy for it, I love, I adore it. I run after danger as one runs after women; I wish it never to stop" (pp. 215-216). To most people, love is more attractive than danger (although danger can increase susceptibility to love). But love, too, can lead to a life that differs strangely from the ordinary. "Love would not be love unless it would carry one to crime," James quoted Bourget as saying (p. 214).

And why does the life of an emotional genius differ strangely from that of ordinary people? In part, said James, because the usual deterrents do not apply — this is the third element in his characterization of emotional genius.

Usual Deterrents

We are often deterred in emotional expression by social norms — and not just in outward expression. How we think and feel is also regulated by socially transmitted beliefs and rules. For example, in contemporary American culture, a person should not laugh at a funeral, or even feel like laughing; and if a person does laugh, the behavior is likely to be taken as a sign of ignorance or rudeness, not creativity. Thus, James's contention that an emotional genius is not "checked" by "usual deterrents" may be correct as far as it goes, but the idea needs expansion.

The term "deterrent" has a one-sided, largely negative connotation. It focuses on the regulation of previously formed emotions; it leaves unaddressed how emotions originate in the first place, and how they might be transformed. Most social norms have constitutive as well as regulative functions. A nonemotional example will illustrate what we mean. A game such as chess is constituted — made the kind of game it is — by a set of beliefs and rules that govern the movement of the pieces, the arrangement of the board, what it means to checkmate the king, etc. Or, to take a more naturalistic example, language is constituted as well as regulated by the rules of grammar. If the grammatical rules of English were eliminated completely, a person could not speak English more freely, there would be no English language as such to speak. And so it is with the beliefs and rules that help constitute as well as regulate emotional syndromes.

If we expand James's notion of "usual deterrents" to include the constitutive as well as regulative function of social beliefs and rules, the possibilities for emotional transformation become evident. Change the rules and you change the emotion. When the change is for the better, we may speak of emotional creativity (Averill & Nunley, 1992); when it is for the worse, of neurosis (Averill & Nunley, 2010).

Preparedness As a Precondition For Creativity

Extended periods of preparation are typically necessary for creativity, even if the final product seems to appear suddenly. Thus, while preparedness is not, strictly speaking, a criterion for creativity, it is almost a necessary precondition. That is true in the arts and sciences (Weisberg, 1986), and there is no reason to believe it is not also true with respect to the emotions. Many of the creative emotional episodes cited by James, for example, were preceded by spiritual practices extending over months or years. St. Augustine provides a famous example. For many years Augustine wanted to convert to Christianity, but he could not make himself believe through an act of will. As a youth he famously pleaded to God: "Grant me chastity and continency — but not yet" (*Confessions*, VIII, 7). After many years of

study and contemplation, he suddenly got his wish. One day, while in a state of mental turmoil, he retreated to a garden and threw himself on the grass under a fig tree. There, he heard a child's voice saying "take up and read, take up and read" (*tolle lege, tolle lege*). He took up a book of St. Paul's epistles, started to read a random passage, and, as they say, the rest is history.

Eminent versus Everyday Emotional Creativity

Although James's focus in the *Varieties* was on emotional genius, he did not neglect mundane, everyday experiences entirely. The majority of people, he observed, can imagine what an emotionally creative experience might be like "by recalling our state of feeling in those temporary 'melting moods' into which either the trials of real life, or the theatre, or a novel sometimes throws us" (p. 217). Most any good work of literature will contain descriptions of — and may stimulate in the reader — emotional responses that meet the criteria for creativity outlined earlier but do not qualify as "eminent." For more on the distinction between eminent and everyday creativity, see Richards (1990).

Supporting Evidence

Support for emotional creativity stems from two main sources: Theoretical background and empirical data.

Theoretical Background

Emotional creativity is a straightforward inference from a social-constructionist view of emotion (Averill, 1980, 2005). Social constructionism makes three fundamental assumptions: First, emotions are complex patterns of response or syndromes; second, no one kind of response (e.g., facial expression, physiological arousal, or subjective experience) is a necessary or sufficient for the whole; and, third, social norms (shared beliefs and rules), not genetic programming or individual experience, are the main principles by which emotional syndromes are organized.

The first two of these assumptions are now widely — albeit not universally — accepted. The third, is more controversial, for it seems to overlook the importance of biological and psychological factors in the development of emotional reactions. That, however, is to misunderstand the case. Biological (genetic) influences are clearly important organizing influences, on some emotions (e.g., sudden fright) more than others (e.g., righteous anger). But even at the level of subcortical and hormonal mediating mechanisms, the environment into which an individual is born and matures can have a formative influence (Mason & Capitanio, 2012). Individual experience adds another level of organization (Russell, 2003). However, a completely idiosyncratic emotion makes no more sense than a

completely idiosyncratic language. Simply put, for an emotion to be understood, it must involve socially shared principles of organization.⁹

If we accept the three conditions mentioned earlier as underpinning a social-constructionist view (i.e., emotions are complex syndromes, no one component of which is essential to the whole, with social norms providing the primary — though not exclusive — organizing principles), the possibility for emotional creativity follows logically. *What societies construct, individuals can reconstruct.* If the reconstruction meets the criteria of novelty, effectiveness, and authenticity, then it can be considered creative. It is that simple.

Simplicity, however, can be deceiving. We would also like evidence beyond logical argument and the kind of anecdotal reports discussed by James in the *Varieties*.

Empirical Support

Not everyone can be expected to be equally creative in the emotional any more than in the intellectual and artistic domains. One way to explore emotional creativity is, then, by examining the correlates of individual differences. To this end, an Emotional Creativity Inventory (ECI) has been constructed (Averill, 1999; Averill & Thomas-Knowles, 1991). The latest version of the Emotional Creativity Inventory (ECI) includes 30 items, 7 of which are related to emotional preparedness, 14 to novelty, 5 to effectiveness, and 4 to authenticity. Factor analyses suggest that the preparedness items form one facet; the novelty items, another facet; and the effectiveness and authenticity items, a third facet.

Personality correlates. Scores on the ECI are associated in a predictable manner with a variety of other personality variables. Among the “Big Five” personality dimensions, for example, the ECI is significantly correlated with Openness to Experience ($r[147] = .57$) and Agreeableness ($r[147] = .20$), but not with Neuroticism, Extraversion, or Conscientiousness, as measured by the NEO-PI (Costa & McCrae, 1985). People who score high on the ECI are more prone to mystic-like experiences (e.g, transcendence of space and time, the loss of ego boundaries, and a sense that all things are alive), as measured by Hood’s (1975) scale ($r[89] = .46$). Self-confidence should facilitate receptivity to unusual experiences; not surprisingly, therefore, a modest correlation exists between the ECI and Rosenberg’s (1965) self-esteem scale ($r[87] = .25$). Finally, a negative relation exists between the ECI and alexithymia ($r[87] = -.35$), as measured by the TAS-20 (Bagby, Parker, & Taylor, 1994). These correlations are for the total scores on the ECI; the pattern of relations differ somewhat when the preparedness, novelty, and effectiveness-authenticity facets are considered separately.

Behavioral correlates. People who score high on the ECI are rated by their peers as emotionally more creative than are low scorers, presumably on the basis of their everyday behavior. In the laboratory, they are also better able to express unusual emotions symbolically in words and pictures (Gutbezahl & Averill, 1996); and benefit more from solitude, a condition traditionally associated with creativity (Long, Seburn, Averill, & More, 2003).

Some Objections to the Idea of Emotional Creativity

Two kinds of objections may be raised against the idea of emotional creativity. The first kind of objection, epitomized by the observation of Zajonc cited at the outset of this article, is that the idea is simply “absurd.” A second kind of objection is almost the opposite, namely, that the idea is “nothing new.” We consider each type of objection briefly.

The “Absurdity” Objection

Let us return for a moment to Zajonc’s (1998) observation that is absurd to speak of emotional prodigies. “Absurdity” is a strong word, and perhaps we should not interpret Zajonc literally. But whether meant literally or not, his contention echoes a long-standing theme in the Western intellectual tradition. “Absurdity” implies a deep-seated — almost “emotional” — objection; it deserves to be taken seriously, if only for the sake of argument.

By way of background, let us consider for a moment Csikszentmihalyi’s (1999) systems approach to creativity. Csikszentmihalyi points out that judgments of creativity are not based on individual achievement alone, but also depend on the domain and field of endeavor. The distinction between the domain and the field corresponds roughly to the distinction between culture and society, as adumbrated by Kroeber and Parsons (1958). The *domain* of emotion is the cultural background, the network of stable ideas and customs that preserve and transmit new ideas from one generation to another. The *field*, as Csikszentmihalyi (1999) conceives of it, is the set of social institutions that selects novel ideas that seem worth preserving as part of the domain (p. 325). As represented in contemporary American psychology, the field of emotion involves professional organizations such as APA, funding agencies, journal reviewers and editors, and academic departments, to mention a few of the more prominent “gate keepers.”

With Csikszentmihalyi’s distinction in mind, we may call the one type of objection to emotional creativity, *domain antipathy*, and another type, *field impediments*.

Domain antipathy. An important feature of the emotional domain is its link to cultural values. Emotions are related to values in two ways. First, emotional arousal typically involves a value judgment, an appraisal that something is good or bad, right or wrong, beneficial or harmful. Second, emotions themselves are targets of value judgments. As

Aristotle put it, and many others have followed, virtue is the ability to experience the right emotion in the right way, toward the right person, on the right occasion, and with the right motive. Vice is just the opposite.

It follows that creativity in the domain of emotion may seem absurd to many people. Creativity in any domain is liable to be met with resistance, at least initially. If the creative response gains currency, behavior that was previously considered “virtuous” may be devalued. To the extent that emotions are linked to deeply held values, any innovation in the emotional domain is thus liable to meet strong opposition.

Illustrations are not difficult to find. In 1940, Bertrand Russell was appointed professor at the City College of New York. After a public outcry over his political and social views, particularly his views on love and marriage, the appointment was annulled by court order. This seemed to confirm an earlier observation by Russell (1930/1958) that “Caution is enjoined both in the name of morality and in the name of worldly wisdom, with the result that generosity and adventurousness are discouraged where the affections are concerned (p. 185).

We are not suggesting that Zajonc, when he claimed that the idea of an “emotional giant” is absurd, was attempting to discourage “generosity and adventurousness . . . where affections are concerned.” We do believe, however, that his charge reflects a deeply held strain in Western culture. In fact, his claim is often warranted.

When emotional creativity, in fact, becomes absurd. Many — even most — innovations in any domain ultimately prove ineffective or actually harmful. Genetic mutations are an obvious example on the biological level, but similar considerations apply to innovations on the psychological and social levels. Thus, we do not mean to gloss over the heavy burden that dysfunctional emotional reactions often place on human relations (Averill & Nunley, 2010). Some selective mechanisms, as represented by field impediments, are necessary.

Field impediments. Throughout most of the 20th century, as psychology strove for recognition as a science, emotions were not so much disparaged as neglected, at least within the academic field. That situation appears to be changing, and we are entering a period that Robert Solomon (1976, p. 120 ff.) Has called “Rational Romanticism”: Rational, because it views emotions and reason as inextricably linked and mutually reinforcing; and Romantic, because it views emotions as life-affirming and not disruptive of human welfare. James's notion of an emotional genius fits easily in Solomon's hybrid category of romantic rationalism, but only after a long detour known as the James-Lange theory.

The crux of the James's theory as first presented (1884) is that we are sad because we cry, afraid because we run, etc., rather than vice versa. This idea was hardly novel with James. Titchener (1908) has traced its antecedents as far back as Descartes (Titchener,

1908), and he could have gone much further, for example, to the third century Graeco-Roman philosopher, Plotinus (ca. 270/1969; see especially *Ennead* III, vi, 5, on fear; IV, iv, 19, on pain; and IV, iv, 28, on anger). Undeniably, the theory contains a grain of truth; however, it hardly does justice to the kinds of experiences of concern to James in the *Varieties*, nor to his notion of emotional genius. Subsequently and independently of James's initial publication, the Danish physician Carl Lange presented a view of emotion that was similar in some respects. Hence, the position has come to be known as the James-Lange theory. Actually, there were significant differences between the views of James and Lange. For example, Lange focused on vascular changes, particularly in the brain, as the sine qua non of emotion. James included afferent feedback from bodily movements of all kinds, even refference from the brain's own motor impulses. Such an expansive view of bodily activity makes the theory virtually immune to falsification; moreover, it seems to ignore a central feature of everyday emotional experience, namely, that emotions are involuntary reactions divorced from higher (cognitive) thought processes. For these and other reasons, the James-Lange theory has traditionally been interpreted narrowly, more along the lines of Lange than of James; that is, as referring to visceral feedback, or to feedback from largely reflexive motor movements such as facial expressions. It is therefore not surprising that James makes little mention of the James-Lange theory in the *Varieties* (neither the theory nor Lange himself are mentioned in the 1961 reprint of that work). We believe the reason is evident: If the idea of an emotional genius is to have meaning, we must abandon the James-Lange theory in favor of something more akin to James's "other theory" as presented in the *Varieties*, vague and open-ended as that account may seem (Averill, 1992).

Let us turn now to a different kind of objection to the idea of emotional creativity.

The "Nothing New" Objection

There is not space, nor is there need, to consider all the ways that emotional creativity might be reinterpreted as "nothing new." For illustrative purposes, we will consider briefly the relation of emotional creativity to three other constructs, namely, emotional intelligence, appraisal, and mixed emotions.

Emotional Intelligence

Few recent constructs have caught the scientific and popular imagination as startlingly as has the idea of emotional intelligence. For the sake of brevity, we focus here on the version of emotional intelligence forwarded by Salovey, Mayer, and their colleagues (e.g., Salovey, Hsee, & Mayer, 1992; Mayer, Salovey, & Caruso, 2008), and the test they have constructed for its assessment, the MSCEIT (the Mayer Salovey Caruso, Emotional Intelligence Test)¹⁰. Like traditional intelligence (IQ) tests, the MSCEIT contains mini-

problems to be solved, such as identifying a facial expression. A response is considered correct if it matches the responses made by the majority of persons who have taken the test, or by a smaller group of presumed experts. Such “consensus scoring” tends to devalue unusual and idiosyncratic emotional responses. In this respect, the MSCEIT, also like most standard IQ tests, is a measure of convergent rather than divergent intelligence.

A study by Ivcevic, Brackett, & Mayer, (2005) compared emotional creativity and emotional intelligence directly, using a variety of measures including the ECI and the MSCEIT. Intercorrelations and confirmatory factor analyses suggest that emotional creativity and emotional intelligence are independent abilities, at least in terms of the measures used. Moreover, the ECI was a better predictor of creative writing and artistic activities than was the MSCEIT. This is consistent with the notion that the MSCEIT is a measure of convergent rather than divergent emotional intelligence.

To summarize briefly, emotional creativity is related to emotional intelligence, but the relation is undoubtedly complex and little understood (as is the relation between cognitive creativity and cognitive intelligence).

Appraisal Theory

The so-called “cognitive revolution” in studies of emotion stems, in part, from recognition of the fact that the way people respond emotionally depends on how they appraise or evaluate a situation, e.g., as threatening in the case of fear, as an affront in the case of anger, as an irreparable loss in the case of grief, and so forth (Arnold, 1960. Lazarus, 1966; Scherer, 1999).

Appraisal is also important to emotional creativity. Unless a person can appraise a situation in ways that are novel, effective, and authentic, the associated emotion is unlikely to be creative. But emotional creativity goes beyond appraisal theory as typically understood. A little history will help to illustrate the point. In an early attempt to integrate James’s theory of emotion with Darwin’s theory of evolution, Dewey (1895) pointed out that the appraised object of an emotion is part of the emotion itself, not an antecedent condition or cause of the emotion (although it can be that, too). For example, to see a bear as frightening, I must already fear the bear. This, on Dewey’s analysis, is a logical, not an empirical point. (For similar analyses by more recent philosophers of emotion, see xxxx.) It follows that if I change my appraisal in a creative way, I also change other aspects of the emotional syndrome; and, vice versa, if I creatively change the way I respond behaviorally, I will also will change my appraisals.

In short, emotional creativity treats appraisals as only one aspect of an emotion that is subject to innovation and change.

Basic and Mixed Emotions

It might seem ironic, if not outright contradictory, to include basic-emotion theory as an alternative to emotional creativity. As described earlier, emotional creativity is an offshoot of social constructionism, which rejects the idea of basic emotions, at least in the biological sense.

However, creativity can take a variety of forms. Consider for a moment “found art,” in which an artist uses a preexisting object to achieve an aesthetic end. Analogously, an emotionally creative response might involve the particularly effective and authentic application of a preexisting emotion, regardless of its origin, without the emotion itself undergoing fundamental change. And, of course, we need not limit consideration to a single emotion. Some basic-emotion theorists assume that complex emotions arise when a small number of biologically based emotions are combined. An analogy with the color wheel has been used to illustrate the point. All the colors normally seen by humans can be obtained by combining a few primary colors (Plutchik, 1980). On this analogy, an emotionally creative response might simply be a novel (effective and authentic) combination of pre-existing emotions.

Whether singly or in combination, we have no argument with the notion that pre-existing emotions can be used, not just intelligently (see earlier discussion of emotional intelligence), but also creatively. But there is a serious limitation to the analogy between mixed emotions and mixed colors. A painting (e.g., by Rembrandt, or even Jackson Pollock) involves a mixing of colors, but such a description hardly does justice to the creativity of the result. Similarly, a creative emotional episode may involve a combination of emotions, or emotional components, but its creativity depends on the way those emotions are synthesized into a whole, which may differ fundamentally from a mere sum of its parts.

Concluding Observations

We began this article with an observation by James (1902/1961) that “when a person has an inborn genius for certain emotions, his life differs strangely from that of ordinary people, for none of their usual deterrents check him.” We believe this statement has widespread implications. It obliges us to rethink what we mean by emotion; the principles by which emotions are constituted as well as deterred; and how emotions can be reconstituted creatively to meet new challenges.

James made his observation on emotional genius in a chapter on Saintliness. That was fitting, given that the *Varieties* is a work on religious experience. The religious subject

matter of the work may have diverted attention from the broader implications of James's analysis. However, as his references to “the fighting temper,” and to love that “would carry one to crime” suggest (see earlier citations), his interests were not limited to the saintly.

Several years after publication of the *Varieties*, James (1907/1949a) delivered the presidential address to the American Psychological Association, titled *Energies of Men*. In that address, he asked the question: How is it that people are sometimes able to perform at an “appreciable maximum” when faced with challenge? This, he believed to be “the great problem” for psychology. It is a problem that has been taken up in recent years under the banner of “positive psychology” (S. Lopez & Snyder, 2009).

James (1910/1949b) approached the issue from yet another angle in his essay, *The Moral Equivalent of War*. There, he sought ways to achieve not only the “saintly” virtues esteemed by pacifists, but also the “martial” virtues esteemed by apologists for war. Many of these virtues overlap, for example, hardiness, courage, honor, loyalty, perseverance, and self-sacrifice. Disagreement is, or should be, over the means for their attainment — through peaceful pursuits or war.

Peaceful pursuits face many challenges: Overpopulation, poverty, ethnic strife, religious zealotry, and environmental degradation, to mention but a few. James’s emotional genius does not lack opportunities.

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Endnotes

1. Unless otherwise indicated, in the remainder of this text all page references to quotes by James are to the 1902/1961 edition of the *Varieties*.
2. In important respects, the position taken by Zajonc reflects a *social representation* as adumbrated by Moscovici (2008). It draws on common sense and ordinary ways of speaking, but also incorporates scientific theory, in particular, post-Darwinian theory of evolution. Nevertheless, we maintain that the

representation is largely mythical. It helps explain and even legitimizes behavior that deviates from the norms of deliberate, rational action.

3 Like the quest for novelty, the quest for authenticity can reflect an “urge to evade” a given condition. In what is sometimes referred as the “cult of authenticity,” people may search for meaning by identifying with conditions other than their own, for example, a cultural tradition that is more “primitive” or “closer to nature” than modern, industrialized (and commercialized) societies. Typically, however, the identification is superficial and based more on ignorance than on understanding. Be that as it may, for persons who adhere to the cult of authenticity, almost any behavior may be excused as long as it is considered “authentic.”

4. The controlling emotion need not be religious in the ordinary sense. Contrast James’s description of the “strange” life of an emotional genius with Nietzsche’s (1889/2003) call for a “spiritualization of the passions.” Nietzsche recognized that the passions often “drag down their victim by the weight of their folly” (*Morality as Anti-Nature*, 1). The solution, he believed, is not to eliminate the passions, but to spiritualize (*vergeistigen*) them. This, according to Nietzsche, does not involve a “return to nature” (the emotions often being considered a lower, less exalted part of human nature). It is not “a going-back but a *going-up* — up into a high, free, even frightful nature and naturalness, such as plays with great tasks, is *permitted* to play with them” (*Expeditions of an Untimely Man*, 48, italics in original).

5. This is true even of fear, often considered the most “basic” of emotions. Granted, some fears may be elicited by species-wide dangers prevalent during our evolutionary past, and are apparent among infrahuman animals (Le Doux, 1996). However, the majority of human fears involve social threats and follow socially prescribed scripts. Indeed, what a person fears is often a better sign of his or her social identity than it is of any objective danger (Douglas & Wildavsky, 1982).

6. This is not to slight the significant contributions of others. For a general review and critique of emotional intelligence, see Zeidner, Mathews, and Roberts (2009).

EMOTIONS AND CREATIVITY

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Emotions are related to creativity in three main ways: First, as *antecedents to creativity*; second, *creativity can be an emotional experience*; and, third, *emotions themselves can be creative products*. Let me say a few words about each of these three ways.

Emotions as Antecedents to Creativity

This has been the topic of much research in recent years. The results are, to my mind, quite confusing. But two points are worth mentioning because of their consistency. First, persons tend to be more creative when in a positive mood. The implication seems clear: If you want to encourage creativity in a person, do him or her a kindness. Unfortunately, for some persons, or for some phases of the creative process, a negative mood is also helpful.

Second, a predisposition to clinical depression is more common among creative writers and artists (but not scientists) than among the general population. This is not necessarily in contradiction to the first point. Creative episodes tend to occur as depression lifts and the person enters a mildly manic phase.

Creativity as an Emotional Experience

This is the Aha! Or *Eureka* phenomenon. It has been little investigated for the simple reason that it is difficult to capture in a laboratory setting. Hence, it is poorly understood; or even misunderstood. Creative insights may indeed occur suddenly, as many anecdotal accounts illustrate; but so, too, do many nonsensical thoughts and imagery. For every dream that leads to a noble prize (as in the famous case of August Kekulé), numerous others lead nowhere and are quickly forgotten. In any case, most creative episodes do not happen in a moment, but require long periods of preparation (the equivalent of ten years of immersion in a subject is often cited).

¹¹ Paper presented at the 12th Conference on Creativity & Innovation (ECCI XII), Faro, Portugal, September 14-17, 2011.

Emotions as Creative Products

This is the topic on which I focus the present discussion. By way of introduction, consider the following two observations, the first made near the beginning and the second near the end of the 20th century.

"When a person has an inborn genius for certain emotions, his life differs strangely from that of ordinary people, for none of their usual deterrents check him"(William James, 1902, p. 215).

"There are 'cognitive virtuosos' . . . but there are no 'emotional prodigies.' We can speak of an 'intellectual giant' but an 'emotional giant' is an absurdity" (Robert Zajonc, 1998, p. 597).

Given that this is a conference on creativity and innovation, it is no surprise that I favor the observation by James. I take it for granted that "genius" implies creativity. (The reverse, however, is not true: Many people can be creative without being recognized as geniuses.) In his book, *Varieties of Religious Experience*, from which the above quote is taken, James (1902) gave many examples of emotionally creative episodes, not just in the religious domain, but in what he called "susceptibility to wrath, the fighting temper," and also love, which he asserted could "carry one to crime"— an example, perhaps, of emotional creativity gone awry.

Nevertheless, most people would probably agree that Zajonc has the better argument. Everyone recognizes Einstein as a genius, and Beethoven and Picasso as giants in music and art. But an emotional genius? Names do not come readily to mind. Even our ordinary language seems to favor Zajonc. Colloquially, emotions are often described as "thoughtless," "impulsive," "immature," "rigid," "gut" reactions. Such descriptors are seldom applied to creativity, which is typically ranked among the highest of the "higher" thought processes. Thus, the idea of an emotional genius does indeed seem to be an absurdity. That being the case, why do I believe James's observation to be closer to the truth?

Before addressing this question, I should be clear what I mean by "emotion." The term "emotion" covers a broad range of phenomena. No single account will fit all instances. My concern is with "standard" emotions, that is, those recognized and named in ordinary language, such as anger, love, fear, grief, and the like. Depending on the culture, standard emotions can range in number from a few to the hundreds.

By what criteria do we judge an emotional response as creative? Novelty and effectiveness (i.e., value) are the two most widely mentioned criteria for evaluating any

response, emotional or otherwise, as creative. They hardly need further discussion. To these, I want suggest a third criterion, namely, authenticity.

Whatever else it entails, authenticity implies that a response is consistent with a person's goals and values. But more than that: as a criterion for creativity, an authentic response involves, in the words of Arnheim (1966), "the pregnant sight of reality" (p. 299). This contrasts with novelty which, again in the words of Arnheim, may simply involve a "desire to get away from what is normal and ordinary for the purpose of being different." Put otherwise, if less eloquently, a creative response leaves room for further growth and development, whereas novelty may simply reflect an escape mechanism. A similar theme is voiced by Jodelet (2008), when she says that the term "beautiful" (which she applies to creativity of all kinds) "must be reserved for an idea that can lead to the discovery of more ideas, and for an invention that is fruitful to future generations" (p. 411)

Authenticity is relevant to creativity in any domain, but it is particularly important with respect to emotional creativity. Intense emotional reactions are often taken as ipso facto authentic. For this reason, emotional responses tend to give added credence to almost any experience, from the possible but unlikely (e.g., recollections of previously "forgotten" episodes of childhood sexual abuse) to the outright implausible (e.g., sexual experimentation by aliens while held captive on a space ship). Such experiences may be novel and even effective (at least in the short term, by giving meaning to a stressful experience occurring in the present); but would we judge them creative? Probably not, for they do not reflect the person's best interests or fundamental values, and they short-circuit rather than encourage fruitful development. (For a thorough discussion of authenticity as it applies to emotions, see Salmela, 2005).

Authenticity is important for another reason, namely, it helps account for cultural differences in judgments of creativity. In the West, with its emphasis on individuality, an authentic response also tends to be idiosyncratic to the individual and hence novel; in East Asian cultures, by contrast, where identification with the collective and its traditions is prized over individualism, authenticity is more easily distinguished from novelty (Averill, Chon, & Haan; 2001; Sundararajan & Averill, 2007).

Supporting Evidence

Support for emotional creativity stems from two main sources: Theoretical background and empirical data.

Theoretical Background

Emotional creativity is a straightforward inference from a social-constructionist view of emotion (Averill, 1980, 2005). That view rests on three fundamental assumptions: (1) Emotions are syndromes, comprising behavioral, physiological, and experiential (feelings) components; (2) No single component or type of response is essential to the whole; and (3) Social norms (beliefs and rules) are the main organizing principles that lend emotional syndromes their coherence.

The first two of these assumptions are now widely accepted. The third, is more controversial, for it seems to overlook the importance of biological and psychological factors in the development of emotions. But that is not the case. Biological (genetic) factors are important organizing influences, on some emotions (e.g., sudden fright) more than others (e.g., righteous anger). Through epigenetic mechanisms societies can influence emotional development even at the most elementary (subcortical) levels (Mason & Capitanio, 2012). Individual experience adds another level of complexity (J. Russell, 2003). In the final analysis, however, if an emotion is to be effective, it must involve socially shared principles of organization.

If we accept the three assumptions mentioned underlying social constructionism (i.e., emotions are complex syndromes, no one component of which is essential to the whole, with social norms providing the primary — though not exclusive — organizing principles), the possibility for emotional creativity follows logically. *What societies construct, individuals can reconstruct.* If the reconstruction meets the criteria of novelty, effectiveness, and authenticity, it can be considered creative. It is that simple. Simplicity, however, can be deceiving. Is there any evidence for emotional creativity beyond logical argument and the kind of anecdotal reports discussed by James?.

Empirical Data

Not everyone can be expected to be equally creative in the emotional any more than in the intellectual and artistic domains. One way to explore emotional creativity is, then, by examining the correlates of individual differences. To this end, an Emotional Creativity Inventory (ECI) has been constructed (Averill, 1999; Averill & Thomas-Knowles, 1991). The latest version of the ECI includes 30 items, 7 of which are related to emotional preparedness (e.g., “When I have strong emotional reactions, I search for the reasons for my feelings”; 14 to novelty (e.g., “I have emotional experiences that would be considered unusual or out of the ordinary”; 5 to effectiveness (e.g., “My emotions help me achieve my goals in life”; and 4 to authenticity (e.g., “My emotions are almost always an authentic expression of my true

thoughts and feelings”). Factor analyses suggest that the preparedness items form one facet; the novelty items, another facet; and the effectiveness and authenticity items, a third facet.

Personality correlates. Scores on the ECI are associated in a predictable manner with a variety of other personality variables. Among the “Big Five” personality dimensions, for example, the ECI is significantly correlated with Openness to Experience ($r[147] = .57$) and Agreeableness ($r[147] = .20$), but not with Neuroticism, Extraversion, or Conscientiousness, as measured by the NEO-PI (Costa & McCrae, 1985). People who score high on the ECI are more prone to mystic-like experiences (e.g, transcendence of space and time, the loss of ego boundaries, and a sense that all things are alive), as measured by Hood’s (1975) scale ($r[89] = .46$). Self-confidence should facilitate receptivity to unusual experiences; not surprisingly, therefore, a modest correlation exists between the ECI and Rosenberg’s (1965) self-esteem scale ($r[87] = .25$). Finally, a negative relation exists between the ECI and alexithymia ($r[87] = -.35$), as measured by the TAS-20 (Bagby, Parker, & Taylor, 1994). These correlations are for the total scores on the ECI; the pattern of relations differ somewhat when the preparedness, novelty, and effectiveness-authenticity facets are considered separately.

Emotional creativity, as measured by the ECI, is not related to cognitive intelligence, as reflected in Scholastic Assessment Test (SAT) scores (Averill, 1999), nor to emotional intelligence, as measured by the *Mayer Salovey Caruso Emotional Intelligence Test* (MSCEIT).

Like traditional intelligence (IQ) tests, the MSCEIT contains mini-problems to be solved, such as identifying a facial expression. A response is considered correct if it matches the responses made by the majority of persons who have taken the test, or by a smaller group of presumed experts. Such “consensus scoring” tends to devalue unusual and idiosyncratic emotional responses. In this respect, the MSCEIT, again like most IQ tests, is a measure of convergent rather than divergent intelligence.

A study by Ivcevic, Brackett, & Mayer, (2005) compared emotional creativity and emotional intelligence using a variety of measures, including the ECI and the MSCEIT. Intercorrelations and confirmatory factor analyses suggest that emotional creativity and emotional intelligence are independent abilities, at least in terms of the measures used. Moreover, the ECI was a better predictor of creative writing and artistic activities than was the MSCEIT. This is consistent with the notion that the MSCEIT is a measure of convergent rather than divergent emotional intelligence.

On the other hand, Fuchs, Kumar, and Porter (2007) found that scores on the ECI loaded on a general creativity factor together with self-report measures of cognitive creativity. To some extent, this may reflect common method variance — all measures involved self-reports. However, it also makes theoretical sense. Cognitive processes are involved at all

stages of an emotional episode, from initial appraisals to the organization of responses. It would not be possible to be creative emotionally without some degree of cognitive creativity (Averill, 2007).

Behavioral correlates. People who score high on the ECI are rated by their peers as emotionally more creative than are low scorers, presumably on the basis of their everyday behavior (Averill, 1999). In the laboratory, they are also better able to express unusual emotions symbolically in words and pictures (Gutbezahl & Averill, 1996).

Needless to say, the ability to express emotions symbolically in words and pictures is not necessarily an indication of emotional creativity; a large gap often exists between what a person says and what a person does. A brief digression on the relation between poetry and emotion may indicate how that gap might be bridged.

Wordsworth (1805/1952) described poetry as “the spontaneous overflow of powerful feelings: it takes its origin from emotion recollected in tranquility” (p. 84). Wordsworth’s concern was to distinguish poetry from scientific discoveries, the former having to do with feelings and the latter with facts. Inspired by Wordsworth, John Stuart Mill (1833/1981) took the issue a step further, distinguishing poetry from other forms of literature and, incidentally, from music and art.

Mill considered poetry as a way of educating and expanding the emotions; in other words, as ways of being emotionally creative. This is important, he believed, because emotions, especially sympathy, are the bedrock on which a good society rests.

Mill (1833/1981) began his analysis of poetry by noting that people who “are perpetually engaged in hunting for excitement from without, are invariably those who do not possess, either in the vigor of their intellectual powers or in the depth of their sensibilities, that which would enable them to find ample excitement nearer home [i.e., from within].” That is an exaggeration, surely, and unnecessarily pejorative. Nevertheless, let us follow Mill’s line of argument, for it leads to some relevant conclusions concerning emotional creativity. Most literature (e.g., prose, drama, and rhetoric, no matter how eloquent) may also afford emotional excitement, Mill conceded, but also “of the kind that comes from without.” Poetry is different: Its object is “to paint the human soul truly.” “Great poets,” Mill asserted, “are often proverbially ignorant of life. What they know has come by observation of themselves: “they have found within them one highly delicate and sensitive specimen of human nature, on which the laws of emotion are written in large characters.” It follows, Mill concluded, that poetry “is the natural fruit of solitude and meditation,” not of active engagement in external affairs. Consistent with this last observation, Long, Seburn, Averill, and More (2003) found emotionally creative persons as measured by the ECI are better able than others to derive benefits from solitude.

What should we conclude from this brief digression on the relation between poetry and action. Certainly not that we should all become poets. (Mill was not, although he was one of the major 19th century British philosophers.) In fact, poetry is not even the issue. Rather, the issue is the source of a person's "excitement" (to borrow Mill's term). Emotional creativity presumes a rich inner life, and a willingness to explore and learn from it (cf. the preparedness items of the ECI). Of course, one's inner discoveries should find expression when conditions warrant; under ordinary conditions, however, emotionally creative responses may be more the exception than the rule.

Some Obstacles to Emotional Creativity.

This week we celebrate the many contributions made by Mihalyi Csikszentmihalyi to our understanding of creativity. By way of background, therefore, let me refer briefly to Csikszentmihalyi's (1988) systems approach. Csikszentmihalyi points out that judgments of creativity are not based on individual achievement alone, but also depend on the domain and field of endeavor. The distinction between the domain and the field corresponds roughly to the distinction between culture and society, for example, as adumbrated by Kroeber and Parsons (1958). The *domain* of emotion is the cultural background, the network of stable ideas and customs that preserve and transmit ideas from one generation to another. The *field*, as Csikszentmihalyi (1988) conceives of it, is the set of social institutions that selects novel ideas that seem worth preserving as part of the domain. The field of emotion involves professional organizations, funding agencies, journal editors, and academic departments, to mention a few of the more prominent "gate keepers."

With Csikszentmihalyi's distinction in mind, we may call the one type of obstacle to emotional creativity, *domain antipathy*, and another type, *field impediments*. I will focus on the former. The nature of field impediments needs little explanation, although their influence may be subtle and vary over time. At present, few impediments to research and publication on emotion seem to exist. After a period of relative drought, which lasted most of the 20th century, the past decade has seen an outpouring of books, journals, and conferences on emotion. The domain of emotion, by contrast, has not changed as rapidly as the field; hence, our focus on the former.

Domain Antipathy

Let us return for a moment to Zajonc's (1998) observation that is absurd to speak of emotional prodigies. "Absurdity" is a strong word; it seems to point toward something deeper or more fundamental than a simple mistake or misunderstanding. Perhaps we should not

interpret Zajonc literally. But whether meant literally or not, his contention echoes a long-standing theme in Western culture. It deserves to be taken seriously.

An important feature of the emotional domain is its link to cultural values. Emotions are related to values in two ways. First, emotional arousal typically involves a value judgment, an appraisal that something is good or bad, right or wrong, beneficial or harmful. Second, emotions themselves are targets of value judgments. As Aristotle put it, and many others have followed, virtue is the ability to experience the right emotion in the right way, toward the right person, on the right occasion, and with the right motive. Vice is the opposite.

Creativity in any domain is liable to be met with resistance, at least initially. That is particularly so in the case of emotional creativity. An emotionally creative response may call into question deeply held values. To call it absurd is among the milder rebukes.

Illustrations are not difficult to find, as indicated by current controversies over the extension of love, and the privileges it entails, to same-sex couples, or to more than one partner at the same time. This controversy is hardly new. In 1940, Bertrand Russell was appointed professor at the City College of New York. After a public outcry over his political and social views, particularly his views on free love and marriage, the appointment was annulled by court order. This seems to confirm an earlier observation by Russell (1930/1958) that "Caution is enjoined both in the name of morality and in the name of worldly wisdom, with the result that generosity and adventurousness are discouraged where the affections are concerned (p. 185).

I am not suggesting that Zajonc, when he claimed that the idea of an "emotional giant" is absurd, was attempting to discourage "generosity and adventurousness . . . where affections are concerned." I do not believe that for a moment. However, I do believe his charge reflects a deeply held strain in Western culture.

Some Theoretical and Practical Implications

Why is emotional creativity worth considering in a conference devoted largely to innovation in artistic and technical fields? The reasons are both theoretical and practical. Theoretically, the idea of emotional creativity goes counter to all kinds of preformism (i.e., the notion that emotions are determined beforehand, either through biological evolution or socialization). Let me first say a few words about biological determinism. According to what is sometimes called "basic-emotion theory," beneath a patina laid down by culture, there exist basic emotions that are uncorrupted by social norms.

I have no objection to the idea of basic emotions, only to the contention that what makes an emotion basic is its biological origins. "Basicness" is a feature of any hierarchically organized system of classification, where some levels of organization are more fundamental

(information rich) than levels higher or lower in the hierarchy. To say that some emotions are more basic than others says something about our folk-taxonomies of emotion, not about the origins of emotions, biological or otherwise.

I emphasize this point because the idea of basic emotions as biologically determined, and hence invariant across individuals and cultures, has had a subtle but profound influence on research and theory. Few “basic scientists” want to investigate phenomena that are not also considered “basic.” This has restricted both the range and types of emotions investigated. It is time, I believe, for basic-emotion theory in affective science to go the way of phlogiston theory in chemistry.

Emotional creativity also has implications for psychological and sociological theories of emotion. Psychologically, it encourages us to look at emotional development as a life-long process, and not as something completed during infancy and childhood (Averill, 1984). Sociologically, emotional creativity offers a principled account of how cultural differences in emotions arise. The social norms that help organize emotional syndromes are not all embracing. Ample latitude exists for improvisation during specific episodes, depending on the individual and the situation. Emotional improvisations, as they accumulate and diffuse through society, ultimately result in emotional syndromes that are specific to a culture and that help differentiate one culture from another.

Turning to more practical concerns, Dr. Elma Nunley, a clinical colleague, and I have explored the relevance of emotional creativity in the treatment of emotional disorders (Averill & Nunley, 1992; 2010; Nunley & Averill, 1996). Whether in individual psychotherapy or group workshops, emotional creativity can be arduous. Like creativity in other domains, preparation is necessary. As people learn to attend to their own thoughts, feelings, and reactions, they are often surprised, not only at the way they respond emotionally, but also at the degree of control they have over their emotions. Also, as discussed earlier, emotions are inextricably linked to a person's sense of self and widely held cultural values; at some point in the therapeutic process, therefore, emotional innovation is likely to meet with stricture in the form of self-recrimination and/or social sanctions. A good deal of perseverance is thus necessary. Perhaps the most important prerequisite for emotional creativity is practice, practice, and more practice. Through imagery, observation, direct participation, and self-reflection people can learn to respond emotionally in different, more effective and authentic ways.

Emotional creativity can also play an important role in organizations. Sandelands and Buckner (1989) argue that work, at its best, can be viewed as an aesthetic experience. I doubt that many workers in the typical office or assembly line regard their activities as aesthetic. Yet, Sandelands and Buckner make an important point: Work can be aesthetic. For that to happen, certain conditions must be met. For example, there must be certain

tension in the work, as when challenges match capabilities (cf. Csikszentmihalyi's, 1990, concept of "flow"), and there must be opportunities for growth.

Sandelands and Buckner (1989) speculate that an aesthetic attitude toward work is reflected positively in such personality attributes as "playfulness, creativity, sense of humor, ego-strength, and self-actualization and negatively in the case of dogmatism, authoritarianism, and self-consciousness" (p. 125). These characteristics correspond well with the correlates of the emotionally creative individual as measured by the ECI (see earlier discussion). But a creative attitude is not just a matter of personal predispositions; it also depends on the work environment. And here we find an interesting paradox.

Csikszentmihalyi (1990) has found that people are more likely to report experiences of flow (one manifestation of a creative attitude) during work than during leisure activities; yet, most people still prefer leisure to work. In an attempt to resolve this paradox, Csikszentmihalyi postulates that people "disregard the quality of immediate experience, and base their motivation instead on the strongly rooted cultural stereotype of what work is *supposed* to be like. They think of it as an imposition, a constraint, and infringement of their freedom, and therefore something to be avoided as much as possible" (p. 160). In other words, the concept of work has accrued a negative connotation in spite of the pleasurable experiences people often have while working.

How might the negative attitude toward work be changed to one that is more aesthetic? Altering the work environment might be a start. Perhaps organizations should hire artists and poets as consultants, as well as accountants and engineers. An emphasis on the aesthetic would complement, not replace, more traditional concerns regarding productivity, quality control, and the "bottom line." The aesthetic and the practical are not antithetical, but mutually reinforcing.

Concluding Observation

It is often said that recognition of a problem is more critical than discovering the solution. Asking the right question is, at least, a necessary beginning. I believe one the greatest obstacles to emotional creativity is simply the belief that it cannot occur, that even the idea is "absurd.." I hope that I have been able to convince you of the opposite. Many of the problems we face in our interpersonal relations and business practices are not subject to a technological solution. Put bluntly, our future well-being depends as much on our emotional as on our technological creativity.

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COLLABORATIVE RESONANCE: INTERMEDIATE SCALE AND CREATIVE NETWORKS

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Abstract

The received wisdom about small collaborations holds that they don't always scale up to larger, more complex forms of collaboration. Augmenting the scale of the collaboration established on a small scale, to include a somewhat larger, more complex group of collaborators often reveals the kinds of processes crucial to the productive scaling of the collaboration to an even broader and more extensive network. Using examples from artistic processes, and a university research initiative focused on creativity and innovation across the arts and sciences, we will reflect on the dynamics of creating intermediate scale. we will looks at ways to create and design an intermediate scale and show how this is often more productive than jumping from a small scale to a broad, vast, scale. The intermediate scale functions as a testing and proving ground for the transformation of collaborative practices within the complexity of large scale.

REWARDS AND CREATIVITY: NEW APPROACH – NEW RESULTS

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Abstract

Debate regarding reward - creativity (R-C) relationship is old but unsettled. Behaviorist view suggests extrinsic rewards to enhance creativity whereas cognitive perspective suggests these rewards as detrimental for creativity. Previous research supporting these views largely consists of quantitative lab studies conducted on students under specific and restrictive conditions. This study starts with blank page approach to explore R-C relationship through an in depth qualitative inquiry in organizational setting, on employees involved in creative tasks. Results show that R-C relationship is moderated by personal and contextual factors, such as locus of control, self efficacy, supportive supervision and psychological safety. Depending on the moderating factors, the relation between rewards and creativity can be positive, negative or insignificant. These factors have never been explored previously in the creativity literature and thus the results open a new arena in creativity research

UMA PERSPECTIVA CONCEPTUAL E INTEGRATIVA DAS ARTES VISUAIS NA ANÁLISE DO CONCEITO DE STRESSE

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Resumo

O stresse tem vindo a ser um problema crescente na nossa sociedade. Embora haja várias definições de stresse, predomina a perspectiva transaccional que considera que as situações de stresse ocorrem quando o sujeito faz uma avaliação das exigências como superiores aos seus recursos para responder às mesmas de forma adequada ou competente. Há vários sintomas de stresse, tal como há vários tipos de factores internos e externos.

Neste artigo apresentamos vários trabalhos artísticos que criámos para ilustrar o conceito de stresse, os seus sintomas e principais factores. Para esta perspectiva integrativa e conceptual da arte, utilizámos diversas técnicas de arte visual: a fotografia, a pintura, a foto-pintura, a escultura, a instalação e o desenho.

Palavras-chave: Arte conceptual; Fotografia; Pintura; Escultura; Instalação; Desenho; Stresse.

A CONCEPTUAL AND INTEGRATIVE PERSPECTIVE ON VISUAL ARTS: A CREATIVE ANALYSIS OF THE STRESS CONCEPT

Abstract

Stress is an increase problem in our society. Nevertheless there are several definitions of stress, are accepted the perspective that considers the transactional stress situations occur when the subject makes an assessment of the demands it faces higher than its resources to respond adequately or competently. There are several stress symptoms, as well as several types of internal and external stress factors.

At this work, we present several art products that we create to illustrate the concept of stress, it's symptoms and main factors. For this integrative and conceptual art perspective was used several visual arts techniques: photography, painting, photo-painting, sculpture, installation, and drawing.

Key-words: Conceptual Art; Photography; Painting; Sculpture; Installation; Drawing; Stress.

1. Introdução

O stresse foi um conceito que surgiu no século XVII, no âmbito da engenharia, para traduzir a pressão exercida sobre as pontes, as quais deveriam ser projectadas para suportar essa carga de stresse. No século XX surgiram diversas definições de stresse no âmbito da Psicologia, sendo aceite a perspectiva que considera o stresse como o resultado da avaliação da transacção entre as exigências colocadas sobre o sujeito e os seus recursos para responder de forma adequada ou competente (Lazarus & Folkman, 1984).

O stresse pode ser causado por factores externos, como seja a pressão social, isto é, as exigências colocadas por outros sobre o sujeito, mas também pode ser causado por factores internos, tal como as exigências que o sujeito se coloca a si próprio (Jesus, 2007).

Temos realizado diversas investigações sobre o conceito de stresse, quer no plano da conceptualização teórica, quer no plano empírico, encontrando-se os resultados publicados em vários livros e artigos científicos. Um dos trabalhos realizados no plano da conceptualização teórica traduziu-se no modelo desenvolvimentista de stresse (Jesus, 2002), em que procurámos abordar o stresse associado ao desenvolvimento humano, distinguindo entre a valência negativa do stress (distress) e a sua também possível valência positiva (eustress). Um outro contributo importante traduziu-se na formulação de um programa de gestão do stresse através do treino de competências (Jesus, 1998; Jesus, 2010; Jesus & Conboy, 2001; Jesus & Esteve, 2000).

No plano empírico temos ainda coordenado diversas investigações, algumas delas no âmbito de teses que dirigimos, de mestrado (Almeida, 2002; Barahona, 2008; Fonseca, 2006; Leal, 2011; Pacheco, 2002; Quirino, 2008) e de doutoramento (Amaro, 2010; Martins, 2005; Ramos, 2011).

O reconhecimento dos trabalhos que temos desenvolvido sobre este conceito levaram a termos sido escolhidos para coordenar, em 2013, a organização do congresso mundial da STAR – Stress and Anxiety International Research. Esta é uma sociedade mundial em que se encontram representados mais de quarenta países de todos os continentes e que se dedica ao estudo das situações de stresse e de ansiedade há mais de 30 anos.

Para além do contributo que temos tido no âmbito da investigação científica, quisemos também procurar abordar o conceito de stresse através da arte.

Diversos artistas realizaram já trabalhos em que, de forma explícita ou implícita, é abordado o stresse. Muito recentemente, alguns artistas apresentaram trabalhos sobre este tópico em diversos tipos de arte visual: Pais de Sousa na pintura (2009), Kurt Wenner na pintura urbana (2007), Mauro Pimentel na fotografia (2010) e Yoan Capote na escultura (2010). No entanto, conseguimos encontrar trabalhos cujo conteúdo pode ser relacionado com o stresse, em diversos artistas que marcaram a história de arte, nomeadamente em Eduard Munch, com o quadro “Grito” (1893), e Pablo Picasso, com o quadro “Mulher Chorando” (1905) e até mesmo no famoso trabalho “Guernica” (1937).

Desde há muito tempo que a arte e a ciência andam interligadas, sendo os primeiros grandes cientistas identificados na história também como artistas, como é o caso de Leonardo Da Vinci.

No entanto, a cada vez maior especialização das várias áreas do conhecimento levou à perda de uma visão mais holística do saber e a um progressivo afastamento entre a arte e a ciência. Na linha do dualismo cartesiano, Snow (1906) vem distinguir entre a ciência e a arte, como culturas diferentes, opostas nos pressupostos, sendo a ciência considerada como racional e a arte como emocional.

Nos últimos anos têm surgido movimentos para promover a interdisciplinaridade e a integração do conhecimento científico, permitindo uma visão mais ampla e abrangente da complexidade dos fenómenos e aproveitando os vários contributos específicos das diversas teorias (Jesus & Lens, 2005).

E há também na história moderna vários casos de cientistas, inclusivamente vencedores de Prémios Nobel de medicina ou fisiologia, como são os casos de Roger Guillemin, Salvatore Luria ou Robert Holley, todos eles nascidos no século XX, que também desenvolveram trabalhos no domínio da arte visual (Araújo-Jorge, 2004), sendo a criatividade necessária à produção científica e à produção artística que permite fazer a ponte entre os dois domínios. Embora tenha sido pouco frequente a tentativa de transpor para a abordagem artística, temas estudados no âmbito científico, temos alguns exemplos na história da arte. O conceituado Salvador Dali foi um dos que procurou inspirar-se em descobertas da ciência para criar algumas das suas obras surrealistas (Dali, 2004).

Só a partir dos anos 60 se iniciou um movimento consistente de arte conceptual, permitindo valorizar sobretudo o conceito subjacente ao produto artístico (Marzona, 2006). Embora vários artistas tenham anteriormente tentado evidenciar a arte como um veículo para transmitir ideias ou conceitos, em particular Duchamp que em 1914 criou o primeiro “ready-made” (Barros, 2008), só em 1961 é utilizado o conceito de arte conceptual por Henry Flynt, segundo o qual o mais importante para a arte conceptual são as ideias, ficando a execução da obra para segundo plano, podendo até ser executada por outros que não o artista que a concebeu e criou. O importante seria o conceito, o projecto da obra, o qual é formulado antes da sua materialização. Esta perspectiva da arte tornou-se mais consistente a partir do manifesto de George Maciunas, em 1963, um dos fundadores do grupo “Fluxus”, e da primeira edição da revista “Art-Language”, em 1969. Muitos artistas actuais têm vindo a desenvolver o seu trabalho neste enquadramento da arte conceptual, utilizando diversas técnicas artísticas e, inclusivamente, as novas tecnologias, produzindo instalações, vídeo arte, etc. O artista procura conciliar as tradições artísticas tradicionais com as técnicas contemporâneas, permitindo a livre expressão artística.

O movimento da Arte Integrativa que surgiu nos anos 90, embora com uma conotação inicial ligada à Arte Terapia, também contribuiu para acentuar a perspectiva de flexibilidade e integração de várias técnicas artísticas no trabalho realizado.

Esta perspectiva da arte cria a possibilidade de estabelecer pontes entre os conceitos estudados na ciência e a expressão e comunicação dos mesmos através da arte, permitindo retomar uma maior proximidade entre a ciência e a arte.

Neste enquadramento numa perspectiva integrativa de arte conceptual, procurámos representar o conceito de stresse através de vários tipos de arte visual: fotografia, pintura, foto-pintura, escultura, instalação e desenho.

2. Trabalhos artísticos realizados sobre o conceito de stresse

2.1. Fotografia



Stresse – Máscara na sociedade (0,20 x 0,30; 1986)

Nesta fotografia pretendemos destacar os factores sociais subjacentes ao stresse e os comportamentos inadequados que muitas vezes os sujeitos desenvolvem perante situações de stresse, como seja fumar.

A pressão social pode provocar uma elevada tensão no sujeito, podendo este desenvolver certos comportamentos em reacção a isso. Estas reacções englobam-se nas estratégias de coping, conceito que pretende traduzir as formas que o sujeito pode utilizar para lidar com o stresse (Lazarus & Folkman, 1984). Os autores têm procurado agrupar as estratégias de coping em categorias, sendo a proposta de Latack (1986) uma das mais utilizadas. Segundo esta autora, podemos entre as estratégias de confronto, as estratégias de evitamento e as estratégias de gestão dos sintomas. As duas primeiras têm a ver com o comportamento do sujeito em relação a factores específicos de stresse, enquanto a última têm a ver com comportamentos que o sujeito realiza, que vão ter implicações nos sintomas de stresse, mas que podem não estar relacionados directamente com nenhum factor específico de stress. Por exemplo, perante uma situação de conflito com outra pessoa, o sujeito pode utilizar uma estratégia de confronto, indo falar com essa pessoa para resolver o conflito, ou pode utilizar uma estratégia de evitamento, procurando não encontrar essa pessoa, ou pode utilizar estratégias que não têm relação directa com esse conflito, como seja fumar. Esta é uma

estratégia de coping considerada inadequada, pois tem um efeito negativo sobre os sintomas, ao contrário de outras consideradas adequadas, ou com um efeito positivo sobre a saúde do sujeito, como seja a prática de exercício físico.

Nesta fotografia, o comportamento de fumar aparece ainda como algo automático ou reactivo em situações de stresse social, num sujeito anónimo ou não identificado, que se mascara ou esconde atrás desse comportamento. O facto da face do sujeito aparecer negra, pela falta de luz, não obstante estar a acender um isqueiro, procura traduzir também que esse é claramente um comportamento negativo para si próprio, não sendo o possível prazer decorrente do momento em que fuma (simbolizado pela luz momentânea do isqueiro a acender) suficiente para inibir os efeitos negativos para a sua saúde física (simbolizado pela face negra da senhora que está a fumar).

2.2. Foto-pintura



Stresse na procura de identidade: conflito entre o id e o superego (0,70 x 0,70; 2006)

Neste quadro pintámos uma jovem que apresenta um comportamento inibido revelado pelo facto de estar um pouco encolhida, com as mãos entre as pernas fechadas, o rosto escondido pelo cabelo, num quarto fechado. No entanto, a jovem está despida e apresenta um rubor na pele, simbolizado pela cor vermelha, olhando pela janela, única saída visível, como que observando o que desejava ser, isto é uma jovem expressiva, aberta ao mundo, envolta por um calor de sensualidade que a cor vermelha desta fotografia procura retratar. Temos assim um paradoxo, um conflito, ou uma aparente contradição entre o comportamento inibido da jovem, representado pela pintura, e o comportamento expressivo que ela deseja ter, representado pela fotografia.

Com este quadro pretendemos ilustrar o conceito de stresse segundo a perspectiva psicanalítica. De acordo com Freud (1927), o eu ou o ego do sujeito desenvolve-se a partir do confronto entre as pulsões do id e as pressões das regras sociais impostas pelo superego. Assim, a construção da identidade de cada sujeito é um processo stressante, resultante duma constante gestão de duas forças ou tensões contraditórias: uma de origem interna (o id), funcionando segundo o princípio do prazer, para o qual não há normas ou regras, e outra de origem externa (o superego), que procura impor os limites socialmente aceitáveis do comportamento.

2.3. Pintura



Stresse – Grito de sangue em atentado terrorista (4,10 x 2,00; 2010)

Esta pintura representa o comportamento limite do sujeito face a uma situação de stresse, em que este grita de forma desesperada, sentindo que não pode fazer nada, uma total impotência, ou um total descontrolo, face à situação em que se encontra.

A falta de controlo das situações é apontada como um dos principais factores de stresse das últimas décadas (Lévy-Leboyer, 1994)). As investigações realizadas desde final dos anos 90 até à actualidade têm permitido verificar que, de forma bastante evidente, as expectativas de controlo de resultados, ou locus de controlo, são cada vez mais externas (Rotter, 1990), o que também justifica o elevado nível de stresse em que as pessoas se encontram actualmente. O aumento da violência na sociedade e, em particular, os atentados que ocorrem cada vez com maior frequência e gravidade, aumentam a insegurança das pessoas e a incerteza quanto ao futuro, parecendo que, não obstante a longevidade ser cada vez

maior, a perspectiva temporal de futuro (Nuttin, 1980), que diz respeito à localização temporal dos objectos motivacionais que constituem o conteúdo da vida mental do sujeito, é cada vez menor, traduzindo que as pessoas se focalizam cada vez mais no presente e nos problemas imediatos que têm para resolver.

A situação de stresse escolhida para esta pintura é uma situação limite, pois traduz um atentado terrorista, como é expresso pelas duas explosões representadas neste trabalho. Assim, este trabalho integra três telas, sendo as telas laterais representativas do factor limite de stresse em que o sujeito se encontra e a tela do meio representativa do impacto que esse factor provoca no comportamento do sujeito.

Para além de representarem explosões, as telas laterais têm escritos dois textos que se complementam e que pretendem reforçar a mensagem já expressa pela imagem. Desta forma, pretendemos ainda expressar a perspectiva integrativa e a complementaridade que pode existir entre mensagem escrita e mensagem visual, aspecto que já anteriormente tentámos destacar no livro “Foto-pintura e poesia. Escrever com a luz e com as palavras” (Jesus, 2009). Os textos estão escritos em espanhol, pois este trabalho foi concebido em Madrid, no dia 11 de Março de 2010, dia em que decorriam nesta cidade as comemorações dos seis anos dos atentados de Athocha.

A situação limite em que o sujeito se encontra é reforçada pela cor cinzenta da pintura e pelas lágrimas vermelhas que lhe escorrem pela face, isto é o sujeito não só grita como chora ao mesmo tempo, “lágrimas de sangue”, representando a situação em que houve muito sangue derramado pelas vítimas dos atentados.

2.4. Escultura



Stresse (0,50 x 2,00 x 0,30; 2010)

Esta escultura, em que foi utilizado alumínio e gesso, procura sintetizar o conceito de stresse, em termos dos principais factores e sintomas que podem ocorrer.

Em relação aos sintomas, tendo em conta que o órgão mais sensível às situações de stress é o coração (Serra, 2007), sendo aliás uma adequada tensão arterial um dos principais indicadores de saúde física, procurámos representar o coração como o aspecto que mais se destaca na escultura, até pela cor vermelha com que está pintado.

O coração está “rasgado” por correntes que pressionam em vários sentidos, representando as exigências ou os factores de stresse que podem ser externos e internos.

As pressões internas, sobretudo devido a conflitos internos face a decisões que têm que ser tomadas, ou a indecisões face à multiplicidade de alternativas possíveis hoje em dia, ou a uma excessiva ambição pessoal, ou ainda a expectativas irrealistas por parte do sujeito, traduzem que o próprio sujeito pode ser o principal factor do stresse que apresenta e encontram-se representadas pelas correntes puxadas para lados diferentes destruindo o coração.

No que diz respeito às pressões externas, estão representadas através de um peso pendurado no coração, que é um coração invertido, significando e sintetizando todas as exigências externas que podem prejudicar a saúde do sujeito, em particular o coração. Além disso, o facto deste coração ser em metal significa a falta de suporte social e emocional que aumenta o impacto negativo das exigências exteriores sobre o sujeito.

2.5. Instalação



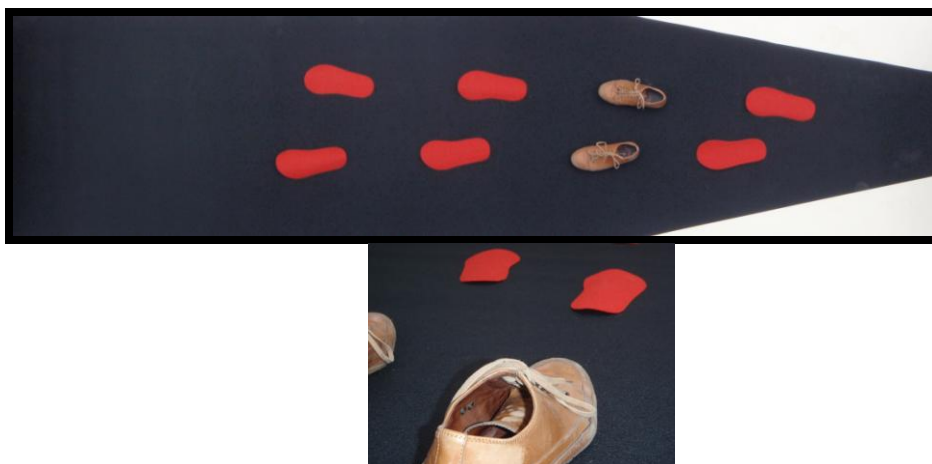
Stresse nas condições de vida – Azar (4,00 x 1,00; 2010)



Condições de vida – Sorte (4,00 x 1,00; 2010)



Stresse na qualidade de vida – Pessimismo (4,00 x 1,00; 2010)



Qualidade de vida – Optimismo (4,00 x 1,00; 2010)

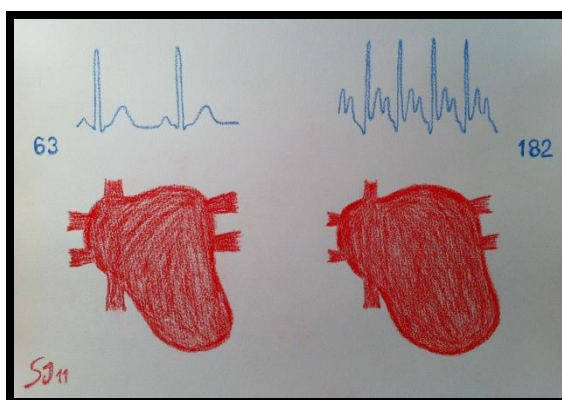
Nesta instalação apresentamos situações que pretendem representar a distinção entre condições de vida e qualidade de vida, muitas vezes confundidos na linguagem do senso comum. O conceito de stresse pode ser associado a ambas as situações.

A principal distinção entre as noções de qualidade de vida e de condições de vida é porque, enquanto esta última diz respeito às condições objectivas em que o sujeito se encontra, a primeira integra uma componente subjectiva, referindo-se à percepção que o sujeito tem das suas condições de vida (Ribeiro, 2006). Neste sentido, o stresse nas condições de vida pode ser traduzido por uma situação de azar, pólo negativo das condições de vida que se opõe a uma situação de sorte que constitui a possibilidade positiva dentro das condições de vida. Por seu turno, tendo em conta a importância de variáveis de personalidade para compreender o stresse do sujeito (Serra, 2007), o stresse na qualidade de vida pode ser representado pelo pessimismo, isto é o sujeito tende a ter percepções e expectativas negativas sobre a sua realidade e condições de vida, o qual se opõe ao optimismo, conceito que ilustra as percepções positivas do sujeito sobre a sua realidade presente e as suas expectativas também positivas face às possibilidades do futuro (Barros, 2004).

Procuramos representar as condições de vida positivas por uma passadeira vermelha em que se encontra um par de sapatos de marca “Boss”, simbolizando um sujeito com sorte caminhando no seu percurso de boas condições de vida. Por seu turno, as condições de vida negativas são representadas por uma passadeira negra, com pedras e pregos, em que se encontra um par de chinelos pobres, simbolizando um sujeito com azar nas suas condições de vida, deixando para trás um rasto de memórias de “sangue”, significando as dificuldades e as constantes situações de stresse por que tem passado.

No que diz respeito à qualidade de vida, o stresse é representado por um par de sapatos de marca “Lacoste” numa passadeira vermelha, traduzindo a aparente sorte do sujeito com as suas condições de vida. No entanto, o sujeito encontra-se numa situação de stresse pois percebe uma realidade negativa e antecipa um percurso difícil, representado pelas pegadas negras com pedras e pregos que se encontram no seu percurso, o qual se afunila no final, significando a diminuição da perspectiva de possibilidades e de expectativas em relação ao futuro, cenário característico das situações de pessimismo. Ao contrário, o sujeito optimista consegue prevenir situações de stresse e usufruir de qualidade de vida pois, embora possa ter condições de vida difíceis, representadas por uma passadeira negra e por um par de sapatos sem marca e de menor qualidade, consegue perspectivar outras alternativas e hipóteses para um percurso com qualidade de vida, representado pelo alargar da dimensão da passadeira e pelas pegadas vermelhas que nela se encontram.

2.6. Desenho



Stresse cardíaco (0,42 x 0,30; 2011)

Neste desenho, abordamos novamente o stresse com uma ênfase no coração, pela importância deste órgão para a vida e pelo facto de ser um do que mais pode ser afectado por situações de stresse. Desta vez, procuramos destacar a importância das pulsações ou do ritmo cardíaco, podendo ser distinguida entre uma situação de relaxamento, em que o coração apresenta poucas pulsações por minuto, traduzindo um estado considerado de tranquilidade que é benéfico para a saúde do sujeito, e uma situação de stresse, em que a frequência cardíaca aumenta de forma bastante relevante.

Para além dos dois desenhos do ritmo cardíaco, encontram-se dois desenhos do coração, representando as imagens do batimento cardíaco, podendo o coração estar

contraído numa situação de sistole dos ventrículos, ou podendo estar mais expandido na situação de diástole dos ventrículos, sendo o processo circulatório uma alternância entre sistole e diástole (Parker, 1997). As situações de stresse podem levar a perturbações neste processo, com o surgimento de arritmias, prejudiciais para a saúde cardíaca.

Estes foram os trabalhos artísticos que produzimos sobre o conceito de stresse, segundo a perspectiva integrativa e conceptual em que nos enquadrámos, procurando utilizar diversas artes visuais para explicitar vários aspectos deste conceito, os seus principais sintomas e factores, bem como a relação entre este conceito e outros com os quais pode ser relacionado, como é o caso da qualidade de vida.

No futuro pretendemos trabalhar também o conceito de stresse utilizando outras técnicas das artes visuais, nomeadamente a media arte, e procuraremos ainda aprofundar a perspectiva das relações que se podem estabelecer entre a linguagem visual e a linguagem escrita.

A ciência pode contribuir para um cada vez melhor conhecimento da realidade e a arte pode contribuir para comunicar o conhecimento que a ciência vai alcançando.

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META-ANALYSIS OF THE STUDIES ON MOTIVATION AND CREATIVITY RELATED TO PERSON

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ABSTRACT

Creativity and Motivation are two of the main psychological concepts to understand the flexibility and innovation of human behavior. Nevertheless many studies were conducted on both concepts, but any meta-analysis about the relationship between them was previously done. Thus, the aim of this study was to analyze the relationship between intrinsic motivation and creativity related to person by using meta-analytic procedures based on random-effects model.

The present meta-analysis included seven independent samples (representing a total of $N = 3,173$ participants) that met the inclusion criteria. The results indicated the expected significant positive relationship between intrinsic motivation and creativity related to person ($r_0 = .34$, 95% CI = [.30, .39]). The percentage of the variance explained by sampling error ($36.29\% < 75\%$) and the probability of the Q test ($p < .01$) revealed that there was no homogeneity across the effect sizes included in the whole set of studies. The moderator analysis indicated that the relationship between intrinsic motivation and creativity related to person was moderated by the type of the sample (students vs. employees). Particularly, it was found that intrinsic motivation is stronger related to creativity on the sample of employees compared to those of students.

Keywords: Creativity related to person; Intrinsic Motivation; Creativity; Meta-analysis.

INTRODUCTION

Since Humanistic Psychology, motivation and creativity were considered as two concepts that could have important relationships (Maslow, 1954).

Many researches were conducted and many theories were proposed about motivation and creativity since many years, and these concepts had an important contribution for the history of Psychology, and for the explanation of human behavior, namely in what concern to his flexibility and potential for learning.

In particular, taking into account that all behaviors are motivated, motivation it is a key concept in Psychology. As Weiner said "motivation lies at the heart, the very center of Psychology" (1992, 1).

Nevertheless, at the last decades, there was a tendency to a higher specialization of the authors, and specific theories and variables began being proposed for behavior analysis.

As contemporary motivational theories have become more specific and precise, they have also become more restricted in their range. For instance, many theories tend to overvalue just one concept or variable, such as intrinsic motivation (Deci, 1975).

When this occurs, an integration of theories becomes especially profitable for a better understanding of the complexity of human behavior.

As Madsen point out: "the importance of motivation coupled with the existence of many different theories of motivation created a major problem for psychologists" (1974, p. 13).

This situation was considered by Ford as an "identity crisis, centering on the problem of how to define the field of motivation" (1992, p. 4).

One of the ways to solve this identity crisis is to select several theories of motivation that could be additionally together and integrate them in a more complex theoretical model. An integration of theories becomes especially profitable for a better understanding of the complexity of human behavior.

A theoretical integration should seek to harmonize the contributions from various relevant, comparable and comprehensive theories.

If competing theories make the same basic epistemological assumptions and differ primarily due to the specialization and focus of their authors, it is often best to undertake a coherent unification of those theories, in order to be better able to explain the complexity of the phenomenon under study.

An original theoretical synthesis, or a more global framework, may result from such an integration. In a previous study we formulated a theoretical model of different cognitive-motivational theories in order to explain functional relations that exist between cognitive-motivational variables. The results showed the empirical sense of the proposed model (Jesus & Lens, 2005).

Another option is to select a theory of motivation that should be the best for the aims of a new research.

To analyze the relationships between motivation and creativity, it seems that intrinsic motivation is the best theory, because the majority of the studies about the relationship between motivation and creativity use intrinsic theory as the framework for that (Amabile, 1996; Runco, 2007).

Intrinsically motivated activities are those for each ones there isn't any further more reward than the activities themselves. For the subject intrinsically motivated by an activity, this kind of activity is an end in itself (Deci, 1975).

One decade after proposed the theory of intrinsic motivation, this theory was developed by Deci and Ryan (1985), pointing out the competence and the self-determination as the basis for intrinsic motivation, that is, the subject is more intrinsically motivated for an activity as higher his own perception of competence at this activity, and higher his autonomy and decision making related to this activity.

More recent advances in this theory were done by Chikszentmihalyi (1988; 1996) with the flow theory. Flow is the state of mind known as the action of inaction or doing without doing.

At this [mental state](#) of operation a person in an activity is fully immersed in a feeling of energized focus and full involvement in the process of the activity. The activity is intrinsically [rewarding](#), so there is an effortlessness of action. According to Csikszentmihalyi (1988; 1996), flow is completely focused [motivation](#). It is a [single-minded immersion](#) and represents perhaps the ultimate in harnessing the [emotions](#) in the service of performing and [learning](#). This author hypothesized that people with several very specific personality traits, called autotelic personalities, may be better able to achieve flow than the average person. These personality traits include curiosity, persistence, low self-centeredness, and a high rate of performing activities for intrinsic reasons only.

So this theory allows for connections between intrinsic motivation and creativity (Imaginário, Duarte & Jesus, 2010).

Creativity is a complex concept, with authors diverging in their precise definitions (Quitério, Martins, Silva, Pacheco, Martins, Mendonça & Jesus, 2010). Meusburger, Funke and Wunder (2009) claimed that over a hundred different versions can be found in the literature. At the same way, a previous paper identified 239 instruments to assess creativity (Hilário, Martinho, Godinho, Martins, Pacheco, Mendonça & Jesus, 2010).

But, as Candeias (2008) point out, the increase of the relevance of this concept in Psychology, was simultaneous to the diversity of theoretical models and instruments to assess it.

Nevertheless, creativity is generally considered as a phenomenon whereby a person creates something new (a product or a solution) that has some kind of value (Moraes, 2001).

Theories of creativity (in particular investigating why some people are more creative than others) have focused on a variety of aspects. Initially proposed by Rhodes (1961), the most dominant are usually identified as the four "P's" of creativity: process, product, person and place (Kaufman & Sternberg, 2010). Additionally these facets are interrelated, they could be distinguished. Creativity related to the person refers to the individual degree of creativity, and creativity related to the product is the outcome of creativity, and it's usually his materially focused expression. The place means the conditions or the environment to create. The process of creativity is the "bridge" between the person and the product, and several stages could be identified: preparation, incubation, intimation, illumination or insight, and verification. [Graham Wallas](#), in his work *Art of Thought*, published in 1926, it's usually identified as the first model of the creative process, but the paper of Leibbrand (1940) is the first publication obtained by a search in the Web of Knowledge database.

This concept had a higher important recognition at Psychology after Guilford, as APA President, namely by his paper "Creativity" in 1950. [Guilford](#) (1950; 1967) performed important work in the field of creativity, drawing a distinction between [convergent and divergent production](#) (commonly renamed convergent and divergent thinking). [This](#) author

was pioneered the modern [psychometric](#) study of creativity and constructed several tests to measure creativity in 1967.

Nevertheless, Guilford considered creativity as part of intelligence, and was Torrance (1974) that point out the identity and autonomy of this concept. Building on Guilford's work, [Torrance](#) developed the [Torrance Tests of Creative Thinking](#) in 1966. It involved simple tests of divergent thinking and other problem-solving skills, which were scored on fluency, originality and elaboration.

Others authors had an important contribution for the recognizing of this concept, such as Gardner (1982; 1993), Runco (1997), and Sternberg (1999).

Specifically about the relationships between creativity and motivation, it could be point out the work of Csikszentmihalyi (1996) and Amabile (1996).

To Amabile (1996) creativity thrive in conditions of freedom, and creative performance is believed to be more dependent on intrinsic motivation than are other types of performance. This author argued that to enhance creativity in business, three components were needed: expertise, creative thinking skills and intrinsic motivation.

At a recent meta-analysis about the relationship between stressors and creativity, Byron, Khazanchi and Nazarian (2010) concluded that mediators, such as motivation, may further explain the relationship between stressors and creative performance, and recommend that future research should examine mediation of intrinsic motivation.

More than five hundred studies were published pointing out the relationship between creativity and motivation. The most part of the studies was about intrinsic motivation and creativity related to product. Probably there are more studies about creativity related to product than the other three aspects of creativity because sometimes were an equivalence between “creative thinking” and “productive thinking” (Sternberg, 1988), as well as between “divergent thinking” and “divergent production” (Guilford, 1967). At other paper (Jesus, Rus, Lens & Imaginário, in press), we did a meta-analysis of the studies about the relationship between intrinsic motivation and creativity related to product.

The main aim of this paper is to make a meta-analysis of the previous empirical studies about the relationship between intrinsic motivation and creativity related to person.

METHOD

Selection of the studies

In order to identify the relevant studies for this meta-analysis, it was performed a computerized search in the online database Web of Science®-with Conference Proceedings (ISI Web of KnowledgeSM). This search was conducted using simultaneously the following broad keywords: *motivation* and *creativity*. The search period was limited to studies published from 1990 until 31st December 2010. The first study retrieved was Karle, J. (1990).

The role of motivation in scientific-research. A view of creativity. *Interdisciplinary Science Reviews*, 15, 4, 357-363. The last was Wyer, R. S. (2010). Global and local processing: A clarification and integration. *Psychology Inquiry: An International Journal for the Advancement of Psychological Theory*, 21, 3, 250-256. This search was conducted in 31st December 2010 and generated 533 citations. From these citations only those published in English were selected.

The selected studies had to meet several criteria in order to be included in the analysis:

1. To include a measure of intrinsic motivation as an independent variable from extrinsic motivation
2. To include a measure of creativity related to person
3. To examine intrinsic motivation and creativity using a sample from the general, nonclinical population
4. To examine intrinsic motivation and creativity at an individual level of analysis (and not to a group, organizational and societal level of analysis)
5. To report a value of the Pearson product-moment correlation (r) between intrinsic motivation and creativity or to provide the necessary statistical information to compute an effect size.

In this analysis were excluded:

1. The studies or the samples that did not reported the r correlation coefficient or sufficient data for its calculation
2. The studies or the samples that were considered as being duplicates. In order to detect the duplicate studies we used the heuristically methodology presented by Wood (2008). We eliminate from the meta-analysis one of the studies that used the same sample and measurement instruments (e.g. Zhang & Bartol, 2010a). In this case of duplication, in the analysis it was chosen to be included only the first published study.

A number of 18 papers have met these inclusion and exclusion criteria. In the case of the studies that included on a single sample more than two instruments that measured the same construct (intrinsic motivation, or creativity related to person) we decided to aggregate the effect sizes. Because not all of the studies reported the correlation between the variables that measured the same construct, it was chosen to average the effect sizes. The relation between intrinsic motivation and creativity related to person was examined in seven studies that included seven independent samples and 3137 participants. All the studies that were included in the two meta-analysis are marked with an * in the reference list.

Coding of the studies

For each independent sample included in the analysis were coded the following information: sample size, sample type (child, college and undergraduate students vs. adult population),

study design (cross-sectional vs. causality-oriented design), reliability of the intrinsic motivation measure, creativity construct related to person, reliability of the creativity construct measure, the effect size or the information required to compute an effect size. The relevant information for each independent sample that was included in the analysis is presented in Table 1. The coding of the studies was done by two researchers. The differences related to the results of the coding were settled through discussions till the agreement between researchers was reached 100%.

Table 1. *The characteristics of the studies included in the meta-analysis of correlations between intrinsic motivation and creativity related to person (N =7)*

Reference	N	Sample type	Study design
Shalley, Gilson, & Blum (2009)	1465	Employees	Cross-sectional
Prabhu, Sutton, & Sausser (2008)	124	Students	Cross-sectional
Oral, Kaufman, & Agars (2007)- Study 2	575	Students	Cross-sectional
Choi (2004)	386	Students	Causality-oriented
Amabile, Hill, Hennessey, & Tighe (1994)	284	Students	Cross-sectional
Amabile, Hill, Hennessey, & Tighe (1994)	35	Students	Cross-sectional
Amabile, Hill, Hennessey, & Tighe (1994)	268	Employees	Cross-sectional

Procedure

In this study we used a random effects model in order to conduct the meta-analysis of the correlations r between intrinsic motivation and creativity, using Hunter and Schmidt's (1990; 2004) method. So, the common metric effect size in this study is r Pearson. Based on the rationale of the random effects model, we assumed that the population effect size is variable rather than constant (Hunter & Schmidt, 2004; Kisamore & Brannick, 2008).

First, it was calculated the sample-size weighted-mean correlation (r_o). The weighting variable in this study was the sample size (N) (Brannick, Yang, & Cafri, 2010). Using this procedure, it was gave more weight to the correlations that are least susceptible to sampling error (Hunter & Schmidt, 2004). In this study it was chosen to compute only the sample-size weighted-mean correlation because more than a half from the selected studies did not report the value and the type of the reliability coefficient of the instrument used to measure the variables included in the analysis. Given this situation we did not computed the attenuation-corrected correlations between the intrinsic motivation and creativity related to person.

Next step comprised the estimation of the confidence interval for each mean r correlation computed. In this study it was used a 95% confidence interval to assess the accuracy of the estimate of the mean effect size. Based on the rationale of the random effects model, it was expected that the mean size effect will fall within the 95% CI if other sets of studies were taken from the population of the studies that investigated intrinsic motivation in relation to

creativity. When the 95% CI does not include zero than the mean r effect size is significantly different from 0.

In the next step, it was estimated the degree to which the effect size is homogenous across studies using Hunter and Schmidt (1990, 2004) 75% rule. The value of the variance computed using this meta-analytic technique provides an indication of the degree to which the variability across studies may be due to other factors than sampling error. A smaller value of the observed variance than 75% indicates the existence of the moderators on the relationship between intrinsic motivation and creativity related to person. Ulterior, the homogeneity of the effect size was evaluated using a χ^2 test (Hunter & Schmidt, 1990, apud. Ellis, 2010). A significant probability of the χ^2 test indicates the presence of the moderators.

In order to identify potential moderators on the relationship between intrinsic motivation and creativity related to person, the total set of the studies was partitioned into subsets of studies that represent categories of the moderator variables such as sample type (students vs. employees), study design (cross-sectional vs. causality-oriented design). For each subset were computed meta-analysis correlations, variances and variance corrected for sampling error across moderator subsets. Based on these data, the presence of a moderator is revealed in two ways:

1. The average correlation will vary from subset to subset
2. The standard deviation will average lower in the subsets than for the standard deviation of the whole set (Hunter & Schmidt, 2004).

Also, a separate χ^2 test was computed for studies within each category of the moderator. Following Aguinis, Sturman and Pierce (2009), in order to test the differences between the mean correlations across moderator subsets, it was performed a statistical significance test. It was chose the Welch's t test (Welch, 1938, 1947) for unequal sample sizes and variances, using a two-tailed test for significance.

RESULTS AND DISCUSSION

The aim of the study was to analyze the relationship between intrinsic motivation and creativity related to person by using meta-analytic techniques. First, we present the results of the meta-analysis of correlations between intrinsic motivation and creativity related to person including the main effects (Table 2) followed by the moderator effects (Table 3).

Table 2 comprises the results of the overall meta-analysis of the correlations between intrinsic motivation and creativity related to person. Data reflect the number of independent samples that investigated each relationship (k), the total number of the participants from the all independent sample included in the analysis (N), the sample size-weighted mean effect

size ($\bar{r}_0$), the estimated standard deviation (SD), the 95% confidence interval (95% CI), the percentage of the variance explained by sampling error (%), and χ^2 test.

Table 2. Overall results of the meta-analysis of correlations between intrinsic motivation and creativity related to person

Variable	k	N	$\bar{r}_0$	SD	95%CI	% variance explained by artifacts	$\chi^2_{(k-1)}$
Creativity related to person	7	3137	.34	.06	[.30; .39]	36. 29%	19.28**

The results indicate that intrinsic motivation is moderated associated with creativity related to person ($\bar{r}_0 = .34$). The relationship between these two variables is significant as reflected by the 95% CI [.30; .39] that does not include the 0 value.

Even if the 95%CI of the mean $\bar{r}_0$ indicate the presence of a significant relationship between intrinsic motivation and creativity related to person, the two homogeneity tests revealed that this relationship is influenced by some moderators. As shown in the Table 2, the percentage of variance explained by artifacts was below 75% (36.29% < 75%). The heterogeneity of the effect size across the studies included in the analysis was reflected also by the chi-squared test. The value of this test is significant at $p < .01$. So, the percentage of the variance explained by the artifacts and the chi-squared test indicate the need for a moderator analysis of the relationship between intrinsic motivation and creativity related to person. In the case of the variables that did not included at least two independent samples per subset they were dropped from the moderator analysis.

Table 3 summarizes the results of the moderator meta-analysis of correlations between intrinsic motivation and creativity variables by type of sample (students vs. employees).

Table 3. Moderator analysis of the meta-analysis of correlations between intrinsic motivation and creativity by type of sample (students vs. employees)

Variable	Students					Employees					t test	
	k	N	$\bar{r}_0$	SD	$\chi^2_{(k-1)}$	k	N	$\bar{r}_0$	SD	$\chi^2_{(k-1)}$	t	df
Creativity-person	5	1404	.27	0	2.74	2	1733	.40	0	.03	6.88**	4

The results reveal that type of sample is a moderator of the relationship between intrinsic motivation and creativity related to person. As shown in the Table 3, the mean effect sizes vary across the two subsets of the studies and their standard deviations are less than the standard deviation of the whole set of studies ($0 < .06$). The probability of the t test indicates a significant difference between the mean correlations of the two subsets, $t(4) = 6.88$, $p < .01$. The studies that used employees as participants present a mean correlation that is higher compared to that of the studies that used samples of students ($.40 > .27$). It seems

that the relationship between intrinsic motivation and creativity related to person is stronger on the samples of employees compared to those of students.

CONCLUSIONS

The main conclusion of this meta-analysis is that creativity related to person is significantly associated with intrinsic motivation, and this relationship is influenced by some moderators, namely the type of sample, that is the relationship between the two variables is stronger on the samples of employees compared to those of students.

These results had several implications, namely about how to increase motivation and creativity at different contexts, such as schools and organizations.

At school, students are more creative when they see a task as intrinsically motivating, valued for its own sake (Robinson & Azzam, 2009). To promote creative thinking educators need to identify what motivates their students and structure teaching around it. By other way, to encourage motivation and creativity at work, several managerial practices could be used, such as challenge, freedom, resources, supervisory encouragement and organizational support (Amabile, 1996).

One of the conclusions of Byron, Khazanchi and Nazarian (2010) research is that uncontrollability conditions thwart the need for autonomy and competence, and so diminish intrinsic motivation to be creative and cause decrements in creative performance.

Edison's famous line "genius is one per cent inspiration and ninety-nine per cent perspiration", translate the importance of effort and motivation for the creativity.

Recently, at 2009, was the "European year" of creativity, and Pink (2005) argued that we are entering a new age where creativity is becoming increasingly important.

Future researches about the relationships between creativity and motivation, using meta-analysis techniques, should study other aspects of creativity.

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STRESS APPROACH BY MEDIA ART

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Abstract

With a background in conceptual art and media art, and the relations between science and art, we tried to approach the concept of stress through art.

Stress is a recent problem of people in several countries, and could be caused by external factors, such as social pressure, or be derived from internal factors, such as the requirement that the subject puts himself. Stress had a negative impact at several organs of the human body, but heart is the main one.

Taking into account all of these aspects, and from photos of two drawings of the heart beating, was simulated the heartbeat, in order to produce a 2'30 media art film, using a setup program EDIUS, that integrate all the images and sounds planned to perform the stress.

Key-words: Media Art; Conceptual Art; Stress.

1. INTRODUCTION

Media Art is a concept that has emerged in the '90s to describe projects that make use of emerging technologies and who care about the aesthetic possibilities of these tools (Tribe & Jana, 2010), surpassing the movement of Video Art which had begun in the '60s (Martin, 2006).

At first, the art-based computers was a marginal field, but with the potential of new technologies has greatly increased the interest of artists for the use of computers and software in the production of visual art, especially the new generation of artists, allowing the conduct of visual art in a more creative and less expensive.

For a long time that art and science go hand intertwined, with the first great scientists in history also identified as artists such as Leonardo Da Vinci.

However, the increasing specialization of the various areas of knowledge led to the loss of a more holistic view of knowledge and a gradual separation between art and science. In line with Cartesian dualism, Snow (1960) to differentiate between science and art, as different cultures, opposite assumptions, and science and art seen as rational and emotional.

In recent years there have been moves to promote interdisciplinary and integration of scientific knowledge, allowing a broader and more comprehensive the complexity of phenomena and taking advantage of the various specific contributions of the various theories (Jesus & Lens, 2005).

And there are also many cases in modern history of scientists, including Nobel Prize winners in physiology or medicine, as in the case of Roger Guillemin, Salvatore Luria and Robert Holley, all born in the twentieth century, which also developed in the field of art works visual

(Araújo-Jorge, 2004), and the creativity needed for scientific and artistic production that allows to bridge the gap between the two domains.

However, it is less common the attempt to transpose the artistic approach, on scientific topics studied.

Conceptual art possible, from the '60s, the expression of ideas or concepts through art, and art the concept and not the material object produced (Marzona, 2006).

With this background in conceptual art and media art, and the relations between science and art, we tried to approach the concept of stress through art.

Stress was a concept that has emerged in the seventeenth century, under the engineering, to translate the pressure that the loads exerted on the bridges, which should be designed to withstand the stress caused. In the twentieth century there were several definitions of stress in Psychology, and accept the perspective that considers the transactional stress situations occur when the subject makes an assessment of the demands it faces are greater than its resources to respond adequately or competent (Lazarus & Folkman, 1984). Thus, the pressure exerted by the requirement of the situation on the subject leads to a proportional voltage.

There are several symptoms that can arise in situations of stress, but increased heart rate is a major one being the heart of the body that reacts more readily to such situations (Serra, 2007).

There is a close relationship in the way of functioning of various body organs, as the result of activation of the sympathetic system that prepares the individual to respond to the situation that is perceived as stressful. In particular, the respiratory rate and heart rate have an almost direct, and somewhat faster heart rate as is the respiratory tract.

Stress can be caused by external factors such as social pressure, that is, the requirement placed by others on the subject, but can also be derived from internal factors, such as the requirement that the subject puts himself (Jesus , 2007).

In any case, stress is a subjective phenomenon, and the same situation cause stress symptoms in a subject and not in another. Moreover, the subject can manage the impact of potentially stressful situations that may or may not have on its own.

2. WEB3D GRAPHICS VISUALIZATION

The 3D graphics technology has been growing to attend the increasing needs of the cinema, gaming industries and art, reaching the web browser through the use of plug-ins or html5.

One of the first solutions was VMRL97 which lately evolved to the standard X3D.

The later X3D is a standard defined through three ISO documents. ISO/IEC-19775 addresses the definition of the architecture and functionality; ISO/IEC-19776 defines the three different encodings; and ISO/IEC-19777 establishes the language-specific API.

X3D is a component based architecture with capability to extend objects individually allowing the composition of subsets with modular blocks. It includes capabilities such as geometric primitives like boxes, cones and spheres or surfaces defined by low-level triangle definition, extrusion, elevation-grids and Bézier surfaces (NURBS). Another powerful characteristic of X3D is the Scene Access Interface (SAI) which provides scene control from a script embed in the scene it self or from an external application.

X3D obeys to a node structure, which is grouped into components when functionally related. There are 34 components combined at specific levels defining six profiles with nesting relations (see Figure 1). This structure has mechanisms such as subtree switching and level of detail proximity checks scenes are that are optimized to optimal rendering.

Designed for high compatibility with internet applications, X3D is optimal for interoperability with other XML based standards and formats.

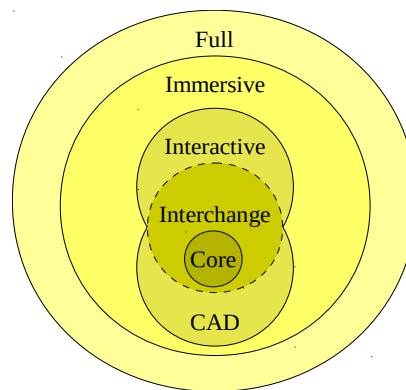


Figure 1: X3D profiles nesting (Daly & Brutzman, 2007).

3. FRAMEWORK

In a perspective and integrative conceptual art, the first author of this work has sought to illustrate the concept of stress through a variety of visual arts: photography, painting, photo-painting, sculpture, installation and drawing.

Now, the authors want to work with the concept of stress through the media art. To this end, it is used the design of the first author, entitled "Cardiac stress", with 0.42 x 0, 30m (see Figure 2).

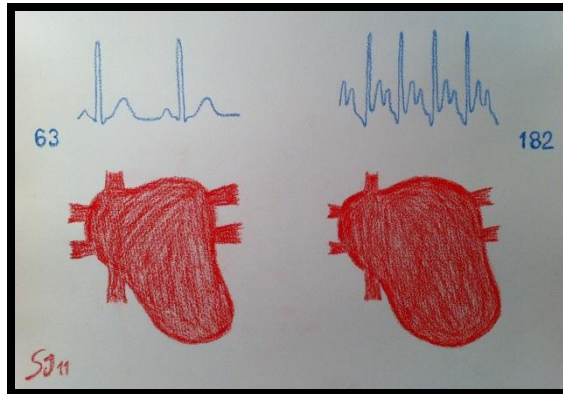


Figure 2: Drawing "Cardiac stress" (Jesus, 2011).

From photos of the two drawings of the heart was performed using the program "EDIUS" in order to simulate the heartbeat (see Figure 3).

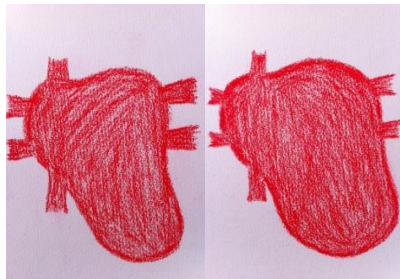


Figure 3: Photos used to mount on the heartbeat.

These images follow one another at a frequency of 63 beats per minute, accompanied by the sound of their heartbeats.

During the first minute is both a sound integrated supposedly slow breathing of the subject, reflecting the relationship between the rhythm of breathing and heartbeat. In the first minute, the same guy who are breathing, said so quiet, "That's being a day!", reflecting the influence that the attitude of the subject itself can have on your stress level. At a minute and fifteen, outside voice that arises concerns in a calm manner, "You've done what I asked you?", reflecting the influence of external factors, particularly other subjects, may have on the level of stress. The subject answer "I'm doing it", and the heart rate remained quiet during this period.

At one minute and forty, the same voice outside say, aggressively, "You've done what I asked you?", greatly increasing the breathing rate of the subject, as well as your heart rate. At two minutes, the subject referred, so puffy and irritated, "That's being a day!" continuing respiratory and cardiac rhythms to increase, reaching the 182 pulses.

At two minutes and fifteen, the subject scream "Ahhhh!", and the heart fails working, going to keep the noise, which reflects the situation of the subject's death, derived from the stress resulting from external pressure and the negative attitude of the subject.

All of this images and sounds planning were fulfil using the program “EDIUS” (see the images and sounds schedule at the Appendix).

In the future we intend to develop a web application, using X3D, that enables users using a computer, a tablet computer or a smart phone, that can deliver the same idea but from a perspective of interactive art, and the sounds made by someone outside of the public attending the presentation and picked up by a microphone. The way the user interacts with the computer in terms of the rate of respiration and how he says the sentences, will be reflected in the speed of heart rate from the projected computer image.

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VISUALISING INNOVATION ECO-SYSTEMS

A workshop for the 12th European Conference on Creativity and Innovation September 2011

Simon Evans, InnovoFlow Ltd

Abstract

Your ability to innovate is key to survival and success. We have been exploring ways to help innovation leaders see the big picture, understand their current innovation eco-systems and then take a proactive approach to their nurture and growth. Using components of an innovation Game (InnovoZone™), participants in this workshop will visualise different innovation scenarios and develop narratives to tell stories about successes and failures. We will use these stories to help us see how to analyse, diagnose and fix unhealthy innovation eco-systems using a simple model, and explore how a taking a gaming approach can accelerate learning.

Workshop Activities

1. Visualising Innovation, introducing the innovation eco-system
2. Adding processes to the eco-system and resourcing them
3. Eco-system modelling – stories that help us improve on reality!
4. What gets in the way – barriers to innovation and how to overcome them
5. The next step - creating a dynamic simulations

1. Visualising Innovation

There are many models of innovation out there – each trying to create a common language that we can use to discuss innovation processes with the hope that we can improve our capability. Many of these models however focus too heavily on the creative processes which of course and by definition are crucial to the process. However focusing too much on this aspect underplays the importance of other activities essential to true innovation – development, leadership and generating a return. Our concept of the innovation eco system covers all these areas and helps us to see the big picture.

What is the Eco-system?

In this workshop we propose that by visualising the whole innovation “Eco-System” we are in a better position to ensure that all parts of the idea lifecycle are covered and working effectively. The idea lifecycle at its most basic level consists of:

- **Creativity** – how ideas are generated
- **Development** – translation of the idea into something of potential value (n.b. not necessarily financial value)
- **Value Realisation** – generating value from your developed idea, a return on your investment
- **Leadership** – creating the environment where innovation can prosper – tending the innovation eco-system

Together, these 4 zones of activity represent the environment in which we can build eco-systems of techniques and approaches consciously designed to fit the innovation situation, rather than continuing (by default) to use the same old accidental approach that you have applied so far and hoping it will work out.

By adding “processes” which represent the people, skills, architectures, technologies, leadership capabilities, events and strategies into these 4 activity zones, we can construct any number of innovation eco-systems (or scenarios) and use the visual model to help us see where things work well or where there are gaps or barriers.

Exercise: Participants will brainstorm at a high level what type of processes might be included in each of the four activity zones to build effective innovation eco-systems

2. Populating Eco-systems - Adding processes to the model

The workshop will explore how processes (a term used in the broadest context) can be defined to represent anything from traditional business processes, to specialist skills, architectures, events and strategies. These processes can then be added to the eco-system to describe how ideas flow through it. Nothing comes for free, and so these processes will have to have some kind of resource assigned to make them work.

Exercise: Participants will brainstorm a number of specific processes and discuss what sort of resource might be needed.

3. Modelling an eco-system – real examples

Using “Process Cards” from InnovoZone, The Innovation Game [™] we will model innovation eco-systems and diagnose problems. Using narrative development techniques, we will explore some case studies which illustrate the diagnostic power of visualising and storytelling to illustrate broken eco-systems and the steps we can take to fix them.

Exercise: Participants will be invited to model their own stories and reflect these back to the group.

4. What gets in the way?

Exercise: The participants will use “reverse innovation” techniques to identify critical barriers to innovation that emerged from the previous modelling exercise. Strategies to overcome these (provide antidotes) will be developed.

5. Playing Games – adding the dynamic element

If time allows, we will discuss the value of adding a dynamic simulation to the modelling process to see how this makes the model much more “real”. In simulation mode, players develop innovation eco-systems in real time in competition (or collaboration) with the other players with the objective of generating as much value (e.g. money) as possible, more quickly than their competitors.



PETER PAN

REDES DE APRENDIZADO VIRTUAIS NA INTERNET E SUA IMPORTÂNCIA COMO FONTE DE INFORMAÇÃO E CONHECIMENTO PARA INOVAÇÃO: UM ESTUDO SOBRE UM PORTAL DE DEMANDAS E OFERTAS TECNOLÓGICAS

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Resumo

Com o surgimento do atual paradigma das tecnologias da informação, as novas condições de apropriação de conhecimento e aprendizado, favorecidas pelo advento da internet, e a necessidade de cooperação entre universidades e empresas, faz-se necessário discutir estes mecanismos, enfatizando sua importância e o novo foco de sua compreensão e aplicabilidade, dentro do cenário da chamada “era do conhecimento e do aprendizado”. O objetivo deste estudo é explorar os mecanismos de aprendizado, voltados para inovação, em ambientes virtuais a partir da perspectiva de rede. Como metodologia realizou-se uma pesquisa exploratória, qualitativa, através de estudo de caso. Obtendo como resultado, um panorama sobre as relações estabelecidas em um portal na internet, desenvolvido por uma rede de instituições de pesquisa (ICTs) para concretizar relações de demandas e ofertas tecnológicas, compreendendo o envolvimento dos atores: empresários, pesquisadores e núcleos de inovação tecnológica daquelas ICTs.

Palavras Chave: Redes de aprendizagem virtuais; Inovação tecnológica; Internet.

Virtual Learning Networks on the Internet and its importance as a Source of Information and Knowledge for Innovation: A Study on a Web site for Demands and Technology Offers

Abstract

With the arising of the current paradigm of information technology, the new conditions of knowledge and learning acquisition, favored by the advent of the internet and the need for cooperation between universities and enterprises, it is necessary to discuss these mechanisms and the new focus of their comprehension and applicability, within the scenario of the so-called “era of knowledge and learning acquisition”. The objective of this paper is to explore those mechanisms, focused on innovation in virtual environments from a perspective of network. As methodology, an exploratory, qualitative research was carried out through case study. It was obtained, then, as a result, an overview of the relations established through an internet portal, developed by a networked consortium of research institutions (ICTs) to realize technological demands and offers, including the involvement of the entrepreneurs, researchers and Technological Innovation Centers (NITs) of those ICTs, each one as a performer *par excellence*.

Keyword: Virtual learning networks technological innovation; Internet

Introdução

Dadas as características do atual paradigma das tecnologias da informação, as novas condições de apropriação de conhecimento favorecidas pelo advento da Internet, a necessidade de cooperação universidades e empresas, faz-se necessário discutir estes mecanismos, enfatizando sua importância e o novo foco de sua compreensão e aplicabilidade, dentro do cenário da chamada “era do conhecimento e do aprendizado”.

Este estudo tem como objetivo explorar os mecanismos de aprendizado, voltados para inovação, em ambientes virtuais a partir da perspectiva de rede, tal como relaciona a literatura sobre aprendizado organizacional.

Teixeira e Guerra (2002) destacam que pesquisas realizadas em sistemas complexos de produção sugerem que o arranjo inter-organizacional típico em que se apresentam é o de rede de firmas, marcada por uma forte especialização dos agentes que compõem suas cadeias de suprimentos (*supply chain*) e uma intensa complementaridade entre eles, o que atenua ou elimina rivalidades potenciais. A frequente heterogeneidade desses agentes, em termos de capacitações produtiva, tecnológica e organizacional, termina por estimular essa rede de firmas a se transformar em uma rede de aprendizado, entendida enquanto um *pool* social de conhecimentos e informações que circulam entre seus membros, gerando fortes externalidades positivas.

Segundo Maciel (2001), os dados dos países mais avançados demonstram que a capacidade inovadora de uma empresa ou de uma nação não depende pura e simplesmente de sua capacidade econômica de investir em novas tecnologias nem das de seus dirigentes para elaborar estratégias econômicas adequadas, mas, sim, da capacidade social, cultural e política de aplicar produtivamente e aproveitar socialmente os recursos – materiais e imateriais – disponíveis. Nesse sentido, a internet desempenha um papel cada vez mais importante na estratégia das organizações.

“A internet é o tecido de nossas vidas. Se a tecnologia da informação é hoje o que a eletricidade foi na Era Industrial, em nossa época a Internet poderia ser equiparada tanto a uma rede elétrica quanto ao motor elétrico, em razão de sua capacidade de distribuir a força da informação por todo o domínio da atividade humana. Ademais, à medida que novas tecnologias de geração e distribuição de energia tornaram possível a fábrica e a grande corporação como fundamentos organizacionais da sociedade industrial, a Internet passou a ser a base tecnológica para a forma organizacional da Era da Informação: a rede.” Castells (2003, p.7).

Entretanto, para Castells (2003), apesar de suas vantagens em termos de flexibilidade, as redes tiveram tradicionalmente de lidar com um grande problema, em contraste com hierarquias centralizadas; elas têm tido considerável dificuldade em coordenar funções, em concentrar recursos em metas específicas e em realizar uma dada tarefa dependendo do tamanho e da complexidade.

Castells (2003) relaciona a emergência da internet ao debate sobre a ascensão de novos padrões de interação, destaca afirmações sobre a formação de comunidades virtuais, baseadas em comunicação on-line, interpretada como a culminação de um processo histórico de desvinculação entre localidade e sociabilidade na formação da comunidade. Deste discurso emerge elementos como: novos padrões, seletivos, de relações sociais que substituem as formas de interação humana territorialmente limitada.

Assim, surge uma indagação sobre o quanto o surgimento destes novos padrões de interação influencia a organização em seu processo de aprendizado e inovação. Principalmente a partir de redes de aprendizado virtuais.

Para Castells (2003), há algo especial no caso da internet.

“Novos usos da tecnologia, bem como as modificações reais nela introduzida, são transmitidos de volta ao mundo inteiro, em tempo real. Assim, o intervalo entre o processo de aprendizagem pelo uso, e de produção pelo uso, é extraordinariamente abreviado, e o resultado é que nos envolvemos num processo de aprendizagem através da produção, num *feedback* intenso entre difusão e o aperfeiçoamento da tecnologia.”

Castells (2003) destaca que é uma lição comprovada da história da tecnologia que os usuários são os principais produtores da tecnologia, adaptando-a a seus usos e valores e acabando por transformá-la.

Ferreira e Neves (2004) caracterizam os sistemas de inovação pelo desenvolvimento de ambientes ricos em informações e conhecimentos e por seus fluxos (transferências) entre organizações, ou seja, quanto mais essas características se verificam, tanto mais o sistema é desenvolvido e eficaz. Para aumentar a conectividade dos sistemas de inovação, serviços, redes e estruturas-interface são criados, intensificando as transferências de informação e conhecimento.

Este trabalho está dividido em duas etapas. Na primeira etapa serão apresentados aspectos relevantes à construção do conhecimento e do aprendizado segundo a ótica evolucionista e a seguir, aspectos, relativos ao aprendizado organizacional e à construção de redes de aprendizado; na segunda, por sua vez, será caracterizada uma rede de aprendizado virtual, instituída no Brasil a partir da parceria entre núcleos de inovação

tecnológica de 17 instituições de pesquisa e empresas privadas com o objetivo de criar sinergias positivas para o processo de inovação.

2. Aprendizado e Conhecimento

Bell (1984) classifica o termo “aprendizado” a partir de dois diferentes tipos de processos onde a capacidade tecnológica é adquirida: no primeiro, “aprendizado” é freqüentemente usado para referir-se ao processo de aquisição de competência e conhecimento que dependem amplamente da experiência *learning by doing*. As atividades de produção executadas em um período geram um fluxo de informação e entendimento que permite que a execução seja melhorada no período seguinte. Este fluxo de aprendizado é, além disso, visto como um processo de *feedback* que se opera com a atividade de produção e seu desempenho. Assim, a análise dos problemas e as oportunidades encontradas geram o estímulo para a mudança.

No segundo tipo, o termo “aprendizado” é utilizado para referir-se mais comumente à aquisição de crescentes competências e conhecimentos, por qualquer caminho. Consequentemente, “aprendizado” refere-se a qualquer caminho que uma empresa encontra para aumentar sua capacidade de gerenciar tecnologia e implementar mudança técnica.

Dosi (1988) observa que a solução de muitos problemas tecnológicos, como por exemplo, o projeto de uma máquina com certas características de desempenho, desenvolvimento de um novo composto químico com certos elementos, melhorias de eficiência de insumos na produção, implica o uso de partes de conhecimento de vários grupos. Alguns elementos representam um entendimento amplamente aplicável, que pode ser conhecimento científico direto ou conhecimentos relacionados com princípios amplamente aplicáveis e bem conhecidos (por exemplo, na eletricidade, mecânica, mais recentemente, a informática). Algumas partes do conhecimento são específicas a um particular “meio de fazer coisas”, a experiência do produtor, do usuário ou ambos.

Mais do que isso, alguns aspectos deste conhecimento são bem articulados, até mesmo registrados, em considerável detalhe em manuais e artigos e ensinados em escolas. Outros são amplamente tácitos, principalmente apreendidos através da prática e de exemplos práticos: ora, existem elementos em ser um bom engenheiro, um bom projetista, ou mesmo um bom matemático que não podem ser transmitidos em forma algorítmica, ou seja, codificados.

Alguns conhecimentos que envolvem o uso e melhoramento de tecnologias são abertos e públicos: os mais óbvios exemplos são as publicações científicas e técnicas. Entretanto, outros aspectos são privados, alguns “implícitos” porque são de qualquer forma

tácitos, ou explícitos, no sentido que eles são segredos ou instrumentos legais como patentes.

Em geral, o progresso técnico origina-se por meio do desenvolvimento e exploração de elementos públicos de conhecimento, compartilhados por todos os setores envolvidos em certas atividades, e formas acumulativas de conhecimento privado, local, tácito, empresa-específicos. Existiriam certos elementos "públicos" no progresso tecnológico essencialmente derivado de um livre fluxo de informações, disponíveis em publicações etc.

Outro aspecto importante a se destacar em relação ao conhecimento é o caráter acumulativo do elemento tácito adquirido durante um projeto de Pesquisa & Desenvolvimento (P&D) e que se reflete nos projetos seguintes, inclusive afetando seu custo de transferência para competidores.

Em vista do conhecimento adquirido no curso de um projeto frequentemente ter implicações para o novo *round* de projetos de P&D, é importante para a entidade que está patrocinando a atividade de P&D manter um inter-relacionamento próximo com a unidade de P&D, não somente para acessar tecnologias valiosas e possíveis conhecimentos específicos da empresa que a unidade de P&D irá gerar, mas também por razões de prevenir *spilling over* para os competidores (...) Teece (1988).

A partir do momento em que o processo inovador passar a ser interpretado como um modelo estruturado em cadeia, em que *feedbacks* e interações entre diferentes variáveis, como: em que pesquisa aplicada, desenvolvimento, prototipação, teste, produção e marketing têm lugar. Novos avanços nas ciências e tecnologias agem não somente nos estágios de pesquisa básica e aplicada do processo de inovação, mas também são altamente distribuídas e afetam todas as ligações do processo inovador.

Este modo de interpretar o processo de inovação implicou em que uma grande variedade de mecanismos de aprendizado ocorre quando empresas estão envolvidas no processo de inovação. Para Lundvall (1992) alguns destes mecanismos de aprendizado são internos, enquanto outros são externos. Malerba (1991) afirma que a combinação destes mecanismos de aprendizados difere de setor para setor e de trajetória tecnológica para trajetória tecnológica.

A efetividade do aprendizado é altamente afetada pelo nível e composição das atividades e capacidades das empresas. Estas capacidades incluem capacidades de absorção, científicas, tecnológicas, produtiva e de marketing. Segundo Malerba e Torrisi (1991) elas são acumuladas através do tempo, pelas empresas e de diversas formas.

Lundvall (1998) destaca que a importância em se estudar os sistemas nacionais de inovação, a partir da abordagem que coloca inovação e aprendizado no centro da discussão, está em identificar como diferentes elementos que diferem entre diferentes países conduzem a diferentes estilos de inovação. Estilos de inovação, segundo Lundvall

(1998), referem-se a diferentes modos de fazer as coisas no contexto de aprendizado e inovação.

3. Aprendizado Organizacional e Redes de Aprendizado

As mudanças ocorridas com a globalização são econômicas, políticas, sociais, culturais e, principalmente, tecnológicas, vêm exigindo dos profissionais um novo perfil perante as organizações e a sociedade.

Com relação a este novo quadro, Oliveira (2004, p. 329) afirma:

“Nos atuais contextos organizacionais de contínuas e rápidas mudanças para melhor definir políticas de gestão, assim como para implementar procedimentos que facilitem a produtividade e a competitividade organizacional, a clara e explícita compreensão dos processos de aprendizagem é determinante”.

Diante deste quadro, as organizações são levadas a discutir os novos modelos de gestão. A partir deste momento, elas percebem que o processo de aprendizagem organizacional pode ser um caminho para desenvolver competências, preparando-as para gerir, processar e sedimentar os novos conhecimentos.

Estes novos conhecimentos têm exigido dos indivíduos, uma maior disposição para aprender, como forma de poder possibilitar o acompanhamento das novas tecnologias e das novas informações, agora introduzidas na estrutura organizacional.

Neste foco, a aprendizagem organizacional passa a ser vista como uma vantagem competitiva, que envolve meios capazes de propagar o conhecimento com o objetivo de solucionar problemas, repassar informações, proporcionar mudanças comportamentais e, criar novos conceitos.

De acordo com Nakano (2005) in Amato (2005), as redes de cooperação interinstitucionais podem ser constituídas como um “novo *locus* da inovação, ambientes onde o conhecimento pode ser gerado de forma mais eficiente e rápida”.

Segundo Teixeira e Guerra (2002), o processo de aprendizado organizacional é um fenômeno estudado há muito tempo no campo das organizações. Considera-se que ele depende tanto de mudanças na base técnica da produção, como nos processos gerenciais que dão sustentação a essa base. Vale dizer, deve-se examinar não apenas a adoção ou implementação de novas tecnologias no ambiente organizacional, mas também como as organizações desenvolvem estratégias, estruturas, processos de trabalho, estilos de liderança, comportamentos e culturas que lhes permitam obter desempenhos diferenciados em relação à concorrência.

Teixeira e Guerra (2002) acrescentam que o desempenho de alguns setores industriais japoneses, nas décadas de setenta e oitenta, foi fundamental para renovar o interesse nesse tipo de abordagem. Avaliou-se que as inovações organizacionais introduzidas nas empresas nipônicas foram as principais responsáveis pela *performance* diferenciada por elas apresentada, sendo que o aspecto mais importante desse conjunto de inovações teria sido o estabelecimento de processos de melhorias contínuas (*Continuous Improvement*).

Reforçou-se, assim, por um lado, a convicção de que a renovação tecnológica, baseada na mera compra de equipamentos de base microeletrônica, por exemplo, não era uma resposta suficiente para a obtenção de um desempenho superior. Por outro, cresceu a atenção dada às organizações de aprendizado (*learning organizations*) e reviveu-se o interesse pelos mecanismos que levam ao aprendizado organizacional.

Scott-Kemmis e Chitravas (2007) destacam que o desenvolvimento de mecanismos de aprendizagem nas organizações deve ocorrer de forma intencional e gerenciada, visto a necessidade de investimentos, ações de P&D, contratação de novos funcionários, capacitação de funcionários existentes e parcerias estratégicas de transferência de conhecimento com outras empresas, institutos de pesquisas.

Miguel e Teixeira (2005), no seu estudo sobre aprendizagem organizacional teve como objetivo identificar a relação entre valores organizacionais e a criação do conhecimento. E concluiu que os valores organizacionais “Realização”, “Autonomia”, “Bem-Estar do Empregado” e “Preocupação com a Coletividade” foram os que apresentaram os mais elevados índices de correlação com as seguintes condições capacitadoras de criação do conhecimento: “Estímulo ao Enfrentamento de Desafios”, “Compromisso com a Empresa”, “Processo Decisório Participativo” e “Conversão do Conhecimento”.

De acordo com a literatura revisada por Bessant e Tsekouras (1999), existem alguns requisitos para o funcionamento de Redes de Aprendizado: i) estabelecer e definir formalmente a rede; ii) ter um objetivo primário e uma definição sobre o tipo de aprendizado e conhecimento com que se irá trabalhar; iii) contar com uma estrutura de operação e com protocolos que estabeleçam fronteiras de participação; iv) processos que podem ser mapeados no ciclo de aprendizado; v) escolher instrumentos de medidas que permitam verificar os resultados da operação da rede, que permitam decidir pela sua continuidade ou não. Cumprir esses requisitos é fundamental para que bloqueios à efetiva operação da rede possam ser superados

Com base em diversas experiências existentes, Bessant e Francis (2005) propõem uma tipologia de Redes de Aprendizado tendo como base o alvo de aprendizado de cada uma delas. Essa tipologia é apresentada na Tabela 1. É importante observar que, em alguns casos, a rede de aprendizado é uma das atividades desempenhadas pelo seu

promotor/operador, como uma entidade de certa categoria profissional ou um órgão de representação de classe (sindicato patronal, por exemplo), em paralelo às outras atividades comuns nesse tipo de instituição. Nessa tipologia, o papel do governo pode ser tanto de promoção e operação, como de incentivador da formação de redes a serem operadas por outros agentes.

Tabela 1-Tipologia de Redes de Aprendizado

Tipo de Rede	Alvo do Aprendizado	Exemplos
Profissional	Aumentar o conhecimento e as capacitações profissionais visando atingir a melhor prática na área.	Rede organizada por entidade de categoria profissional.
Setorial	Melhorar a competência em algum aspecto do desempenho competitivo de um setor. Por exemplo, conhecimento tecnológico.	Rede organizada por sindicato patronal, associação de indústria ou entidade de pesquisa voltada para um setor.
Tópica	Aumentar o conhecimento sobre uma nova técnica em um campo particular e suas aplicações. Por exemplo, uma nova tecnologia de interesse comum de várias empresas.	Clubes de “melhores práticas”.
Regional	Aumentar conhecimento sobre temas de interesse regional. Por exemplo, rede de pequenas e micro empresas voltadas para exportação, difusão tecnológica e melhorias gerenciais etc.	Cooperativas de aprendizado que podem levar a formação de clusters.
Cadeia de Suprimento	Alcançar padrões de qualidade, custo e atendimento demandados por cliente (s) ao final de uma cadeia de suprimento (supply chain).	Rede de firmas que participam de uma cadeia de suprimento com grandes clientes finais.
Promovida pelo Governo	Iniciativas nacionais ou regionais visando melhorar o desempenho competitivo de grupos de empresas, em termos de conhecimentos sobre novas tecnologias, exportação, marketing etc.	Redes organizadas por agências regionais ou setoriais de desenvolvimento.
Redes de suporte á atividades	Similar as redes profissionais, preocupa-se em compartilhar e desenvolver conhecimento sobre como fazer uma atividade em particular, especialmente uma nova atividade	Rede de profissionais

Fonte: Adaptada de Bessant e Francis (2005)

Segundo Teixeira e Guerra (2002), a idéia de que uma rede de aprendizado pode ser resultado de uma iniciativa planejada pressupõe que haja uma organização por trás da sua operação. Essa organização tem como tarefa o gerenciamento de atividades e processos que contribuam para que se atinja a missão da rede. Seu principal papel é o de servir como estimuladora da integração dos membros e, ao mesmo tempo, coordenadora dos trabalhos que levem ao compartilhamento do aprendizado e do conhecimento.

Nesse sentido, descrevem-se, na Tabela 2, oito processos considerados centrais na operação de uma rede, que devem receber especial atenção da organização responsável pelo seu funcionamento, pois a eficácia da rede dependerá da maneira como eles forem gerenciados.

Tabela 2 - Processos Centrais na Operação de uma Rede

Processos	Propósito
Criação da rede	Definir como os participantes serão atraídos e como serão mantidos.
Tomada de decisão	Estabelecer como, onde, quando e quem será o responsável pelas decisões.
Resolução de conflitos	Fixar os mecanismos de resolução de conflitos, quem irá implementá-los e como.
Processamento de informações	Gerenciar o fluxo de informações a circular entre os participantes.
Obtenção de conhecimento	Articular o acesso e a obtenção de conhecimento relevante para a rede e torná-lo disponível para os participantes.
Motivação/compromisso	Desenvolver mecanismos que assegurem a motivação dos participantes e o compromisso com seus objetivos.
Compartilhamento dos custos e benefícios	Definir como serão compartilhados os benefícios e os eventuais custos e riscos associados ao funcionamento da rede.
Integração	Estipular como as relações entre os participantes da rede serão construídas e mantidas, tendo em vista a necessária integração entre eles.

Fonte: Adaptada de Bessant e Tsekouras (1999)

Sintetizando, convém reafirmar alguns pontos e apresentar outros, até então não mencionados, que, de acordo com Bessant e Tsekouras (1999), devem ser considerados na constituição e operação de uma rede de aprendizado.

É de fundamental importância que a rede estabeleça uma meta clara e factível, que seja compartilhada por todos os participantes. Isso torna o trabalho de promoção do aprendizado mais focado, facilita a medição dos melhoramentos alcançados e mantém a motivação dos participantes.

Os critérios para participação na rede devem ser claros. A princípio, uma rede deve manter-se aberta à participação de novos membros, desde que eles se enquadrem nos limites estabelecidos. A definição dessa fronteira ajuda a focar os objetivos e as metas de aprendizado.

O modelo de estrutura organizacional a ser adotado depende do tipo de rede e do fluxo de informação que se quer estabelecer e enfatizar. Quando o fluxo de informação é mais complexo, envolvendo comunicação em dois ou mais sentidos, é necessária uma estrutura mais bem definida e formalizada.

A definição do papel da coordenação é crucial. Ela é responsável pela organização dos eventos, edição de boletins e, acima de tudo, pela manutenção da motivação dos membros. Uma atividade crítica é a seleção de intermediários e consultores que irão promover o aprendizado interativo dos participantes.

A caracterização do tipo de aprendizado que será promovido possui sérias implicações para o funcionamento da rede. O aprendizado pode ter diferentes focos, desde a familiarização com uma nova regulação, passando pela difusão de uma nova técnica, até formas mais complexas, como a adoção de novas filosofias gerenciais. Estruturas de operação, métodos e mecanismos diferem de acordo com o tipo de aprendizado que se quer promover.

O conteúdo do processo é diferente para cada tipo de aprendizado. Cumpre, portanto, estabelecer de forma clara o plano que levará à difusão das técnicas e dos métodos que resultem em efetiva melhoria do desempenho. Nessa área, não é recomendável criar novas técnicas ou metodologias, mas selecionar, entre as existentes, aquelas que estarão disponíveis para os participantes.

A motivação inicial para que as empresas participem da rede é de crucial importância. Essa motivação pode vir de mudanças no meio ambiente, a exemplo de desregulamentação de mercados e/ou derrubada de alíquotas de importação, mudanças essas que devem ser usadas pela coordenação da rede como uma das justificativas para um esforço coletivo. Campanhas de conscientização sobre a ameaça de desaparecimento de empresas devido às novas condições de concorrência, realização de *benchmarks*, e a formatação coletiva de programas de fomento industrial a serem pleiteados ao governo, são exemplos de mecanismos para atrair e manter a participação.

A identificação dos recursos necessários ao funcionamento da rede e como eles serão mobilizados é outro ponto importante. O planejamento deve especificar os recursos humanos, financeiros e técnicos que serão necessários para que a rede aconteça.

A coordenação da rede deve, essencialmente, buscar a facilitação do processo de aprendizado. Ela não deve se envolver diretamente com consultoria, nem em diagnósticos das empresas participantes. Seu papel é fazer com que essas empresas definam suas necessidades de aprendizado e tornar disponíveis os meios para o atendimento dessas necessidades.

Os critérios de mensuração do desempenho da rede devem ser claramente estabelecidos e monitorados. Esse monitoramento facilitará a manutenção da motivação e, conseqüentemente, da participação.

Existem bloqueios e barreiras que devem ser identificados e evitados ao longo do processo. Perda de motivação, dificuldades de comunicação, comportamento arreadio de indivíduos-chave e resistência à mudança se encontram entre os mais frequentes.

Szulanski (1996) in Oliveira, Sommer et al. (2007) afirma que o grau de dificuldade para transferir um conhecimento é consequência do grau de aderência do receptor, seja ele indivíduo, grupo de indivíduo ou mesmo uma organização. O autor expõe quatro fatores que podem influenciar o processo de transferência de conhecimento.

Quadro 2 – Fatores que influenciam a transferência do conhecimento

1) Características do Conhecimento Transferido

- a) Ambigüidade causal: é o resultado da incompreensão do novo contexto do qual o conhecimento está sendo aplicado. São as dificuldades em replicar esse conhecimento para um novo contexto.
- b) Falta de provas: conhecimento com provas gravadas de processos usuais e ajuda na transferência. Sem essas provas, torna-se difícil induzir potenciais receptores para empenhar-se na transferência.

2) Características do Transmissor do Conhecimento

- a) Falta de motivação: o transmissor do conhecimento torna-se relutante para transferir o conhecimento por causa do status, posição e superioridade provenientes desse conhecimento.
- b) Necessidade de confiança: um transmissor no qual o receptor sente-se seguro e pode confiar.

3) Característica do Receptor do Conhecimento

- a) Falta de motivação: relutância do receptor em aceitar o conhecimento vindo de fora – rejeição por usar algo que não foi criado e desenvolvido internamente – para a unidade de negocio.
- b) Falta de capacidade de absorção: o receptor está impossibilitado em absorver o conhecimento do transmissor por ser incapaz de absorvê-lo, uma vez que esse novo conhecimento é muito baixo para se assimilar e aplicar.
- c) Falta de capacidade de reter o conhecimento: a habilidade do receptor em institucionalizar a utilização desse novo conhecimento reflete na capacidade de retenção. Na ausência dessa habilidade, haverá dificuldades durante a integração do conhecimento recebido, podendo ser até descontinuado o uso e possivelmente voltar ao seu estado anterior.

4) Características Contextuais

- a) Árduo relacionamento: a transferência do conhecimento, principalmente quando se trata do conhecimento tácito, requer a troca do conhecimento entre as partes. O sucesso dessa troca depende da facilidade de comunicação e da intimidade de relacionamento entre a unidade transmissora e a unidade receptora.

Fonte: Oliveira, Sommer et al. (2007)

Goussevskaia et al. (2005), em sua pesquisa investigam as redes de inovação colaborativa, baseando-se nos conceitos de rotinas para o compartilhamento de conhecimento e capital social; como principal resultado, encontraram evidências de que essas rotinas se relacionam ao capital social de forma dinâmica, por meio de mecanismos mútuos de retroalimentação.

Balestrin (2005), em seu trabalho, procurou apresentar algumas teorizações sobre conhecimento organizacional, sobretudo, em relação à dimensão dos “espaços de criação de conhecimento”, concluindo com a apresentação de um esquema conceitual. Suas principais implicações teóricas foram às seguintes: a) em uma mesma organização podem coexistir diversos tipos de conhecimento – tácito *versus* explícito, simples *versus* complexo,

sistêmico *versus* independente; b) o conhecimento não existe somente na cognição dos indivíduos, necessitando para a sua criação um contexto específico em termos de tempo, espaço e relacionamento entre indivíduos; c) as tecnologias de informação e de comunicação (TIC) poderão contribuir ou dificultar o processo de criação de conhecimento; e, d) para potencializar os processos de inovação, a organização deverá dispor em sua estrutura de espaços e situações que favoreça o relacionamento informal e face a face entre os indivíduos, criando um ambiente de sinergia e estímulo em que as emoções, as experiências, os sentimentos e as imagens mentais sejam livremente compartilhados.

Ferreira e Neves (2004) estudaram a variedade de iniciativas que são hoje desenvolvidas para apoiar a transferência e o compartilhamento de informação e conhecimento no interior dos sistemas de inovação dos países desenvolvidos através da análise de alguns aspectos da experiência canadense nesse campo. Apresentando programas, serviços e estruturas criados para apoiar as atividades de inteligência econômica e tecnológica, a monitoração e a prospecção do ambiente de negócios, o desenvolvimento de redes voltadas para o registro e o compartilhamento do conhecimento e a criação de pequenas empresas de base tecnológica, vetores de difusão de novo conhecimento.

Ferigotti (2004) examina as implicações dos processos de aprendizagem intra e inter-empresariais (fluxo de conhecimento) para a acumulação de competências na Electrolux do Brasil S/A, Curitiba/PR no período de 1980 a 2003. O objetivo foi analisar como a aprendizagem influenciou a acumulação de competências inovadoras na função tecnológica e conclui que as evidências que emergem contradizem generalizações comuns, em relação à ausência de inovação e a inexistência de fluxos de conhecimento para inovação, em subsidiária de país em desenvolvimento de grupo transnacional.

Balestro (2004) examina as relações teóricas entre capital social, conhecimento e aprendizado no contexto das redes de inovação. Com base em uma revisão sobre redes de inovação e capital social a partir de autores como Bourdieu e Coleman, e desenvolve o argumento de que o capital social possibilita as empresas aumentarem sua capacidade inovadora e ajuda a explicar a dinâmica das redes de inovação. As redes de inovação, neste estudo, são definidas como processos de interação entre atores heterogêneos produzindo inovações. Na sua relação mais direta com o conhecimento e aprendizado dos atores em rede, o capital social possui duas dimensões centrais, segundo Balestro (2004): a dimensão estrutural estaria mais relacionada com o acesso a diferentes fontes de informação e de conhecimento, atores mais centrais possuiriam um maior número quantidade de conexões ou de fontes. No caso da dimensão relacional, pressupõe que relações com maior nível de confiança afetam a qualidade das relações. Conclui que a combinação de ambas faz do

capital social um fator importante para aumentar o aprendizado, pois elas abrangem a extensão dos contatos e a variedade dos conteúdos trocados entre os atores.

Balestrin e Vargas (2004) buscam compreender o efeito “rede” nos processos de inovação, mais especificamente, aprofundando a questão de como ocorre a complementaridade de conhecimentos e habilidades em um ambiente em rede. Os resultados apresentados pelos autores ratificam a importância da complementaridade de conhecimentos nos processos de inovação, porém indicam que o surgimento do efeito “rede”, em tais arranjos industriais, é muito mais complexo que o simples fato de aproximar um grupo de atores em um mesmo espaço geográfico.

Oliveira e Goulart (2003) em seu trabalho exploram a relação entre inovação e alianças para gerar novos conhecimentos e tecnologias, transformando-os em novos produtos, serviços, processos, mercados, fontes de suprimentos ou desenhos organizacionais. Analisando três casos de inovações em empresas de diferentes setores, os autores se propõem a dar os primeiros passos em direção a um processo estruturado de inovação, que envolva recursos internos da empresa e a participação ativa de atores externos a ela. Características comuns a todos eles sugerem que o desafio na criação de novas soluções está não apenas em desenvolvê-las alavancadas no conhecimento existente na organização, mas na sua capacidade de utilizar o conhecimento de clientes, fornecedores e parceiros para alcançar um resultado que nenhum deles poderia fazê-lo isoladamente. Concluem que isso requer da organização o conhecimento das competências e habilidades que deve possuir ou criar e os processos estruturados, pois os papéis em cada fase exigem diferentes tipos e processos de gerenciamento de parcerias e alianças.

4. A Internet e seus Tipos Sociais

Castells (2003) afirma que a especificidade biológica da espécie humana é feita a partir da comunicação consciente (linguagem humana). E, acrescenta que, como nossa prática é baseada na comunicação, e a internet transforma o modo como nos comunicamos, e nossas vidas são profundamente afetadas por essa nova tecnologia da comunicação. O autor conclui que, por outro lado, ao usá-la de muitas maneiras, nós transformamos a própria internet e um novo padrão sócio-técnico emerge dessa interação.

Para Castells (2003), ao analisar o movimento para fonte aberta, a cultura da Internet caracteriza-se por uma estrutura em quatro camadas: a cultura tecnomeritocrática, a cultura hacker, a cultura comunitária virtual e a cultura empresarial (Quadros 2, 3, 4 e 5).

QUADRO 3 - Estrutura cultural da Internet: características fundamentais - Tecnoelites

-
- A descoberta tecnológica é o valor supremo.
 - A relevância e aposição relativa da descoberta dependem da contribuição para o campo como um todo, num contexto de objetivos de solução de problemas definidos pela comunidade dos cientistas/tecnólogos.
 - A relevância da descoberta é determinada pelo exame dos pares entre membros da comunidade.
 - A coordenação de tarefas e projetos é assegurada por figuras de autoridade.
 - Para ser respeitado como membro da comunidade, e, mais ainda, como figura de autoridade, o tecnólogo deve agir de acordo com normais formais e informais da comunidade e não usar recursos comuns (conhecimento) ou recursos delegados (posições institucionais) para seu benefício exclusivo, além de partilhar bens com avanços das capacidades tecnológicas pelo aprendizado a partir da rede.
 - A pedra angular de todo o processo é a comunicação aberta do software, bem como todos os aperfeiçoamentos resultantes da colaboração em rede
-

Fonte: Castells (2003)

QUADRO 4 - Estrutura cultural da Internet: características fundamentais - Hackers

-
- Liberdade. Liberdade para criar, liberdade para apropriar todo o conhecimento disponível e liberdade para redistribuir esse conhecimento sob qualquer forma ou por qualquer canal escolhido pelo hacker.
 - Satisfação de alcançar status na comunidade, e alegria inerente à criação.
 - Sentimento comunitário, baseado na integração ativa a uma comunidade, que se estrutura em torno de costumes e princípios de organização social informal.
 - A Internet é o alicerce organizacional dessa cultura. A comunidade hacker é global e virtual
-

Fonte: Castells (2003)

QUADRO 5 - Estrutura cultural da Internet: características fundamentais – Comunidades virtuais

-
- Diversidade. Não existe uma cultura comunitária unificada.
 - Características sociais tendem a especificar a cultura virtual.
 - Os usuários tendem a adaptar novas tecnologias para satisfazer seus interesses e desejos.
 - Não representa um sistema relativamente coerente de valores e normas sociais.
 - Valorização da comunicação livre
 - Formação autônoma de redes. Possibilidade dada a qualquer pessoa de encontrar sua própria destinação na Net, e, não a encontrando, de criar e divulgar sua própria informação, induzindo assim a formação de uma rede.
-

Fonte: Castells (2003)

QUADRO 6 - Estrutura cultural da Internet: características fundamentais – Empresários

-
- Cultura do dinheiro.
 - Trabalho compulsivo e incessante.
 - É a fabricação do futuro, e não sua troca por poupanças precavidadas, que fornece a segurança da vida.
 - Individualidade.
-

Fonte: Castells (2003)

Metodologia

Minayo (1998) descreve que é importante escolher uma metodologia de pesquisa que venha a contribuir de forma efetiva com a resposta da pergunta de pesquisa. Não adianta o pesquisador utilizar instrumentos altamente sofisticados de mensuração, se os mesmos não corresponderem às expectativas de compreensão de seus dados, ou mesmo não responderem as perguntas fundamentais.

Um método é um conjunto de processos pelos quais se torna possível conhecer uma determinada realidade, produzir determinado objeto ou desenvolver certos procedimentos ou comportamentos Oliveira (1999). O método científico caracteriza-se pela escolha de procedimentos sistemáticos para descrição e explicação de uma determinada situação sob estudo e sua escolha deve estar baseada em dois critérios básicos: a natureza do objetivo ao qual se aplica e o objetivo que se tem em vista no estudo Fachin (2001).

O Método do Estudo de Caso enquadra-se como uma abordagem qualitativa e é frequentemente utilizado para coleta de dados na área de estudos organizacionais, apesar das críticas que ao mesmo se faz, considerando-se que não tenha objetividade e rigor suficientes para se configurar enquanto um método de investigação científica.

Yin (2001) discute que a adoção do Método do Estudo de Caso é adequada quando são propostas questões de pesquisa do tipo “como” e “por que”, e nas quais o pesquisador tenha baixo controle de uma situação que, por sua natureza, esteja inserida em contextos sociais.

Yin (2001) discute que os estudos de caso vão além de uma estratégia meramente explanatória, reforçando a existência de estudos de caso exploratórios, descritivos ou explanatórios, embora esta visão seja contestada Tull e Hawkins, citados por Lazzarini, 1997 ou assumida Stake, In Denzin e Lincoln (2001) por diferentes autores.

Yin (2001) afirma que o fator predominante para a escolha da estratégia de estudo de caso em contraposição ao uso de experimentos, levantamentos de dados, pesquisa histórica, etc., é a consideração da forma de questão da pesquisa, do controle exigido sobre eventos comportamentais e do foco sobre acontecimentos contemporâneos ou não.

Esta metodologia foi escolhida por compreender que seria possível realizar registros e interpretações dos fenômenos, dentro do contexto organizacional selecionado para o desenvolvimento da pesquisa, buscando a sua essência da percepção e da consciência dos indivíduos envolvidos.

O estudo de caso, para Yin (2001), é geralmente uma estratégia escolhida quando questões do tipo “como” e “por que” são investigadas e o pesquisador tem pouco domínio sobre os eventos e o foco é sobre fenômenos contemporâneos de um contexto da vida real.

De acordo com Hartley (1994), o estudo de caso consiste em uma investigação minuciosa, por determinado período, de uma ou mais organização ou grupo dentro de uma organização, procurando promover uma análise do contexto e dos processos envolvidos no fenômeno em estudo. O fenômeno não é isolado do contexto (como nas pesquisas em laboratórios), ao contrário refletem um interesse real do pesquisador dentro do contexto em que está relacionado.

Após definir, em linhas gerais, a abordagem que orientou este trabalho, faz-se necessário demonstrar quais os instrumentos foram utilizados. Neste trabalho optou-se pela investigação exploratória, de natureza qualitativa, compreendendo pesquisa bibliográfica, documental e análise da aplicação de um portal para concretizar relações de demanda e oferta através de uma rede de instituições de pesquisa, compreendendo o envolvimento de três atores, sendo eles: empresários, pesquisadores e núcleos de inovação tecnológica.

Os sistemas nacionais de inovação representam o conjunto de organizações que contribuem para o desenvolvimento da capacidade inovativa de um país. Constituem-se de elementos e relações que interagem na produção, difusão e uso do conhecimento. A idéia básica desse conceito é que o desempenho da inovação não apenas depende do desempenho dos principais agentes econômicos do sistema – empresas, organizações de ensino, pesquisa e desenvolvimento tecnológico (as ICTs) e governo – mas depende, também, de como eles interagem entre si e com diversos outros atores e, ainda, da confluência de fatores sociais, políticos, institucionais e culturais específicos aos ambientes em que tais agentes econômicos se inserem.

A necessidade de que esses ambientes sejam propícios, de forma a conduzir à obtenção de produtos e processos inovadores, torna-se, portanto, imprescindível para criar condições mais favoráveis e que diminuam o risco inerente à atividade de inovação. Isso inclui desde investimentos na formação de recursos humanos, de forma adequada e suficiente, à manutenção de política micro e macroeconômica que estimule o crescimento. Contudo, ainda passa por uma série de outros instrumentos voltados especificamente para promover a capacidade inovativa daqueles agentes econômicos. A aproximação desses atores envolvidos na obtenção do conhecimento científico e tecnológico é extremamente saudável.

As instituições de ensino, pesquisa e desenvolvimento tecnológico são atores fundamentais em qualquer sistema de inovação, por abrigar as principais competências técnico-científicas e a formação de pessoal. Há muitas questões relevantes que a elas dizem respeito, como a necessidade de recuperar sua infra-estrutura de pesquisa e desenvolvimento, estender ainda mais a qualificação do corpo docente e ampliar as oportunidades de acesso a essa qualidade de ensino. Destaca-se também a premente necessidade de maior integração entre elas e o mundo empresarial.

Observada, portanto, como problema a falta de sinergia entre pesquisadores de ICTs e empresas indica ser necessário Manfio (2009):

1. Manter canais de relacionamento entre a empresa e ICT:
 - Comunicação freqüente de ofertas e demandas - intercâmbio de informações e intenções futuras em P&D, análise contínua de oportunidades para novos projetos;
2. Ferramentas de gestão do conhecimento:
 - Documentação dos resultados de parcerias realizadas;
 - Prospecção de novas oportunidades;
3. Intercâmbio e recrutamento de pesquisadores e alunos:

- Maior vivência de profissionais da empresa na ICT e dos pesquisadores da ICT na empresa;
 - Maior entendimento das culturas e fortalecimento da relação de confiança;
4. Entender empresas e ICTs como parceiros estratégicos para inovação tecnológica:
- Sinergia de competências e otimização de ativos de pesquisa.

Como resultado deste estudo uma metodologia foi desenvolvida para a aplicação de um portal com a finalidade de concretizar relações de demanda e oferta através de uma rede de instituições de pesquisa que atualmente envolve dezessete instituições de ciência e tecnologia, denominada REDENIT-CE.

A Rede de Núcleos de Inovação Tecnológica do Estado do Ceará (REDENIT-CE) e seu portal de Demandas e Ofertas Tecnológicas

A REDENIT-CE foi constituída em março de 2010 com o objetivo difundir as melhores práticas de propriedade Intelectual e transferência de Tecnologia entre as 17 Instituições de pesquisa e ensino superior no Estado do Ceará. A REDENIT-CE é composta de núcleos de inovação tecnológicas, que tem como objetivo principal, definido por lei, a gestão da política de inovação das ICTS. A Rede possui um conjunto de ações presenciais para seus membros: reuniões de coordenadores periódicas, cursos, palestras e oficinas realizadas com temas de gestão de inovação, propriedade intelectual e transferência de tecnologia, além de acompanhamento na elaboração de patentes e visitas periódicas às instituições.

A Rede possui um núcleo gestor formado por profissionais de diversas áreas, entre eles: direito, administração, jornalismo, sistemas, publicidade, economia. Este núcleo tem como missão principal apoiar os membros da rede nos seus processos de aprendizado.

Um dos desafios da REDENIT-CE é promover a aproximação das empresas privadas e as ICTs, permitindo a transferência de tecnologias e a resolução de problemas demandados pela indústria. Essa problemática foi identificada através de ações internas e externas da REDENIT-CE, sendo elas: debates, reuniões, workshops e palestras de difusão da cultura da inovação, onde pesquisadores e empresários constataram a falta de sinergia para resolução de problemas das indústrias locais.

Foi identificado pela REDENIT-CE que a falta de sinergia entre os três atores, a saber, empresas, instituições de ciência e tecnologia e núcleos de inovação tecnológicas, impacta negativamente o avanço do processo de inovação.

Assim a rede desenvolveu o portal: www.redenitce.com.br (Figura 1), que pretende integrar o aprendizado das instituições envolvidas e aproximar das demandas tecnológicas da indústria.



Figura: 1 – Portal REDENIT-CE

Neste portal destacam-se as áreas para os usuários interagirem com conteúdos voltados para a propriedade Intelectual e transferência de tecnologia, mas principalmente a área de demandas e ofertas tecnológicas (Figura 2), que visa criar sinergias entre as empresas, ICTs e pesquisadores dessas Instituições para resolução de problemas.



Figura 2 – Área de Demandas e Ofertas

Nessa área, três atores são envolvidos: os empresários com demandas tecnológicas, os pesquisadores de várias áreas de conhecimento e os representantes dos núcleos de inovação tecnológica que fazem a gestão da inovação. Os primeiros possuem uma área específica para gerenciarem suas demandas (figura 3), incluindo demandas, selecionando propostas, aceitando acordos de cooperação e sigilo, participando de eventos de negociação e suspendendo a demanda quando da finalização de seus prazos (Figuras 4, 5, 6). Vale ressaltar que a empresa mantém o anonimato até o envio da primeira proposta pelo pesquisador.



Figura 3 – Área da Empresa para Gestão de Demandas

Figura 4 – Área para Inclusão de Demandas

Capacete antiestresse

Precisamos que seja criado um capacete antiestresse.

Palavras chave: capacete, anti, estresse, stress

De 29/06/2011 à 29/11/2011

Status: Encerrada

Data	Horário	Histórico	Descrição
29/06/2011	09:32:24	Criada	
29/06/2011	09:32:24	Enviada para avaliação	
29/06/2011	09:32:42	Aprovada pela Redenit-CE	
29/06/2011	10:07:47	Proposta aceita	
29/06/2011	10:07:47	Demanda encerrada	

Figura 5 – Histórico de mensagens trocadas

Ao final do processo espera-se que o portal tenha promovido a interação e o aprendizado entre os atores envolvidos, quais sejam as empresas, as Instituições de Ciência e Tecnologia e seus Núcleos de Inovação Tecnológica, gerando novos produtos e serviços a partir das demandas alinhadas com os atores do mercado.

Análise do Caso

O portal desenvolvido pela REDENIT-CE constitui-se em um ambiente virtual de aprendizagem, no qual os atores pertencentes às ICTs e empresas têm a oportunidade de interagir participando efetivamente na busca de soluções e respostas para o desenvolvimento tecnológico e consequentemente para o processo de inovação. Este portal vem, ainda, possibilitar a reflexão sobre os impactos destas relações por se tratar de um espaço de cooperação entre os setores ofertantes e demandantes no País.

Mais do que estimular inovação, o portal gera oportunidades para a criação de novas relações entre empresas e ICTIs. Assim, a REDENIT-CE, dito anteriormente, hoje constituída por dezessete instituições de diferentes setores, público e privado, disponibiliza, através do portal um forte mecanismo de aprendizado em rede a partir de cooperação tecnológica, alinhando interesses de diferentes atores.

No caso estudado o foco está nas interações entre pessoas, entre as todas as instituições que dela fazem parte e também as que não fazem, e são essas interações que permitem e acirram a aprendizagem organizacional, fortalecendo as relações e os benefícios advindos delas. Sendo, portanto, este o objetivo do portal.

É sabido por todos que fazem a rede que uma grande maioria dos investidores, empresários não tem conhecimento e nem acesso às competências em determinada área, bem como, as ICTs desconhecem as demandas tecnológicas do setor produtivo, por falta de divulgação, portanto, o processo de comunicação em rede uma das estratégias que estão alinhadas ao portal.

A partir desta comunicação em rede, da existência de espaços de colaboração online surge a integração e a troca de experiências entre os atores, ICTs e empresas, resultando na geração de novos conhecimentos e aprendizagem, o que vem corroborar com o pensamento de Oliveira e Goulart (2003), quando citam que a relação entre inovação e alianças podem gerar conhecimentos e tecnologias, transformando-os em novos produtos, serviços, processos, mercados, fontes de suprimentos ou desenhos organizacionais.

No caso deste estudo puderam ser identificados os processos centrais na operação de uma rede híbrida: setorial e tópica, conforme enumerados por Bessant e Tsekouras (1999), pode-se também analisar o portal do o ponto de vista dos processos centrais de operação de uma rede conforme demonstrado na literatura, tabela 3.

Tabela 3 - Processos Centrais na Operação de uma Rede e o Portal desenvolvido

Processos	Propósito	Portal
Criação da rede	Definir como os participantes serão atraídos e como serão mantidos.	Os participantes são atraídos a partir da possibilidade de resolverem problemas de suas demandas tecnológicas a partir da interação com Universidades e Institutos de pesquisa
Tomada de decisão	Estabelecer como, onde, quando e quem será o responsável pelas decisões.	O portal mantém a autonomia de tomada de decisão na empresa quanto o aceite ou não de propostas, no pesquisador quanto a participar do processo de resolução de demandas
Resolução de conflitos	Fixar os mecanismos de resolução de conflitos, quem irá implementá-los e como.	O núcleo de inovação tecnológica tem mecanismos de fóruns para dirimir conflitos com a empresa e com o pesquisador, atuando como mediador,
Processamento de informações	Gerenciar o fluxo de informações a circular entre os participantes.	O NIT agenda reuniões com a empresa e pesquisadores para conduzir o processo a um termo.
Obtenção de conhecimento	Articular o acesso e a obtenção de conhecimento relevante para a rede e torná-lo disponível para os participantes.	O conhecimento é obtido a partir da interação da empresa com os pesquisadores das Universidades e Institutos de pesquisa que participam do portal.
Motivação/compromisso	Desenvolver mecanismos que assegurem a motivação dos participantes e o compromisso com seus objetivos.	Necessidade de inovar para ser competitivo (empresas), levar o conhecimento ao mercado (pesquisadores), segurança que o processo será mediado e levado a um termo.
Compartilhamento dos custos e benefícios	Definir como serão compartilhados os benefícios e os eventuais custos e riscos associados ao funcionamento da rede.	A necessidade de desenvolver instrumentos formais de cooperação definindo as participações em Propriedade Intelectual e financeira das partes envolvidas (termos de aceite do portal)
Integração	Estipular como as relações entre os participantes da rede serão construídas e mantidas, tendo em vista a necessária integração entre eles.	O foco está nas interações entre pessoas, entre as todas as instituições que dela fazem parte e também as que não fazem, e são essas interações que permitem e acirram a aprendizagem organizacional, fortalecendo as relações e os benefícios advindos delas. A o respeito pela autonomia de cada uma das instituições da rede.

Fonte: Adaptada de Bessant e Tsekouras (1999)

Este portal traz desafios, pois para o seu desenvolvimento foi percebido que por meio dele haveria redução de custos nas transações entre os diversos atores, por ser este um canal de comunicação aberto, com uma só linguagem e de fácil partilha de informações.

Foi percebido ainda que o conhecimento em rede facilita o acesso a estas informações e conhecimento estratégico, principalmente no que diz respeito a mercados, tecnologias, novos produtos, materiais e processos. Estes desafios levam à criação de sinergias, além da quebra de barreiras geográficas.

No caso do portal da REDENIT-CE, a cooperação em inovação é promovida por diferentes recursos: informação sobre competências, as oportunidades de cooperação técnico-científica. O principal diferencial, no entanto, está na utilização de uma ferramenta web capaz de promover a interação e o aprendizado entre seus atores, gerando negócios e desenvolvendo uma política de relações interinstitucionais.

Conclusão

Deste estudo emergem duas contribuições principais: a primeira é destacar que através dos portais, ambientes virtuais de aprendizado, vêm causando mudanças cada vez profundas e rápidas nos processos gerenciais e no mundo como um todo, principalmente no processo de dinamização do aprendizado em rede.

O portal do caso estudado pretendeu ir além do mero acesso à informação. Ele foi desenhado para apresentar soluções que respondam as necessidades de informação e de colaboração entre os atores envolvidos para a geração de produtos e serviços inovadores a partir da perspectiva de rede.

Por ser este ambiente virtual de aprendizado desenvolvido com uma linguagem única e de fácil compartilhamento de informações, o conhecimento propagado em rede vem facilitar o acesso a estas informações e conhecimentos estratégicos, principalmente no que diz respeito a mercados, tecnologias, novos produtos, materiais e processos. Estes desafios levam à criação de sinergias positivas, além da quebra de barreiras geográficas.

O Estudo indica que um portal, como uma rede virtual de aprendizagem pode trazer para o processo de aprendizagem vantagens importante, se apoiado nas novas tecnologias digitais de comunicação da informação.

Assim, o processo virtual de aprendizagem pode vir a ter capacidade de atingir a sociedade como um todo, não só ao nível local, mas também nacional e internacional, ou seja, de forma global, tendo como base as tecnologias digitais de comunicação da informação.

Contudo, este deve ser um trabalho inter e multidisciplinar, com a cooperação de todos os envolvidos, com a perspectiva de estar sempre em reconstrução, atendendo as mudanças rápidas e contínuas da contemporaneidade, assim a segunda contribuição é a necessidade de estudos mais aprofundados a serem realizados, a fim de compreender de forma mais extensiva as relações estabelecidas quando da utilização de ambientes virtuais

de aprendizagem, sob a perspectiva de rede e a necessidade de inovação contínua que estamos vivenciando nos dias atuais.

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BRAND ARTIFACTS CO-CREATION: A MODEL FOR THE INVOLVEMENT OF CREATIVE, NON-SPECIALIZED INDIVIDUALS

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ABSTRACT

Institutional brand usually neglects internal members' (IM) contributions who, in other hand, don't understand the abstract values it represents and are often unaware of the specific rules governing the graphic brand's proper use. Although the distribution of brand guidelines, these are too technical and unattractive to those who are not specialized neither in brand communication nor graphic design. However, because the brand usage is constant in several organizational activities, IM apply it in any way, sometimes leading to devalue of the brand. Literature review reveals that when IM come into contact with appropriate information related to the brand, they develop a strong commitment to the brand and to the organization. Our goal is to identify a technology mediated communication-based model, that grants IMs the chance to experiment and properly co-create brand artifacts, strengthening IM involvement and commitment, throughout an interactive experience that fosters their creativity in their working contexts.

KEYWORDS

Brand, holistic brand knowledge, creativity, internal members, visual literacy, computer-mediated communication, sense of belonging, organizations

1. INTRODUCTION

Internal branding has been identified as a means to generate outcomes such as institutional success and internal members' (IM) satisfaction. When these come into contact with appropriate information and processes related to the brand, they develop a strong commitment to the brand and to the institution. Also, the internal members' participation in organizational decision making has proved to be a subject of major social significance, assuming participation as an essential dimension in the processes of institutional communication. What if, internal members, people with entirely different occupations, backgrounds and experiences, had the opportunity to actively participate in brand-related activities, including visual exercises, in which they could experience the brand graphical and tangible components, in its standards and design principles, while, simultaneously, they would learn the values and assumptions associated with the institutional brand? To better understand the relationship between brand participatory creative initiatives and the degree to which the brand knowledge is incorporated in work activities, improving commitment and sense of belonging, we propose a computer-mediated communication (CMC) model — the CMC Participatory Branding Model — with the aim of generating a heuristic and a set of guiding principles, regarding the participation of internal members (IM) in the construction and enhancement of the institutional brand,

aiming to foster, mostly, sense of belonging and holistic brand knowledge, and to make explicit the intellectual and creative capital of the institutions.

Our goal is to identify a set of processes, principles and guidelines that grant IM with the chance to experiment and properly create graphic and tangible elements of the institutional brand, highlighting the intellectual and creative capital of all working individuals, strengthening their involvement and commitment to the institution they work for. We intend to validate that these internal brand-related activities can be performed with the participation of all institutional IM, triggering interest, commitment and sense of belonging so that insiders feel the institutional brand and identity through its functional attributes and applications, encouraging and preserving its emotional aspects (Goss, Pascale, & Athos, 1998). Thus, in this research, the word “brand” is used to refer the tangible components of brand identity and “brand users” are considered all IM that, within a given institutional context, use the brand and contribute to its valuation.

In the following we will first present the relationship between the institutional brand and internal members and argue for the need of a broader concept than “brand knowledge”, a new construct which we called “holistic brand knowledge”. We then describe the main concepts that have been distinguished in research on the involvement of IM in participatory and creativity activities. Finally, we will present the methods and prior empirical evidence for the relevance of holistic brand knowledge in the participation of IM in creative internal brand-related activities. In an empirical exploratory study conducted in University of Aveiro (Portugal), we will provide preliminary evidence for our arguments.

2. THEORETICAL FRAMEWORK

There have been various attempts at building models of brand relationship with customers and of brand equity, such as those proposed by Aaker (1991) and Keller (2002), but these conceptualizations have their roots in the fast moving consumer goods industry. In services industry, the intangibility and the inseparability between production and consumption lead to different approaches to brand building. Kimpakorn & Tocquer (2010) literature’s review allows them to postulate that “most authors who focus on service branding agree that employees’ attitude, belief, value, and behavioral style reflect the brand” (p.378), which foresees the importance of having IM in adequate contact with the brand. An important question is whether internal members think and act differently towards the brand than their external counterparts. In fact, little research has been devoted to exploring the perceptions and the relationship IM have of and with institutional brands.

Before presenting the empirical study, the theoretical concepts used in our analysis shall be described in more detail.

2.1. INSTITUTIONAL BRAND AND INTERNAL COMMITTED MEMBERS

The institutional brand (also known as corporate brand) is an element of constant presence in the professional life of those who represent an institution. We do not neglect its importance in defining product, advertising and marketing strategies, but in the context of this investigation the brand is thought of in the context of internal communication and knowledge within institutions. Thus, our concern in the establishment of constructs and ideas depends on the relationship that IM of a given institution have with their institutional brand.

2.1.1. BRAND IDENTITY

Every brand has its own identity, which makes it unique. Upshaw (1995) defines brand identity as the configuration of words, images, ideas, behaviors and associations that allow the aggregate perception of the brand, i.e., "the fingerprint that makes it unique among many" (p.13). Aaker (1996) defines brand identity as the unique set of brand associations (attributes of products/services, characteristics of the institution, inheritance, brand personality, metaphors associated with it) which can establish a compromise between all institutional IM and the audiences, highlighting the fact that everyone in an institution should know and uphold the values of the brand, and participate in its valuation. For this author, the essence of the brand must evolve, supported on the answers to four questions: *What is the soul of the brand?*, *What beliefs and values underpin the brand?*, *What are the current skills in the institution that represents the brand?*, *What are the values, the mission and the vision of the institution?* Malaval & Bénaroya (2002) reported that the identity of the institutional brand should reflect the values of the institution, in a tone and style that, at best, should be unmistakable and, at least, recognizable.

Thus, an [institutional] brand is the perception of the sum of all the functional and emotional aspects related to an entity. These functional and emotional aspects are the brand DNA, granting it with name, distinctiveness, novelty and attributes (Bergstrom, Blumenthal, & Crothers, 2002). Functional aspects are defined by all the physical elements of brand identity i.e., brand tangible attributes and applications (brand artifacts) that are rationally evaluated:

- symbols and slogans (Aaker, 2004);
- name, logo, colors, advertising (Bailey II & Schechter, 1994);
- distinctive name and logo, graphic design and space decoration (Grossman, 1994),
- merchandising, exhibitions, stationary, among others.

There are also symbolic, intangible features, such as the values of the brand (de Chernatony & Riley, 1998), its personality (Aaker, 1997), its culture (Davidson, 1997) and its image (Kapferer, 1997), which are emotionally assessed and that build commitment (de Chernatony & Riley, 1998).

Mowday, Steers & Porter (1979), authors of the Organizational Commitment Questionnaire (OCQ), define commitment as the strength of an individual's identification with an organization, which in turn is said to be composed of one's: i) belief in and acceptance of the organization's goals and values, ii) willingness to exert effort on behalf of the organization, and iii) desire to maintain membership. According to Olins (1990), institutional brand identity can serve as an emotional "glue". In fact, to live and grow in complexity, a deep solidarity and sense of community among IM is essential (Albert, Ashforth, & Dutton, 2000). However, identity is potentially unstable, liable to change, frequently redefined and reviewed by IM (Gioia, Schultz, & Corley, 2000). Its more explicit manifestations, such as the institutional brand, while processes, are dynamic and multivariate, with a tendency to evolve, adapting to the complexity of the environment.

Bergstrom *et al.* (2002) define "branding" as the exercise of attaching a higher level of emotional meaning to an entity, enhancing its value to the audience; the greater the commitment, the greater the range of followers, admirers, sympathizers or even fans. Thus, branding is an intangible, emotional asset, which aims to turn brand values tangible, explicit and visible.

But, according to several authors, branding investments fail or are covered with little success if the institution does not work its brand internally (Sartain, 2005; Aurand, Gorchels & Bishop, 2005; Vallaster & de Chernatony, 2006; Harris, 2007; King & Grace, 2007). "Employees make or break the company's brand and, ultimately, the company's results" (Sartain, 2005, p.89).

2.1.2. INTERNAL BRANDING

Harris (2007) defends that brand should be incorporated into internal activities. "The key is to provide staff with appropriate tools, allowing them to be the strategy and live the brand" (p.104). Burmann & Zeplin (2005) advocate that all IM need to know the brand identity concept and commit to live the brand. Bergstrom *et al.* (2002) refer that *internal branding* means effectively communicating the brand to IM, making them certain of its relevance, benefits and significance and assuring that every job in the organization is somehow linked to brand substance delivery.

[...] implicitly or explicitly, consciously or unconsciously, representatives of the organization are always communicating something (Bergstrom *et al.*, 2002).

Internal branding activities establish processes, systems and behaviors that assure consistency with the external communication efforts (Aurand, Gorchels, & Bishop, 2005). Training programs and internal communications were identified as the major tools for internal brand-related activities (Punjaisri & Wilson, 2007).

According to designer Marty Neumeier (2006), “a living brand is a collaborative performance, and every person in the company is an actor” (p. 136), ensuring that branding is a process that “can be learned, taught, replicated, and cultivated” (p. 139).

Internal brand-related activities will trigger interest, compromise and sense of belonging (Goss, *et al.*, 1998). Thus, internal members need to sense the institutional brand identity through its functional elements, whenever they have contact with institutional issues, so that emotional aspects can be encouraged and preserved. Otherwise, sense of belonging, commitment or even pride may fade.

2.1.3. NEED OF BELONGING

All individuals have a natural need of belonging, adapting to norms and values of a team (Yu, Lu, & Liu, 2010). The identification with the institutional identity achieved by a particular group has been considered an underlying aspect for participatory activities and institutional support (Jones, Cline, & Ryan, 2006). This is true both on face-to-face communication mode and on technology mediated communication systems, such as the Internet. Members of online communities within institutions can perceive themselves as “mates” participating and sharing intentions with respect to a common goal (Yu, *et al.*, 2010) if the identity system is perceived, received and cherished by all. Thus, an active, efficient and satisfactory participation of IM could be an indicator of commitment and sense of belonging (King & Grace, 2008).

Belonging is a fundamental human motivation, which was first proposed by Maslow’s (1943) motivational hierarchy theory. Needs of belonging occupy the middle of Maslow’s hierarchy, indicating that they do not emerge until physiological and safety needs are satisfied (Figure 1). But, for self-esteem and self-actualization needs to be addressed, belonging needs must be fulfilled.



Figure 1 - An interpretation of Maslow's hierarchy of needs, represented as a pyramid

According to McMillan & Chavis (1986) belonging in a group or community is an individual perception that one has invested to become a member and has the right to belong. Sense of belonging is “an individual’s perceived acceptance by a group within an

organization” (Hou & Fan, 2010, p.28), leading him to become emotionally attached to and identify himself with that community (Gautam, Van Dick, & Wagner, 2004).

Kimpakorn & Tocquer (2010) affirm that the affective dimension of commitment — the extent of IM sense of identification and regard for an organization — has been emphasized in most researches on organizational commitment because it influences IM on exerting institutional additional efforts. Thus, belonging perception and identification are affective dimensions of commitment, which may induce commitment to the brand (King & Grace, 2008).

2.1.4. EMPLOYEE BRAND COMMITMENT

King & Grace (2008) propose the Employee Brand Commitment Pyramid (EBCP), shown in Figure 2, which foundation represents rudimentary-level information such as technical (or task-associated) information, for employees to undertake their jobs. Having access to this technical information the authors argue that employees get committed to their respective jobs, but when they get the chance to access appropriate brand-related information, they will be able to move to the top of the pyramid and develop a strong brand commitment.



Figure 2 - Employee Brand Commitment Pyramid (EBCP)

Source: King & Grace (2008)

Kimpakorn & Tocquer (2010) define Employee Brand Commitment as the degree IM identify themselves with the brand and their willingness to exert additional effort to achieve brand goals. Building on the Organizational Citizenship Behavior construct, which Podsakoff, McKenzie, Paine, *et al.*, (2000) define as the individual voluntary actions outside of role expectations that are not expected to be acknowledged, and which enhance the institutional performance, Burmann & Zeplin (2005) propose the Brand Citizenship Behavior (BCB) construct, which they define “as an aggregate construct which describes a number of generic employee behaviors that enhance the brand identity”

(p.282). Thus, IM need to know the institution and its brand identity so they can commit with it and feel compelled to exert BCB.

2.2. TACIT AND EXPLICIT KNOWLEDGE

Nonaka & Takeuchi (1995) distinguish explicit knowledge, with tradition in Western management, from tacit knowledge, essential for Japanese management. For these authors, explicit knowledge can be expressed through codes and symbols and is easily communicated in codified procedures, scientific formulae or guidelines. Tacit knowledge is not easily transmitted because it is highly personal: it is composed by intuitions, hunches and perceptions that settle on the experience individuals cumulate and on their own values and principles. Such knowledge is difficult to systematize and share with others, while explicit knowledge can be electronically processed, stored and communicated. Thus, according to these authors, the creation of new knowledge takes place with the conversion of tacit knowledge into explicit knowledge that, within a group, occurs through participatory activities: dialogue and discussion, sharing experiences and artifacts, and observation.

2.2.1. BRAND KNOWLEDGE

The knowledge and understanding that members have about the brand are reinforced through institutional messages that, the more frequent they are, the greater the brand knowledge IM can achieve, which, in turn, is of great relevance for the participation in internal branding activities (Mangold & Miles, 2007)). According to King & Grace (2008), brand knowledge is composed by desired brand values, practices and behaviors. Richards, Foster & Morgan (1998) define brand knowledge as:

... especially (...) the tacit knowledge about a brand that is tucked away and usually not shared, because it is so hard to communicate. Knowledge, then, is the essence of what a brand represents, how it can achieve competitive advantage and ultimately significant value to a business. Brands are, quintessentially, knowledge (p.48).

These views regard brand knowledge mostly as tacit knowledge and, therefore, difficult to share. Approaching the Japanese view, designer Neumeier introduces the need to make explicit and collective all the existing brand knowledge within an institution:

For brand knowledge to become imbedded throughout the organization, it has to be protected against "evaporation", the tendency for decisional wisdom to disappear as experienced people leave the company. The long-term success of any brand depends on the constant regeneration of corporate memory. (...) How? With a brand education program that's distributed throughout the company and its creative network, guaranteeing the survival of the brand, while keeping it open to feedback from the brand community (Neumeier, 2006, p. 141).

2.2.2. EXPLICIT BRAND KNOWLEDGE

Burmann & Zeplin (2005) state that while IM consider the brand as being of little relevance in their daily work activities, they will not be motivated to understand the brand identity. Corporate graphic design embraces all the visual features of brand identity, usually specified in brand manuals. Although exhaustive brand manuals “will be able to capture the full complexity of the brand identity, it will hardly be entirely memorized by all employees, if even read” (Burmann & Zeplin, 2005, p.288), or understood. Vallaster & de Chernatony (2006) consider that corporate design, through brand manuals, enables brand consistent communication but restricts IM's creativity. Burmann & Zeplin (2005) complete that brand manuals can represent “a good guideline for those who develop internal branding activities, for example, HR and internal communications staff” (p.288).

Following Burmann & Zeplin's line of thought who argue that employee participation will generate a stronger brand commitment based on identification processes, while imposed guidelines will only generate weak commitment based on compliance (2005), we consider that brands should become more flexible, more open to non-specialized interventions — without meaning that they will necessarily lose their identities — and that brand manuals or books, with its brand standardization, should be redefined. One of the current most flexible and strong brands is Google, with its Doodles that are created not only by its IM, but by anyone, children included, becoming obvious, in this case, that these interventions on the original brand design represent an activity which, in addition to promote visual literacy is, above all, entertaining and experiential.

2.2.3. HOLISTIC BRAND KNOWLEDGE

According to Mangold and Miles (2007), internal branding efforts are influenced by two dimensions: IM brand knowledge and IM psychological contract with the organization (commitment). However, we believe that the dimension “brand knowledge” is somehow incomplete because it is mainly implicit and tacit and it corresponds to the understanding IM have of the brand, based on brand identity information, unidirectionally conveyed by the organization. For this, we propose the Holistic Brand Knowledge (HBK) construct that involves the conceptual, tactical and operational participation of IM on brand valuation activities, in a logic of empowerment of the individual intelligence, synchronized with the collective and consistent with the organization ideals.

Hence, visual literacy is, an important construct for this research and needs a definition. According to Fransecky & Debes (1972), the members of the National Conference on Visual Literacy proposed the following definition:

Visual literacy refers to a group of vision-competencies a human being can develop by seeing and at the same time having and integrating other

sensory experiences. The development of these competencies is fundamental to normal human learning. When developed, they enable a visually literate person to discriminate and interpret the visible actions, objects and symbols, natural or man-made, that he encounters in his environment. Through the creative use of these competencies, he is able to communicate with others. Through the appreciative use of these competencies, he is able to comprehend and enjoy the masterworks of visual communications.

In his well known book *Toward a Psychology of Art*, Rudolf Arnheim (1966) defines visual literacy as the attribute we would hope to find in every well-educated adult in our society, because our culture is increasingly represented and perceived in visual terms. In fact, basic literacy seems to evolve with time and general evolutions. Reading, writing and arithmetic, which have been considered the basic components of literacy — while skills of visual literacy “have traditionally been set aside as *extras* or reserved for those with *talent*” (Fransecky & Debes, 1972, p.9) — are not enough “to be literate in what has come to be called the technology age” (Christopherson, 1996, p.169).

Stokes (2002), based on the premise that visual literacy precedes verbal literacy in human development, refers that currently skills with words and numbers are narrow and must be complemented with other basic skills (reading and writing visually) due to the presence of new and emerging technologies in daily living. Fransecky & Debes (1972) argue that the visual age we’re in requires, from every individual, both verbal and visual skills since they are interconnected.

According to Christopherson (1996), the individual visually literate interprets, understands and appreciates the significance of visual messages, communicates more effectively applying the principles and basic concepts of graphic design, produces visual messages by means of technology resources/devices, makes use of visual thinking to conceptualize problem solving.

Thus, HBK is composed by tacit and explicit brand knowledge, that is, by King & Grace’s desired brand values, practices and behaviors (2008), by brand visual literacy and by individual and collective experiences and interactions with the brand, within a given institutional context. Brand commitment and HBK place IM in a privileged position in which its willingness to exert brand extra efforts is combined with a collective knowledge which is iteratively converting the tacit into explicit and the explicit into tacit (Nonaka & Takeuchi, 1995).

In order to clarify the process of HBK achievement, we propose the Holistic Brand Knowledge Pyramid (Figure 3), built from the Employee Brand Commitment Pyramid, proposed by King & Grace. HBK Pyramid (HBK-P) depicts the building blocks in creating IM *holistic brand knowledge* — institutional and task-related information, brand experience

and brand knowledge — and the inducing factors that drive and enable this process: sense of belonging, commitment and brand citizenship behavior.

The base of the pyramid represents the information associated with the performance of working tasks in accordance to the institutional objectives and mission. When IM have access to this information, appropriately and timely, it is expected they already feel like belonging to the institution, moving to the next level, in which they can access to brand identity information that allows them to experience the brand. When, on this level, IM reach such an affective involvement that motivates them to commit to the institution and to the brand, they progress to the next level. There, they already know the brand, typically through operational tasks (for which they are required with minimum brand visual literacy). Once armed with the right skills, enough motivation and given the opportunity to explore their creative potential, IM participate in community, sharing their spontaneous and willful efforts around the valuation of the brand — through brand citizenship behaviors — enabling them to achieve HBK.

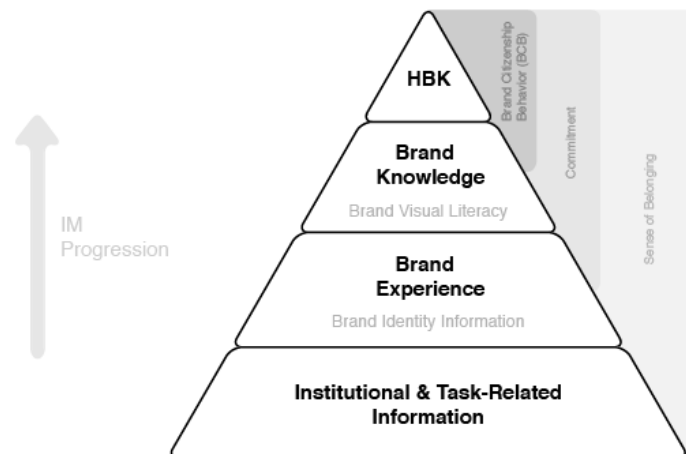


Figure 3 - Holistic Brand Knowledge Pyramid (HBK-P)

2.3. PARTICIPATORY, CREATIVE INITIATIVES

There are several authors who advocate the existence of largely untapped capabilities in internal members such as creativity and participation. According to Ulrich (1999) intellectual capital, whose base is IM commitment and competence is mainly in how they think about and execute their work, and also in the way organizations create policies and systems so that work can be done. “Many of the individuals with high intellectual capital are the least appreciated within organizations” (p. 126). King & Grace argue, “people possess skills, knowledge and experiences and, therefore, are of significant economic value to organizations” (2008, p.359). These authors defend that organizations should support their intellectual capital through the effective transmission of

knowledge; otherwise, they may not have any access to valuable knowledge. The negative effect of the specialization of functions was that it requires only a limited amount of IM's skills, so Csikszentmihalyi (2004) also believes there is a lot of talent to exploit and enhance.

2.3.1. OPTIMAL EXPERIENCE AND CREATIVITY

According to this author, those who manage to mix skills with opportunities are not only happier and more optimistic, with high self-esteem, but they also spend more dedicated time in their working context. Csikszentmihalyi (2004) argues that these IM are in *flow* or having an optimal experience — in activities that represent high opportunity to improve and rise to higher stages of complexity, in a level of excitement where neither overstimulation nor monotony are present.

The best experiences of people, those who best memories awaken, always involve moments when the person is required beyond its limits, that is challenged and reveals creative (Csikszentmihalyi, 2004, p.151). Creativity involves the production of novelty. The process of discovery involved in creating something new appears to be one of the most enjoyable activities any human can be involved in (Csikszentmihalyi, 1996, p.113).

One of the emotional components of *flow* (used in flow research) is intrinsic enjoyment (Koufaris, 2002). According to Ghani & Deshpande (1994) intrinsic enjoyment can increase an individual's exploratory behavior, which suggests that pleasurable participatory activities can lead to creative results. Lopes (2004) refers that imagination, originality and human expressiveness are streamlined by playful interaction. Torkildsen (2005) argues that leisure can exist in institutional contexts, resulting in the satisfaction with which humans perform their tasks. De Masi (2000) revolutionized the concept of "work" setting it through the intersection of three elements: work, study and play. When individuals are allowed to join these three points, they are practicing "creative leisure", a unique experience that provides a better fit for the needs of post-industrial society, respecting individuality and providing more joy and productivity to task-related activities. This view supports the education of individuals and organizations to the importance of basic needs, such as introspection, interaction, friendship and enjoyable activities.

Playfulness is a consequential phenomenon, natural to mankind: it is a condition of being Human. It is action and effect. It shows us a quality and a condition that are not only characteristic of childhood, but rather, shared by all age groups (Lopes, 2004, p.72).

However, an individual cannot be creative in a domain (or context) to which has not been exposed, so IM must learn the rules and the content of that specific context, so they can act or produce ideas that change or transform an existing context (Csikszentmihalyi, 1996).

Although the familiarity with the institutional context they work for, the graphic corporate brand is not always clear to the institutional IM that are often unaware of the specific rules governing its proper use and correct application. But it is certain that, somehow, they are exposed to a regulatory framework that contextualizes the brand and its identity, mostly through brand guidelines and brand books, which, on the other hand, seem to be too technical and unattractive to those who are not specialized neither in brands nor in design. Yet, due to the constant and necessary brand appropriation and usage, IM apply it, the way which seems most appropriate, based on the logic of common sense and good will, sometimes leading to transformations that unintentionally devalue and violate the brand. Though, brand guidelines should become easy and quickly understood by IM, but also flexible and subject to participation, so IM can, in its various interactions, learn, creatively participate, experiencing and properly using the brand, valuing it and, thereby, valuing the institution. In fact, IM who actively participate — from conception, gathering information, generating alternatives, creating recommendations, passing through implementation — build a greater sense of belonging and commitment (Ulrich, 1999), leading us to read the depicted process in our HBK-P as an iterative process, in which factors that influence the progression of IM (sense of belonging, commitment and BCB) are also influenced by their progresses.

2.3.2. EXPERIENCING PARTICIPATION

According to Locke and Schweiger (1979), participation finds several definitions in which there are in common aspects such as delegation, group involvement, decision making, leveling influence, power sharing and the individual ego enhancement. Therefore, Monge & Miller (1988) indicate that the more prominent effects of participation can be grouped into affective, cognitive and behavioral. For affective effects, the authors return to Coch & French (1948) for whom participation serves as a motivational inducer, namely over commitment. Anthony (1978) defends the cognitive effects of participation, suggesting that participation strengthens the sense of common identity leading to increased discovery, dissemination and use of information, and maintains that participatory management should actually use the skills and the knowledge of all institutional IM, who will hold a wider understanding of the institution as a whole. For behavioral effects of participation, Monge & Miller (1988) identify increased communication and improved performance.

Thus, for IM to actively participate and for that these effects (if not all, at least some of them) can be felt, it is necessary to set challenges and goals. According to Pine II & Gilmore (1998), in active participation, individuals “play key roles in creating the performance or event that yields the experience” (p.101). Along with individual skills, the

positive challenges presented by an activity or experience are the most important predictors of flow (Csikszentmihalyi, 1990)

As with Pine II & Gilmore (1998) argue that new technologies encourage new genres of experience, Koufaris (2002) proposes that the process of discovering information and using communication technology-mediated features can feel challenging and ambitious with positive effects. Hou & Fan (2010) propose that “individuals would have highly positive attitudes towards technology use that in turn affects their actual behavior as long as they feel a sense of belonging to a group in an organization” (p.28).

2.3.3. COMPUTER-MEDIATED COMMUNICATION

Technologies to support collaborative work activities find their theoretical framework in the area of Computer Supported Cooperative Work (CSCW), a research discipline from the late 80s of the 20th century (Koch, 2008), focused on the way collaborative activities can be supported and coordinated by computer systems such as the World Wide Web (Bentley, Horstmann, & Trevor, 1997). Karahasanovic *et al.* (2009) argue that the new media and the Social Web (also known as Web 2.0) have dramatically increased the potential for users' active involvement, turning them into co-creators/authors. Furtado *et al.* (2010) suggest that the difference between information producers and consumers has decreased significantly due to the existence of several applications that emphasize the production of information by any Internet user. According to Lister *et al.* (2009), the Social Web is characterized by the establishment of new relations between the users, implementing new forms of content ownership, as well as its production, leading to new relationships with technology media.

O'Reilly (2005) defines the Social Web as a platform that distributes software as a service, which is constantly updated by user-generated content (UGC), and where information is transmitted through research, collection and data comparison, thereby facilitating an "architecture of participation". According to Szabo (2009), UGC allows users to use the information available online, and also to create and add their own information. Therefore, UGC is the type of content that appears to be the most relevant for this research project, with which it is intended to demonstrate that contents related to brand artifacts can be created and proposed by institutional IM, during internal branding activities, supported by computer systems. Vallaster & de Chernatony (2006) argue that graphic design is an important part of internal branding activities because it reinforces brand identity and encourages brand alignment.

Though, supported by technology mediation, it is possible to drive IM to contribute to the institutional brand, in a creative, genuine and collaborative way, with pragmatic graphic proposals that can be shared and used across the corporate community and implemented for several purposes. It is understood, therefore, the need to devise a tool

that works as a software online application, allowing institutional members to experience, by means of graphic activities, brand functional attributes and applications, through an interactive, dynamic and direct handling resource.

Employees, just as consumers, want to be engaged in experiences that let them “touch and feel” the brand (Vallaster & de Chernatony, 2006, p.776).

For effective communication and expected interaction to happen, a structure will be required for this purpose. We believe that it can be through an online platform that centralizes all matters concerning the brand, such as a social brand center (SBC).

Participation in pragmatic and functional brand communication activities — a practical form of brand citizenship behavior — enable IM to experience the brand in its tangible elements and in its identity immateriality, endowing them with the basic literacy so that brand artifacts usage and application can be as aligned as possible with the brand essence, achieving HBK. This comes from the assumption that creativity and collaboration skills also exist in IM and can be used for the development and promotion of the brand, creating opportunities for co-creation activities which, so far, have been attributed to specialized professionals, what seems to be somewhat inflexible and inappropriate in a participatory culture context. Thus, a preliminary hypothesis is:

H1. *Holistic brand knowledge is achieved with the participation in brand artifacts co-creation.*

We believe that the internal *produser* member, who identifies himself with the institutional brand, is able to contribute for it, with visual-oriented content, in a participatory context, technology mediated, that enhances collaboration, sharing, evaluation (and eventually leads to the implementation) of these contributions, that become explicit intellectual capital of the institution, through actively participating in personal meaningful activities.

H2. *Technology mediation of brand-related tasks improves HBK.*

Taken all together, and yet, since sense of belonging is the foundational resource in our HBK-Pyramid, we propose the following generic hypothesis:

H3. *Sense of belonging is strengthened by HBK.*

3. RESEARCH METHODS

So far, this research was exploratory in nature; we were mainly focused on “seek[ing] a deeper understanding of factors” (Chisnall, 2001) involved in holistic brand knowledge, brand citizenship behaviors, sense of belonging and commitment. It became important to choose an institutional universe in which a deeper and empirical analysis with the possibility of occurrence on the field could be made. We chose University of Aveiro (UA), composed by a variety of IM, holding a recently redesigned brand, which has had, among

IM, some impact in identification issues, with both the new brand design, as to its suitability to the institutional values. UA's mission is based on the correlation of tripartite knowledge dimensions, arguing that learning — both theoretical and practical — but also dialogue, exchange of experiences, emotions and relationships are also ways to create and share knowledge. These principles are reflected in the institutional motto *theoria, poiesis, praxis*, representing the Hellenic and Aristotelian triangle of knowledge.

We intend to achieve a model that, when validated, will generate a heuristic and a set of guiding principles, regarding IM participation in the construction and enhancement of the institutional brand, aiming to foster sense of belonging, commitment, brand citizenship behaviors and consequently, holistic brand knowledge, and to make explicit the intellectual and creative capital of institutions, through computer-mediated communication (CMC) processes. With its tone and its hypothetical particularistic aspects, close to concreteness, models can be considered as the ideal frames for scientific explanation ("Enciclopédia Einaudi," 1984).

For our model conceptualization and for our hypotheses preliminary validation we applied structured interviews with some IM. This methodological technique was, therefore, considered appropriate for this primary, qualitative and conceptual stage of validation. The broad approach was an inductive one, aiming the understanding of the social context through the interpretation of its participants. However, the sample was deliberately biased, composed namely by UA's internal individuals who are experts in their scientific areas, with great institutional influence and certainly, somehow, considered UA's brand promoters. At this stage, it was not our ambition to offer generalizations, but most of all to understand what CMC processes could encourage the participation of individuals in activities of brand experimentation. Though, whilst appropriate for an exploratory qualitative study, it is accepted that these results are representative but certainly not conclusive.

A total of 14 interviews were conducted to the directors of four of the most important UA's research units, to the three entities that currently manage the skills and/or permissions in respect to graphical content associated with UA's brand and corporate communication, to three individuals from top and middle management, and to four academic experts in Communication Science and Technologies (CST), three of them in charge of three different graduation and post-graduation courses. An interview guide was used to steer the discussion, but respondents were also invited to expand upon ideas and concepts as they wished. A copy of the interview guide, which construction derived from theory and prior research, is included in the Appendix. To assist in the content analysis process the interviews audio was digitally recorded for later transcription in order to an interpretive accurate analysis. Data analysis began with coding and categorization,

identifying any trends and also reducing the material “while preserving the essential contents” (Schilling, 2006). Codes for analysis are: Institutional Values, Sense of Belonging, Brand Users, Brand Usage, Brand Access, Brand Co-Creation, Brand Artifacts Contribution, Social Brand Centre, Dynamic Brand Standards, Brand Artifacts Validation and Motivations. These analysis codes were divided into five groups that serve as reference for the organization of the Model-Findings section, in which this coding is clarified.

4. MODEL

According to Enciclopédia Einaudi (1984), a model is satisfactory if it provides a satisfactory answer to the question that motivated the modeling. We intend to propose a communication model that allows us to validate that internal branding activities can be performed with the participation of all institutional IM, triggering interest, brand citizenship behaviors, commitment and sense of belonging, so that insiders learn, use, evaluate and feel the institutional brand, through its artifacts, encouraging and preserving its emotional aspects (Goss, *et al.*, 1998).

4.1. FINDINGS

Institutional values and sense of belonging

“Modernity”, “Tripartite Knowledge”, “Accuracy”, “Quality” and “Cooperation” are the most reported institutional values, but most participants do not “feel” them in UA’s current visual identity. Curiously, the enunciation of the institutional values proved to be difficult and has forced some reflection. None of the participants made reference to two of the institutional mission concepts: “Innovation” and “European Education and Research Area”. Also, it was acknowledged that invoking UA’s mission proves to be problematic, as respondents were not sure about its contents, even knowing that the mission is accessible and clearly expressed in UA’s website. Even though, on the basis of this sample, there is great institutional identification among internal members. Participants are not able to objectively identify any techniques nor tools to promote sense of belonging and commitment, but these are seen as strong, and fueled mostly by the individual terms of career, by individual need for membership and by the passage of testimony from more experienced to less experienced IM. Very few made reference to internal communication and to actions/dissemination of professional or academic recognition, which are considered of major relevance in this investigation. Also, the access to creative activities in the workplace, which importance for commitment and belonging is defended by several mentioned researchers — and, as we intend to prove with further research, are essential for HBK construction — is only slightly mentioned.

Brand users, usage and standards

Most of the participants indicate the academic community as the group that makes up UA's brand users. Only three of them refer, in addition to the academic community, the external entities that, in some way, are related with UA. Within this research, interested only in internal members, will be given little attention to these external entities that collaborate with UA. For most of these respondents, traditional communication formats (paper-based files) and electronic communication ones (computer-based files), are the most referred ways of brand dissemination and it is precisely in documents and communication media that non-specialized brand applications and usage occur. When questioned about the origin of the files containing brand original drawings and brand standards, the answers were quite varied, but all reveal little knowledge and unconcern about that subject: some of them assume they don't know but believing that these materials should be online in a proper place; others propose a formal file request to UA's official communication and image services but they assume that they never did it; others indicate reuse, transmitting files from one to another; others "google" the brand and select the image that seem to be the most appropriate; finally, some say that these documents/files do not exist.

When asked about the possibility of conceptualizing the collaborative creation of brand artifacts, in which the creative actors would be themselves — internal institutional members — all respondents replied affirmatively. However, after some reflection, opinions were largely divided: half of the respondents think it is important to take and use the diversity and creative potential of IM, referring that their main contributions could be on brand applications and on disseminating the proper use of the brand; two of them add that it would be essential that IM should be equipped with a minimal visual literacy, approaching our "holistic brand knowledge" construct, and only one individual mentions that "freedom" should be considered as fundamental for such a creative process. The other half believes that these contributions can only happen if the participatory process is very controlled, if it is rooted in a top management imposition, or if the intervenients are (necessarily) experts in design or communication. This faction seems highly critical of possible brand contributions from IM, avoiding answering or assuming that IM do not want to participate or that they should not be allowed to participate on such issues.

CMC processes

As we believe, brand tacit knowledge is not enough for a w/healthy relationship with the institutional brand, so we intend to propose a CMC system in which participatory processes transform IM creativity and tacit knowledge into a collective, usable, explicit knowledge. We asked our respondents what they would think of the existence of a technological online system — a Social Brand Centre (SBC) — to mediate the

contributions that IM can potentially propose to the institutional brand. Most of our respondents (10 out of 14) regard the idea interesting or very interesting adding their immediate views: that the use of the system must be combined with a strong motivation and built on processes that provide explicit feedback, and that such a platform would promote identification with the corporate brand and could give voice to IM suggestions that, otherwise, most probably, would not become known. Some participants referred to processes/procedures that, in their opinion, should be expected in this SBC: templates distribution, thematic rewarded activities, ideas repository, directions for proper use of the brand, artifacts voting system, discussion forum, support to the application of the brand on complex backgrounds, monitoring artifacts popularity. All these proposals are close to the participation and sharing logic of the Social Web which, to us, seems to be the most appropriate approach. The templates distribution — curiously the most common proposal among respondents — if unidirectional, coincides with a process that could not be associated with the holistic brand knowledge construct, as we hold it is grounded on IM participation. Therefore, all proposals are considered valid and to be taken into account, including template distribution, if these are proposed and reviewed by the IM community.

Contact with the brand graphic standards is also essential for the holistic brand knowledge. As we advocate that brand manuals — with their current form and structure (paged, linear, unidirectional) — are too much technical and, as such, almost never consulted by non-specialist individuals, we believe they need to be re-defined, becoming dynamic, interactive, whether experiential and accessible to all IM, to allow elements direct handling, in order that users can get a better perception of the brand identity and contribute with creative and valid artifacts. Most participants commented the little utility and importance given to the brand standards but they agreed with this approach, adding some relevant terms: the most consensual is that this transformation should be evident with the adoption of a language that should be less technical and closer to the user; then, respondents present the expectation that a support system is needed for this interactive brand manual, which should justify and explain the adopted graphic standards, and propose alternatives in case of improper brand manipulation; finally, the need for some flexibility, so that the experience associated with the interactive standards manual will not bound nor shorten brand usage.

Participants were also asked about the processes that could actually govern an interactive standards manual, suggesting the following ideas:

- Clarification of safety margins;
- Assessment of contributions by the IM community;
- Issuing warnings in error situations;
- Links to galleries/repositories for approval;

- Possibility of variables and graphic needs insertion, for the system to generate several instances, which the user can choose;
- Stats and history of the most viewed or most downloaded artifacts;
- Possibility of image upload so it can be experimented and used as background;
- Signing readability and contrast levels on complex backgrounds.

The reference to error warnings lets us foresee a need for instant validation during the brand experimentation. Many of these proposals denote a community vision, but it should be mentioned that these answers were given by a relative majority: 43% of participants chose not to submit any response, referring to have no idea of what processes or procedures could be associated with this tool.

Brand Artifacts Validation

Questioning participants about the evaluation process of the artifacts that make up IM contributions, the majority, and consensually, refer an ascending order:

- The automatic mode within the system (algorithmic and by comparison);
- IM users, by actions such as voting, downloading, visualizing (which are based on personal taste);
- The competent entities such as design and communication professionals (technical evaluation based on brand standards and implicit rules);
- The rectory and administration (for an institutional assessment in accordance with the mission and the availability of funds).

For the validation process 57% agreed it should be granted by specialists such as design practitioners. From our 14 participants, only two believe that IM artifacts can/should not be institutionally implemented nor used, and only one person reports that the implementation process must ensure that those involved know the legal procedures for the allocation of copyrights.

Motivation

Building a community of users will need to be supported by a set of motives, since the issue of the proper use of the brand does not represent a concern for most respondents (and according to signs given by these, we believe to be generalized). It was then important to understand the motivations that may lead individuals to participate in a project like this. The proposal most indicated was to create a rewarding system, distinguishing: i) the best proposals within a given theme, ii) IM that most value the brand and iii) IM artifacts that reach the stage of official certification. Respondents were keen to stress that rewards do not have to be financial nor material prizes: they believe that visibility given to individuals, by creating IM portfolios and displaying analytics results based on their artifacts actions (rankings, number of downloads, number of visualizations) is most certainly enough. Another strong motivation they mentioned is the natural vocation for visual graphics, but this one reaches only a portion of the IM, unless an effort is made to provide IM with some visual literacy. The intrinsic and institutional need to use and

apply the brand correctly, the perceived institutional relevance of the contribution, the identification with the brand and the institution, and the ability to create personally meaningful artifacts were also mentioned as motivations, making clear that social identification, sense of belonging and personal accomplishment, represented in Maslow's pyramid, also have their relevance as motivational factors.

4.2. DISCUSSION

The general reading from data analysis of these interviews is that there is a wide diversity of opinions and clearly distinct positions. However, some generalizations, among these respondents, can be made: the lack of mission awareness and the uncertainty that interviewees demonstrated when asked to list UA's institutional values; this might be considered a handicap, since without this basic institutional knowledge, essential to acquire brand knowledge, one can hardly think of IM reaching HBK — despite inducing factors (identification, belonging, commitment and willingness to further efforts) are evident. This may have to do with failures of internal communication strategy and few opportunities for participation, both of which the respondents gave no great importance, nor mentioned as methodologies to achieve sense of belonging and institutional commitment (King & Grace, 2008). In addition, internal communication and participation are of great relevance in internal branding activities (Punjaisri & Wilson, 2007; Ind, 2007), hence both these issues must be better explored in UA's context.

Also, besides participants reveal little awareness and lack of concern for the context of brand knowledge and graphic brand usage, individuals do not realize that they can and should intervene more actively in brand construction processes.

The fact that the brand usage is widespread in UA community (brewing a diversity of documents and producing variegated content), indicates the urgency of visual literacy access, an asset the vast majority of UA's IM is not endowed. This process cannot restrict itself to consulting the brand manual, as it became obvious that, besides being currently unavailable, it is not read or it is not understood by those who have it or already have had access to it. Since 43% of respondents refuse to answer about the expected procedures in a dynamic and interactive brand manual it is clear that IM do not know what are the contents of such a manual. An alternative is required, through which individuals can have contact with the visual basic principles applied to UA's brand, learning them, in a friendly way and in a less technical approach, so that, afterwards, they can creatively experience the brand and, in community, share their experiences.

It is also clear that creativity and its entertainment component are not yet spontaneous nor clearly covered in UA's work processes and procedures. Answers that highlight processes of creativity stimulation were very few. We believe that with instruction

and involvement, IM will realize that they are able to participate, to contribute and to achieve a broader knowledge about the institutional brand, assuming the operative brand processing as essential for HBK. Organizations should demonstrate and prove to IM that they have capabilities to explore, giving them the resources that provide ways to increase their level of exigency (Ulrich, 1999). Aurand, Gorchels & Bishop (2005) argue for the design and implementation of compensation systems that motivate and reward behaviors that support the brand, even if those are genuine and not expecting any kind of reward.

4.3. PROPOSAL

It seems clear that we face a substantial challenge. In our model, a pedagogical dimension is needed to raise awareness for HBK, which otherwise doesn't happen with unidirectional approaches such as the delivery of templates or by enabling the access to brand standards. Thus, this instructive domain promotes above all the involvement of IM on what defines the brand, both implicitly and explicitly. IM will contact with brand guiding principles, which should not be seen as rules, "because rules are typically prescriptive and describe what can and cannot be done (...) guiding principles are interpretable. They possess a high degree of flexibility" (Harris, 2007, p.105). Thus, the instructive domain will provide brand-related experiences, so IM can create, individually or collectively, their proposals of brand artifacts, in a second constructive domain.

Participation is highly correlated with experience. Pine II & Gilmore (1999) present The Experience Realms, a two axes model that describes the experience as a way to involve individuals along two fields — the participation level (that can be passive or active) and the connection to the experience (with full absorption or complete immersion). When these two axes crossover they set the four pillars of experience: entertainment, educational, escapist and esthetic. We believe that these four realms can easily be achieved, even in just small "doses", and concerning participation in the system, what we intend to propose is largely concerned with entertainment, creativity and visual literacy. It requires IM to be guided through all possible brand experiences and find themselves able and self-efficient to experience it.

Perceived self-efficacy is defined as people's beliefs about their capabilities to produce designated levels of performance that exercise influence over events that affect their lives. Self-efficacy beliefs determine how people feel, think, motivate themselves and behave. (...) The most effective way of creating a strong sense of efficacy is through mastery experiences (Bandura, 1994, p.71-2).

Also, as a third domain of our system, IM should be invited to participate in the processes of evaluating the contributions made by all members of the community. If these processes are transparent, members will have a very concrete idea of the value of their

contribution (both in the creation of artifacts, and in the assessment of artifacts proposed by others), mostly for the community to know its institutional brand and for the brand to be valued and correctly used in its several contexts of possible usage.

All three activity domains — instructive, constructive and evaluative — can be systematized and made available through an online platform, such as a brand center, that assumes interaction paradigms through which the dynamics of the Social Web will be evident.

A standard brand center is an online communication tool, usually an intranet, that provides assistance to brand technical specialized users, and can also be used for the creation of a community, for cohesion purposes (Olins, 2008). Though, brand centers grant users with access to a single place which stores all brand resources: downloadable brand books, logo and brand files, stock or portfolio photos, stationary and promotional materials, conditions and restrictions on use of the brand etc., but in a unidirectional way. We aim to go further, proposing a social brand center (SBC) with intelligence, interaction, and participatory resources, from many to many: a system tool supported on software procedures, allowing IM to interactively experiment brand functional attributes and applications, being audio-visually informed by the system when they get unacceptable experiments, receiving suggestions and tips that optimize their brand design experiment, leading them to satisfactory and creative brand contributions, enhancing their HBK.

We propose a CMC Model for the Participatory Creation of Brand Artifacts which has three activity domains: Instruction, Construction and Evaluation, bound together in a SBC. Systemic by nature, it incorporates feedback and complexity which leads to the inclusion of great flexibility. Assuming that these involvement activities may be endowed with a more pragmatic but also more playful nature, we can envision IM participation in internal brand co-creation activities, which may provide new and better conditions — cognitive-communicative, socio-cultural and affective — for the relationship between the individual and the institutional brand, mostly improving, in the individual, sense of belonging, satisfaction, motivation, brand citizenship behavior, networking, HBK and skills, namely visual literacy. Each one of these individual assets has direct implications on collective assets (acknowledgement, performance and use condition, playfulness, institutional culture, institutional structure, internal brand communication, technology and applications) and vice-versa.

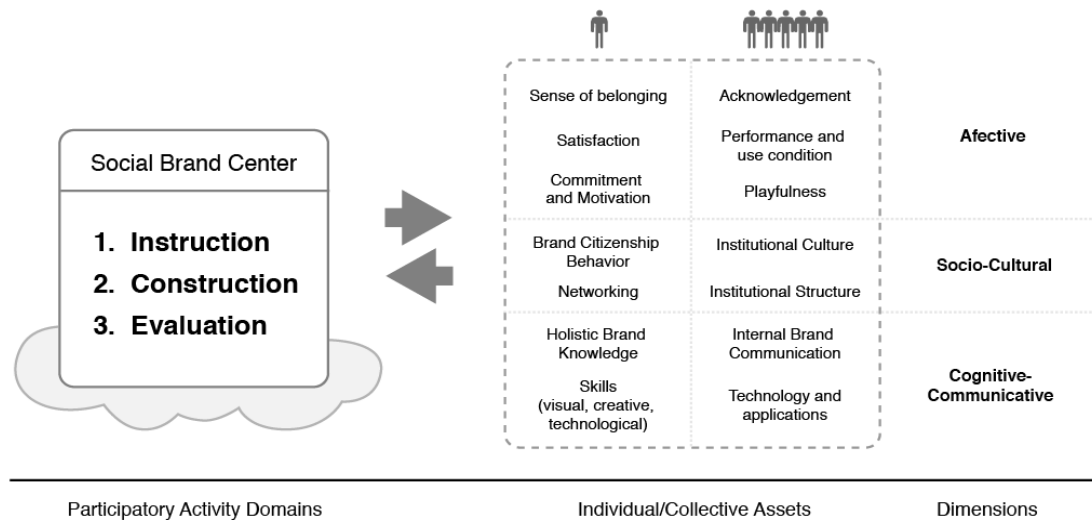


Figure 4 - CMC Model for the Participatory Creation of Brand Artifacts

These assets will also influence IM predisposition to use and their attitude towards this three-domain system, thus an iterative process is expected. SBC activity domains and their implicit participatory processes have influence on cognitive-communicative, socio-cultural and affective dimensions, which, in turn, dominate and determine SBC activity domains. In between, we have the individual and collective assets that define this influence-dominance relationship, from which we should highlight the assets Holistic Brand Knowledge and Sense of Belonging and the effects the proposed SBC have on it, partially validating our preliminary hypotheses.

5. FUTURE WORK

Online communities allow members to express their own opinions and to continually access to others' viewpoints; however, informed participation, does not follow with success when experts' guidelines and perspectives restrict the ability or the opinions of other collaborative participants (Mambrey, Mark, & Pankoke-Babatz, 1998). We believe that the evaluation of the contributions left in the SBC, can be performed by all IM, whether or not they are brand experts. However, a brand guardian is ought to assume, as a community leader, the moderation of the assessment process and of the possible use/application of those resulting contributions, systematizing them as something from all, to all. Therefore, facing the proposed model, the current state of this research leads to the proposition of further hypotheses:

H4. *Technological and interactive incorporation of brand guidelines simplifies the brand knowledge process, and the creation of satisfactory brand functional contributions by any IM.*

H5. *The evaluation of brand functional contributions is likely to be undertaken collaboratively if IM are emotionally and technically involved in internal branding and communication processes.*

H4 will be validated through quantification of log files and qualitative content analysis of a high-fidelity prototype for a collaborative platform aiming the participatory experience over UA's brand — the Social Brand Center. Before that, it will be necessary to undertake a questionnaire to assess, more generally, IM needs and the tasks they expect to perform on such a platform. Then, the technology that will support the community needs will be selected. This prototype ought to be planned, developed, implemented and tested iteratively, involving a beta tester group, which will be selected from respondents to the questionnaire that manifest themselves available to participate as beta testers of the SBC. The respondents who mention to not be interested in this prototype development phase will constitute the control group.

The qualitative analysis of the content and types of usage that IM experience on evaluating brand contributions in the prototype is expected to validate H5. It is therefore deemed necessary to apply a second questionnaire in the same sample large group (including beta testers and control group); in this phase, the variables will be analyzed and compared between these two groups; it is expected that the measured variables manifest themselves more clearly in the beta testers group.

Taken all together, this model and its processes will allow us to generate a heuristic and a set of guiding principles, regarding IM participation in the construction and enhancement of the institutional brand, making explicit the intellectual and creative capital in individuals, through computer-mediated communication (CMC) processes.

6. CONCLUSIONS

The main point of this article has been to present and position an approach to communication research that builds on participatory brand-related activities and on computer-mediated communication, with an emphasis on knowledge production. This approach, called the CMC Model for the Participatory Creation of Brand Artifacts is an attempt to constitute a CMC system based on a platform for brand visual literacy, holistic brand knowledge and brand experiences and it is committed to an involvement of internal members with the institutional brand, taking into account the sharing possibilities brought by the Social Web.

The lack of common expectations around creative and brand-related activities in the workplace, the deficient visual literacy among the majority of IM, the diversity of individual backgrounds and experiences and the variety of scientific areas in UA's internal members context are all factors limiting the achievement of holistic brand knowledge, a feature

essential to institutional brand usage and representation. However, a common perception of the current disorder in relation to the several brand applications and implementations by non-specialized IM which face, daily, the need for using the brand, give rise to a certain degree of mutual identification with the theme and willingness to participate in its resolution.

Participation and creativity, on which our CMC Model is based, owe much of their strength to their sensitivity to the complex realities of change and to human complexity. We hope that we have posed a convincing argument for how this sensitivity may be appropriated in brand issues, in organizing internal communication and even in design research, devising ways of directing people with entirely different occupations, backgrounds and experiences, to value and promote the institutional brand they daily represent.

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APPENDIX

Interview Guide

Codes	Goals	Formulation of questions
Institutional Values	Check the knowledge on UA's institutional values held by insiders	What are the values that the UA's brand identity supports?
Sense of Belonging	Gather perspectives on the strategies for promotion of belonging and identification feelings	- How does UA nurtures the institutional identification and the feeling of belonging? - What is the role of the institutional brand in this context?
Brand Users	Understanding who are the users of UA's brand, according to insiders perspective.	Who are the users of UA's brand?
Brand Usage	Check what types of use that insiders give to the brand in its various activities. Define brand artifacts and brand applications. Verify the perception of appropriation and free transformation of the brand	- What use will these users give to the brand? - How should institutions deal with internal situations of appropriation and transformation of the institutional brand?
Brand Access	Understand what resources are available so that internal members have access to the brand and to the information related with its use.	In what way (s) do internal members have access to the brand and to its supporting documents?
Brand co-creation	Check how internal members face the idea of becoming contributors for the promotion of the institutional brand	Is it possible to envision the collaborative construction of brand artifacts, being the actors/creates the internal members of an institution?
Brand Artifacts Contribution	Ascertaining what are the contributions related to the brand that could be given by internal members	What kind of contributions related to the institutional brand could be given by UA's internal members?
Social Brand Centre	Understand how could the concept of a Social Brand Center (SBC) be of interest for the UA's internal members. Gather ideas on the possible processes and procedures associated with the SBC	- Becoming available an online platform that mediates such a participatory process, it becomes possible to promote the sharing and evaluation of contributions of all for all — What do you think about this? - What kind of processes/procedures should we find in a tool of this nature?
Dynamic Brand Standards	Check what acceptance and processes could a dynamic, instructive and experiential brand guide have, and what impact would it have on brand knowledge.	- If the concept of brand guide and standards is redesigned, becoming dynamic, interactive, direct-handing, experiential and accessible to all IM, do you believe that they could get a better understanding of the brand identity and come up with valid contributions? - What kind of processes/procedures could be associated with this experience?
Brand Artifacts Validation	Gather insights about the processes that could lead to validation of contributions given by internal members and its implementation.	- How could the validation process be conducted to validate these non-specialized brand artifacts? - Who could validate and under what criteria? - Once validated, these brand artifacts could be implemented and applied in various media, analog or digital. Do you agree?
Motivation	Understand what would be the main motivations for UA members to participate in the SBC.	What motives could drive UA's internal members to participate in a project like this?

WAHAHA GROUP'S MANAGEMENT INNOVATION

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ABSTRACT

The Wahaha group is the No.1 maker of soft drinks in China and was founded by Zong Qinghou in 1987. Wahaha did not have any capital for business registration at the time. Thus, they borrowed 140,000 RMB (about US\$21,000) from the local government agency for registration and started their business of consignment sale. The main goods were notebook, pencil, and ice-lolly.

The Wahaha group has experienced prodigious expansion and reported a sales volume of 43.2 billion RMB (US\$6.54 billion) in 2010 and continuously kept its position in China. Why did the company achieve its growth so rapidly? This paper attempts to answer that question and was written based on literature research and an interview with Zong. The authors conclude and explain Wahaha's success from the perspective of management innovation, including innovations of product development, marketing, and managerial method.

1. Who is Zong Qinghou?

Zong Qinghou was employed in the 1980's by Hangzhou Gongnong, which was a small factory that produced cardboard boxes. It was established by a local government agency (the Department of Education, Shangcheng District, Hangzhou City), but the management of the factory was not effective. Thus, the local government agency decided to introduce a new management approach in the spring of 1987, which was named the Contract and Responsibility System. Any employee could contract with the factory to generate money each year for the factory based on his/her work/sales endeavors, even if he/she undertook through contractual agreement to achieve a fixed sum every year. This would then allow the contractor to legally keep any surplus, i.e., any amount over the predetermined fixed sum. In effect, this system resulted in a competitive approach for promotion with regard to factory management, and Zong Qinghou, was granted the power of management the first year, because he undertook to return 100,000 RMB (US\$15,000), an amount of money that was larger than any other offer (Luo, 2008).

Zong was 42 old at the time and did not have a strong educational background. He had to work away from home because of poverty when he finished a middle school in 1963. He had been working hard on farms almost every day, but he was unable to save any money due to living cost. A government policy, which forced school 'drop-outs' who were living in a city to go to a rural area and live by self-sufficiency, had been enforced from the end of the 1950's to the beginning of the 1970's. It was called the 'Xiafang Policy' in Chinese. Because of it, about 20 million young people went to rural areas, and Zong was one of them. However, in 1978 Deng Xiaoping became a very strong political leader in China, without ever holding any official state office, and through his strength of reputation and his vision to help China move to a market economy, the 'so-called' Great Cultural Revolution (1966-1976) ended.

One policy change that emerged, through his efforts, allowed the school 'drop-outs,' who had been forced to move to rural areas, to return to their hometowns. Zong came back to Hangzhou after 15 years. He was very responsible in work and quite ambitious and never passed up any opportunity (Gao, 2004).

Following his experience with the cardboard box factory, Zong borrowed 140,000 RMB (US\$21,000) from the local government agency for registration and started a business of consignment sales. Having no subordinates, other than two retired persons, he had to do everything himself, not only stocking goods, but also delivering them to customers, although he was the manager. As Zong sold notebooks, pencils, and ice-lolly to elementary schools, the rate of profit was very low. However, he worked hard every day and cut down on expenses. The result of his endeavors became apparent after 9 months, and Mr. Zong received 170,000 RMB (US\$25,700), excluding his undertaking of 100,000 RMB (Luo, 2008).

The later progression of Zong's business activities included many crises and failures. For example, the development of a medicinal drink and packaged foods both failed. A legal quarrel with DANONE educated him regarding the risk of a joint enterprise with a global giant. After this lesson, he turned his attention to his own endeavors, persisted, and eventually achieved great success that resulted in him being listed in *Forbes* (March 29, 2010) as the No.1 millionaire on the Chinese mainland and with an estimated his property value of US\$7 billion.

2. What is Wahaha?

In 1988, Zong introduced a manufacturing line that produced a nutrient for children. He placed an advertisement on *Hangzhou Daily*, in order to identify a good name for the goods. As a result of this endeavor, the name of Wahaha was chosen by Zong. It means a laughing voice in Chinese and is known widely as a title of a children's song. Thus, Zong named the goods as Wahaha Children Nutrient and registered a series of trademarks (Luo, 2008). Due to an effect the goods had on increasing appetite, parents wanted their children to drink it, and the nutrient products became an instantaneous hit. Zong then changed the company name to Hangzhou Wahaha Children Nutrient in 1989, and it was the first unification of the name and the trademark (Zuo & Liu, 2008). However, there was a limit in production facilities for expansion, and market demand had been increasing every day. Thus, Zong searched for an opportunity for M&A.

At the same time, Hangzhou Canned Foods, which was a state-owned company, had been suffering from deficit operation. It was a bigger company than Wahaha and was authorized by the Chinese Government as one of the exporters in the canned foods industry. Due to its failing operation, the Government of Hangzhou City decided to force the company to go bankrupt or sell off. Zong decided to take over the company for the purchase price of

80 million RMB (US\$12 million). In the end, it became one of the unusual cases of a small fish (Wahaha only had 200 employees) eating a big fish (Canned Foods had 2200 employees) in the business history of China. After that, Wahaha Group was abbreviated to Wahaha and was officially born in 1991 (Zuo & Liu, 2008).

As indicated above, Wahaha's history was that of a state-owned company, but several years later, Zong and WAES (Wahaha Association of Employee Stock-ownership) bought a great deal of stock back from the Shangcheng District. Now, the composition of stock ownership is as follows: Shangcheng District has 46 percent; Zong, 29.8 percent; and WAES, 24.2 percent (F. Xu, personal communication, March 30, 2010). While the district is the largest stockholder, basically 54 percent is private capital versus 46 percent, national capital. Also, Zong and WAES have established a number of companies thus far. Such companies do not include any governmental funds. Therefore, Wahaha Group is a private company now.

3. What is Wahaha's management innovation?

According to our research, Wahaha's management innovation consists mainly of three branches, i.e., product development innovation, marketing innovation, and managerial method innovation. The details, as we interpret them, are below.

A. Product development innovation

When Wahaha was a small company, it mainly targeted competitor's goods and added some ideas for improvement. For example, a competitor developed a new milk drink, which became a hit. Wahaha added vitamin A and vitamin B to it and identified it as nourishing milk. In the end, Wahaha's sales volume was larger than the competitor's. In negative terms, we may basically call it 'imitation.' However, if the product did only simple imitation, it would never have become a hit. Making additions to the product and including the popularity of the Wahaha name provided qualities that emphasized the notion of imitation with modification. Since this aspect of innovation built on a competitor's action, Zong labeled it as "Following Type Innovation" (Xu, 2010).

When Wahaha became a medium sized company, they had been doing what they identified as 'innovation by importation,' including that of new technology and equipment. For example, when a competitor developed a mineral water from mountain springs and advertised the characteristics of natural water, Wahaha developed Chunjing Water by using the newest manufacturing facility and measurement instruments, and advertised the quality of the water. In Chinese, the word of Chunjing means water that is pure and clean. Now, Wahaha has the top consumer share in the water market in China. According to Zong, such innovation is "Import Type Innovation" (Xu, 2010).

In recent years, Wahaha has been doing 'original innovation' by themselves, meaning that they want to develop goods that do not yet exist in the world. For example, "Nutri-Express," a mixture of fruit juice and milk, is a good case. This product has now become one of their best sellers. The sales volume was 9 billion RMB (US\$1.36 billion) in 2009. Zong explained such innovation is "Original Type Innovation" (Xu, 2010).

Underlying these three types of innovation are two basic characteristics of Wahaha product development. One involves starting from a simple case and gradually building upward to higher levels of difficulty. The other focuses on meeting the demands of consumers, i.e., innovations do not always use high levels of technology, but always attempt to gratify their customers' thirst for new goods.

B. Marketing innovation

There are many unique cases of Wahaha's marketing entrance.

In the middle of the 1980s, local makers entered the cola market one after another. There were many brands of cola in China, such as Tenfu Cola, Shaolin Cola, Happy Cola, etc. But, once the two cola giants, Coca Cola and PepsiCo, started to counter-attack, the local cola brands were soon driven out of the cola market. The same eventuality may be found in many countries around the world. Consumers naturally associate Coca Cola and PepsiCo with the word 'cola.' In fact, for these two cola giants, there have not been many competitors anywhere, if any at all, who have achieved success without some sort of co-operator or partnership arrangement.

It was big news in China when Zong decided to enter the cola market. Everyone who knew the cola history opposed his decision, because Coca Cola and PepsiCo seemed too powerful. But Zong did not alter his intention. His competitive strategy became that of 'farm areas and small towns surround cities,' which some might trace to the thinking of Mao Zedong during China's guerrilla age (Wang, 2010). Mao was the first president of socialism in China and implemented a 'rural and small town' policy that reflected his strategic thinking. In market economy terms that was developed in later years, this strategy might suggest that a new cola company should not try to compete initially with Coca Cola and PepsiCo giants in the big cities, but, rather should focus on servicing the vast farm areas and small town, and then to attack big cities after building a consumer base in areas near the big cities.

Wahaha developed a cola with more Chinese characteristics, in order to meet the needs of customers who live in farm area and small towns. For example, it contained more sweetness than general cola, and was initiated with a sale price about 10% cheaper than Coca Cola and PepsiCo. They



started promotion on a large scale through TV commercials, newspaper advertisements, and so on.

Through attentive supervision and mass promotion, Zong's strategy succeeded, contrary to a lot of people's expectation. Wahaha put its Future Cola (photo) on sale in 1998, and they gained a 14% share of the cola market in China by 2001, although Coca Cola and PepsiCo had 42% and 23% share in the same year (Bagchi, 2009). While this ratio has not changed greatly over subsequent years, it is still an indicator of Zong's vision and strategic planning.

Moreover, this innovative business venture demonstrates a very important concept of differentiation, which was developed by Professor Michael E. Porter of the Harvard Business School in the United States of America (Porter, 1980). If we interpret Wahaha's competitive strategy in terms of Professor Porter's conceptualization, Wahaha's activities clearly demonstrated that they used differentiation strategy. Concretely, their differentiation strategy included five factors:

1) Differentiation of area

Coca Cola and PepsiCo focused on big cities, but Wahaha targeted farm areas and small towns, where about 70% of the Chinese people live, providing the potential of a much large market.

2) Differentiation of customer

Coca Cola and PepsiCo appealed to white-collar customers living in bigger cities, while Wahaha sought to appeal to blue-collar workers, as well as the common people living in farm areas and small cities.

3) Differentiation of taste

Coca Cola and PepsiCo used their traditional taste recipe as they expanded globally, but Wahaha developed a cola with Chinese taste characteristics.

4) Differentiation of price

There are no differences in price between Coca Cola and PepsiCo, but Wahaha Future Cola is cheaper of 10% than them.

5) Differentiation of advertising medium

Coca Cola and PepsiCo primarily use each city's advertising medium, i.e., local TV, radio, and newspapers, because of most people who are live in cities do not watch National TV. However, Wahaha uses mainly National TV for advertising, which is popular in rural areas and small cities.

C. Managerial method innovation

Wahaha's management innovation sometimes appears as not only product development, but also management methodology. For example, it is a very difficult in China for a product production company to collect accounts receivable. Wahaha had tackled the

problem without exception, and their accounts receivable remain at almost zero. How was this achieved?

In fact, Zong had been troubled by it for several years after he started the business. So, he decided to solve the problem fundamentally through quality and trust. He paid much attention to quality improvement and made sure quality was up to both national standards and ISO standards. At the same time, he visited a lot of dealers and proposed mutual trade principles, making it necessary for the dealer to pay a percentage in advance. The amount of money is about 10% of expected turnover in one year. Once the payment was confirmed, Wahaha ships the goods quickly. As for his part of the trade agreement, Zong guarantees the dealer's profit. Needless to say, it is almost impossible for the dealer not to trust Zong. Swindlers do appear anywhere in China. For example, in one instance a dealer paid in advance to a company, but the company disappears suddenly after receiving the advance payment. Such risks exist, but Zong never compromises and held fast to own consent. Only a few dealers believed him at the start. But now, Wahaha has over 2,000 primary dealers and the number has been increasing every year in China (Li & Zou, 2009). Competitors have attempted to introduce the same method, but it has not gone well. Why? Apparently, they were unable to develop a trustful relationship, as did Zong. Personal contact and years of business relationships have helped him develop a reputation based on his integrity.

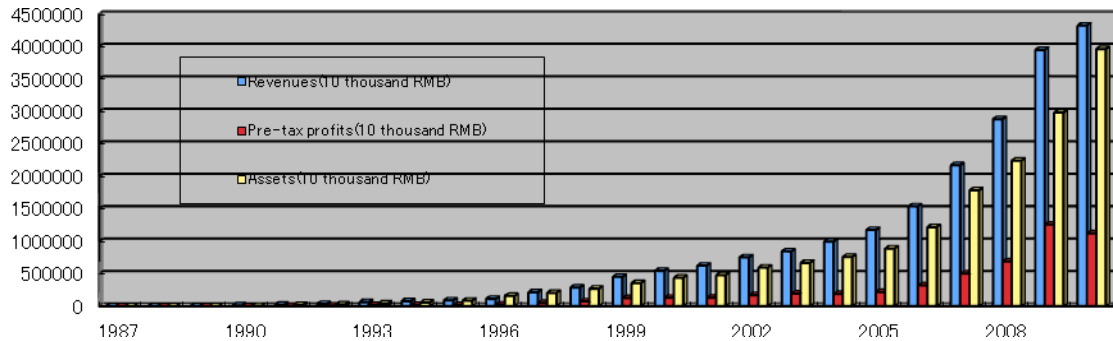
Also, we can provide another case to explain Wahaha's innovation of management methodology. For example, there is not a 'vice position' in Wahaha. Zong is Chairman and President. Nobody has been appointed to vice chairman or vice president thus far. The mass media often considers Zong to be a despot and are sometimes critical of him. However, Zong has stated that:

Why I did not prepare vice president so far? The main reason is I want to make decision rapidly. We have twenty heads of departments as well as competitor's vice president. But since the position is not equal, they will follow me and not negotiate with me. It is necessary that to concentrate the power in China. However, it is no problem that to appoint some people as vice positions, because of my prestige was established and Wahaha became a big company today. But vice position would not be useful for competitiveness at the time (F. Xu, personal communication, March 30, 2010).

4. What factors contributed to Wahaha's rapid growth in its brief history?

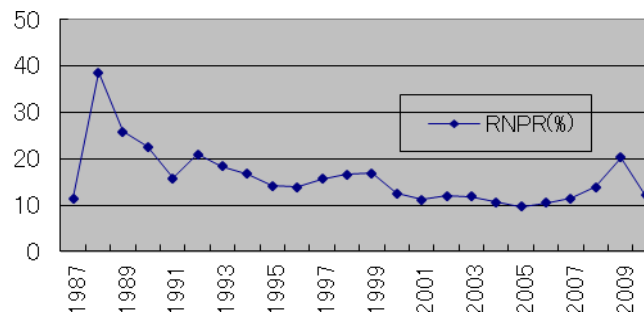
Figure 1 illustrates Wahaha's transition of growth in only 23 years.

Figure 1. Wahaha's financial date



Source: Developed by the senior author and based on Wahaha's financial material.

Figure 2. Ratio of Net Profit to Revenues



Source: Developed by the senior author and based on Wahaha's financial material.

Wahaha's achievement is documented in the figures above. A basic question is what factors led to such rapid success. If we employ the term 'factors' in our analysis, we might do so in terms of outside and inside factors.

A. The outside factors

We think the outside factor included three aspects. The first is the reform of the economic system for the farm areas, i.e., policy change regarding the farm and city relationships. The second involves the acceleration of opening China to the outside world. Finally, the third is the development of a market economy.

As noted much earlier in this paper, the policy of reform of the economic system was started with the farm area in China in 1987, by liberating the productivity of the farm area. Since a series of policy changes (for example, the system of land contracting, tax exemption, lease of agricultural land, working away from home, etc.) were enforced, the peasants'

standard of living improved quite rapidly. As the result, the purchasing power of the peasants increased and a consumption market was established and has continued to develop.

Next, the acceleration of opening China to the outside world provided outstanding business opportunities to individuals who have strong entrepreneurship propensities, such as Haier's Zhang Ruimin, Lenovo's Liu Chuanzhi, and, of course, Zong Qinghou.

Needless to say, a 'so-called' planned economy had been enforced in China until 1978. There were no private companies at that time. After the 1978 policy change, private companies were born like mushrooms. Moreover, thanks to the transition to a market economy, a many private companies were able to grow and prosper. Of course, it has taken a number of years to make progress in this transition, and many companies, both state owned and private, have gone bankrupt.

B. The inside factors

The 'inside factors' are based primarily on Zong. In other words, Wahaha would not have existed without Zong. Although he has a limited formal educational background, having left school after middle school, he has become a life long learner, and, thus, he has been able to overcome poverty and a modest beginning in life. An analysis of his personal characteristics would also define him as a creative entrepreneur, who displays outstanding abilities with regard to a tendency for reflective thinking, the art of persuasion, decision-making, taking action to seize opportunities, endurance during difficult times, and a focus on uniting those with whom he chooses to develop relationships. Further elaboration of what might appear to be the 'mystery of Zong' is delineated below:

- 1) Zong once said that, "I like reading and have read a variety of books. Even now, the custom never was changed. If I have some time, for example, in the business trip, I will buy a book or magazine. It made me to learn much knowledge. And since I had been living in social lower layer, I am able to understand deeply the social present condition" (F. Xu, personal communication, March 30, 2010). This comment is quite revealing of Zong's drive, ambition, and desire to improve his mind; and it probably is the basis of his development of his ability to think through issues and reflect on a variety of possibilities; it seems to come neither naturally nor by accident, but, rather is based on his constantly seeking to educate himself through reading and taking risks to experience possibilities.
- 2) It has become obvious that Zong is not an ordinary entrepreneur, but, rather, a brilliant one who leads through the ability to sincerely articulate his vision and lead by persuasion. Outstanding entrepreneurs understand that they rarely achieve great success by acting alone. They know that they have to provide persuasive narratives of their visions to their employees to enable them to gain their trust and commitment to goals. It also involves more than just being a good talker, particularly when the

ability to act is weak; no one will believe him/her. At the same time, if an entrepreneur has the ability to act but is unable to articulate his/her vision, nobody will follow. Zong never uses flowery expressions, but his sincerity seems to charm others.

- 3) Zong is sensitive to business opportunities and is willing to take calculated risks, particularly with regard to changing government policy and resultant evolution of economic conditions. As indicated near the beginning of this paper, he realized what was transpiring with the change of economic conditions and decided and acted quickly when the Contract and Responsibility System presented him a management opportunity with the cardboard box company. He didn't miss that opportunity and risked a higher offer than others. Later, he realized a new business opportunity when he started the consignment venture, even though it involved great hardship and endurance.
- 4) It is also obvious that when Zong decides something, he took action quickly. Sometimes, his subordinates are unable to follow his vision, but still show respect for their boss' actions. His entrance into the cola market, when most thought the endeavor would fail due to large company competition, is a good example. Few thought he would succeed, but Wahaha was born and became a huge success.
- 5) Zong's ability of uniting others is remarkable. During his lifetime, he has experienced all social levels and finds it easy to associate with everyone. For example, politicians, bureaucrats, scholars, journalists, suppliers, dealers, employee, competitors, agencies, customers, etc., all seek to cooperate with him. So, he is not a lonely entrepreneur. To the contrary, he has built trusting relationships with so many in such a variety of endeavors that he has built an incredible network that provides him much insight.

5. What have we learned through this case study?

After reforming the economic system and opening to the outside world, a numerous enterprises were born and foreign companies expanded to China every year. One initial result was that many Chinese enterprises underwent bankruptcy due to a lack of competitiveness. However, some enterprises like Haier, Lenovo, and Wahaha became stronger through competition with foreign giants. Studying such successful enterprises leads to some common findings. Although these Chinese entrepreneurs' educational backgrounds are modest, i.e., none have an MBA degree, they developed outstanding management skills, and they have distinctive Chinese characteristics. Wahaha's Zong certainly is a typical case.

Many Western people were unable to understand such Chinese enterprises' competitive strategy in terms of western management theory. This is certainly understandable, since

Chinese entrepreneurs had not read any Western books on management nor studied Western management theory during their student days.

However, they were able to succeed, the main reason being the ability to innovate by combining what they were observing the as Western management practices with Chinese conditions. In Chinese, innovation is Chuangxin, and it is accompanied by a common awareness that 'only Chuangxin is our company's core competence.' There is one Western creativity researcher, Robert Sternberg, who has proposed that *Creativity is a decision* (2003), and he asserts, "People are creative largely by dint of their decision to go their own way. They make decisions that others lack the will or even the courage to make..." (p. 5). Sternberg additionally provides a list of 10 items, e.g., "To define problems in ways different from those in which their colleagues define them" (p. 5), that seem to be involved in this decision to be creative (see website at the bottom of this paper listed for his column when he was President of the American Psychological Association, i.e., APA). Sternberg's proposition that "creativity is a decision," along with his list of 10 items, could possibly be used to describe Zong, as well as other innovative Chinese entrepreneurs. In any event, these Chinese entrepreneurs certainly seem to intuitively understand the creative and innovative process.

Finally, this paper has presented only a part of Wahaha's management innovation. However, we hope the readers can discern some things about this outstanding Chinese company. It is possible that, in the future, some Chinese companies, as well as Wahaha, will enter the European or North American markets. We hope this paper will be a good reference for western readers.

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Web links

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Japan Creativity Society: <http://www.japancreativity.jp/>

Kinki University: <http://www.kindai.ac.jp/>

Texas A&M University: <http://epsy.tamu.edu/>

Wahaha's website: <http://www.wahaha.com.cn/>

Short Bios

Dr. Fangqi Xu is professor of the School of Business Administration, Kinki University, Japan. He started creativity research in the beginning of 1980s and became the one of leading researchers in China. He went to Japan with a government scholarship, which was chosen as the first national project on creativity research in 1991. After he received his Ph.D. degree at the Japan Advanced Institute of Science and Technology, he began doing post-doctoral research at the laboratory of Prof. Ikujiro Nonaka, who is the father of knowledge creating theory at the Graduate School of International Corporate Strategy, Hitotsubashi University. After that, he established the Institute for Creative Management at Jiangsu Polytechnic University in China in 2005. Also, he established the Institute for Creative Management and Innovation at Kinki University last year. He is the author of many books, chapters and articles, and is one of winners of Tudor Rickards Best Paper Award 2007 of *Creativity and Innovation Management*.

Prof. Xu is president of Japan Creativity Society and a regular participant of ECCL.

Dr. William R. Nash is Professor Emeritus of Educational Psychology at Texas A&M University, where he taught graduate courses on the study of Creative Thinking and biographical studies of Creative Genius and served both as Coordinator of the (then entitled) graduate specialization on 'Studies of Intelligence, Creativity, and Giftedness' (now entitled 'Cognition, Creativity, Instruction, and Development') and as Director of the (then entitled) 'Institute for the Gifted and Talented' (now entitled the 'Youth Adventure Program') until his retirement in 2008. He graduated over 50 Ph.D. students from around the world. Dr. Nash is a former President of the National Association for Gifted Children in the US and served as Chair of the Charter Board of Directors of the American Creativity Association. He is a recipient of the Texas A&M University's Association of Former Students Distinguished Faculty Achievement Award and Texas A&M University's College of Education and Human Development's Advisory Council's Extraordinary Faculty Service Award. He has also received awards from the American Creativity Association and the Texas Association for the Gifted and Talented.

DO INTELLIGENT LEADERS MAKE A DIFFERENCE? THE EFFECT OF A LEADER'S EMOTIONAL INTELLIGENCE ON FOLLOWERS' CREATIVITY

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Key words: Emotional Intelligence; Creativity; Organizational climate; Leadership.

Abstract

Authors have suggested that emotional intelligence (hereinafter EI) of leaders has an impact on several individual and organisational outcomes (e.g. Zeidner, Matthews & Roberts, 2004). Rego, Sousa, Cunha, Correia & Saur (2007) found a positive relationship between supervisors' EI and their employees' creativity; however, their research is impaired by the common-method variance error, since all data was collected from the same source. Moreover, they did not explore if the observed relationships were affected by other individual and/or organisational factors.

The current research takes Rego et al.'s (2007) work a step further, by tackling some of the unresolved questions in their work. The goal is still to explore the relations between EI and creativity, but this is carried out with 66 leader-follower dyads from an organisation operating in the health-care industry.

The findings confirmed those found by Rego and colleagues, i.e. there is a positive relationship between leaders' EI and their followers' creativity. However, this is confirmed only for the higher-level construct of EI, and not for its dimensions. Furthermore, creative climate did not mediate the linkage between leaders' EI and their followers' creativity.

Introduction

If there is any consensus in the last century with regards to change, is that it occurred at a higher rate than ever before, and it was widespread around the globe, including some of the poorest regions of the planet, where communication was regarded as a luxury, but is now a common feature of society (Prahalad, 2010). This calls more than ever for creativity and innovation to act as engines pushing the pace of change. And yet, innovation and creativity are only meaningful as long as people and environments are innovative and creative.

The literature on organisational attributes that encourage – and hamper – creativity is profuse and rich. This literature (e.g. Amabile, 1996, 1998; Woodman, Sawyer & Griffin, 1993) emphasizes the idea that organisational creativity is influenced by the macro features of the workplace, such as the climate and reward systems.

More recently, authors (Wang & Rode, 2010; Mayfield & Mayfield, 2008; George & Zhou, 2001; Oldham & Cummings, 1996) have suggested that leaders are key factors to promote creativity. In particular, leaders' values, personality, and emotions, amongst other aspects, are said to encourage and promote innovation and creativity.

Amidst such attributes, a leader's EI may play a crucial role in influencing employees' skills and behaviours. For example, some literature has suggested that a leader's EI is associated with employees' commitment, innovative behaviour, and motivation (Zeidner, Matthews & Roberts, 2004).

This study explored the relationship between EI and creativity. In particular, the research investigated the connection between a leader's EI and his/hers employees' creativity. This liaison was initially proposed by Zhou and George (2003), and despite some empirical works on the subject (see Rego, Sousa, Cunha, Correia & Saur, 2007; and Barczak, Lassk & Mulki, 2010), little is still known with regards to the intentional drive that leaders may imprint in their own behaviour, towards promoting their followers' creative behaviours. This intentional drive lies at the heart of the EI concept. Therefore one can conjecture that emotionally intelligent leaders are more able to pull creative behaviours amongst their followers than their less emotionally intelligent counterparts.

The paper is organised in five parts. In the first one, the existing literature is briefly examined, with emphasis on EI, individual creativity and creative climate. The second section presents the hypotheses, further detailing the proposed associations between the key concepts. The third part of the text details the method, and the fourth section shows the results. Finally, the last part discusses the results and delivers some cues for future research.

Theoretical framework

From emotional intelligence to leadership

EI is a subset of social intelligence, defined as the aptitude to perceive and express emotions, understand them and use them, as well as the aptitude to manage the individual's own and other people's emotions (Salovey & Mayer, 1990). This definition assumes that EI is a cluster of well-defined cognitive aptitudes dealing with emotionally-based information and with emotions regulation. Other authors have defined EI as a set of generic competencies and dispositions, which allow people to adapt to their environment (Zeidner et al., 2004).

Notwithstanding the differences, most popular EI models and theories (e.g. Bar-On, 1997; Goleman, 1995; Mayer, Caruso & Salovey, 2000) share some key elements. Firstly, EI implies that people are aware of their own emotions, i.e. individuals are able to understand their emotional activity as well as the role of these emotions in regulating their behaviour. Secondly, it is also assumed that EI people are aware and understand others' people emotions. Finally, the EI concept entails the idea that people are able to manage their own and other people's emotions, i.e., individuals can use emotional activity to achieve specific goals and carry out particular activities.

When these ideas are brought into the leader-follower process, they highlight the ability of leaders to use emotions (their own and their followers') in the workplace. Managing emotions is therefore an important tool to accomplish organisational goals, to motivate people and teams, to foster satisfaction and commitment, and to influence the work environment (Avolio & Gardner, 2005; Bass, 1997; George, 2000). Some authors (e.g. Goleman, Boyatzis & McKee, 2002) explain that leaders tend to be people through which other people seek for security and/or for action. Leaders are emotional beacons to individuals and groups, therefore they are a critical factor as far as getting the most out of people is concerned.

In fact, the aptitude to manage emotions seems to be embedded in the leadership literature. For example, Yukl (2006) defines leadership as a process in which certain individuals understand and influence agreement about what needs to be done and how to do it, as well as facilitate individual and collective efforts to accomplish shared objectives. George (2000) argues that leaders who manage their own emotions and those of their followers are more capable of looking in different ways to the same problems, and of thinking outside the square.

Perhaps the leadership field, in which emotion management seems to be more central, is the transformational/transactional paradigm. Transformational leaders are highly committed to their followers, i.e., they go beyond conventional exchanges and transactions (Avolio & Bass, 1988). Recent studies show that those leaders capable of recognising emotions are more transformational than transactional (Butler & Chinowsky, 2006). Other authors have argued that transformational leadership is strongly associated with creative thinking, identification, and positive organisational culture (Yammarino, Spangler & Bass, 1993).

From creativity back to emotional intelligence

There is not a consensual definition of creativity. According to Woodman et al. (1993), creativity is the creation of a new product, service, idea, procedure, or process, which has value and is useful. This link between creative potential and useful and valued ideas is a key

point in many theoretical frameworks; furthermore, it is also stated that such link is essential to organisational efficiency, complex problem-solving, and global efficacy (DiLiello & Houghton, 2008).

Creativity in social psychology is regarded as a phenomenon which is influenced by both the environment and individual factors (Amabile, 1996). Researchers in this area have highlighted the role of the context in individual creativity (Sternberg, 1999), or the macro determinants of organisational creativity, such as leadership and the organisation climate (Amabile, 1998; Amabile, Barsade, Mueller & Staw, 2005; Borghini, 2005).

The social dimension of creativity is central in Csikszentmihalyi's systemic vision (e.g. 1996). According to the author, creativity is a process that involves a combination of individuals, domains, and fields (see also Ford, 1996).

Another research stream has focused on factors that develop followers' creative skills. The literature has called attention to the role of leaders' attributes such as technical expertise, creative problem-solving skills, and social competencies (persuasion, social intelligence, and coaching), in stimulating followers' creative outputs (Mumford, Scott, Gaddis & Strange, 2002). Other authors have called attention to the instruments and processes that leaders need to use in order to promote followers' creativity: motivation, intellectual stimulation, support, autonomy, goal-setting, feedback, and access to resources (Mayfield & Mayfield, 2008; Tierney, Farmer & Graen, 1999).

Creative management is another means to increase employees' creative output. Creative managers are capable of recognising their employees' creative potential and skills, and of using such potential. In order to achieve that, they work on communication, they accept error and conflict, they allow their employees to work with autonomy and flexibility, they assign responsibilities, and they encourage intrinsic rewards (Sousa, 2000; 2003). The manager acts as a facilitator, since he or she creates the environments, settings, and conditions in which people can set free their creativity (Guastello, 1995).

For what was presented, leadership and creativity seem to be inevitably linked. Leaders are potential influencing elements in fostering – and hampering – their followers' creative behaviours. The following section details the associations between these concepts.

Research hypotheses

As the previous review showed, leaders with higher EI levels push and inspire followers to identify opportunities where they can be creative. These are leaders who understand conflicts and tensions in the groups, and they can use such tensions to stimulate individual and group creativity. Moreover, they act as facilitators towards group goal-setting and they point to creative solutions and to improvement opportunities. Some steps in the creative process, such as data gathering, and idea generation and implementation are made

easier by an emotionally intelligent leader (Zhou & George, 2003; Rego et al., 2007). In sum, we envisage that:

Hypothesis 1: There is a positive relationship between a leader's EI and followers' creativity.

Although in general terms EI leaders are more likely to affect their followers' creativity than less EI leaders, there are certain dimensions in EI which may be more responsible for such effects. Since EI is a multidimensional concept, specific hypotheses can be placed with regards to the relationships between EI and creativity. The following associations are based on the exploratory results of Rego and colleagues (2007), as well as on a number of other works in the area.

Firstly, empathic leaders are more capable of capturing and understanding emotional signs from people around them than less empathic leaders (Goleman et al., 2002). They are able to read and recognize values, fears, and positive emotions in their followers, and they respond accordingly. Followers with such leaders are more optimistic about their future, more confident and more proactive in their actions (Zhou & George, 2003).

Secondly, leaders who are better at understanding others help their followers to recover from negative emotional states, and to take creative steps to solve problems (Zhou & George, 2003). These leaders are better at perceiving their followers' frustrations, and they stimulate them to build up confidence in their own ideas, to negotiate with others, and to keep a positive stance when implementing their ideas (Rego et al., 2007).

Thirdly, EI leaders who are better at self-controlling against external strain events, are likely to act more positively and constructively when facing frustrations. They are also more capable of providing constructive feedback to their followers, which increases their motivation and resistance to failure (important in creative processes; Oldham & Cummings, 1996).

Fourthly, self-encouraging leaders are more capable of living with their own frustrations, and are able to turn them into action-drivers towards new challenges. This attitude is passed on to followers, who learn how to look positively at difficult situations, how to assume risks with no fear, and how to produce novel ideas with enthusiasm, optimism, and content (George, 2000).

Fifthly, emotional self-control defines the capability of a person to own control over his or her emotions (Goleman et al., 2002). Emotional self-control in leaders is even more important, given their responsibilities in achieving goals through followers. Leaders need to be able to transmit to followers the idea that emotions may be a key player in creativity. Followers need to understand that they can take risks without fear, and that they can advance novel and unusual ideas and actions.

Finally, leaders who understand their own emotions are aware of the impact of their feelings in their performance and in their followers. They know that they can affect their followers' self-confidence, respect, and drive for creativity. They are able to establish fruitful and supportive relationships with their followers, and they can push for creative thinking and behavior (George, 2000; Goleman et al., 2002).

The abovementioned lines of reasoning detail several associations between EI dimensions and employees' creativity. To sum up the hypotheses outlined above, we predict that:

Hypothesis 2: There is a positive relationship between a leader's EI dimensions of empathy (2a), understanding of other people's emotions (2b), self-control against criticism (2c), self-encouragement (2d), emotional self-control (2e), understanding of own emotions (2f), on one hand, and followers' creativity, on the other hand.

Although leaders may play an important direct influencing role on followers, they may be also influencing them in an indirect way, through their power in changing the organisation environment (Goleman, 2003; Witt, 2003). In fact EI leaders may have a sizeable impact in creating a climate for change, innovation, and creativity (Amabile, 1998; Amabile et al, 2005; Borghini, 2005; Wang & Rode, 2010). This may be explained by the fact that followers interpret their surroundings based on several clues, to which their leaders' behaviours are relevant. The existing literature on EI also supports these arguments. For instance, Goleman et al. (2002) and Momeni (2009) propose that EI leaders create environments in which people experience loyalty, intelligence, risk-taking, and other attributes which pave the way to act creatively. These works lead to the third hypothesis:

Hypothesis 3: A creative climate mediates the relationship between leaders' EI and their followers' creativity.

Method

Design

The current investigation is inspired by the theoretical proposals of Zhou and George (2003), and it goes beyond Rego and colleagues' (2007), Wang and Rode's (2010), and Barczak et al.'s (2010) findings. In particular, this research attempts to deal with the shortcomings of Rego et al.'s investigation, namely the fact that the data was collected from the same source (138 top and middle managers) and from 66 organisations. The first problem poses the common-method variance error (Podsakoff, MacKenzie, Lee & Podsakoff, 2003), while the second introduces organisational-level variables that contaminate the mediating effect of climate (H3).

Data was collected via questionnaire from both leaders and employees in a single organisation. Leaders and followers were asked to evaluate creativity, EI, and climate, according to the design shown in table 1.

Table 1 – Study design

	Creativity	EI	Creative climate
Questionnaire answered by leaders	Q1 Hetero-evaluation (leaders assess their employees' creativity)	Q3 Auto-evaluation (leaders assess their own EI)	Not assessed
Questionnaire answered by employees	Q2 Auto-evaluation (employees assess their own creativity)	Q4 Hetero-evaluation (employees assess their leaders' EI)	Q5 Employees assessment of climate (individual subjective accounts)

Sample

Data was collected in the largest private health-care organisation operating in the Iberia Peninsula. The sample included 7 leaders and 66 followers, which resulted in 66 leader-employee dyads. The return rate was 60,8%. Six of the 7 leaders were female, and 61 of the 66 employees were also female (92,4%), which made the current sample homogeneous in gender terms. Age means was 39 years for leaders and 31 for employees. Seniority means was 9,5 years for leaders and 1,5 years for employees. Number of employees per leader ranged between 3 and 17, with a means of 9.

Instrument and variables

All scales used in the current investigation were translated from English to Portuguese following the translation/back-translation technique. Other adaptations to the original scales included slight changes in wording (to comply with auto or hetero evaluations), and item scale (1 to 7 points in a Likert-type, excluding the climate for creativity – see below). The main scales and variables measured in the current study were:

Creative performance (adapted from Zhou & George, 2001) – 13 items asking managers to evaluate employees' creative performance. The same scale was used to assess employee's auto-perception of creative performance. This required small changes in the original wording. For example, one sentence states that "he or she is not afraid of taking risks". In the auto-evaluation mode, this sentence became "I'm not afraid of taking risks".

Emotional intelligence (adapted from Rego & Fernandes 2005; Rego, Godinho, McQueen, & Cunha, 2009) – Rego and his group have developed and refined their EI measure in several studies, following the works by Mayer and associates. The scale gives an auto-evaluation of EI in six dimensions (23 items): understanding of other people's emotions, self-control against criticism, emotional self-control, self-encouragement, and understanding

of own emotions. Two of the items had to be removed so that the scale could apply to followers (rating their leaders' EI).

Climate for Creativity (KEYS, adapted from Amabile et al., 1996) – KEYS is composed of 78 items assessing the stimulating factors and obstacles to creativity in the workplace. We used two organisational-level dimensions which relate to creative climate: organisational encouragement (15 items) and organisational impediments to creativity (12 items). The first one is defined as a “culture that encourages creativity through the fair, constructive judgement of ideas, reward and recognition for creative work, mechanisms for developing new ideas, an active flow of ideas, and a shared vision of what the organization is trying to do”; the second is a “culture that impedes creativity through internal political problems, harsh criticism of new ideas, destructive internal competition, an avoidance of risk, and an overemphasis on the status quo” (Coveney, 2008, p. 44). A Likert type of scale was used, ranging from 1 (climate feature never applies in the company) to 4 (climate feature always applies in the company).

Both questionnaires were sent to managers via electronic mail. They were instructed to answer the version “Leader”, and forward the version “Employee” to each of his/her employees. After answering their version, employees were instructed to send their questionnaires to an email account created by the researchers, thus avoiding problems of confidentiality. Identification was requested in order to match supervisors' and employees' answers.

Reliability results of the scales showed good results on average. Four items had to be deleted from the KEYS scale, due to their negative impact on alpha coefficients. Some EI dimensions showed poor reliability results (below the 0,70 threshold) which could not be improved even after items removal. We decided to proceed with the main statistical procedures, although in the discussion part we address this problem.

Results

Hypothesis 1 stated a positive association between a leader's EI and followers' creativity. This was tested in several ways: i) EI hetero-evaluation X Creativity auto-evaluation (Q4XQ2 in table 1, individual level); ii) EI hetero-evaluation X Creativity hetero-evaluation (Q4XQ1, individual level); iii) EI hetero-evaluation X Creativity hetero-evaluation (Q4XQ2, group level); and iv) EI hetero-evaluation X Creativity hetero-evaluation (Q4XQ1, group level).

Numbers i) and ii) used all 66 dyads. Numbers iii) and iv) required aggregation of the data at a group level (by leader, i.e. all answers pertaining to a leader were aggregated and the mean was used). This in practice meant that the sample in cases iii) and iv) consisted of 7 cases (7 observations of means). Table 2 shows the results.

Table 2 – Hypotheses 1 – Pearson-correlation results

		EI hetero- evaluation (employees assess their leaders' EI)
Individual level (all 66 dyads)	i) Creativity auto-evaluation (employees assess their own creativity)	0,329 *
	ii) Creativity hetero-evaluation (leaders assess their employees' creativity)	0,270 *
Group level (7 observations)	iii) Creativity auto-evaluation (employees assess their own creativity)	0,817 *
	iv) Creativity hetero-evaluation (leaders assess their employees' creativity)	0,490
		* p< 0,05

All the correlations in table 2 show a positive and significant association between EI hetero-evaluation and employees' creativity (non-significant in case iv, but still a medium-size correlation value). Even in the two cases where the common-method variance error is theoretically absent (cases ii and iv), correlation coefficients are either significant or moderate to high. In sum, hypothesis 1 is fully supported by the data, which means that supervisors' EI is positively related to their employees' creativity.

In hypothesis 2 there were several predicted relationships, between a leader's EI dimensions (2a to 2f) and his/her followers' creativity. This hypothesis was tested in two ways: i) EI hetero-evaluation (with 6 dimensions, acting as independent variables) X Creativity auto-evaluation as dependent variable (Q4 X Q2 in table 1); ii) EI hetero-evaluation (with 6 dimensions, acting as independent variables) X Creativity hetero-evaluation as dependent variable (Q4 X Q1). Due to the small sample size, this hypothesis was not tested with data at a group level. Several multiple regression models were tested. Table 3 shows the results.

Table 3 – Hypothesis 2 – Multiple regression results

i) Creativity auto-evaluation (employees assess their own creativity)			EI hetero-evaluation (employees assess their leaders' EI)	ii) Creativity hetero-evaluation (leaders assess their employees' creativity)		
Adj. R ²	F	β	EI Dimensions	β	Adj. R ²	F
0,208	3,533 *	-,226	a) Empathy	0,045	0,052	1,571
		-,117	b) Understanding of other people's emotions	-0,209		
		-0,218	c) Self-control against criticism	-0,237		
		0,441 *	d) Self-encouragement	0,380		
		-,275	e) Emotional self-control	-0,149		
		0,627 *	f) Understanding of own emotions	0,363		
* p< 0,05						

These regression results give limited support to hypothesis 2. The six EI dimensions are accounted for 21% (when employees assess both their leader's EI dimensions and their own creative performance) or 5% (when employees assess their leader's EI dimensions but their creative performance is assessed by their leaders). In other words, although in general terms a leader's EI seems to have an impact on followers' creativity (as confirmed in hypothesis 1), at a more specific level EI does not seem to influence creative performance. The most important EI dimensions, as observed in table 3, are self-encouragement and understanding of own emotions.

Finally, for hypothesis 3, the goal was to analyse the mediating effect of creative climate on the relationship between leaders' EI and their followers' creativity. Mediation effects were tested following the generic indications by Baron & Kenny (1986). We used Creativity hetero-evaluation as the dependent variable, EI hetero-evaluation as the independent variable, and employees assessment of climate (organisational encouragement and organisational impediments) as the mediating variable (Q1, Q4, and Q5, respectively, in table 1). Following Baron & Kenny's indications, table 4 shows the three steps to establish a mediation effect.

Table 4 – Hypothesis 3 – Testing mediation

Mediating variable (climate dimension)	1 st step (regressing climate on EI)	2 nd step (regressing creativity on EI)	3 rd step (regressing creativity on both climate and EI)
Organisational encouragement	$R^2= 0,171$ $\beta_{EI}= 0,414$	$R^2= 0,073$ $\beta_{EI}= 0,270$	$R^2= 0,124$ $B_{Clima}= -0,205$ $\beta_{EI}= 0,384$
Organisational impediments	$R^2= 0,008$ $\beta_{EI}= -0,09$	$R^2= 0,073$ $\beta_{EI}= 0,270$	$R^2= 0,124$ $B_{Clima}= 0,092$ $\beta_{EI}= 0,331$

From table 4, and according to Baron & Kenny (1986, p. 1177), no mediation effect can be established in the current sample, since: a) climate (in both dimensions tested) does not show to have an effect on creativity; and b) the effect of EI on the 3rd step is higher than its effect on the 2nd step (according to the authors, mediation exists when the effect of the independent variable is lower in the 3rd step than in the 2nd, which was not observed in our case). In sum, according to these results, hypothesis 3 could not be confirmed, i.e., creativity climate does not mediate the relationship between a leader's EI and his/her followers' creativity level.

Discussion and Conclusions

The current research aimed at exploring the relationship between leaders' EI and followers' creativity. Furthermore, it also looked into the mediating effect of creative climate on the aforementioned relationship.

The findings show that followers' creativity is associated with their leaders' EI. This was observed both at an individual and at a group level of analysis. Since the current research dealt with the common-method variance error, the findings support and strengthen Rego et al.'s (2007) research, as well as the theoretical propositions of Zhou and George (2003). It is therefore shown from these works, that the way leaders manage their emotions and their employees' emotions is undeniably linked to their creativity. When EI is broken down in its constituent dimensions, the strength of the relationships between EI and followers' creativity decreases considerably. However, a limited support was found for the linkage between creativity, on one hand, and the EI dimensions of self-encouragement and understanding of own emotions, on the other hand. In this respect, the current research does not support Rego and collaborators' work, since in the later a stronger predictive power was revealed by self-control against criticism, and empathy. The differences between the two works suggest that other factors may be influencing the relationship between IE dimensions and employees' creativity. These factors may pertain to the individual, group, or even

organisational level (Amabile, 1996, 1998; Sternberg, 1999; Borghini, 2005) and they recommend a careful exploration in future investigations.

Finally, hypothesis 3 was not supported by the data, i.e. creativity climate does not mediate the relationship between leaders' EI and their followers' creative level. Despite the vast amount of studies suggesting this mediating effect (e.g. Amabile, 1998; Goleman, 2003; Witt, 2003), empirical research seems to demonstrate that the relationship between creative climate and EI and creativity is far more complex than proposed. In addition to the current findings, Barczak et al.'s (2010) work support such conclusion: the authors found a mediating effect of collaborative culture in the association between trust and team creativity. Also in Wang and Rode's (2010) research innovative climate affects employee creativity only as a third-order factor, interacting with transformational leadership and employee identification with leader.

As far as managerial implications are concerned, the current investigation calls attention to the relationships between the supervision level in the organisation and creativity of employees. Particularly significant in this relationship is the EI of supervisors. By understanding their own emotions and especially their employees' emotions, supervisors are able to directly stimulate the creative outputs of workers. As the current work has shown, such effect is mainly a direct one, and not so much an indirect one, through creative climates. Creative climates are probably a much more complex phenomenon to manage and handle which deserves further research.

Limitations of this investigation include: 1) the conditions of questionnaire administration (e.g. there was no control with regards to which workers the questionnaire was sent to); 2) the dependent variable; in this regard, it is worth mentioning that Zhou and George's (2001) scale addresses the perceived creative performance, and not the objective creative output; future studies should be able to use a mix of concurrent creative measures, from objective to subjective; and 3) the effect of other mediator and/or moderator variables with close links to EI, such as personality.

Modern organisations are faced with an increased pressure to innovate in order to remain competitive. Creativity plays a crucial role in the organisation's innovation and entrepreneurial activity. But creativity does not come out easily; it needs to be stimulated, cherished, and appreciated. The current research has confirmed that such encouragement is influenced by the relationship between supervisors' EI and their employees' creativity.

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KNOWLEDGE MANAGEMENT PRACTICES ORIENTED FOR INNOVATIVE COMPANY PERFORMANCES

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Summary

This article analyses how knowledge management practices drive innovation processes. Previous research has demonstrated that knowledge management practices potentially do make a positive contribution towards innovative performance levels. Furthermore, this input rises in proportion to the level of effort organisations attribute towards creating contexts favourable to knowledge management. However, studies have thus far focused on the relationship between the creation and sharing of knowledge and innovative performances, i.e. prior analysis have not reached out to incorporate the entire knowledge life cycle. Furthermore, in some cases, the actual positive effect of the cycle's respective phases on innovation is never rendered explicit. Correspondingly, we propose a conceptual model that enables analysis of the contextual variables and how the different phases in the knowledge management cycle impact on innovation processes. We seek to capture the direct effects of knowledge management practices on company innovation performance levels. Based upon a review of the literature on knowledge management and innovation, we set out an analytical model that provides the theoretical foundations for the empirical processes necessary for researching these interactions. From a practical point of view, the study results enable information technology managers to refocus their priorities and investments on those knowledge management practices able to return the best results.

Key-words: Knowledge Management Enablers; Knowledge Management Practices; Integrated Knowledge Management Cycles; Innovative Performance

1. Introduction

For many organisations, the development and implementation of innovation represent absolute needs within the framework of remaining competitive (Hislop, 2009). Indeed, this may well explain why the interest in knowledge and innovation management has risen not only among academic specialists (e.g. Nonaka, 1994; Davenport and Prusak, 1998) but also in the corporate world (e.g. Boston Consulting Group).

In keeping with the diversity in approaches and the multiplicity of studies, the two concepts have subsequently evolved. Indeed, the focus in knowledge management (KM) has progressively shifted moving on from concentrating on the “hard” factors, based on technology and the reutilisation of knowledge, to take on a “soft” perspective based on the prevailing interactions and social contexts (e.g. McElroy, 2000; Choi and Lee, 2003; Chao, Li and Clarke, 2008; Hislop, 2009). As regards the innovation concept, this was initially bound

up with technological innovation (Tidd, Bessant and Pavitt, 2003; Davilla, Epstein and Shelton, 2006) while it has now begun to take on a multidisciplinary character and incorporating various types of innovation – product, process, marketing and organisational (e.g. OsloManual, 2005; Piteira, 2010).

The relevance of these two concepts to the current socioeconomic context is unquestionable and our purpose here involves ascertaining the extent that there is a relationship existing between them. In efforts to answer this question, various authors have engaged in theoretical and empirical studies with a significant majority of their findings verifying the existence of such a relationship (e.g. Nonaka, 1994; Caloghirou, Kastelli and Tsakanikas, 2004; Forcadell and Guadamillas, 2002; Gloet and Terziovski, 2004). Nevertheless, despite the range of studies on these issues, our literature review identifies at least three facets requiring greater and deeper consideration. Firstly, not all the stages in the KMLife cycle have been attributed due attention by the field which tends to broadly study the creation and sharing of knowledge. Secondly, some studies are based on relatively small samples. Thirdly, the positive impact of KMon innovation does not seem to have been portrayed particularly clearly and including correlations that are not always subject to due explanation. The empirical study set out here seeks to help in overcoming these shortcomings in knowledge on the KMLife cycle and to describe those practices most appropriate to fostering innovation throughout the knowledge life cycle.

The central objective of this study consists in identifying those KMpractices able to drive the best levels of innovation performance and enabling information technologies company managers to redirect their efforts and investments towards those KM practices able to guarantee the best results.

This paper is structured into five sections. Following this introduction, section 2 reviews the literature on KM, and section 3 approaches the relationship between KM and innovation. The fourth section presents the conceptual model. Finally, section 5 provides a brief conclusion that furthermore includes a brief consideration of the potential study results.

2. Knowledge management

In the mid-1990s, interest in the KMtheme mushroomed among academics, politicians, consultants and managers. Studies carried out by consultants such as KPMG and McKinseysuggested that various organisations and entities were setting about implementing structured knowledge management programs. This trend was similarly accompanied by the academic community with the last two decades having witnessed an exponential rise in the number of books and articles and conferences and academic events dedicated to this theme (Hislop, 2009) .

However, progress in the study of knowledge and its management has been marked by divergent lines of thinking. Following our review of the literature, we find that there is no simple and consensual definition of KM capable of being applied at all organisations. Davenport and Prusak (1998) consider KM consists of a set of processes and means for creating, utilising and disseminating knowledge throughout the organisation. In turn, Allee (2003) affirms KM practice should prioritise and support processes designed to create, maintain, share and renew organisational knowledge so as to boost the potential for economic growth whether through creating value or improving performance levels. More recently, Chao et al. (2008) propose that KM should not only focus on managing the activities of knowledge workers, with an emphasis on facilitating and supporting mechanisms, but also on motivation, leadership and fostering environments propitious to KM. Hislop (2009) deems KM to be a broad reaching term incorporating any deliberate effort seeking to manage the knowledge of employees in a particular organisation. This may be achieved through a broad variety of methodologies, including those based on the deployment of purpose designed technologies (the “hard” perspective) and those seeking to bring about the more efficient management of social processes, organisational structures, cultures and personalised management practices (the “soft” perspective). These different positions demonstrate that there are multiple and diverse, when not contradictory, interpretations as to just how knowledge management should be put into effect (e.g. Chao et al., 2008). The perspectives and processes associated with KM are analysed below.

Perspectives

There are two dominant perspectives in epistemological terms (e.g. Chao et al., 2008; Hislop, 2009). In accordance with the terminology of Chao et al. (2008) these perspectives are denominated here *hard* and *soft*. The way in which organisational knowledge is defined provides a clear division between the two lines of thinking. The former assumes that knowledge is a factor susceptible to codification and separable from the person holding it. In contrast, the soft perspective challenges this conceptualisation of knowledge in assuming it is rooted in persons and developed through them and therefore inseparable from its holders, the contexts and practices adopted by organisations (Hislop, 2009). We detail each perspective below:

Hard perspective

The hard approach is built on the assumption that knowledge derives from information, information comes from data, and data come from events (Chao et al., 2008). According to this approach, KM should concentrate on rendering the most relevant explicit knowledge, placing it in a central storage facility and ensure its accessibility to all users (Hislop, 2009).

Followers of this trend frequently resort to terms such as “capture”, “codify”, “organise”, “store”, “reutilise”, “transfer” or “transform” (Chao et al., 2008).

Knowledge is shared through transfer and codification of explicit knowledge between an isolated emitter to a similarly isolated receptor. Achieving the sharing of tacit knowledge is considered to be difficult, complex and time consuming (Hislop, 2009). In this perspective, technology plays a central role as this enables the setting up of storage facilities and information technology structures and facilitating the transfer of codified knowledge between individuals (Chao et al., 2008; Hislop, 2009).

The characteristics associated with this perspective are fairly visible in the early projects taking place within the KM framework (Hislop, 2009) and make up what McElroy (2000) labelled ‘first generation KM’.

Softperspective

The soft approach proposes that knowledge is inseparable from its holders and its development represents a continuous process based on the routines and activities undertaken by persons. In the understanding of these authors, purely explicit knowledge does not exist as all knowledge is found to contain a tacit dimension (Hislop, 2009).

This conception of knowledge obviously carries implications in terms of its creation and sharing. This approach believes in the feasibility of creating new knowledge extending beyond simply revisiting and reusing the knowledge already existing in the organisation (e.g. McElroy, 2000; Chao et al., 2008).

The creation and sharing of knowledge involves a large component of social interaction and face to face communication (e.g. Chao et al., 2008; Hislop, 2009). The acquisition and sharing of information is essentially undertaken by two means: (1) immersion in the practice and hence learning while actually engaged in and/or observing the processes (learning by doing), and (2) social interaction, that is, through interactions able to raise levels of confidence and foster the sharing of values and other tacit components (e.g. McElroy, 2000; Hislop, 2009).

It is the responsibility of the organisation’s management to facilitate the creation and sharing of knowledge through encouraging and facilitating communication and social interaction. The organisational context needs to foster such interactions and involving tools such as communities of practice (CoPs) and forums nurturing and boosting the sharing of knowledge (Chao et al., 2008; Hislop, 2009).

In the terminology put forward by McElroy (2000), the soft perspective corresponds to “new KM” or second generation KM. Within this second generation, KM is intrinsically linked with concepts of learning and organisational innovation (McElroy, 2000; Chao et al., 2008). McElroy (2000) defends how the soft perspective leads to better organisational results as,

beyond distributing and utilising the existing knowledge as efficiently as under the hard approach, such methods also foster organisational learning and innovation through constant stimuli to discover and create new knowledge. Other studies (e.g. Nonaka, 1994; Massey, Montoya-Weiss and O'Driscoll, 2002; Gloet and Terziovski, 2004) find that balancing and reconciling the hard and soft perspectives leads to the most innovative performances.

The knowledge life cycle

A product of the different perspectives defining the prevailing thinking on KM, there are also different means of identifying and defining the KM process and hence involving differences to the identification of its core component activities (Comité Européen de Normalisation [CEN], 2004). The set of activities making up the KM process is commonly known as the “knowledge life cycle” (e.g. McElroy, 2000; Birkinshaw and Sheehan, 2002). This term aims to convey the idea that KM represents a complex and dynamic process that functions in a cyclical fashion, in which the different stages are continually undergoing repetition (e.g. McElroy, 2000).

Various specialists have dedicated studies to stages in the KM life cycle (e.g. Rollett, 2003; CEN, 2004). While the literature again fails to attain a consensus, we may identify two key stages: the creation and the sharing of knowledge (e.g. McElroy, 2000; Dalkir, 2005). Beyond these, the literature mentions knowledge planning (e.g. Rollett, 2003), storage, utilisation (e.g. CEN, 2004) and evaluation (e.g. Birkinshaw and Sheehan, 2002; Dalkir, 2005).

The core stages to the cycle as referred to in the literature are: identification, creation, storage and the sharing and using of knowledge. Table 1 features the structure and integration of the various approaches.

Table 1–The knowledge life cycle

McElroy (2000)	Birkinshaw e Sheehan (2002)	Rollett (2003)	CEN (2004)	Dalkir (2005)	Integrate Cycle
-	-	Plan	Identify	-	Identify
Production / Individual and group learning	Create	Create	Create	Create & Capture	Create
Production / Requiring validation	-	Integrate			
Production / Acquiring information	Mobilise	Organise	Store	Create & Capture / Contextualise	Store
Knowledge Validation	Diffuse	Transfer	Share	Share & Disseminate / Assess	Share & Use
Integration	-	Maintain	Use	Acquire & apply	
-	Commoditize	Assess		Update	
-		-	-		

Identification

This essentially strategic stage is crucial to the successful completion of the subsequent series of activities (e.g. Rollett, 2003). The main objective consists of identifying the knowledge needs based upon analysis of the organisation's strategic positioning. In accordance with analysis of the organisation's strategy, objectives are then defined in conjunction with the KM targets to be reached in order to ensure alignment between the respective organisational strategy and the knowledge management plan to be implemented.

The KM strategy needs to set down general guidelines integrating operational measures structured according to the respective phases in the cycle and enabling their subsequent monitoring and evaluation. Identified as critical aspects in this phase are: (1) the identification of the actual knowledge needs and requirements based on the organisational strategic positioning (CEN, 2004) and (2) the definition of general and specific objectives for each of the KM knowledge cycle stages (Rollett, 2003). This initial diagnostic consists of identifying the current and future knowledge needs in conjunction with the respective gaps and shortcomings in organisational capacities. The differential between the knowledge available and that required in the present is termed a knowledge gap (CEN, 2004). The analytical model proposed results in the identification of strategic knowledge gaps.

This analysis is fundamental for supporting and justifying decision making regarding facets related to personnel needs, the acquisition of KM support tools (CEN, 2004) and the definition of specific KM related objectives (Rollett, 2003). The success of KM assumes that the organisation supervises the evolution in the objectives defined and that they are subject to regular revision in accordance with the then prevailing organisational needs (Rollett, 2003).

Creation

The creation of knowledge seeks to boost the amount of knowledge available to the organisation (Dalkir, 2005). As such, an organisation should simultaneously concentrate on capturing the existing knowledge (Dalkir, 2005) and fostering the creation of new knowledge (e.g. McElroy, 2000; Birkinshaw and Sheehan, 2002; Rollett, 2003).

Taking into consideration the different approaches analysed, learning, creativity (and the generation of new ideas), and the utilisation of existing knowledge are the factors essential to the success of this phase. Various authors defend that the creation of new knowledge, through learning and generation of new ideas and concepts, lies at the base of organisational innovation processes (e.g. Nonaka, 1994; McElroy, 2001; Forcadell and Guadamillas, 2002; CEN, 2004). Creativity and experimentation may nurture the emergence of new ideas that give rise to new knowledge. Stimuli for the generation of new ideas derives

both from internal sources, especially through contact with experts, and also from external sources through contact with clients and other partners (e.g. Birkinshaw and Sheehan, 2002; Rollett, 2003). Finally, it is important that the organisation ensures all of this internal and external know-how is rendered accessible (e.g. Rollett, 2003; Dalkir, 2005). Such knowledge may facilitate the identification of new characteristics and different usages to those planned – for example, improvements to technical specifications, components and materials, software applications, ease of utilisation (Oslo Manual, 2005).

To the extent that knowledge is produced, such needs to be validated in order to ascertain whether organisational targets are being met and whether the knowledge is worth integrating into the organisation. This validation process is crucial to affirming the quality and applicability of the new knowledge (McElroy, 2000; Dalkir, 2005).

STORAGE

When new knowledge is evaluated as valid and appropriate to the organisation then it requires internal dissemination (McElroy, 2000; CEN, 2004) as a means of extracting value from that which has been produced (Birkinshaw and Sheehan, 2002). The storage stage incorporates activities related to the selection, organisation, categorisation and updating of information and knowledge (CEN, 2004).

In the knowledge storing process, competitive advantage derives from the effectiveness of means of accessing the information as well as the quality of the information given that such dimensions are difficult to copy (Birkinshaw and Sheehan, 2002).

In this stage, the critical factor for success consists of identifying the most appropriate means for the codification and recovery of knowledge. New knowledge needs to be lodged in the organisational memory and institutionalised through the respective organisational culture, processes and structure (CEN, 2004), as well as through its information technology systems (Birkinshaw and Sheehan, 2002). Dalkir (2005) includes both the experiences built up in members of staff and in teams as well as the tangible internally stored knowledge within the concept of organisational memory.

Furthermore, attention also needs paying to the contextual framework surrounding the storage of information and ensuring such is correctly learned by users. As Dalkir (2005) states, codification and storage should not be perceived as some merely mechanistic process. The organisation holds its own history and organisational memory and any new knowledge should be stored in accordance with these aspects. Contextualisation ensures uniformity in the terminology applied and adapted to the “organisational language”, maintaining the interconnection between the knowledge and its producer and facilitating its later sharing and utilisation. Contextualisation may be deemed successful

whenever the new knowledge becomes rooted into the organisation's business processes (ibid).

Sharing and Application

Having created and stored the knowledge, the organisation then needs to concentrate on its internal transfer and subsequent deployment. Knowledge management adds value to an organisation through optimising the utilisation of knowledge (Rollett, 2003).

The central concern in the sharing phase is made up of transferring knowledge to the right place, at the right time and at an appropriate level of quality (CEN, 2004). The main challenge facing the organisation involves incorporating the knowledge produced into organisational practices inherently requiring the experimentation and sharing of knowledge between people (e.g. Birkinshaw and Sheehan, 2002; CEN, 2004). Two critical variables identified within the scope of this knowledge sharing process are: social interaction (e.g. Nonaka, 1994; Lee and Choi, 2003; Rollett, 2003; CEN, 2004) and contact with the exterior (e.g. Birkinshaw and Sheehan, 2002; Rollett, 2003; Tidd et al., 2003; Booz & Company, 2010).

The cycle of knowledge is renewed to the extent users grasp the content of the knowledge available and opt to make appropriate usage of it. The application of knowledge generates new experiences thereby generating feedback for its practitioners/users (e.g. McElroy, 2000; Birkinshaw and Sheehan, 2002). This experimentation and feedback drive the formation of user judgements and opinions as to the value and utility of the new knowledge (McElroy, 2000) as well as generalising best practices and "lessons learned" (Dalkir, 2005). Additionally, the utilisation of knowledge ensures the organisation remains updated on the prevailing contexts and sourcing new information as it becomes available and simultaneously shedding knowledge that has been rendered obsolete (e.g. Birkinshaw and Sheehan, 2002, Rollett, 2003; Dalkir, 2005).

As knowledge is applied to organisational processes and/or incorporated into new products or services, the feedback generated encourages the emergence of new problems, new learning opportunities and nurturing individual inventive trends (McElroy, 2000). Furthermore, this also enables the identification of new and looming knowledge gaps (CEN, 2004), thus rebooting the knowledge life cycle— a process undergoing continuous repetition.

Knowledge management and Innovation

Innovative capacities make organisations more competitive as the new knowledge at the heart of the innovation is necessarily distinctive and difficult to imitate, and potentially the source of sustainable competitive advantages enabling organisations to turn in higher

performance levels (e.g. Braganza Edwards and Lambert, 1999; Forcadell and Guadamillas, 2002; Bogner and Bansa, 2007). Many authors have posited this correlation between KM and innovation and consider KM provides an important tool for enhancing innovation processes (e.g. Nonaka, 1994; McAdam, 2000; Massey et al., 2002; Zack, McKee and Singh, 2009). Beyond this general conclusion, the literature also reveals three other interesting aspects. Firstly, a combination of “hard” and “soft” KM practices produces better and more innovative performances (e.g. Choi and Lee 2003; Gloet and Terziovski, 2004). Secondly, the capacity to create knowledge based upon external interactions bears a positive effect on innovative performances (Caloghirou et al., 2004; Jiang and Li, 2008). Thirdly, there is a broad consensus around the existence of organisational factors that may act as drivers or brakes on KM practices, with a particular emphasis on organisational culture (e.g. Birkinshaw and Sheehan, 2002; Forcadell and Guadamillas, 2002; CEN, 2004). Among the other key factors emerging out of this literature review, we would highlight: (1) the KM practices fostering innovation; (2) the existence of facilitating organisational contexts, and (3) means of measuring organisational and product innovation. Below, we detail the dimensions identified as core to innovation processes.

KM practices fostering innovation

As regards the KM practices identified by empirical studies, seven types of practices generate a highly positive impact on innovation. These KM practices relate to: (1) learning (e.g. McAdam, 2000); (2) creativity (e.g. Birkinshaw and Sheehan, 2002), (3) utilisation of existing knowledge (e.g. Zack et al., 2009), (4) codification and storage (e.g. Massey et al., 2002), (5) social interaction (e.g. Lee and Choi, 2003); (6) cooperation with other organisations (e.g. Caloghirou et al., 2002) and (7) the strategic value of knowledge (e.g. Zack et al., 2009).

Learning deals with the capacity to absorb the knowledge of other persons and transform it into new knowledge (e.g. McElroy, 2000). Hence, much importance is attributed to establishing learning networks (e.g. McAdam, 2000) in organisations. The literature refers to various tools driving learning in organisations such as learning by doing (e.g. CEN, 2004), discussion forums and CoPs, among others (McElroy, 2000; Birkinshaw and Sheehan, 2002).

Creativity is a critical input into the development of new ideas (e.g. Piteira, 2010) and may, in turn, be transformed into marketable products and services (Birkinshaw and Sheehan, 2002; Lee and Choi, 2003a). Creativity may be boosted through specific tools, including: brainstorming, problem solving groups, external benchmarks and CoPs, among others (e.g. Birkinshaw and Sheehan, 2002; Rollett, 2003; CEN, 2004).

Creating knowledge benefits from the exploration of multiple sources of learning (e.g. McAdam, 2000) and it is important that an organisation acquires the know-how existing through academic journals, conferences (e.g. Calighirou et al., 2004) and acquiring best practices (e.g. Dalkir, 2005; CEN, 2004a).

There is a corresponding need to store such knowledge in a way able to facilitate and foster searches for knowledge/learning as well as for problem solving (e.g. Rollett, 2003). The storage practices analysed in the literature's empirical studies featured manuals, documents (e.g. Lee and Choi, 2003) and technological tools (e.g. Massey, et al., 2002).

Social interactions are billed in practically every study as the means of excellence for conveying knowledge (e.g. Nonaka, 1994; Lee and Choi, 2003a; CEN, 2004). Direct relationships may be established through mentoring programs, contacts with experts (e.g. Birkinshaw and Sheehan, 2002; Lee and Choi, 2003) or communities – of practice, interest or users (e.g. McElroy, 2000; CEN, 2004a).

Relationships with third parties are also among the most commonly referenced KM practices in the studies carried out (e.g. Jiang and Li, 2008). Some studies analysed the impact of strategic alliances on innovation to conclude that the capacity to share knowledge through this type of relationship brings positive consequences for innovative performance levels (e.g. Calighirou et al., 2004). Contact with the external environment also proves relevant to ascertaining the needs and expectation of clients, validating concepts/prototypes and running pilot projects (e.g. Birkinshaw and Sheehan, 2002; Booz & Company, 2010). Cooperation with the exterior may take on various formats – e.g. strategic alliances and joint ventures, research consortia, taking out licenses (e.g. Tidd et al., 2003).

Lastly, the KM practice of seeking to extract strategic value from knowledge is among the lesser mentioned by empirical studies. This strategic planning technique is often implemented through forms of KM strategic design processes (e.g. Forcadell and Guadamillas, 2002) or planning techniques (e.g. Zack et al., 2009). The literature also refers to the adoption of auditing practices, surveying the specific needs of users and monitoring objectives (e.g. Rollett, 2003; CEN, 2004; CEN, 2004a).

Cross-referencing these KM practices with the aforementioned knowledge life cycle, we find learning, creativity and the existing organisational knowledge to be structured towards the creation of new knowledge, with codification for storage, social interaction and cooperation with the exterior falling within the scope of knowledge sharing and utilisation and, finally, practices aimed at extracting strategic value related with the identification of knowledge.

Organisational context

As regards organisational context, the authors point to the organisational culture as playing a fulcral role in KM (e.g. McAdam, 2000; CEN, 2004) due, above all, to its influence on the

behaviour of persons and on formulating the organisational structure (e.g. Forcadell and Guadamillas, 2002). Organisational culture should foster values such as openness, confidence, cooperation, participation and avoid fears about making mistakes (e.g. McAdam, 2000; Lee and Choi, 2003; CEN, 2004).

Organisational structures should enable the “personification of knowledge” (McAdam, 2000) through: workplace design, the opportunity to experiment with new tools (e.g. Birkinshaw and Sheehan, 2002; CEN, 2004); flexible structures (low levels of hierarchy) and the establishment of autonomous working teams (e.g. Forcadell and Guadamillas, 2002; CEN, 2004c). Management (senior and middle) should avoid traditional control and supervision mechanisms, convey the importance of knowledge and motivate employees in openly supporting the generation of new ideas, the sharing of knowledge and collaboration between members of staff (ibid.).

Employee competences are also dealt with in the literature (e.g. Forcadell and Guadamillas, 2002; Lee and Choi, 2003a). Beyond personal knowledge, these include competences such as: efficient communication, active listening, research capacities, information selection and analysis skills, etcetera. The organisation should encourage the development of these capacities and the individuals holding them should equally express their willingness to engage in such development (CEN, 2004).

The studies also attribute importance to the external environment, especially the level of competitiveness, as a stimulus boosting the development of new products and other innovations (e.g. Massey et al., 2002). Finally, technology is widely referred to as a support tool for group working – communication and cooperation – and in the search for knowledge (e.g. Birkinshaw and Sheehan, 2002; Lee and Choi, 2003; CEN, 2004).

Innovative performance

Measuring the results of innovation encounters a series of difficulties ranging from its continuous nature (especially incremental innovation) to how much of the information on innovation expenditure is not normally specified in accountancy reporting and making the financial dimension also difficult to calculate. In addition, the success of one particular innovation may depend on diverse factors (e.g. the success of product innovations, in particular, may depend strongly on marketing decisions over the product launch) (Oslo Manual, 2005).

Perhaps due to the difficulties mentioned above, across the body of literature subject to analysis there was no consensual approach to ascertaining and measuring innovative performance levels. Authors made recourse to qualitative indicators (e.g. empowerment) and/or quantitative (e.g. research and development expenditure, turnover) (e.g. McAdam, 2000; Gloet and Terziovski, 2004).

The studies available analyse the direct effects of KM on innovation activities (e.g. product development [e.g. Jiang and Li, 2008]), on the impacts (e.g.) resulting from the introduction of new products (e.g. turnover [Gloet and Terziovski, 2004]) or on both (e.g. Massey, et. al., 2002). Furthermore, there are also authors opting to integrate innovation drivers in the KM models set out in order to verify the positive effects of KM through qualitative metrics such as empowerment and creativity (e.g. McAdam, 2000). Other studies take into account the KM contribution towards innovation through indirect approaches considering such to be a specific aspect of organisational performance or organisational innovation (e.g. Forcadel and Guadamillas 2002; Lee and Choi, 2003).

3. Conceptual model

Based upon our literature review and the various existing studies, we would highlight three core facets. Firstly, a significant percentage of the studies, as well as the literature in general, concentrate on analysis of the practices involved in the creation and sharing of knowledge (e.g. Nonaka, 1994; Caloghirou et al., 2004; Jiang and Li, 2008). However, there is clearly a need to expand the research into the other stages of the knowledge life cycle and verify their effects on product and service innovation.

Secondly, the various studies defending positive KM impacts on innovation are based on relatively small samples (e.g. McAdam, 2000; Forcadel and Guadamillas 2002; Massey et. al., 2002) and with very few ever carried out in Portugal. Hence, we would point to the relevance of results obtained from larger samples and covering Portuguese companies.

Thirdly, verifying the relationship between KM and innovation has proven to be a significantly major research challenge. There are studies in which this impact is not totally clear, particularly in those cases where such innovation is not measured directly (e.g. Birkinshaw and Sheehan, 2002; Forcadel and Guadamillas 2002, Lee and Choi, 2003).

With the objective of overcoming the gaps existing in the literature, we hereby propose the following conceptual model and apply it in analysis of the direct effects of various KM practices on innovation performance levels. The central objective consists of identifying just which KM practices contribute most towards innovation thereby enabling information technology company managers to redirect their priorities and investments into those KM practices guaranteeing the best results. The literature review ensures we may propose that there is a positive relationship between KM and innovation even while there is still the need to identify just which KM practices are capable of generating the best innovation performances.

The focus of the study and analysis of the literature result in the identification of three key variables: KM enablers, KM practices and innovation performance levels.

3.1. Knowledge management enablers

The KM enablers incorporate the set of organisational mechanisms and initiatives that foster continuous knowledge development (Lee and Choi, 2003a). The literature refers to a long list of drivers (e.g. McAdam, 2000; CEN, 2004; CEN, 2004d) of which the following are incorporated into our theoretical model: 1) organisational culture, 2) leadership, and 3) information technologies support.

Culture is based upon a set of values shared throughout the organisation (e.g. Forcadell and Guadamillas, 2002), which guide and structure the behaviour of its members (e.g. CEN, 2004d). Correspondingly, the proposed conceptual model integrates the level of confidence and the level of collaboration existing in the organisation (Lee and Choi, 2003a). The company leadership supplies the models for intentions, direction and behaviours with such characteristics important across all levels of the organisation (e.g. CEN, 2004d). Technology is included within the study as a support tool for communication and collaboration between organisation members (Lee and Choi, 2003a). Trust, collaboration and IT support are measured according to the scales put forward by Lee and Choi (2003a).

Hence, analysis of the KM enablers takes into consideration the following variables:

- Trust (e.g. the existence of relationships of reciprocal trust between members of the organisation, the conviction that other members are competent, trust in the decision making of other members),
- Collaboration (e.g. the existence of mutual help, availability for supporting colleagues, the opportunity to individually assume responsibility),
- Leadership (e.g. the creation of a shared vision, team motivation, group working incentives),
- IT support (e.g. team working supports, ease of communication, capacities for storing knowledge).

3.2. Knowledge management practices

KM practices are defined as those organisational initiatives and activities that seek to manage the knowledge held by organisational members through the main phases in the knowledge life cycle (CEN, 2004; Zack et al., 2009). The concept is structured according to four dimensions: (1) knowledge identification practices concentrate on planning KM and determining current knowledge requirements (Rollett, 2003; CEN, 2004); (2) knowledge creation practice designed to boost the level of knowledge available to the organisation (Dalkir, 2005). (3) Storage practices relate to that done to integrate (internal and external) knowledge thereby avoiding its “loss” (Rollett, 2003); (4) knowledge sharing and utilisation seeking to transfer knowledge to the right place, at the right time and with the appropriate quality (CEN, 2004).

Analysis of KM practices takes the following variables into consideration:

- Knowledge identification

- analysis of current gaps (e.g. questionnaires; audits)
- analysis of strategic gaps (e.g. KM strategy, follow-up on objectives)
- Knowledge creation
 - facilitating learning (e.g. discussion forums, reflection on best practices)
 - fostering creativity (e.g. creative problem solving groups, brainstorming sessions)
 - acquisition of existing knowledge (e.g. seminars, conferences)
- Knowledge storage
 - research tools (e.g. FAQs, yellow pages)
 - learning support tools (e.g. corporate sites and networks, data warehousing)
- Knowledge sharing and utilisation
 - incentives for social interaction and experimentation (e.g. mentoring, CoPs)
 - maintaining contacts with the exterior (e.g. institutional partnerships, interactions with clients)

4.3 Innovative performances

The innovative performance facet aims to measure the results of innovation, hence, the impact of innovation activities on the economic and financial performance of the organisation (COTEC, 2010). This study combines the indicators measuring innovation activities and those measuring the innovation impact on turnover and the market (Oslo Manual, 2005; Boston Consulting Group, 2010; COTEC, 2010). Taking into account the study objectives, organisational results stemming from process, marketing and organisational innovation are excluded with the focus exclusively on product innovation.

Performance analysis takes the following variables into consideration:

- innovation activities (e.g. number of new products, patents, innovation expenditure)
- impacts of launching new or significantly improved products (turnover, market share and time to market)

The conceptual model presented seeks to analyse the contribution of KM practices towards product innovation. Excluded from the scope of research is analysis of other types of innovation or any other factors influencing innovation (e.g. innovation objectives, available financing and other barriers [Oslo Manual, 2005]). In empirical terms, the research sample is made up of information technology (IT) sector companies. The study incorporates a questionnaire survey of CEOs of IT companies operating in Portugal. The definition of this empirical field was based upon the prior research precedent established by projects on the most innovative sectors and companies. Means of communication have been identified as of importance to this sector [information and communication technologies] in Portugal both in terms of the positioning a significant number of entirely home grown companies have been taking in markets globally and due to the awards picked up by Portuguese researchers and research teams, with their scientific outputs deemed revolutionary (Piteira, 2010).

The ongoing research seeks to contribute to knowledge on the interrelationships between KM practices and product innovation, analysing the effects of KM practices on innovation

performances in terms of the launch of new or significantly improved products. The overall research purpose is to facilitate the role of IT company managers in the allocation of resources and investments in KM practices able to guarantee the best results.

4. Conclusion

The literature review highlighted how studies examining the relationship between KM and product innovation emphasised the existence of three core concepts: KM enablers, KM practices, and innovation performance. We correspondingly assume that KM practices positively impact on performance whenever supported by an organisational context favourable to their implementation.

Despite this relationship having been subject to study, we found there were several shortcomings and gaps in the existing body of knowledge. Various authors concentrated only on knowledge creation and sharing practices and, furthermore, very few such studies have been carried out in Portugal. The research project we propose seeks to overcome both of these gaps. Firstly, KM practices are analysed based upon a broad reaching understanding of the knowledge life cycle including the identification, creation, storage and sharing and utilisation of knowledge. Secondly, this study seeks to prove a relationship between KM and product innovation and build on the empirical grounds of justification by demonstrating the relationship holds for IT companies in Portugal.

The data collection process takes place at IT companies in the aforementioned country through a questionnaire survey of either the CEO or the Chairperson of the Board of Directors, depending on the respective case. The objectives include identifying the practices implemented under the auspices of KM, the most important drivers and what is the actual contribution of such practices to the level of company innovation performance.

We expect the study results to expand the foundations of empirical justifications for the best KM practices in terms of their potential for innovation. Finally, from an overall perspective, we hope the results advocate the more widespread adoption of best practices at companies able to knowingly focus their investments on those practices actually leading to the best results.

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PINOCCHIO

DESARROLLO INNOVADOR DE CAPACIDADES EN LOS AGRONEGOCIOS DE COSTA RICA Y LA REGIÓN DE MURCIA

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1. INTRODUCCIÓN

El artículo responde a los contenidos y resultados del proyecto de investigación de la Agencia Española de Cooperación Internacional para el Desarrollo (AECID), que lleva por título: *“Mejoramiento de las capacidades en los agronegocios de Costa Rica y la Región de Murcia, en las áreas emergentes de la economía, la responsabilidad social y las estrategias de cooperación de las empresas”*. Los objetivos de la *investigación fueron para contextualización* económica de los agronegocios y estudio de las MIPYMES productoras de frutas y hortalizas de la Región de Murcia y Costa Rica.

Así mismo, ha sido posible caracterizar el sector de los agronegocios teniendo en cuenta los siguientes parámetros. Los consumidores de América y de la Unión Europea (UE) exigen mayor calidad, disponibilidad, diversidad y seguridad de los alimentos a un precio adecuado y elaborados de forma sostenible. La calidad y la seguridad alimentaria a través de las denominaciones de origen, son preferencias de todos los clientes. Las políticas agrarias comunitarias se consolidarán en base a tres pilares fundamentales: (1) garantizar la seguridad alimentaria para un mejor abastecimiento; (2) mejorar la seguridad productiva avalada a través de programas que potencien la trazabilidad de los alimentos; y, (3) potenciar y diversificar con agronegocios el desarrollo socioeconómico y territorial de las zonas rurales.

Por tanto, hemos configurado el trabajo que presentamos con un primer estadio donde describimos las principales estrategias y medidas innovadoras en el ámbito de los agronegocios y el sector agroalimentario y a continuación, se presenta la metodología y los principales resultados de la investigación.

2. ESTRATEGIA INNOVADORAS EN EL SECTOR AGROALIMENTARIO

Las principales estrategias y políticas del sector agroalimentario pueden ser:

- (1) Establecer una política de **reducción de los costes** de producción para paliar el escaso poder de negociación ante los distribuidores en el sector de las frutas y hortalizas.
- (2) Lleva a cabo cuantas medidas se precisen tanto en la producción como en la **adaptación** de las explotaciones y los centros de comercialización a las nuevas demandas de las cadenas de distribución.

- (3) **Internacionalización** de las empresas con productos diferenciados que posean un alto valor añadido, con unos altos controles de calidad y seguridad para responder a los cambios que se producen en la cadena alimentaria.
- (4) **Concentración de la oferta** de los productos a través de acuerdos bajo fórmulas societarias de cooperativas y consorcios, u otros grupos empresariales potentes que puedan realizar una comercialización en común.

Con estas medidas estratégicas se puede llegar a ofrecer cierta rentabilidad sostenida al agricultor, en su mayoría propietario de sus explotaciones, vía reducción paulatina de costes y mejora de la eficiencia interna para el aprovechamiento de las economías de escala que la concentración de la oferta y la estandarización de la producción puede garantizar.

La concentración de la oferta está motivada por las principales tendencias que el mercado de las frutas y hortalizas está sufriendo en los últimos tiempos puesto que con ella, puede crecer el volumen de mercancía entregado a la distribución, y además, esta última tiende a centralizar sus decisiones de compra y a exigir protocolos de producción y especificaciones de productos. En este sentido, las cadenas de distribución tienden a centralizar las decisiones de compra y a exigir protocolos de producción y especificaciones de productos. A su vez, pueden desarrollar acuerdos con los suministradores, ofrece certificaciones de los procesos de calidad y trazabilidad. Finalmente, garantiza en determinadas ocasiones la entrega al consumidor con determinadas marcas del distribuidor y de empresas filiales.

Así, se ha generalizado la figura de la Organización de Productores de Frutas y Hortalizas (OPFH), como elemento básico de la Organización Mundial del Comercio (OMC), que empuja a la organización entre la fase agraria y los operadores del mercado en origen. A ella se han adaptado los distintos tipos de operadores, de forma que se ha avanzado mucho en la verticalización del sector (operadores comerciales en origen con sus suministradores)

Las OPFH se encargan de la planificación y ordenación de la producción y tienen funciones en la promoción de la calidad y mejora de la competitividad. A través de ellas se aplican los instrumentos financieros comunitarios para la regulación de los mercados, tales como los Fondos Operativos y las retiradas de productos.

Los Fondos Operativos son el instrumento financiero que permite a las OPFH desarrollar sus funciones en la regulación del mercado. El fondo se nutre de las aportaciones financieras de los agricultores miembros de la OPFH y de una ayuda económica de la Unión Europea.

Los fondos pueden utilizarse para financiar inversiones de mejora de las estructuras de producción medioambientales y de cumplimiento de las disposiciones de calidad, normas fitosanitarias y también pueden utilizarse para financiar el coste de las retiradas de productos del mercado en momentos coyunturales de exceso de oferta. En la aplicación de estos fondos operativos se precisan inversiones que repercuten en beneficio de los productores a través de ayudas públicas sobre las acciones privativas en las explotaciones

de los socios y comunes en las instalaciones y condiciones de comercialización. Estas pueden llevar a actuaciones para:

- Realizar inversiones en **modernización de los procesos** de producción, que provoquen una reducción en los costes de producción. Así, los planes operativos de las OPFH han permitido realizar importantes inversiones en mejora de las instalaciones.
- Promocionar las figuras de **calidad** de los productos como pueden ser mediante la obtención de denominaciones de origen, indicaciones geográficas protegidas, especialidades tradicionales garantizadas, agricultura ecológica, o la producción integrada.
- Invertir en **nuevas líneas de producción de productos** cada vez más demandados por un segmento de consumidores que buscan la comodidad a la hora de preparar los alimentos.
- **Tecnología e innovación directa en las explotaciones agrícolas a través de:**
 - a) Poseer invernaderos de alta tecnología con control del clima que puedan disminuir la estacionalidad del producto, con infraestructuras que consigan condiciones climáticas adecuadas, control de humedad, temperatura, aireación, etc.
 - b) Innovación en el uso del agua y su reutilización, creando las explotaciones plantas desalinizadoras de agua de mar y plantas depuradoras de aguas residuales. También se recogen aguas pluviales a través de sistemas de canalizaciones instaladas en los invernaderos. Por otro lado, se deben crear sistemas de recirculación de aguas en los sistemas de cultivos hidropónicos que permiten un uso más eficiente del agua y de los nutrientes que se les aportan a las plantas.
 - c) Trazabilidad de la producción a través de la inversión en las explotaciones con sistemas de gestión que aporten un valor añadido al producto hortofrutícola, en términos de calidad y sanidad de los alimentos. La nueva política europea de seguridad alimentaria se basa en la aplicación de un enfoque integrado en todas las fases de producción y manipulación de la cadena alimentaria.
 - d) Investigación de diferentes líneas de procesos, entre las que se destacan la conservación del producto mediante la cadena de frío, la obtención de nuevas variedades con mayor duración, conservación y sabor, y finalmente, el desarrollo de una producción integrada denominada “residuo cero que consiste en obtener productos totalmente garantizados libres de residuos de fitosanitarios y pesticidas.
 - e) Acuerdos de colaboración de las empresas con el Instituto Murciano de Investigación y Desarrollo Agrario y Alimentario (IMIDA). Este instituto tiene firmado un convenio de colaboración de actividades de investigación científica, de desarrollo, transferencia tecnológica y formación con las universidades públicas de la Región de Murcia. Así mismo, en el Instituto Tecnológico de Costa Rica existen otras líneas de actuación y colaboración con las asociaciones más representativas del sector. Entre las acciones de cooperación en I+D+i para el sector de los agronegocio y agroalimentario podemos destacar las siguientes; la mejora genética, resistencias a plagas, utilización de materiales no contaminantes, nuevas variedades e híbridos, agricultura ecológica, materiales fotoselectivos y oxodegradables, declaración de acolchados, nuevos sustratos, control de la contaminación y en general la mejora sostenible de la producción agraria.

3. METODOLOGÍA DEL ESTUDIO EMPÍRICO

Población y recogida de datos de la investigación

La selección de empresas encuestadas proviene de una investigación financiada por el Programa de Cooperación Interuniversitaria e Investigación Científica entre España e Iberoamérica, Agencia Española de Cooperación Internacional (AECID), Ministerio de Asuntos Exteriores y de Cooperación, Proyecto AECID (A/8124/07), donde participa el Instituto Tecnológico de Costa Rica y la Universidad Politécnica de Cartagena.

Para conocer la realidad existente de los agronegocios en las regiones objeto de estudio, se puso en marcha una misma encuesta que se llevó a cabo en ambos continentes durante el período de vigencia del proyecto (años 2008 y 2009). La actividad principal de estos agronegocios se ciñe al sector agroalimentario, lo que incluye la producción, preparación y conservación, exportación e importación, y comercialización de frutas y hortalizas, además de venta de insumos (abonos, fitosanitarios y riego), venta de equipos agrarios, semillas y semilleros, diseño y asesoría de riego e invernaderos.

El análisis empírico para Costa Rica se efectuó sobre una población de 72 empresas de agronegocios, a través de encuestas presenciales en las empresas. Para ello se hicieron visitas in-situ a las empresas seleccionadas y se cumplimentaron las encuestas por el personal asignado. De esta forma la tasa de respuesta alcanzada ha sido del 100%.

Para el desarrollo de la investigación en la Región de Murcia, se llevó a cabo un programa de visitas a empresas, organizaciones e instituciones públicas y privadas relacionadas con el Desarrollo y la Innovación en los Agronegocios. Se pone de relieve en el estudio de la Región de Murcia, la importancia de impulsar el desarrollo rural y la economía social para el impulso de las zonas territoriales. Consecuentemente, en esta Región se pudo contactar con organizaciones de productores hortofrutícolas, organizaciones agrarias, asociaciones representativas de empresas e instituciones del gobierno regional (Mendoza, De Nieves y Briones, 2010).

La recogida de datos se realizó mediante encuesta dirigida a 450 agronegocios, entre los que se encontraban productoras agrícolas, empresas dedicadas a la preparación y conservación de frutas y hortalizas, venta de insumos, venta de equipos agrícolas, semillas y semilleros, diseño y asesoría del riego e invernaderos. Para entrevistar a los agricultores y ganaderos, se utilizaron las dependencias de los técnicos de la Coordinadora de Organizaciones de Agricultores y Ganaderos (COAG-IR) de la Región de Murcia, y se contó con la ayuda de los técnicos de COAG-IR.

La investigación se realizó mediante encuesta postal, respondiendo las empresas mayoritariamente durante el periodo comprendido entre julio y diciembre de 2008; obteniéndose 226 cuestionarios completos, lo cual supone una tasa de respuesta del 50,22%, con un error del 4,4% para $p=q=50\%$ y un nivel de confianza del 95,5%.

De los 226 cuestionarios completos empleados en el presente proyecto, 84 se han obtenido vía postal, como respuesta a los cuestionarios enviados. Por lo que la tasa de respuesta se sitúa en un 15,46%, con un error del 10% para $p = q = 50\%$ y un nivel de confianza del 95,5%. Los 142 cuestionarios completos restantes, se han obtenido mediante entrevista personal. Para dicha entrevista, se realizó un desplazamiento a todas las oficinas de COAG concentradas en la Región de Murcia, siendo los técnicos de esta asociación los encargados de llevar a cabo la entrevista personal a sus asociados. La asociación COAG es la Coordinadora de Organizaciones de Agricultores y Ganaderos.

Destino de los cuestionarios enviados	Población
<i>Base de datos del Servicio de Industrias Agroalimentarias, Consejería de Agricultura y Agua, CARM</i>	Centrales Hortofrutícolas 421
<i>Cooperativas asociadas a FECOAM</i>	75
<i>Otras fuentes: Infoagro y Páginas Amarillas</i>	168
<i>Devolución de cuestionarios</i>	-121
<i>Total Empresas Cuestionario Postal</i>	543

Fuente: Elaboración propia.

Objetivos e implementación de la investigación empírica

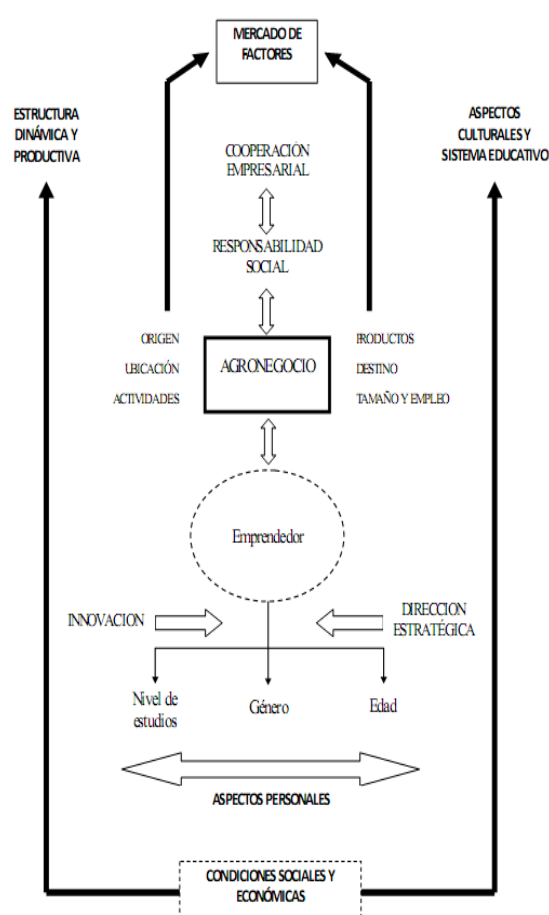
El estudio pretende detectar las capacidades y habilidades para la Cooperación de España con Costa Rica, apoyar el mejoramiento del sector agropecuario en ambos países, visualizar soluciones técnicas a problemáticas comunes, mejorar la competitividad de las MIPYMES, y las posibles relaciones de intercambio. En esta dirección, se ha centrado la investigación en los Agronegocios de Costa Rica y la Región de Murcia para caracterizarlos y conocer prioritariamente los aspectos relativos a la “Creación de Empresas”, la “Cooperación Empresarial”, la “Responsabilidad Social Empresarial”, y la “Dirección Estratégica de los Agronegocios”. En la misma, han intervenido de forma activa las empresas, las asociaciones vinculadas al sector agroindustrial y las entidades representativas de la economía social, con especial reconocimiento al cooperativismo de Costa Rica y la Región de Murcia.

Las actividades llevadas a cabo en el proyecto AECID A/8124/07 y su renovación en el proyecto AECID A/017025/08 están relacionadas con las ciencias y las tecnologías Agroalimentarias y Medioambientales para la formación de profesores y el intercambio académico-científico. En este camino, ha sido protagonista la investigación a través de la utilización en las movilidades del método del caso en empresas de Costa Rica (como COOPERIO, APTA, CORREDOR BIOLÓGICO, etc.) y en la Región de Murcia, empresas consolidadas como (SAT SAN CAYETANO, AGROMEDITERRÁNEA HORTOFRUTÍCOLA,

GREGAL, AGROQUÍMICOS LA PALMA, PROCOMEL) y asociaciones con especial compromiso con el desarrollo agrario de la Región como la Coordinadora de Agricultores (COAG-IR) y Federación de Cooperativas (FECOAM).

La figura muestra un modelo para el desarrollo de la investigación con las variables que se han analizado en el estudio.

FIGURA
DESARROLLO DE LA INVESTIGACIÓN EN LOS AGRONEGOCIOS



Fuente: Morales-Granados (2009)

En una segunda etapa, y previas consideraciones a la revisión de la literatura, y el conocimiento académico de los investigadores de ambos países sobre los objetivos prioritarios de los proyectos PCI-AECID (2008; 2009) aprobados; se ha utilizado el cuestionario de investigación que presentamos al final de este capítulo de conclusiones. Este cuestionario se ha configurado con las apreciaciones de los agronegocios de Costa Rica y la Región de Murcia, que son los esencialmente y más importantes partícipes para su buena definición, teniendo en consideración las variables esenciales del estudio de

investigación, y utilizándose íntegramente el mismo cuestionario previo acuerdo por los investigadores de todos los ítems, para el conocimiento de la población de agronegocios de Costa Rica y la Región de Murcia.

El enfoque que se le da al cuestionario de investigación considera distintos tipos de factores principalmente en función de las características del agronegocio referenciado en el diagrama causa efecto de la figura. Contempla las etapas constitutivas desde el emprendedor y sus aspectos personales (nivel de estudio, género y edad) que depende el inicio del agronegocio (origen, ubicación, actividades productivas, productos comercializados, destino de esos productos, además del tamaño y del desempeño), que se ven influenciadas por la innovación y la dirección estratégica. Esto a su vez tiene implicaciones en la responsabilidad social y en la cooperación empresarial. Éstas se ven fuertemente afectadas por la estructura dinámica y productiva, así como por los aspectos culturales de los responsables de los agronegocios.

4. RESULTADOS DE LA INVESTIGACION

ASPECTOS GENÉRICOS DE LOS AGRONEGOCIOS

La ubicación de los agronegocios estudiados en Costa Rica se localiza mayoritariamente en las Regiones de Cartago, Alajuela y Limón. Las actividades principales de estos agronegocios se definen como de preparación y conservación de frutas y hortalizas al igual que las firmas que respondieron en la Región de Murcia.

En Costa Rica al ser la agricultura una de las ramas de la actividad económica más importantes, con mayor peso porcentual (un 6,5% en el año 2008) en el PIB nacional; cabe destacar que las exportaciones han permitido un gran salto de su economía debido a la transformación del sector para adecuarse a las necesidades mundiales. Los mercados internacionales de preferencia son el estadounidense y el europeo. El emprendedor con niveles de educación superior prefiere dirigir sus productos al mercado internacional, mientras que los emprendedores con educación primaria consideran dirigir sus productos al mercado nacional. Los modelos de asociacionismo agrario son parecidos en ambos países, presentando mayor importancia en Costa Rica los modelos de organización “cooperativas agrarias” que en la Región de Murcia.

EMPRENDIZAJE Y CREACIÓN DE AGROGENOCIOS

El perfil del emprendedor de agronegocios en Costa Rica se identifica principalmente con un hombre maduro con niveles de educación primarios. Este emprendedor cuenta a su vez con agronegocios de reciente creación (15 años máximo). Sin embargo en la Región de Murcia,

los emprendedores de agronegocios los podemos calificar como muy jóvenes con pocos estudios para las actuales necesidades del sector.

Es de destacar que en Costa Rica los emprendedores de agronegocios utilizan estudios de mercado (un 19%) como fuente de información primaria, lo cual asegura la utilización de esta herramienta de planificación en un porcentaje importante, para el análisis del negocio y conocimiento del sector antes de comenzar la empresa.

Los criterios principales que utilizan los emprendedores para elegir la actividad del agronegocio se basan en las oportunidades del mercado, y continuar con las actividades que tradicionalmente estaban en la familia y en el entorno socioeconómico. La experiencia en el sector, la intuición propia y la información de terceros han sido en la Región de Murcia desde siempre, las principales variables que han condicionado la puesta en marcha de agronegocios y el desarrollo socioeconómico del emprendedor.

Los problemas de ambos emprendedores se repiten para fases de maduración de la idea de negocio y antes de comenzar con las actividades de la nueva empresa, señalando como al financiamiento del proyecto, el conocimiento insuficiente del entorno competitivo y las tramitaciones con la administración pública.

INNOVACIÓN TECNOLÓGICA EN LOS AGRONEGOCIOS

Los agronegocios de Costa Rica se presentan manifiestamente más innovadores que los de la Región de Murcia a la hora de iniciar y en el proceso de su creación, apoyándose de un mayor grado de innovación en sus procesos de dirección estratégica y en el aprovechamiento de las oportunidades que ofrece el mercado.

La empresa murciana no se ha creado pensando en desarrollar nuevos procesos y productos innovadores, quizás debido al nivel de consolidación de estas agroindustrias en los mercados nacionales e internacionales donde opera, así como los productos mediterráneos donde tradicionalmente envía sus exportaciones de frutas y hortalizas.

En los procesos de innovación tecnológica por los agronegocios, es de destacar la valoración a las innovaciones en la actividad económica a través de nuevos productos o bien modificaciones sobre los anteriormente comercializados. Y en cuanto a los servicios, los agronegocios destacan la mejora en sus instalaciones productivas.

Las recientes innovaciones tecnológicas abren expectativas de conseguir una producción agrícola especializada en determinados países como España y Costa Rica; avanzando significativamente en la reducción de pérdidas por desechos, y en la búsqueda de productos con propiedades saludables y con seguridad alimentaria. En este camino se necesita alcanzar un liderazgo estratégico y obtener una posición “best in class”, trabajando por alcanzar niveles de calidad superiores, con productos más exclusivos, servicios ofrecidos más eficientes y procesos tecnológicos avanzados.

El reconocimiento de los agronegocios de su inversión en proyectos de I+D+i es más bien escaso, pudiendo cumplir este compromiso de I+D, aquellas firmas que piensan pueden tener en esta innovación un reconocimiento en la demanda del consumidor. Por otro lado, es recomendable tanto para la empresa de la Región de Murcia, como para la de Costa Rica, acudan a contratación de personal especializado, ya que parte de los resultados procedentes de la innovación, pasa por un mayor conocimiento insertado a través de los recursos humanos en las empresas agrícolas.

El sector agrario demanda productos especializados y Costa Rica tiene una elevada preocupación por trasladar esta especialización a los mercados donde operan sus agronegocios. Dedicar fondos para la obtención de nuevas tecnologías productivas, puede convertirse en innovaciones altamente apreciadas por el mercado, bien como novedades de productos, o haciendo más eficientes los procesos productivos.

En general, la especialización les ha llevado a las empresas murcianas y costarricenses a innovar para obtener rentas superiores mejorando sus procesos productivos y obteniendo un producto de mayor calidad.

En este sentido, la Región de Murcia es la Comunidad Autónoma con más superficie productiva destinada a la cuarta gama o productos agrarios mínimamente procesados; además, cuenta con empresas que junto con otras del país localizadas en la Rioja y Andalucía como (VEGA MAYOR; GRUPO PRIMAFLORES; POZO SUR, S.L.; PERICHAN, S.A.; FRUTAS ESPARZA; MIRA HERMANOS, S.L.); sitúa a la industria agroalimentaria española con un gran reconocimiento en todos los canales de distribución de la Unión Europea (UE). Debido al esfuerzo de estos agronegocios, sus directivos y las industrias agroalimentarias para mejorar constantemente, gracias a la innovación y la mejora de productos alimenticios; el grado de especialización en procesos productivos, es reconocido para la agricultura murciana en los mercados europeos de frutas y hortalizas. Por tanto, podemos asegurar que la Región de Murcia, acrecienta de forma manifiesta, y sitúa a los agricultores españoles y sus industrias agroalimentarias con un gran reconocimiento en la Unión Europea (UE).

COOPERACIÓN INTEREMPRESARIAL EN LOS AGRONEGOCIOS

En ambos países existe predisposición para cooperar con los diferentes grupos de interés, siendo el grado cooperativista muchísimo mayor en Costa Rica (94%) frente al 54% de los agronegocios murcianos que declaró haber mantenido relaciones de cooperación. Independientemente del país analizado, la inexistencia de cooperación se debe en primer lugar a la falta de información en cooperación, seguida de la falta de confianza con los socios participantes. El factor que menos afecta a la falta de cooperación en Costa Rica es

la ineficacia en la gestión empresarial, mientras que para los murcianos sería la experiencia previa negativa.

Tanto los agronegocios murcianos como los costarricenses declararon cooperar en primer lugar con sus clientes y en segundo lugar con sus proveedores, lo que puede entenderse como un esfuerzo en colaborar con aquellos grupos de interés externos que conforman las actividades primarias de la cadena de valor. En ambos países existe menor predisposición a la cooperación con competidores, y en caso murciano pueden añadirse a su vez instituciones como universidades, centros de investigación, etc. Mientras que las empresas de Costa Rica manifiestan colaboran un 80% con centros de investigación, los agronegocios en la Región de Murcia lo hacen en un 16%. Por tanto, sería recomendable llevar a cabo campañas de concienciación y formación entre los diferentes actores; y, más concretamente en las empresas murcianas, que acercara a estas a las universidades y a los centros de investigación.

Los modelos de cooperación se ponen en marcha por motivos distintos a uno y otro lado del Atlántico. En Costa Rica la tendencia es hacia mejorar la eficiencia, y reducir los riesgos y la incertidumbre así como facilitar la especialización.

La ventaja de estratégica que aporta la cooperación empresarial en ambas regiones se basa en varios aspectos valorados de forma similar: en primer lugar debido al aumento de la capacidad, y para el caso concreto de Costa Rica habría que añadir que con una mayor cooperación se consigue una mejor adaptación al entorno. La ventaja menos valorada por todos los participantes en la implementación de acciones cooperativas es obtener una mejora en la gestión del tiempo, a lo que los murcianos suman la obtención de mayor flexibilidad.

RESPONSABILIDAD ESTRATÉGICA DE LAS ORGANIZACIONES

Entre las medidas que son resultado de una dirección eficiente y responsable, los emprendedores consideraron que las más importantes son: atender las sugerencias de los clientes, adoptar un estilo de trabajo en equipo y mejorar la gestión ambiental. Por otro lado, la gestión responsable de la empresa de forma integral es considerada un valor al alza por los agronegocios de Costa Rica y la Región de Murcia.

La responsabilidad estratégica en la empresa, puede llegar a conseguirse debido a la presión de los trabajadores, incidiendo positivamente en la RSC. La formación y el reciclaje de profesionales engendran valores culturales cambiantes en las empresas.

Por tanto, los factores que posicionan a los agronegocios y definen sus estrategias de RSC son “las medidas para la mejora de la gestión ambiental”, así como “la profesionalidad a través de la formación de sus trabajadores”.

Modificar los mecanismos de aprendizaje, dando entrada en las escuelas, centros de capacitación y universidades a nuevas materias formativas como la “*Responsabilidad de las Organizaciones en el Siglo XXI*”, es el objetivo prioritario de años venideros.

Los agronegocios de la Región de Murcia, han implementado la “*estrategia de RSC de atención a los stakeholders*”, que es aquella, donde la empresa no se limita a cumplir las exigencias de la legislación, sino que genera una expectativa de preocupación hacia la satisfacción de estos grupos de interés, atendiendo las sugerencias de los clientes y trabajando aquellos aspectos de mejora de la gestión ambiental. En Costa Rica en las firmas se han implementado las medidas de RSC, haciendo de esta estrategia un valor considerado en todos los niveles de la organización.

Tanto los agronegocios de Costa Rica como los de la Región, consideran que la estrategia de RSC “mejora los resultados de la empresa” e “influye positivamente en el reconocimiento social de la empresa”. En ambos casos, los encuestados consideran que puede suponer un “incremento de la productividad de los agronegocios”.

COMPETITIVIDAD DEL CONOCIMIENTO Y LAS TECNOLOGÍAS

Los directivos consideran que los procesos de decisión son tomados en base a sus conocimientos empresariales, que mayoritariamente provienen de la experiencia acumulada en la tradición y el propio desempeño de la empresa.

Por otro lado, algunos factores socioeconómicos y del ámbito político pueden condicionar la posición competitiva de los agronegocios; la dotación de infraestructuras por el Estado, bienes de equipo en las instalaciones y centros de trabajo y las nuevas tecnologías en las explotaciones pueden ser cuestiones importantes para el crecimiento de los agronegocios. En Costa Rica, atribuyen a la formación técnica agrícola dedicada a los trabajadores, la principal causa que manifiestan los encuestados que directamente incide en el buen hacer de sus empresas.

Es de destacar cada vez más la inclusión y consideración por el empresario de otros factores que inciden en la competitividad de sus agronegocios. Por ejemplo, la aplicación de *medidas de innovación social*. Esta hace referencia a la introducción de cambios relacionados con nuevas formas organizativas y de gestión, las redes sociales y los procesos de innovación medioambiental; que además, tienen implicaciones directas sobre las personas de la organización. Entre sus principales objetivos figuran la inserción socio laboral, la protección y el respeto al medioambiente mediante el crecimiento sostenible. Esta *innovación social* conecta con la Responsabilidad Social Corporativa (RSC), el Balance Social, el Gobierno Corporativo y el Codesarrollo o Desarrollo Ecológico.

El factor del entorno considerado vital, es la diferencia de productividad de los agronegocios sobre otras actividades y sectores de la economía nacional. Otra variable significativa para

las firmas de la Región de Murcia, es el diferencial de salarios que puede existir en países vecinos; éste puede incidir en las explotaciones agrícolas, y suponer economías en las empresas que reubiquen sus centros de trabajo, inclusive mejorando la situación frente a nuevos competidores de la Unión Europea (UE). En Costa Rica, producir con mayor eficiencia que los competidores, se atribuye básicamente al precio y la calidad de los productos ofrecidos en el mercado.

Los agricultores y directivos de la agroalimentación precisan cada vez en mayor medida el empleo de las TIC's, y máxime en todos los niveles organizativos. Quizás la utilización de las mismas no pueda suplantar problemas derivados de las inclemencias climáticas o incidencias atribuibles al propio sistema de producción agrícola, como la prevención de plagas, o desajustes en los precios de los productos. Sin embargo, su valorización para las explotaciones agrícolas y la obligada necesidad de implantar programas de trazabilidad que garanticen la seguridad alimentaria y mejoren la calidad, hacen de ellas, como una inversión crítica para todos los agronegocios.

5. DISCUSIÓN Y CONCLUSIONES

Los agricultores de un país y otro se esfuerzan por ser cada vez más competitivos y se enorgullecen de la fama mundial de que goza la calidad de sus producciones, beneficiándose en este camino de sus actuaciones los consumidores. Sin embargo, en la última década, mucho ha cambiado la sociedad europea y americana.

En el contexto de la Unión Europea (UE), la Política Agraria Comunitaria (PAC) ha sido, por razones económicas e institucionales, uno de los grandes pilares del proceso de construcción, de la integración comunitaria y el desarrollo agrario de sus estados. La importancia de este sector en la Región de Murcia es muy grande, debido a su clima mediterráneo de veranos calurosos e inviernos muy suaves; así como parecido y próximo a las condiciones climáticas y geográficas de Costa Rica, con un clima estable por hallarse en la latitud tropical, con lluvias abundantes todo el año en la vertiente atlántica, y menos frecuentes en la vertiente del Pacífico con dos estaciones. Todo esto hace que las actividades agroindustriales, representen en Costa Rica y en la Región de Murcia uno de los pilares básicos del crecimiento de sus economías.

Costa Rica tiene una extensión de 51.100 Km² y la Región de Murcia ocupa una superficie de 11.317 Km² en el territorio de España. Las superficies cultivables en ambas regiones, centroamericana y del levante español, hacen que las exportaciones de productos agrícolas conformen el 8% del PIB del Costa Rica y el 5% en la Región de Murcia. Por tanto, se considera que aportan un gran valor agregado en el sector agropecuario, basado en una agricultura de riego y tecnificado sector hortofrutícola.

Los *Agronegocios de Costa Rica y en la Región de Murcia*, incluyen toda una serie de operaciones y ordenamientos necesarios para su buen funcionamiento y desarrollo dentro de un área rural o urbana. Estas firmas, en Costa Rica han tenido la facilidad, de contar con la “*estabilidad de sus instituciones que han facilitado a su vez el desarrollo de una economía de mercado y de la inversión foránea*” (Briones et al., 2010). Esto implica que en la medida en que se den las condiciones ideales en Costa Rica y en la Región de Murcia, el *Agronegocio o Empresa Relacionada con la Agricultura*, Ganadería y Pesca, puede llegar a consolidarse como una fuente importante de atracción productiva y de empleo para el desarrollo de un territorio.

La transferencia tecnológica de conocimiento a la empresa agropecuaria puede suponer nuevas oportunidades de negocio, la diversificación de la producción agraria y la mejora de la sostenibilidad de la empresa. Las políticas agrarias comunitarias de los países recomienda el uso de tecnologías que posibiliten mejoras en los procesos productivos, a través de la dirección estratégica de agronegocios que pongan en marcha la transferencia de conocimiento en asuntos relacionados con agricultura sostenible.

Existen unas demandas sociales en el consumo de productos alimenticios de producción integrada y agricultura verde; biotecnología y nuevos sistemas en riego conforman una agricultura de conservación. En esta dirección, los gobiernos de los países dedicarán mayores esfuerzos en políticas de I+D+I, y prestarán mayor atención a la transferencia de tecnología de Universidades y Centros de Investigación.

En este devenir y sucesos a lo largo de la investigación, hemos detectado algunos problemas básicos en la industria tanto en España como en Costa Rica, estos son:

- Ausencia de un marco normativo serio que regule los mercados.
- Gran poder de concentración de las cadenas de distribución.
- Desequilibrios en la cadena de valor alimentaria final al consumidor.
- Desajustes en la planificación de la oferta y cierto adelanto en las cosechas.

Algunas de las recomendaciones para las empresas del sector agroalimentario, pueden ser: (1) un mayor control de sus costes para no repercutir al consumidor; (2) vigilar la cadena de frío, frescura y seguridad de los alimentos; (3) incrementar la dimensión empresarial a través de las políticas de concentración; y, (4) ofrecer a los consumidores, productos de mayor valor con acuerdos de buenas prácticas. En esta línea, también puede ser de importancia para generar nuevos pequeños productores de unidades agropecuarias y gerentes de agronegocios que los dirijan con eficacia.

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**APRENDIZAJE COLABORATIVO Y USO DE LAS TIC DENTRO DEL AULA:
RESULTADOS EN EL MÁSTER INVESTIGADOR EN TECNOLOGÍAS
DE LA INFORMACIÓN Y LAS COMUNICACIONES
DE LA UNIVERSIDAD POLITÉCNICA DE CARTAGENA**

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RESUMEN

Con esta comunicación se pretende establecer que el aprendizaje colaborativo y el uso de las TIC potencia el aprendizaje del alumnado del Espacio Europeo de Educación Superior (EEES) y mejora la calidad de la enseñanza.

La innovación educativa se asocia a una renovación pedagógica implantando nuevos proyectos y programas, materiales curriculares, estrategias de enseñanza-aprendizaje, recursos didácticos y mejorando la organización y gestión del currículum, el centro y las estrategias dentro del aula. Desde el punto de vista pedagógico tiene como objetivo transformar y mejorar la calidad de la enseñanza.

Los recursos didácticos son esenciales dentro de la enseñanza, de forma que, en algunas ocasiones, se ha asociado la innovación educativa con el uso de recursos innovadores dentro del aula. Por tanto, la dotación de materiales informáticos a los centros de enseñanza se asocia a un proceso de innovación educativa.

La innovación va asociada a planificación y mejora: si se considera la innovación como la selección, organización y utilización creativa de recursos humanos y materiales de formas novedosas y apropiadas que den como resultado la consecución de objetivos previamente marcados, se está hablando de cambios que producen mejora.

La innovación supone una transformación significativa e implica un cambio en la enseñanza, que obviamente provocará transformaciones en la práctica educativa y, en los hábitos con el fin de mejorar la calidad del aprendizaje. Además, está relacionada con la adaptación, y producción de materiales educativos.

Por otro lado, el clima dentro del aula, conjunto de características psicosociales de un centro educativo, se valora por la calidad de las relaciones entre sus miembros y los sentimientos de aceptación y de rechazo de los demás. Un buen clima escolar es determinante para usar satisfactoriamente las nuevas tecnologías dentro del aula.

El uso del ordenador en las aulas ofrece ciertas ventajas: es motivador y versátil, mejora el aprendizaje del alumno, ya que puede explorar libremente e incrementa la retención al

obtener la información por varias fuentes (sonidos, imágenes, vídeos...) y todas estas posibilidades aumentan al incluir el uso de Internet que es un inmenso espacio virtual para la comunicación, intercambio de información y experiencias en el que el profesor se convertirá para el alumno en orientador de la búsqueda de información a través de diversas herramientas educativas.

Las simulaciones son imprescindibles en muchas situaciones dentro del campo de la educación. La enseñanza de ciertos experimentos debe hacerse simuladamente en la pantalla del ordenador, así como también la de experiencias o demostraciones costosas, sistemas de desarrollo temporal muy lento o muy rápido, etc. Se crean entornos interactivos realistas, pero con suficiente riqueza de estímulos. La interactividad con un entorno así preparado hace muy conveniente utilizar simulación en muchas circunstancias de aprendizaje: cuando la experimentación sea aconsejable y no se pueda experimentar con el mundo real. En ocasiones es aconsejable el entrenamiento con un simulador previamente a la operación del sistema real.

Por otro lado, el aprendizaje colaborativo es una herramienta de innovación educativa muy eficaz, que se ocasiona cuando se utilizan métodos de enseñanza basados en el trabajo colaborativo. Este aprendizaje tiene una doble dimensión: se colabora para aprender y al mismo tiempo se aprende a colaborar. Se produce un “trabajo colaborativo” en contextos de interacción social cuando un grupo de personas interaccionan ayudándose solidariamente de manera no competitiva con el fin de realizar una tarea prefijada en la cual el objetivo final es conseguir los objetivos individuales de cada miembro del grupo. Un aprendizaje colaborativo implica un trabajo colaborativo que es diferente de simplemente realizar un trabajo en grupo, ya que un trabajo colaborativo necesita que el resultado obtenido por el grupo refleje lo que todos y cada uno de los miembros han aportado.

Se darán conclusiones respecto al aprendizaje colaborativo y al uso de las TIC dentro del aula en el Máster Investigador en Tecnologías de la Información y las Comunicaciones de la Universidad Politécnica de Cartagena (UPCT).

La era digital está estableciendo un modo de acceder, usar e interaccionar con las tecnologías que rebasa los límites de la escuela y cubre un amplio entorno socio-cultural y formativo (Bautista, 2007; Ballesta, 2009; García Areito, 2009; San Martín, 2009).

El acceso a la interacción comunicativa desde Internet ha supuesto un aumento significativo en el uso de las herramientas y en las tareas colaborativas asignadas a los medios tecnológicos que se utilizan en la formación (Sevillano, 2009). De hecho, con la incorporación de las Tecnologías de la Información y de la Comunicación (TIC) se pretende facilitar el acceso a nuevas fuentes de conocimiento, para dotar de nuevos servicios y recursos a los ciudadanos. Por este motivo las políticas educativas aplicadas en los últimos años, se han visto en la necesidad de propiciar su desarrollo y implantación en el sistema

educativo español aumentando la dotación de medios tecnológicos a los centros. Aunque también se ha trabajado en otros aspectos como la formación del profesorado, la elaboración de materiales educativos, etc.

Desde un punto de vista científico el uso innovador de las TIC está asociado preferentemente a dos áreas científicas de estudio. Una está referida a la integración de las TIC en los sistemas educativos y la segunda a los procesos de innovación, cambio y mejora en las instituciones educativas. A continuación se estudian los elementos facilitadores de la innovación educativa apoyados en las TIC, así como el uso de las nuevas tecnologías aplicadas a la educación. Así, los recursos didácticos son un elemento esencial dentro de la enseñanza, de forma que en algunas ocasiones se ha asociado la innovación educativa con el uso de recursos innovadores dentro del aula. Por tanto, la dotación de materiales informáticos a los centros de educación se asocia a un proceso de innovación educativa. Para Salinas (2004) la innovación va asociada a planificación y mejora: "Si consideramos la innovación como la selección, organización y utilización creativa de recursos humanos y materiales de formas novedosas y apropiadas que den como resultado el logro de objetivos previamente marcados, estamos hablando de cambios que producen mejora, cambios que responden a un proceso planeado, deliberativo, sistematizado e intencional, no de simples novedades, de cambios momentáneos ni de propuestas visionarias". La innovación supone una transformación significativa e implica un cambio en nuestra concepción de enseñanza, que obviamente provocarán transformaciones en nuestra práctica educativa, en nuestros hábitos... con el fin de mejorar la calidad del aprendizaje. La innovación será un medio para mejorar la calidad y conseguir con mayores garantías los fines que se persigue en los centros educativos. Según Cebrián (2004) la innovación educativa está relacionada con la adaptación, revisión y/o producción de materiales educativos. En este sentido, el aprendizaje colaborativo es una herramienta de innovación educativa muy potente hoy en día, que se produce cuando se utilizan métodos de enseñanza basados en el trabajo colaborativo. Antes de definir lo que es el aprendizaje colaborativo conviene establecer la diferencia que existe entre los términos aprendizaje y trabajo colaborativo según Prendes (2004): Cuando se utilizan métodos de enseñanza basados en el trabajo colaborativo de los alumnos se produce un "aprendizaje colaborativo". En este caso este aprendizaje tiene una doble dimensión: se colabora para aprender y al mismo tiempo se aprende a colaborar. Se produce un "trabajo colaborativo" en situaciones de interacción social cuando un grupo de sujetos interaccionan ayudándose mutuamente de manera no competitiva para conseguir realizar una tarea predefinida en la cual el objetivo final es lograr la consecución de los objetivos individuales de cada miembro del grupo. De estas definiciones se puede establecer que un aprendizaje colaborativo implica un trabajo colaborativo que es diferente de simplemente realizar un trabajo en grupo, ya que un trabajo colaborativo necesita que el

resultado obtenido por el grupo de alumnos refleje lo que todos y cada uno de ellos han aportado. A modo de síntesis todo trabajo colaborativo es trabajo en grupo, pero por el contrario no todo trabajo en grupo es un trabajo colaborativo. De acuerdo con Prendes (2004), se pueden resumir las características que definen un trabajo en grupo y un trabajo colaborativo en la siguiente tabla:

Tabla 1: Características de un trabajo en grupo y un trabajo colaborativo

Características	Trabajo en grupo	Trabajo colaborativo
Interdependencia	No existe	Positiva
Metas	Grupales	Estructuradas
Responsabilidad	Grupal	Individual
Sujetos	Grupos homogéneos	Grupos heterogéneos
Liderazgo	Un líder	Compartido por todos
Responsabilidad del aprendizaje	Individual	Compartido
Objetivo final	Completar la tarea	De aprendizaje y de relación
Habilidades interpersonales	Se presuponen	Se enseñan
Rol del profesor	Escasa intervención	Observación y retroalimentación sobre desarrollo de la tarea
Desarrollo de la tarea	No importa modo	Profesor estructura de procedimientos para optimización e importa tanto el proceso como el producto

Fuente: Palomo López, R., Ruiz Palmero, J. y Sánchez Rodríguez, J. (2005)

"El aprendizaje cooperativo es un término genérico usado para referirse a un grupo de procedimientos de enseñanza que parten de la organización de la clase en pequeños grupos mixtos y heterogéneos donde los alumnos trabajan conjuntamente de forma coordinada entre sí para resolver tareas académicas y profundizar en su propio aprendizaje", según Rue (2000). Desde el punto de vista de la organización escolar, se denomina aprendizaje colaborativo o cooperativo al intercambio y desarrollo de conocimiento en el seno de pequeños grupos de iguales, encaminados a la consecución de objetivos académicos (Martín-Moreno, 2004:1). El aprendizaje colaborativo está centrado en el alumnado, que se agrupa en pequeños grupos de trabajo para trabajar conjuntamente en la consecución de las tareas que el profesorado establece para mejorar o maximizar su

propio aprendizaje y el de los otros miembros del grupo. Según Pastor, M.C. et al. (2011) este tipo de aprendizaje colaborativo se caracteriza por su diseño intencional y por el compromiso activo de todos sus integrantes para alcanzar ciertos objetivos.

Las ventajas que ofrece la adquisición de conocimientos a través de este tipo de aprendizaje son las siguientes según Martín-Moreno (2004:1):

Tabla 2: Ventajas que ofrece la adquisición de conocimientos a través del aprendizaje colaborativo

VENTAJAS	
1	Incrementa la motivación de todos los integrantes del grupo hacia los objetivos y contenidos del aprendizaje.
2	El aprendizaje que consigue cada individuo del grupo incrementa el aprendizaje del grupo y sus integrantes alcanzan mayores niveles de rendimiento académico.
3	Facilita una mayor retención de lo aprendido.
4	Promueve el pensamiento crítico, al dar oportunidades de debatir los contenidos objeto de su aprendizaje.
5	La diversidad de conocimientos y experiencias del grupo contribuye positivamente al proceso de aprendizaje, al tiempo que reduce la ansiedad que provocan las situaciones individuales de resolución de problemas.

Pero, según Pastor, M.C. et al. (2011) también presenta inconvenientes como son:

Tabla 3: Inconvenientes que ofrece la adquisición de conocimientos a través del aprendizaje colaborativo

INCONVENIENTES	
1	Disfunciones en el grupo.
2	Participación desigual.
3	Resistencia al trabajo en grupo.
4	Disgregaciones.
5	Trampas.
6	Mayor carga de trabajo.
7	Poco reconocimiento profesional.

En este tipo de aprendizaje, además, el rol del profesorado no se limita a observar el trabajo de los grupos sino a controlar activamente el proceso de construcción y transformación del conocimiento, así como las interacciones de los miembros de los distintos grupos. “Las últimas tendencias en educación propugnan el trabajo en grupo como metodología predominante, en la cual los alumnos son los protagonistas del trabajo en el aula. La interacción que se produce en el aula no sólo es la de profesor-grupo. Es fundamental también tener en cuenta la interacción entre el alumno y el profesor y la de los alumnos entre sí. En múltiples ocasiones los estudiantes aprenden más de sus compañeros (del compañero experto) que del propio profesor” (Santamaría, 2005: 2). Con la aparición de las

nuevas tecnologías, especialmente las relacionadas con la Web 2.0, la Educación ha sido una de las disciplinas más beneficiadas (Cobo y Romaní, 2007: 101). Actualmente, las plataformas virtuales se han convertido en las nuevas aulas de la sociedad del conocimiento (Castells, 1997, 2001; García Aretio, Ruiz Corbella y Domínguez Figaredo, 2007), recintos digitales donde se multiplican las posibilidades de los grupos clásicos de aprendizaje colaborativo. En este sentido, el uso del ordenador en las aulas ofrece una serie de ventajas: es un elemento motivador y versátil, mejora el aprendizaje del alumno, ya que puede explorar libremente e incrementa la retención al obtener la información por varias fuentes (sonidos, imágenes, vídeos...) y todas estas posibilidades aumentan al incluir el uso de Internet. (Hernández, E; Medina, F; 2009). Internet es un inmenso espacio virtual para la comunicación, intercambio de información y experiencias en el que el profesor se convertirá para el alumno en orientador de la búsqueda de información a través de diversas herramientas educativas. Para mejorar la educación en la sociedad actual se necesita fomentar y explorar las posibilidades educativas de las TIC dentro del aula como un instrumento útil siempre que se consigan sacar provechos de sus características. Cualquier técnica de enseñanza debe pretender provocar la actividad del alumno porque, para aprender, éste no debe ser un ente meramente pasivo.

A continuación se examinan, desde el punto de vista de su utilidad educativa, algunas de las herramientas TIC que potencian el trabajo colaborativo en la red de gran aplicación al alumnado del Espacio Europeo de Educación Superior con las que se obtienen un mejor desarrollo de las competencias que debe alcanzar el alumnado.

WebQuests

Según Palomo López et al: "Las WebQuests (es <http://www.webquest.org>) se tratan de actividades de búsqueda de información guiada, orientadas a la investigación, en las que la mayor parte de la información que va a utilizar el alumnado está extraída de Internet." La primera WebQuest fue creada en 1985 por Bernie Dodge y Tom March en la Universidad Estatal de San Diego. El antecedente de estas actividades lo constituye el uso de retos (challenging learning) en el desarrollo de ambientes de aprendizaje basados en tecnologías de la información que aplican desde los ochenta Seymour Papert y sus discípulos. Las WebQuests son utilizadas como recurso didáctico por los profesores, puesto que permiten el desarrollo de habilidades de manejo de información y el desarrollo de competencias relacionadas con la sociedad de la información. Una WebQuest se construye alrededor de una tarea atractiva que provoca procesos de pensamiento superior. Idealmente, se debe corresponder con algo que en la vida normal hacen los adultos fuera de la escuela. (Starr, 2000b:2). Su uso consiste en aplicar una nueva metodología basada en el desarrollo de páginas Web educativas intentando por un lado aumentar el grado de interés y motivación

del alumnado, así como fomentar la utilización de las TIC en el ámbito docente e introducir los temas transversales junto con los contenidos establecidos por el currículo. La publicación de estos recursos didácticos en Internet mejora y amplía las posibilidades de formación que ofrecen los centros. De acuerdo con Palomo López, R., Ruiz Palmero, J. y Sánchez Rodríguez, J (2005) a continuación se muestra una tabla en el que se incluyen una relación de páginas web especializadas que pueden ayudar a crear WebQuests educativas:

Tabla 4: Páginas web para crear WebQuests educativas

HYPERLINK "http://www.aula21.net/" http://www.aula21.net/	HYPERLINK "http://www.xtec.es/~cbarba1/portalsWQ.htm" http://www.xtec.es/~cbarba1/portalsWQ.htm
HYPERLINK "http://www.eduteka.org/webquest.php3" http://www.eduteka.org/webquest.php3	HYPERLINK "http://webpages.ull.es/users/manarea/webquest/" http://webpages.ull.es/users/manarea/webquest/
HYPERLINK "http://www.educa.aragob.es/catedu/araquest/index.html" http://www.educa.aragob.es/catedu/araquest/index.html	HYPERLINK "http://www.eduteka.org/comenedit.php3?ComEdID=0010" http://www.eduteka.org/comenedit.php3?ComEdID=0010
HYPERLINK "http://www.cyta.com.ar/elearn/wq/wq.htm" http://www.cyta.com.ar/elearn/wq/wq.htm	HYPERLINK "http://ryc.educaragon.org/arboles/arbol.asp?guiaeducativa=3&imagen=RYC07&raiz=0&strseccion=FA209" http://ryc.educaragon.org/arboles/arbol.asp?guiaeducativa=3&imagen=RYC07&raiz=0&strseccion=FA209
HYPERLINK "http://www.proarabatic.org/arabatic_cas/proyectos_ikt/webseeducativas/index.htm" http://www.proarabatic.org/arabatic_cas/proyectos_ikt/webseeducativas/index.htm	HYPERLINK "http://www.juntadeandalucia.es/averroes/recursos_informaticos/andared02/webquests_musicales/index.htm." http://www.juntadeandalucia.es/averroes/recursos_informaticos/andared02/webquests_musicales/index.htm

Fuente: Elaboración propia

Cazas de Tesoros

Una "caza de tesoros" (en inglés "Treasure Hunt", "Scavenger Hunt" o "Knowledge Hunt"), es una de las estructuras de actividad didáctica más populares entre los docentes que utilizan Internet en sus clases. Es una actividad sencilla en su diseño y ejecución, ya que se concibe como una página web en la que se formulan una serie de preguntas y un listado de direcciones de Internet en las que los alumnos han de buscar las respuestas. Para que todo el proceso tenga un sentido global y se ponga a prueba la capacidad de síntesis del alumno se termina con la llamada "Gran Pregunta", cuya respuesta no aparece directamente en las páginas web visitadas. Es decir, esta Gran Pregunta exige integrar y valorar lo aprendido durante la búsqueda. Son estrategias útiles para promover la adquisición de conocimientos sobre un tema y desarrollar las destrezas de búsqueda de información online. En grado de dificultad, las Cazas de Tesoros se sitúan en un nivel por debajo de las WebQuests, puesto

que sólo persiguen la comprensión de la información existente en las páginas de referencia y no la resolución de ningún problema, ni la exposición de conclusiones finales. Existen varias páginas web que ayudan a generar de caza del tesoro fácilmente y forma rápida si se tiene claro el diseño previo y el contenido de las mismas. Entre ellas merece la pena destacar:

HYPERLINK "http://www.aula21.net/cazas/caza.htm" http://www.aula21.net/cazas/caza.htm	HYPERLINK "http://www.edukatic.com/curso/mod3/pro9/cazas.htm" http://www.edukatic.com/curso/mod3/pro9/cazas.htm
HYPERLINK "http://www.webquest.es/crear-webquest-o-caza-del-tesoro-online" http://www.webquest.es/crear-webquest-o-caza-del-tesoro-online	HYPERLINK "http://edutec.rediris.es/Revelec2/revelec16/adell.htm" http://edutec.rediris.es/Revelec2/revelec16/adell.htm
HYPERLINK "http://www.educacionenvalores.org/spip.php?article264" http://www.educacionenvalores.org/spip.php?article264	HYPERLINK "http://www.aula21.net/cazas/caza.htm" http://www.aula21.net/cazas/caza.htm

Lessons plans

Son actividades de aprendizaje realizadas a través de las consultas que se hacen por Internet. Son como exámenes con preguntas breves, cuya respuesta se encuentra en Internet. La estructura de este tipo de actividad es flexible y para realizar una "lessons plans" únicamente hay que elaborar las preguntas y buscar los recursos que se van a utilizar para obtener las respuestas.

Viajes virtuales

Los viajes virtuales denominados en inglés VFT (virtual field trips) o Internet field trips son "recorridos virtuales" a un lugar que tiene un interés particular, en vez de una visita real al sitio deseado, utilizando el ordenador. Permiten llevar a los alumnos a donde se quiera. Por ejemplo, se puede visitar un museo de Arte o a uno de Ciencias de manera que se puede acceder desde el aula a todos elementos importantes que integran estos museos tales como monumentos, pinturas, documentos o regiones. Es una herramienta muy interesante para incentivar el proceso de enseñanza aprendizaje. Son un método de innovación que permite que los docentes puedan usar creativamente nuevos recursos y nuevos métodos de enseñanza para mejorar el aprendizaje y cumplir con los objetivos educativos planteados. Algunas de las razones para fomentar la utilización de los viajes virtuales son ayudar a que los estudiantes comprendan mejor un tema mediante experiencias de primera mano, ofrecer

a los estudiantes actividades con las que pueden aprender a resolver problemas de la vida real, cumplir con los requisitos académicos y preparar a los estudiantes para que cumplan objetivos específicos.

Simulaciones

Las simulaciones son imprescindibles en muchas situaciones dentro del campo de la educación, sobretodo en el mundo de las Tecnologías de la Información y las Comunicaciones. En el Máster Investigador en Tecnologías de la Información y las Comunicaciones de la Universidad Politécnica de Cartagena se proporcionan recursos y herramientas variadas para utilizar las simulaciones con el fin de obtener resultados innovadores de investigación. La enseñanza de experimentos peligrosos debe hacerse simuladamente en la pantalla del ordenador, así como también la de experiencias o demostraciones costosas, sistemas de desarrollo temporal muy lento o muy rápido, etc. Hay que explotar la potencialidad de la máquina para crear entornos interactivos realistas, pero con suficiente riqueza de estímulos para alcanzarlo. La interactividad con un entorno así preparado hace muy conveniente utilizar simulación en muchas circunstancias de aprendizaje: cuando la experimentación sea aconsejable y no se pueda experimentar con el mundo real. Muchas veces es aconsejable experimentar de las dos maneras, porque la naturaleza no se deja manipular tan fácilmente como los ordenadores. En ocasiones es aconsejable el entrenamiento con un simulador previamente a la operación del sistema real, como por ejemplo los simuladores de vuelo o los simuladores de centrales eléctricas.

Plataformas virtuales

Aunque la docencia en el Máster Investigador en Tecnologías de la Información y las Comunicaciones de la Universidad Politécnica de Cartagena sea presencial, también se beneficia al alumnado de los recursos que proporcionan las plataformas virtuales (**Aul@Virtual** de la UPCT) ayudando a potenciar la educación en valores y alcanzar los objetivos de aprendizaje propuestos en cada una de las materias impartidas.

Actualmente existen varias plataformas educativas que son instituciones en las que el proceso de enseñanza-aprendizaje se produce enteramente a través de Internet y que intentan dar una respuesta específica a sus necesidades técnicas. Poder acceder a los servicios que ofrecen estas plataformas a través de Internet en cualquier momento y desde cualquier lugar supone una transformación de los estilos de trabajo en los centros educativos. De manera que la utilización de estos entornos virtuales promueven el aprendizaje activo por parte del alumnado, con acceso a diferentes actividades y recursos de aprendizaje. Por otra parte, también promueven la interacción y el trabajo colaborativo

entre los alumnos permitiendo que se intercambien información, fomentando el diálogo y la discusión, facilitan la resolución de problemas y la toma de decisiones.

Algunas de las plataformas más utilizadas en la actualidad se muestran en la siguiente tabla:

Tabla 5: Plataformas educativas estandarizadas de uso gratuito disponibles en la red

PLATAFORMAS	SITIO EN INTERNET
CLAROLINE	HYPERLINK "http://www.claroline.net/" \t "_blank" http://www.claroline.net/
MOODLE	HYPERLINK "http://moodle.org/" \t "_blank" http://moodle.org/
TELEDUC	HYPERLINK "http://teleduc.nied.unicamp.br/pagina/index.php" \t "_blank" http://teleduc.nied.unicamp.br/pagina/index.php
ILIAS	HYPERLINK "http://www.ilias.uni-koeln.de/ios/index-e.html" \t "_blank" http://www.ilias.uni-koeln.de/ios/index-e.html
GANESHA	HYPERLINK "http://www.anemalab.org/commun/english.htm" \t "_blank" http://www.anemalab.org/commun/english.htm
FLE3	HYPERLINK "http://fle3.uiah.fi/" \t "_blank" http://fle3.uiah.fi/
Otras plataformas	HYPERLINK "http://www.unesco.org/webworld/portal_freesoft/Software/Courseware_Tools/" \t "_blank" http://www.unesco.org/webworld/portal_freesoft/Software/Courseware_Tools

Fuente: Página web <http://agora.ucv.cl/manual/plataformas/plataformas.html>

A continuación se van a estudiar diversas utilidades que ofrecen las plataformas virtuales que favorecen el uso de las TIC en el alumnado del Espacio Europeo de Educación Superior:

Correo electrónico

Es una de las herramientas telemáticas más utilizadas, fundamentalmente para el intercambio de información entre personas, pero cada vez se utiliza más para la enseñanza, sobre todo como herramienta para la tutoría electrónica. Permite una comunicación inmediata y eficaz sin necesidad de que exista coincidencia temporal. Asimismo, la enseñanza puede beneficiarse del uso de aplicaciones similares al correo electrónico, como son las listas de distribución y discusión que permiten, por un lado el envío de mensajes masivo y simultáneo a un grupo de destinatarios con el propósito explícito de informar, no siendo posible por ello la emisión de respuestas al destinatario (listas de distribución); por el otro lado, las listas de discusión también pueden ser enviadas a una gran cantidad de receptores con intereses comunes, siendo en este caso posible la emisión de respuesta a todos los miembros que componen la lista. Las plataformas virtuales suelen incorporar este sistema de mensajes internamente para comunicarse.

Foros

Los foros en Internet son también conocidos como foros de mensajes, de opinión o foros de discusión y son una aplicación web que le da soporte a discusiones u opiniones en línea. La forma de ver un foro puede ser llana, en la que las respuestas de una discusión se ordenan en forma cronológica; o puede ser anidada, en la que cada respuesta está vinculada con el mensaje original o alguna de las respuestas subsiguientes formando algo así como un árbol genealógico de discusión. Todos los mensajes enviados por los usuarios quedan recogidos en la aplicación y además se van encadenando en relación con temas y/o intervenciones concretas, pudiendo así resultar útiles para promover el debate, el contraste de opiniones, las encuestas, la colaboración,... Fomenta la participación de los alumnos y constituye una potente herramienta para incitar a participar a algunos de ellos poco receptivos a la hora de expresar sus ideas ante los compañeros, pues se trata de un estupendo modo de dirigirse de forma abierta a la clase.

Chats

Se trata de una comunicación escrita a través de Internet entre dos o más personas que se realiza instantáneamente y permite una comunicación en tiempo real. Su uso se puede plantear como elemento motivador, para resolver dudas acerca del examen, comentar algún trabajo, o incluso comentarios o debates sobre los contenidos teóricos expuestos en clase. Se ha de dividir a los alumnos en grupos reducidos para que la comunicación sea fluida y todos tengan la oportunidad de intervenir, así como para que éstas no sean un cúmulo de ideas independientes e inconexas, para lo cual también es imprescindible que exista la figura del moderador (generalmente el docente) que establezca normas al inicio de la sesión y que regule y coordine su desarrollo y los contenidos emitidos durante la misma. La mensajería instantánea permite además el envío de ficheros de cualquier naturaleza (audio, texto, imagen, vídeo), el uso de elementos visuales, la realización de videoconferencia, y plantear actividades de colaboración por medio de la herramienta de pizarra compartida que algunas de estas aplicaciones poseen, convirtiéndose de este modo también en una potente herramienta para la enseñanza.

Wikis

Se están convirtiendo en fenómeno masivo de edición electrónica, es una herramienta para la edición colaborativa de información que se publica en la web. Este proceso se realiza generalmente de forma anónima y horizontal, aunque su uso en educación requiere la identificación de usuarios. El máximo exponente de las wikis es la Wikipedia. Algunas de las características de los wikis como herramientas de comunicación y colaboración en red son la posibilidad de comunicar masivamente, de enviar gran cantidad de información, que se

basa en un modelo comunicativo de acceso libre y edición de información, la libertad que se puede ejercer en un wiki la convierte en una herramienta flexible y que la información permanece en estado de flujo, ya que nunca estará concluida.

Comunidades virtuales

Son espacios para la colaboración entre los docentes y estudiantes. Howard Rheingold (1996) define las comunidades virtuales como *“agregaciones sociales que emergen de la Red cuando un número suficiente de personas entabla discusiones públicas durante un tiempo lo suficientemente largo, con suficiente sentido humano, para formar redes de relaciones personales en el ciberespacio”*.

Sin embargo Pazos, Pérez y Salinas (2001) definen las comunidades virtuales como *“entornos basados en Web que agrupan personas relacionadas con una temática específica que además de las listas de distribución (primer nodo de la comunidad virtual) comparten documentos, recursos... Estas comunidades virtuales serán tanto más exitosas, cuanto más estén ligadas a tareas, a hacer cosas o a perseguir intereses comunes juntos”*.

En la Universidad Politécnica de Cartagena, se utiliza el OpenCourseWare (OCW) como herramienta para fomentar el aprendizaje. El OCW es una iniciativa editorial electrónica a gran escala, puesta en marcha en Abril del 2001, basada en Internet y fundada en conjunto por el Instituto Tecnológico de Massachusetts (MIT) en colaboración con la Fundación William and Flora Hewlett y la Fundación Andrew W. Mellon. Es una herramienta que permite la libre publicación de material y proporciona los contenidos de forma gratuita a usuarios de todo el mundo. No es un servicio de formación a distancia a través del cual se pueda cursar ningún estudio o titulación, ni recibir ningún tipo de acreditación.

En el Espacio Europeo de Educación Superior (EEES) esta iniciativa tiene como objetivo proporcionar un acceso libre, sencillo y coherente a los materiales docentes elaborados por los profesores de diferentes universidades. Así, estos materiales pueden ser compartidos y utilizados por docentes y estudiantes de cualquier universidad o cualquier persona de todo el mundo que esté interesada en estos contenidos. De esta forma promueve la creación de sinergias y espacios de colaboración.

La Universidad Politécnica de Cartagena, y en particular, la Escuela Técnica Superior de Ingeniería de Telecomunicación, donde se imparte el Máster Investigador en Tecnologías de la Información y las Comunicaciones, dispone de un sitio OCW que permite a los profesores publicar el conjunto de recursos (documentos, programas, calendarios,...) utilizados en el proceso de enseñanza-aprendizaje de las asignaturas que imparten. El uso del portal OCW como herramienta para fomentar el aprendizaje colaborativo en la Universidad Politécnica de Cartagena está extendiéndose entre el conjunto de los profesores que integran la misma, y está mejorando curso tras curso. Los profesores de la Escuela Técnica Superior de

Ingeniería de Telecomunicaciones hacen un uso del 15% del OCW en relación con el uso que hacen todos los profesores de la UPCT.

Por otro lado, La Universidad Politécnica de Cartagena, que apoya las iniciativas de Software Libre, se une a la comunidad Moodle.

Moodle proyecto en desarrollo que se distribuye bajo la Licencia Pública General GNU, es un entorno educativo donde los alumnos pueden, además de aprender, compartir experiencias y conocimientos y los profesores contar con una herramienta eficaz, confiable y con posibilidad de tener una información detallada del progreso y la asimilación de conocimientos por parte de los alumnos.

En **Aul@ Virtual**, bajo la plataforma Moodle, tanto alumnos como profesores cuentan con utilidades para la comunicación (chat, foros, mensajería, calendario de eventos), y herramientas para llevar a cabo un aprendizaje continuo y flexible, (área de contenidos, evaluaciones, encuestas y actividades entre otros) favoreciendo el aprendizaje colaborativo y el uso de las TIC en el alumnado del Máster Investigador en Tecnologías de la Información y las Comunicaciones de la Universidad Politécnica de Cartagena.

La mayoría de profesores del Máster Investigador en Tecnologías de la Información y las Comunicaciones de la Universidad Politécnica de Cartagena utilizan el **Aul@ Virtual de la UPCT**.

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DESIGN DE PRODUTOS PARA A UTILIZAÇÃO HUMANA E OUTRAS ESPÉCIES: INSECTOS DOMÉSTICOS

DESIGN OF PRODUCTS FOR HUMAN USE AND OTHER SPECIES: DOMESTIC INSECTS

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Resumo

Este artigo pretende evidenciar a importância do design enquanto ferramenta de qualificação de produtos industriais. Desenvolvido em ambiente académico, os resultados práticos são representativos da resposta à solicitação de uma indústria portuguesa que actua no sector dos equipamentos eléctricos de eliminação e electrocussão de insectos. O projecto de design, habitualmente centrado no utilizador humano, ligado aos comportamentos dos indivíduos e focado nas relações que estes estabelecem com os artefactos, ganhou uma outra dimensão, já que para além das variáveis que se equacionaram a partir dessas concepções, forem incluídas variáveis de uma outra espécie, os insectos domésticos. A atenção aos factores culturais, e às questões ecológicas e éticas foi evidenciada. O conjunto de produtos que se apresenta, mostra como foi possível abordar este tema de forma criativa resultando em soluções consideradas inovadoras se comparadas com os produtos actualmente disponíveis nos mercados nacional e internacional.

Palavras-chave: Design; electrocutores; insectos; inovação; ética; apropriação; descontextualização

Abstract

This article aims to highlight the importance of design as a tool for qualification of industrial products. Developed in an academic environment, the practical results are representative of the response to a request from the Portuguese industry that operates in the field of electrical equipment for disposal and insect electrocution. The project in design, usually focusing on human user, linked to the behavior of individuals and focused on the relationship they establish with the artifacts, he won another dimension, since in addition to the variables that worked from these assumptions, other variables were included from another species, the domestic insect. The attention to cultural factors, biological and ethical issues was evident. The set of products presented in this paper shows how it was possible to address this issue creatively, resulting in innovative solutions compared to the products currently available in national and international markets

Keywords: Design; bug zapper; insects; innovation; ethics; ownership.

Introdução

Num mercado dos equipamentos eléctrico e electrónicos altamente competitivo como o que se apresenta hoje a nível mundial, o pronto desenvolvimento e o lançamento de novos produtos, que pretendam atender às necessidades e aos anseios dos consumidores, parece já não ser suficiente à própria sobrevivência das empresas. Em busca por um crescimento sustentável e lucrativo, pela conquista de mais clientes e tentando sempre tornar os

produtos ou serviços diferenciados face à concorrência, muitas empresas entram numa guerra constante, que parece só alimentar o mercado de forma desproporcionada. Segundo Kim & Mauborgne (2010), “(...) uma vez que a oferta está a ultrapassar a procura numa quantidade cada vez maior de indústrias, concorrer por uma quota de um mercado em declínio já não será suficiente para conseguir um elevado desempenho.”

Nesta perspectiva, a inovação assume um papel fundamental para o sucesso dos produtos industriais. O design de produto é uma das actividades que faz uso do seu poder criativo na persecução de soluções inovadoras que desejavelmente pretendam antecipar as necessidades dos consumidores e não só respondam às suas demandas presentes e futuras. Disto mesmo, deu-se conta uma micro empresa Portuguesa proponente do exercício que desafiou os alunos e docentes do 3º Ano do Curso Superior de Design do Produto do Instituto Politécnico de Viana do Castelo a desenvolver electrocutores de insectos, produtos com os quais se pretende distinguir no mercado deste sector.

As empresas nacionais vêm na realização destas parcerias uma solução para colmatar a lacuna de possuir departamentos de investigação e desenvolvimento próprios, capazes de incrementar soluções inovadoras adequadas à área de negócio onde se inserem. Por outro lado, estas parcerias possibilitam às unidades de ensino superior a execução de exercícios de projecto mais próximos da realidade com que a muito breve trecho os seus formandos serão confrontados.

O presente trabalho académico, orientado pelos Docentes Designer João Martins e Designer Luis Mota, desenvolvido na unidade curricular de Projecto de Design em Empresas II, durante o segundo semestre do ano lectivo 2010-2011, pretendeu impulsionar o relacionamento dos alunos com as circunstâncias proporcionadas por uma entidade empresarial que actua, neste caso, no mercado dos produtos eléctricos de eliminação de insectos.

Indução metodológica

O projecto “Electrocutor de insectos” visou exercitar o uso do pensamento em Design como princípio de desenvolvimento e de competitividade através da concepção de novos produtos e estratégias de produto. Para além de pretender “...gerir as actividades do Design do Produto próximo da realidade industrial...” reconhecendo “...a ferramenta do Design como agente capaz de distinguir as variantes dos produtos/serviços de uma indústria...” (Martins et Mota, 2011), permitiu igualmente pôr à prova a capacidade criativa dos alunos, convidando-os a desenvolverem novas soluções de produtos que tivessem na sua essência a capacidade de explorar e potenciar as capacidades produtivas existentes na empresa; provocar novos conceitos e novos enquadramentos funcionais; questionar a imagem estereotipada associada ao objecto em estudo; assumir a falta de novos desenhos; compreender a baixa tecnologia de que o produto faz uso e os baixos custos de produção a

que está obrigado, não como limitadores, mas sim como motivadores e oportunidades interessantes para a intervenção do design.

A temática da eliminação de insectos domésticos é por si só um assunto que gera alguma discussão, já que se trata de eliminar voluntariamente indivíduos de uma outra espécie, mas cuja prática parece ser uma inevitabilidade. Ao longo dos tempos têm sido vários os produtos que visam afastar ou eliminar insectos como o mata-moscas, os insecticidas, os insetocaçadores ou os eliminadores/electrocutores de insectos. Estes equipamentos permitem são adequados para um número variado de ambientes interiores onde os insectos voadores não são bem-vindos, bem como para uma variedade de empresas e indústrias com necessidades específicas de controlo eficiente de insectos voadores que lhes permite cumprir com os requisitos legais, de saúde e segurança. Para os manipuladores de alimentos, por exemplo, poderem realizar o seu trabalho nas melhores condições de higiene, é necessário que as instalações possuam electrocutores de insectos. "Os electrocutores de insectos têm que ser instalados em locais adequados, perto das entradas. Nunca devem ser colocados por cima das bancadas, mesas e máquinas. Todos os electrocutores têm de possuir uma base de recolha de insectos mortos."(Silva, 2007). A escolha do tipo de equipamento, está dependente do risco baixo, médio ou elevado de contaminação que os espaços e as actividades que neles se desenvolvem apresentam.

O carácter do projecto, envolvendo o comportamento de uma outra espécie animal, provocou uma alteração quer na abordagem metodológica, quer nos diversos factores considerados no desenvolvimento do projecto como sejam os humanos, tecnológicos, sociais, culturais, ecológicos e também os de índole ética e moral decorrente da utilização prática destes objectos. O projecto iniciou-se com uma investigação geral sobre os insectos e particularmente sobre a mosca-doméstica (*Musca domestica*). Esta mosca tem sido, durante os tempos, responsável por inúmeras propagações de doenças nomeadamente por pousar em géneros alimentícios, contaminando-os de bactérias. É também intensa a percepção da mosca como incómodo, e o aumento desse efeito pode levar mesmo a considerar a hipótese da sua extinção. No entanto, este pensamento é prontamente afastado pelos especialistas já que tal acto provocaria efeitos nefastos na cadeia alimentar. Por isso, continua-se a considerar a existência de produtos que afastam ou eliminam permanentemente este tipo de insecto nas quantidades mínimas julgadas necessárias.

Da análise aos produtos disponibilizados no mercado, concluiu-se que as soluções existentes assentam num desenho fortemente condicionado pelo uso de materiais maioritariamente metálicos e por técnicas básicas de produção (Figura 1).

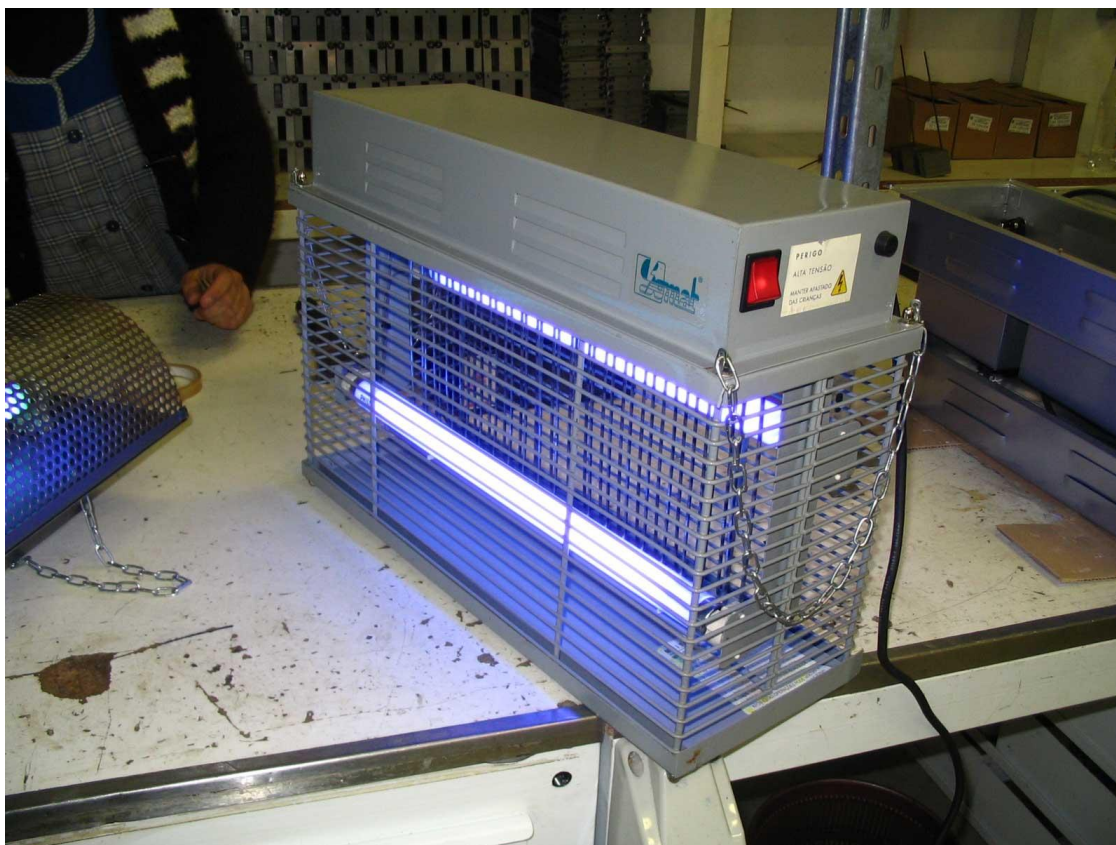


Figura 1: Electrocutador de insectos mais comum

As formas vincadamente geométricas imprimem nos artefactos um carácter “frio” e racional. Talvez na tentativa de os adequar aos ambientes em que são mais utilizados, predominantemente industriais ou espaços comerciais, esta opção poderá conferir ao consumidor comum uma determinada confiança na eficiência destes aparelhos já que pela imagem visual, estes objectos poderão facilmente ser elevados ao estatuto profissional. A relação de proximidade entre o artefacto e o utilizador verifica-se na sua montagem e pontualmente nos períodos de manutenção.

A exploração de novos conceitos teve nestas evidências a motivação necessária para a concepção de novos produtos. No momento de selecção da melhor ideia foram avaliadas as várias propostas, de acordo com os seguintes critérios: utilização transporte; peso; modularidade; durabilidade; manutenção; ciclo de vida do produto; impacte ambiental; instalação; produção e montagem. Esta avaliação permitiu escolher a ideia mais promissora que na fase seguinte foi especificada terminando com a construção do modelo.

O carácter inovador das propostas de produtos assentou no progresso de novas perspectivas sobre o objecto de estudo, a valorização de novos comportamentos do utilizador perante o artefacto, o enquadramento do objecto em novos espaços de utilização, na actualização do desenho ou na introdução de novas combinações de materiais. É genial

a transformação do acto banal, corriqueiro e quotidiano de matar a mosca, numa decisão de fundo ético e como o juízo de valores pode condicionar as decisões de projecto e incitar à inovação. O conjunto de produtos que se apresenta mostra como foi possível abordar este tema de forma criativa e diversa.

Da eliminação de insectos a outros conceitos: algumas propostas de produtos

Para as alunas Margarida Carneiro e Marlene Sá, a redefinição dos comportamentos resultou numa maior “...empatia entre o utilizador e o objecto, permitindo a sua personalização...” (Carneiro & Sá, 2011). O projecto “Módulo” (Figura 2), recorrendo a diferentes aplicações de materiais e padrões, consegue estabelecer modos diferenciados de utilização do objecto e, com isso, conseguir uma maior proximidade e afinidade com o utilizador.

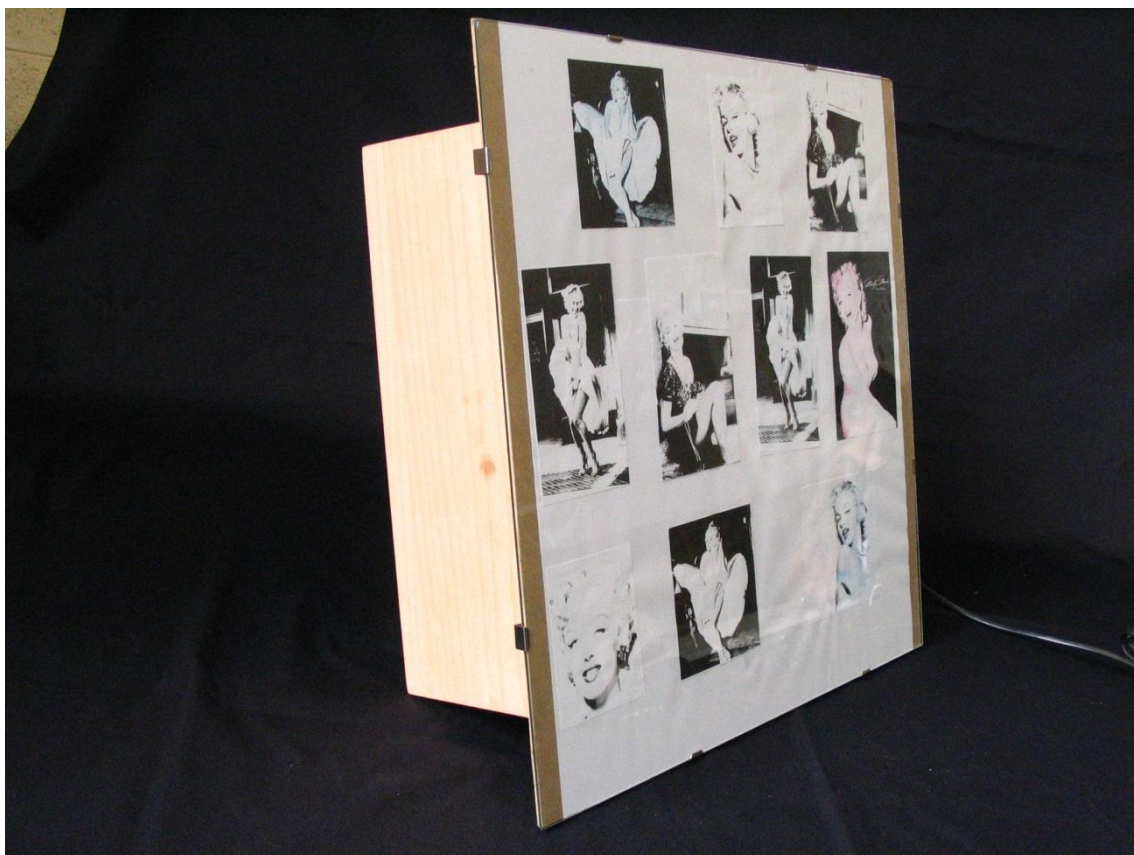


Figura 2: Modelo do electrocutor de insectos “Módulo”. Mudando os materiais empregues na frente do objecto permite personalizar o mesmo através de funções diversas e segundo as necessidades e desejos do seu utilizador.

No projecto “Electrocutor Portátil” (Figura 3) desenvolvido pela equipa de alunos Chiara Francione, Samuel Lemos e Alexandrina Saraiva, a transportabilidade do objecto

confere à solução uma propriedade inovadora de maior proximidade com o utilizador, convidando-o a interagir regularmente com o aparelho, quer pela escolha da melhor localização quer pela facilidade de manutenção com recurso a sacos de papel recicláveis.



Figura 3: Modelo do electrocutor “Portátil” dos alunos Chiara Francione, Samuel Lemos e Alexandrina Saraiva. Electrocuter portátil, que recorre à utilização de sacos de papel já utilizados para servir recolha dos restos dos insectos.

Uma outra perspectiva explorada recaiu na possibilidade de conferir ao objecto novos enquadramentos, aplicando-o em ambientes diferentes em que o objecto é “...desenhado para ser apropriado e ser transportado para um cenário doméstico, descontextualizando-o do ambiente comercial e industrial...” (Francione, Lemos & Saraiva, 2011), para o qual normalmente é utilizado.

Nesse sentido as propostas “Girassol” (Figura 4) e “Electrocutor portátil” (Figura 3), assumem a ruptura na utilização esperada a este tipo de objectos, através da subversão provocada num objecto tipicamente técnico, para um objecto cujo carácter visual marcante convida à sua utilização em ambientes domésticos.



Figura 4: Modelo do electrocutor “Girassol”. Sistema de electrocussão de insectos recorrendo a elementos naturais para atrair insectos em ambiente doméstico.

Os alunos Melissa Borges e Tiago Gonçalves com o projecto “EletroBio” (Figura 5), propõem tirar benefício dos insectos mortos fornecendo alimento a outros seres vivos. O aquário, colocado por baixo do sistema de electrocussão, recebe os restos dos insectos que caiem por acção da gravidade no depósito de água, habitat de uma espécie piscícola. “A ideia apresenta cuidados éticos e ambientais procurando fazer com que a morte destes seres vivos não seja em vão, completando assim um ciclo de vida”. (Borges & Gonçalves, 2011).

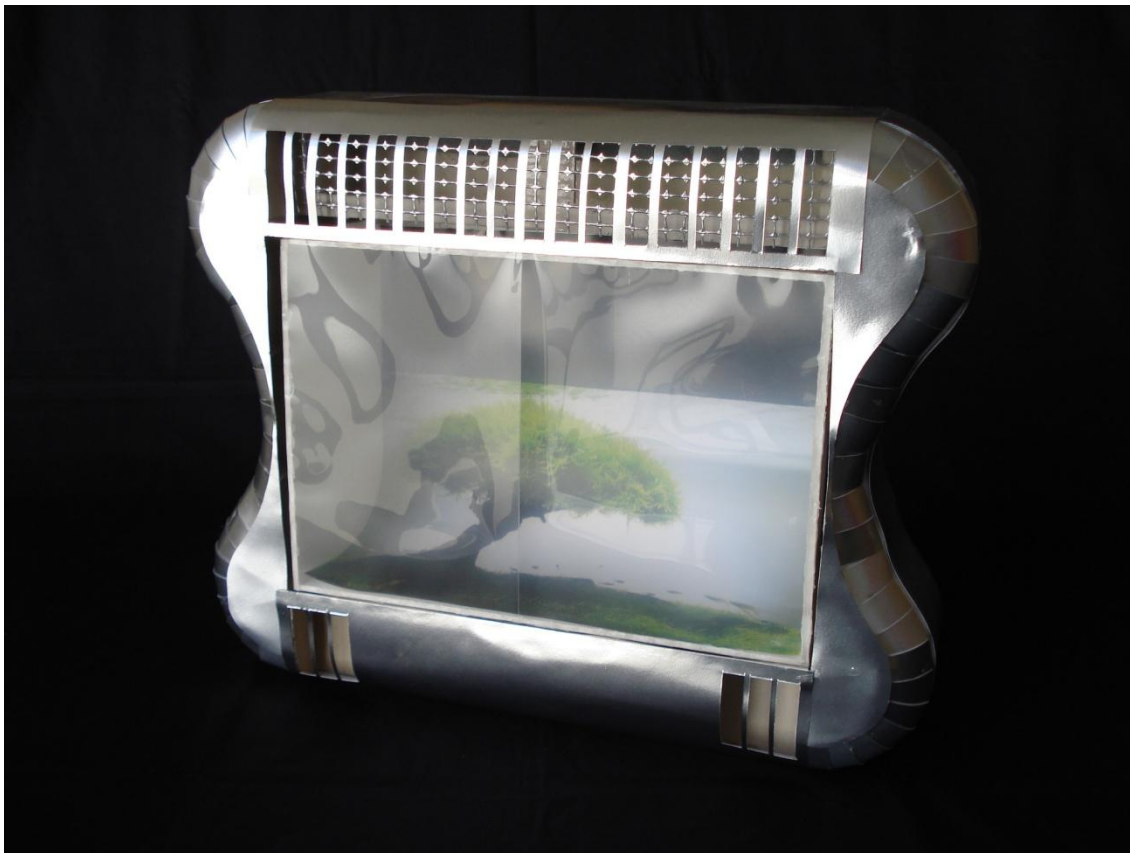


Figura 5: Modelo do electrocutor “EletroBio”. Sistema de electrocussão de insectos e aquário dos alunos Melissa Borges e Tiago Gonçalves. Os restos dos insectos mortos caem para o habitat aquático servindo de alimento aos peixes.

Inspirado no conceito moda, o projecto das alunas Sara Costa e Mariana Novo, denominado “Maleta” (Figura 6), é um Electrocutor de insectos concebido para uma sociedade moderna. Quando exposto pretende provocar no utilizador uma sensação de conforto, de comodidade e de bem-estar, pronto a ser levado para qualquer lugar. “Como é um objecto destinado para o espaço casa é notoriamente agradável e sóbrio, portanto é um produto que tende a dissolver-se pelo próprio ambiente”. (Costa & Novo, 2011)



Figura 6: Modelo do electrocutor “Maleta”. Projecto apoiado em conceitos de moda e inspirado na mala de mão.

O projecto “Circuloluz” (Figura 7) proposto pelos alunos Sara Vaz e Jorge Passos, é um produto idealizado para espaços de restauração, e tem duas funções: electrocutor de insectos e candeeiro de tecto. O produto pretende obter maior eficácia já que utiliza uma grelha electrificada circular podendo a electrocussão de insectos dar-se num ângulo completo (360°).



Figura 7: Modelo do electrocutor "Circuloluz". Sistema de electrocussão circular e candeeiro de tecto dos alunos Sara Vaz e Jorge Passos.

Pretendendo romper com as formas "obsoletas" dos electrocutores de insectos existentes e penetrar em novos segmentos de mercado, o "Home Insect Device" (Figura 8), dos alunos José Cruz e Luis Eusébio, é um electrocutor de insectos de aparência semelhante à de um vaso com plantas. "Este produto destina-se a um ambiente privado, a casa. As suas formas são simples e atractivas, dissimulando-se no ambiente doméstico ou funcionando como elemento decorativo."(Cruz & Eusébio, 2011)



Figura 8: Modelo do electrocutor “Circuloluz” inspirado em produtos arquétipos da nossa habitação (vaso de plantas) dos alunos José Cruz e Luis Eusébio.

O projecto "LedChoK" (Figura 9) consiste na apropriação do objecto lanterna para fusão do sistema de electrocussão. Os alunos Fátima Cerqueira e Luis Viana propuseram "...redesenhar um produto (lanterna) que está nas suas inúmeras variantes, solidamente implantado no mercado e é de utilização habitual e generalizada por variados tipos de pessoas em diferentes cenários, podendo ser usado com as duas funções activadas em simultâneo ou alternadamente." (Cerqueira & Viana, 2011).



Figura 9: Modelo do electrocutor “LedChok”. Peça de iluminação e electrocussão de insectos portátil dos alunos Fátima Cerqueira e Luis Viana

Conclusão

As propostas de produtos apresentadas neste artigo ambicionam mostrar a capacidade criativa dos nossos futuros designers de produto e do trabalho exploratório que se faz nas escolas de Design na tentativa de reflectir em conjunto e através da metodologia do projecto sobre as várias realidades e exigências: da academia à indústria, da sociedade à cultura, do indivíduo humano às outras espécies. Esta aparente dicotomia de conceitos resultou numa síntese de constrangimentos e oportunidades que se tentaram perceber perfeitamente. O entendimento dos constrangimentos comerciais, produtivos, etc, percepcionados não como castradores de soluções criativas, mas sim como motor de desenvolvimento de novas perspectivas e novos enquadramentos sobre a problemática apresentada em programa, verifica-se como argumento essencial na obtenção de soluções diferenciadoras e inovadoras.

A experimentação ou a assunção do risco por novas abordagens, que não viciadas por soluções estereotipadas, assume-se como uma forma de conseguir obter soluções inovadoras e capazes de se distinguir das demais presentes no mercado.

A elevada motivação para a realização de um projecto deste tipo resulta da efectivação da parceria entre uma empresa e a escola. A conjugação de esforços entre

indústrias e o meio académico, visa uma estratégia com grande potencialidade para a obtenção de soluções com aplicabilidade prática e retorno económico capazes de contribuir para o sucesso das empresas no mercado do consumo e da academia no mercado da educação.

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CHANGE PLAY BUSINESS: THE BUSINESS TURNAROUND GAME.

Maria Ana Neves

Just imagine what would happen if you combined...

... a fashion business, with a sandwich bar, with an online social network, with a software developer and your own organization to create a new business concept?

This paper will present an inspiring creative process Change Play Business (CPB) co-designed by The Thinking Hotel ®, as an answer to a challenge set by Own-it and the interdisciplinary partnership between LCC (London College of Communication) and Cranfield University – to identify a new knowledge-transfer process designed to help business leaders overcome the barriers for success in a context where the digital technology, radical change in consumer behavior, the failure of traditional business models, limited access to finance, fierce and global competition for talent, and the need for sustainability are challenging the skills and imagination of today's entrepreneurs, business >managers and their advisers.

CPB is a design-led workshop, combining techniques of play together with business strategic thinking to transform existing and emerging businesses. From random connections, fun, trial and error, imagination and action with business acumen, economical and social awareness to help “players” identify new revenue streams, re-view their business models and develop unusual synergies to leverage underperforming or underdeveloped business areas, aiming to create new potential for innovation and high-growth through creativity and imagination.

CPB was played by diverse teams of people who successfully established a business and started facing unprecedented challenges due to a changing market place.

Players from the pilots and trials editions found this process helped them change the way they think!

As a regular attendee of innovation conferences I was really amazed by the novel approach of the Change Play Business event. Due to the extensive preparation and professional guidance by the organization I quickly noticed that all the teams were truly immersed in this one-day creative journey. If you want to sparkle innovation within your organization, attending Change Play Business will be a great firestarter!

Nick de Mei, founder of the Board of Innovation – and an expert at Change Play Business – Lisbon – July 2011.

Authors:

This paper will be presented by Maria Ana Botelho Neves – project leader of Change Play Business © , however the this work is a co-designed process developed by the team of The Thinking Hotel ® which is an online global network of co-creators based on Lindkedin, and hosted at the C4CC – centre for creative collaboration in London.

The core team behind this project is:

Maria Ana Neves, MA FRSA – Design and Branding Strategist and Associate Lecturer at Central St Martins, University of the Arts – founder of The Thinking Hotel ® and Head of Innovation of Sintese Azul as well as director of London YNOT. Previously Project Manager of DesignPlus – Brunel University.

Olga Casademunt, MSc – A highly creative award winning design professional, Olga has a strong entrepreneurial spirit that allows her to spot good opportunities for business and new product development. Her freelance career as a high end jewelery designer and recent post-graduate Masters In International Marketing have helped her set her future objectives.

Villie Tsang - Villie is a new media designer trained in both traditional and digital arts. Throughout her professional career, she has helped brands build corporate identities across various platforms and develop brand strategies, and is currently completing post graduate studies in MA Innovation Management at Central Saint Martins.

Chris Wilkie Chris began his career in broadcasting, as a researcher and archivist. He progressed to become a senior manager and began a continuing interest in coaching and mentoring to encourage collaboration amongst his teams.

Also very important contributors for this Project are:

Maria João Resende - Maria João engaged with her career in advertising as copywriter in 1980, working at Lintas, one of the top advertising agencies in the world. She is now the CEO, the Financial Director, HR, Creative Director, Copywriter, a PA, office girl, and sometimes a Chief Innovation Executive, in her micro creative agency.

Monika Hestad, PhD and Brand Strategist – Associate Lecturer in Central St Martins and a Lecturer of Oslo school of design and architecture – a key design strategist of the first version of Change Play Business.

And a great team of enthusiastic innovation leaders and Change Play Players and Experts who engaged with this adventure and keep our team's commitment to continue develop.,

Michael Metelits - Director of Business Development at Goldsmiths, University of London, with experience in contract and collaborative research and consultancy development, IP negotiations, spin-out creation, and other aspects of business/academic collaboration. Previous incarnations include innovation consultant and scenario planner, contract project manager, journalist, and operations manager. Current focus is building relationships between business and London academic institutions.

Silvia Baumgart, Programme Coordinator at Own-it Experienced arts management professional, business development and project manager.

Brian Condon, Strategist, Entrepreneur, Manager and Broadband Campaigner - Currently working with top 20 UK universities on technology transfer and research commercialization. Business development with Aquafuel Research Limited in renewable CHP and clean combustion Working on "Next Generation Access" feasibility studies in the UK, and new business models in FTTP and Multi-Utility Service Companies. Actively working in the telecoms space - as a consultant and events organiser and speaker.

LA CREACIÓN DE *SPIN-OFF* UNIVERSITARIAS: CASO DEL INSTITUTO TECNOLÓGICO DE COSTA RICA (ITCR)

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Resumen

El presente artículo expone el caso de las *Spin off* académicas del Instituto Tecnológico de Costa Rica, en este se identifica y determina a los emprendedores académicos, los factores determinantes de su creación y las características más relevantes de las *spin-off* académicas, los hallazgos se contrastaron con las investigación de Ortín *et al.* ADDIN EN.CITE ADDIN EN.CITE.DATA (**HYPERLINK** \l "_ENREF_41" \o "Ortín, 2007 #653" 2007) y Aceytuno y Paz, (2008) utilizadas como medio de comparación. El objetivo es contribuir a explicar el comportamiento de estas variables y su efecto, en el proceso de creación de *spin-off* académicas surgidas en el ITCR, para contar con información que apoye en la toma de decisiones que las impulsen.

Palabras clave: emprendedurismo académico, *spin-off* académico, creación de empresas universitarias, factores determinantes, proceso de creación de *spin-off*

Introducción

La creación de empresas es cada día una prioridad para los países que aspiren a mejorar las condiciones de vida para sus ciudadanos, también se ha dicho que un país sin un sistema fuerte de Ciencia y Tecnología, está en inferiores condiciones para enfrentar los retos que el futuro traerá (Shane & Venkataraman, 2000).

Así la combinación del emprendedurismo y de la Ciencia y la Tecnología, se perfilan como un derrotero para impulsar las economías de los países, a través del instrumento conocido como las *spin-off* académicas, por su capacidad de impactar positivamente el mercado al introducir un nuevo producto o servicio de valor agregado (O'Shea, Allen, Morse, O'Gorman, & Roche, 2007; Laborda & Briones, 2010).

El compromiso de la universidad para con la sociedad, manifiesto este, a través de la vinculación entre la academia y el sector productivo; contribuye a impulsar la creación de empresas (Bueno, 2007). No obstante, ¿cuáles son los factores que contribuyen a impulsar el surgimiento de *spin off* académicas? y ¿cuál es su comportamiento en una universidad tecnológica, pública y latinoamericana? Por esta razón se presenta el caso de las *spin-off* académicas del Instituto Tecnológico de Costa Rica, con la finalidad de contar con elementos que permitan comprender la situación y promover la toma de decisiones a favor del surgimiento de las mismas.

El objetivo principal es Contribuir a promover la creación de Spin-off académicas en el Instituto Tecnológico de Costa Rica. Así como: Identificar y caracterizar las spin-off académicas surgidas en el TEC y caracterizar los factores determinantes que han influido en su proceso de creación

Se utilizó la metodología cualitativa análisis de caso y se realizaron entrevistas personales, a los emprendedores académicos identificados, autoridades universitarias y funcionarios de gobierno, a través de un cuestionario; de acuerdo a los trabajos realizados por O' Shea et al., (2007) y Aceytuno & Paz (2008).

1. La universidad y la universidad emprendedora

La universidad ha evolucionado para responder a nuevos planteamientos de los sistemas políticos, económicos y sociales del mundo. Lo que ha transformado su misión, planteamientos, estructura e, incluso, cultura (Ortega y Gasset, 1937; Bueno, 2007; Morales, 2008). La misión fundamental de la universidad, hasta la edad media, fue la conservación y transferencia del conocimiento. Caracterizándose por la incorporación de nuevas disciplinas humanísticas y técnicas (Bricall, 2000; Bueno, 2007).

A principios del siglo XX se presentó la primera “revolución académica” (Etzkowitz, Carvalho de Mello, & Almeida, 2005), a partir de: La aparición del modelo de “universidad moderna”, elaborado por Humboldt por encargo del rey de Prusia en 1810, y la aparición de la primera intervención sistemática de los gobiernos nacionales en las universidades (Bricall, 2000; Etzkowitz, *et al.*, 2005).

Así la “universidad moderna” incorpora la generación de conocimiento como segunda misión, resaltando la importancia del vínculo entre la enseñanza y la investigación científica. Como característica de este modelo el conocimiento creado por la universidad era valioso en sí mismo (Audretsch & Phillips, 2007).

En Estados Unidos surge, la “segunda revolución académica” a mediados de los años 1980s (Etzkowitz, *et al.*, 2005). Algunos aspectos que impulsaron el surgimiento, fueron los cambios en las políticas públicas gubernamentales y federales que promovían la comercialización de la tecnología, fomentando las alianzas estratégicas para obtener nuevas fuentes de financiación; el deseo de las instituciones gubernamentales y locales de obtener algún tipo de compensación por los recursos asignados a la universidad; la complejidad de los nuevos desarrollos tecnológicos que requería un trabajo multidisciplinar y el desarrollo de nuevos tipos de colaboración entre la universidad y la industria; y una disminución en las fuentes de financiación tradicionales de la universidad, entre otros (Etzkowitz, 2003). Suplementariamente, el cambio en la realidad económica, basada en el conocimiento y la innovación, conllevó a que en la “segunda revolución académica” las universidades replantearan la mejora de su estructura para realizar sus dos misiones tradicionales

(enseñanza e investigación) optimizando los recursos a su disposición y responder a una tercera misión: “contribuir al desarrollo socio-económico de las naciones” (Smilor, Dietrich, & Gibson, 1993).

La tercera misión de las universidades está relacionada “con la generación, uso, aplicación y explotación del conocimiento y otras capacidades de la Universidad fuera del contexto académico. La tercera misión de la universidad, es definida por Clark (1999) como la universidad emprendedora o emprendedurismo académico, la cual se basa en el proceso de la comercialización tecnológica de los recursos universitarios. Este concibe la “tercera misión” a través de la actividad emprendedora de la universidad, visualizándola como una institución fundamental para la transferencia de I+D o del conocimiento tecno-científico la cual realiza las tres misiones (academia, investigación y emprendedurismo académico) de una universidad (Etzkowitz, 1998; Molas, Salter, Patel, Scott, & Durán, 2002).

Así, la tercera misión impulsa la creación de empresas universitarias, como parte de su labor (Serarols, Urbano, & Bikfalvi, 2007; Yusuf & Nabeshima, 2007). Estas son fuente de trabajo para personal altamente cualificado (Steffensen, Rogers, & Speakman, 1999; Shane, Scott 2004), una forma de transmisión de nuevas tecnologías a la sociedad (Markman, 2005), una fuente de financiación para la investigación universitaria u otras tecnologías poco desarrolladas o cualquier tipo de conocimiento tácito (Know-How) generado en la universidad (Serarols, *et al.*, 2007). Por último la creación de empresas universitarias promueve el espíritu emprendedor de la propia universidad y de la región donde se sitúa (Doutriaux, 1991).

2. El emprendedor

El emprendedor, actividad emprendedora o "entrepreneur" es un área de estudio. Es un término de amplia utilización, que no es nuevo, y aún no existe una definición completamente aceptada. (Shane & Venkataraman, 2000; Audretsch, 2002). El término “entrepreneurship” fue, planteado por Richard Cantillon para referirse a un empleador o a una persona de negocios, que opera bajo condiciones donde los gastos son conocidos y ciertos y los ingresos desconocidos e inciertos por el alto grado de incertidumbre en la demanda (Cantillon, 1997).

El informe General Monitor Entrepreneurship (GEM) ofrece la reciente definición sobre emprendedurismo o actividad emprendedora, que se ha convertido en un referente. Se entiende por actividad emprendedora el conjunto de iniciativas de negocio de cualquier tipo y sector, incluido el autoempleo, que están en el mercado por un período no superior a 42 meses o tres años y medio. Superado dicho período, la actividad pasa a ser considerada como consolidada (Vega, Cruz, Justo, Coduras, & González, 2010).

- **Características generales del emprendedor**

Las características generales del emprendedor, fueron definidas a través de la investigación realizada por Pablo *et al.*, (2004), en la que concluyeron que existen varias categorías de factores relevantes, que explican el emprendimiento: a) la personalidad del individuo, es decir, los rasgos psicológicos, el perfil personal del emprendedor, que van a definir sus aptitudes; b) los aspectos motivacionales, o impulsos, que llevan a un individuo a embarcarse en un proyecto; y, c) las capacidades y competencias, las habilidades y conocimientos del individuo que son el resultado de la evolución de las aptitudes desarrolladas a lo largo de su vida, gracias al aprendizaje y la experiencia. En conclusión el perfil del emprendedor es una persona altamente motivada, con gran energía, innovadora y creativa, con gran capacidad de análisis, perseverante, con cierto grado de propensión a correr riesgos y con capacidad de influenciar sobre las demás personas (Pablo, *et al.*, 2004).

3. El concepto de spin-off

El concepto de spin-off expresa la idea de nuevas actividades económicas creadas en el seno de otra empresa o entidad ya existente que, con su apoyo y supervisión, adquieren independencia y viabilidad propias, en términos de estructura jurídica, técnica y comercial. Las empresas o entidades de las que surgen, hacen la función de matriz sirviendo de apoyo para el despegue del spin-off (ANCES, 2003).

Según la OCDE, (2001) (Organización para la Cooperación y el Desarrollo Económico), los spin-offs son: (a) empresas creadas por investigadores del sector público (personal del staff, profesorado o estudiantes); (b) empresas emergentes que disponen de licencias de explotación de tecnologías creadas en el sector público; (c) empresas emergentes sostenidas por una participación directa de fondos públicos, o que fueron creadas a partir de instituciones públicas de investigación. Teniendo en cuenta el sentido amplio del término spin-off, diremos que se refiere al proceso de creación de nuevas empresas a partir de otras ya existentes.

3.1. El spin-off académico

La modalidad del spin-off académico; surge por los buenos resultados que los spin-off industriales y se define como nuevas empresas creadas para la explotación de procesos, productos o servicios basados en tecnologías o conocimientos avanzados, desarrollados en las universidades o centros de investigación. Se caracterizan por ser empresas fundadas generalmente, por el propio personal investigador de la universidad, o doctorandos, profesores o alumnos de la misma y que aunque persiguen intereses empresariales, cuentan con el apoyo institucional (Nlemvo, Pirnay, & Surlemont, 2002; Rubio, 2009).

El término spin-off académico es reciente, por lo que no existe un consenso en la literatura (Morales, 2008; Aceytuno & Cáceres, 2009). En esta investigación se tomará como base la

definición de spin-off, planteada por Pirnay *et al.*, (1998) y la define como el proceso de creación de empresas que cumple los tres requisitos siguientes: 1) tiene su origen en una organización existente; se deriva, de una organización madre u organización de origen; 2) involucra a uno o varios individuos, con independencia de cuál sea su estatus o función en la organización de origen; 3) estos individuos abandonan la organización de origen, para crear una organización nueva, la spin off (Pirnay, 1998).

3.2. Propuesta de definición de spin-off académica

Dada la variedad de definiciones existentes, consideramos apropiado proponer una conceptualización del spin-off académico. Se tomará como base la definición de spin-off general propuesta por Pirnay *et al.*, (1998) con la intención caracterizar este fenómeno.

Tomando de esta definición los aspectos: 1) tiene su origen en una organización existente; 2) involucra a uno o varios individuos, con independencia de cuál sea su estatus o función en la organización de origen; y 3) “estos individuos abandonan la organización de origen para crear una empresa nueva, la spin-off”, y planteando un análisis, esta definición no precisamente se aplica a las spin-off universitarias, ya que por las características propias de la universidad, el emprendedor puede combinar o no, su función emprendedora con su labor académica. Así las cosas, la spin-off académica se define como un tipo particular de spin-off, creada con el propósito de explotar comercialmente conocimiento, tecnología o resultados de investigación, desarrollados en el seno de una universidad; añadiendo que el conocimiento que se constituye como base de la empresa puede ser tácito y/o explícito. Para ser clasificada como una spin-off académica, el fundador debe provenir de una universidad y la actividad de la empresa debe estar basada en ideas técnicas, generadas en el entorno de la misma.

Desde la perspectiva del estatus del individuo en la organización, las spin-off se dividen en estudiantiles y académicas. Las spin-offs estudiantiles son aquellas creadas por miembros de la comunidad estudiantil, con poco bagaje investigador; mientras que las spin-offs académicas son las empresas creadas por un individuo de una comunidad “científica”, incluyendo personas con experiencia investigadora, como es el caso de los profesores, ayudantes, investigadores y estudiantes de doctorado (Pirnay, Bernad Surlemont, & Nlemvo, 2003).

De aquí en adelante se entenderá como spin-off académicas, las empresas que tienen como objetivo la explotación del conocimiento generado en la universidad, con la intención de comercializar conocimiento codificado o tácito, creadas por personal investigador o empleados de universidades y centros de investigación públicos, a partir de conocimiento generado como resultado de su actividad investigadora. Estas empresas pueden ser consideradas spin-off según la clasificación de Nicolau & Birley (2003) a saber: ortodoxas, aquellas donde solo se transfiere la tecnología y el investigador abandona la universidad, o híbrida, aquellas donde se transfiere la tecnología y el emprendedor conserva su puesto en la universidad. Además, desde la perspectiva

del surgimiento, los emprendimientos pueden ser espontáneos o planeados según Steffensen *et al.*, (1999) o bien desde la perspectiva de la actitud de la universidad pueden ser con apoyo o sin apoyo de la misma (Pimay, *et al.*, 2003)

4. Proceso de creación de spin-off académicas

O' Shea *et al.*, (2008), estructuran los cuatro factores tomados en cuenta en esta investigación, como “determinantes de la creación de spin-off en el contexto universitario”, a saber: (1) los atributos y las características de personalidad de los emprendedores académicos; 2) los recursos propios y las capacidades de la universidad; 3) la estructura universitaria y las políticas de comercialización; y 4) los factores ambientales ó externos que influyen en los emprendimientos académicos. O'shea *et al.*, (2007) avalan la importancia de estos cuatro factores como los principales del proceso de creación de spin-off académicos.

Se observa en la **Erro! A origem da referência não foi encontrada.** que a partir de la identificación de la oportunidad tecnológica (Roberts, 1991), se identifican varios grupos de factores determinantes que influyen en la decisión de crear la spin-off y su proceso de formación.



Figura 1 Fuente: Aceytuno y Paz (2008)

4.1. El emprendedor académico como determinante

Es un determinante clave, pues la creación de la spin-off académica es un reflejo de las acciones individuales, resultado en gran medida de los factores personales de los académicos, tales como personalidad, habilidades, trayectoria profesional y disposición a implicarse en actividades empresariales (Aceytuno & Paz, 2008).

El emprendedor académico ha sido estudiado examinando aspectos como el rango académico, la experiencia en actividades emprendedoras, la calidad y productividad científica y las redes sociales, entre otros; así como los factores que influyen en la probabilidad de que

un investigador decida crear una empresa (Shane & Khurana, 2003; Audretsch, Aldridge, & Oettl, 2005).

Shane, (2004) y Franzoni & Lissoni, (2006) indican que los investigadores crean empresa al final de su carrera. Levin & Stephan, (1991) indican que las publicaciones del investigador se convierten en un requisito para acceder a una plaza fija, lo cual le brinda tranquilidad para el desarrollo de otras actividades emprendedoras y que una vez alcanzadas la estabilidad y los premios académicos, éstos se plantean obtener retornos financieros de su capital intelectual a través de otro tipo de actividades como la creación de empresas. Para los científicos, crear una empresa es un medio para apropiarse del valor de su propiedad intelectual y para acceder a mecanismos de financiación adicionales para el desarrollo de futuras investigaciones (Feldman, Feller, Bercovitz, & Burton, 2001). Audretsch & Stephan, (1999) demostraron que los investigadores académicos crean empresas en una etapa más tardía de su carrera, que los investigadores de la empresa privada. Klofsten & Jones, (2000) encontraron que la mayoría de los emprendedores investigadores son mayores de 40 años. Shane & Khurana (2003) sostienen que aquellos investigadores que han alcanzado un alto rango académico, tienen una mayor probabilidad de crear empresa, donde el estatus del científico actúa como un indicador de la calidad del proyecto de empresa para los inversores potenciales y tiende a minimizar el riesgo inherente a la creación de una empresa. Shane & Khurana, (2003) y Shane (2004) señalan que cuando al menos uno de los investigadores involucrados en la empresa tiene un alto estatus, es más fácil obtener financiación para el proyecto empresarial. Por el contrario, Landry *et al.*, (2006) encontraron que el estatus del investigador no influye significativamente sobre la probabilidad de crear empresa. Vohora *et al.*, (2004) indican que la investigación científica es la que permite al emprendedor obtener el conocimiento necesario para poder identificar una nueva oportunidad de aplicación comercial. Landry *et al.*, (2006) encontraron que el número de años de experiencia en investigación influye positivamente en la probabilidad de crear una spin-off. Di Gregorio & Shane (2003) señalan que los científicos de mayor calidad muestran una mayor probabilidad de crear empresas que los de menor calidad, como es el caso de los científicos estrellas, con un record sobresaliente de publicaciones y una posición muy influyente en las comunidades académicas y empresariales y con una amplia experiencia en el manejo de altos volúmenes de subvenciones y de personal en sus laboratorios (Franzoni & Lissoni, 2006) y que además buscan obtener una rentabilidad financiera sobre el conocimiento tácito acumulado (Zucker, Darby, & Brewer, 1998). Este hecho ha sido confirmado por el estudio de casos de empresas realizado en el Reino Unido por Vohora *et al.*, (2004), quienes encontraron que los fundadores de estas empresas se hallaban en la frontera de la investigación en sus campos de conocimiento y poseían un valioso know-how y activos tecnológicos. Igualmente Shane (2004) sugiere que las empresas más exitosas son aquellas creadas por investigadores líderes mundiales en su área de conocimiento. Di Gregorio y Shane (2003), en un estudio sobre los factores que influyen en que una universidad genere más

empresas que otra, hallaron que existe una relación significativa y positiva entre la eminencia de la universidad y el número de empresas creadas. Louis *et al.*, (1989) encontraron que las variables que mejor predecían la participación de un científico en una empresa, eran la existencia de otros comportamientos emprendedores (consultoría, financiación por parte de la industria y las patentes) y el encontrarse en un entorno en el que el "entrepreneurship" sea la norma. Shane & Khurana, (2003) hallaron que los inventores que habían licenciado previamente tecnología, tenían una mayor probabilidad de crear empresa que los que no habían licenciado y que la experiencia en la obtención de financiación externa aumenta la probabilidad de crear empresa.

El perfil del emprendedor académico

Lo anterior, permite concluir que los emprendedores académicos son investigadores que se encuentran en una etapa avanzada de su carrera académica, tienen un alto estatus en su organización de origen, amplia experiencia laboral en la academia, altos niveles de calidad, generalmente los mejores en su área, y una amplia experiencia emprendedora en la universidad en el momento en que deciden crear sus empresas.

4.2. Recursos organizativos de la universidad

Los recursos disponibles en cada universidad, fruto de su historia y éxitos pasados, es un determinante en el número de spin-off generadas y permite explicar las diferencias, en este aspecto, entre universidades (Aceytuno & Paz, 2008). Entre estos tenemos: a) El nivel y naturaleza de los fondos que se utilizan para financiar la investigación. Powers & McDougall, (2005) plantean que la procedencia y cuantía de los fondos utilizados para financiar la investigación son un factor determinante en la generación de spin-off, ya que la investigación financiada con recursos privados es más susceptible de ser comercializada, así los investigadores cuya actividad es financiada mediante recursos procedentes de la industria, son más activos en la transferencia comercial de los resultados, tanto mediante el uso de licencias de patentes, como a través de la generación de spin-off (Aceytuno & Paz, 2008); b) La naturaleza de la investigación, que incluyen tanto el nivel de oportunidades, como la propensión a comercializar los resultados de la investigación. Varían considerablemente entre los distintos campos científicos y son más proclives en aquellos sectores de actividad científica y tecnológica (Shane, Scott 2004; Siegel & Phan, 2006). O'Shea *et al.*, (2004) señalan que la financiación de investigaciones en ciencias e ingeniería es más fructífera en generación de spin-off, destacando especialmente las investigaciones que se llevan a cabo en las ramas de ciencias de la salud, la informática y la química; c) La calidad de los investigadores. Influye positivamente en la obtención de resultados importantes, que pueden ser comercializados mediante la creación de una spin-off (O'Shea, *et al.*, 2004; Powers & McDougall, 2005). Los trabajos de Powers & McDougall (2005) mencionan que la calidad de la investigación en la universidad es un factor determinante en la generación de spin-off. Al obtener resultados importantes y la participación de los científicos y universidades de prestigio, favorece la comercialización, a través de la creación de empresas. La calidad de los investigadores es medida a través de varios índices COTEC (2006):

competitividad investigadora medida como porcentaje de proyectos de I+D aprobados sobre los presentados y El esfuerzo investigador medido como el porcentaje de proyectos de I+D aprobados por profesor en nómina. Zucker *et al.*, (1998) destacan tanto la importancia de la presencia de “científicos estrella” y sus colaboradores para la generación de spin-off, como su relación con universidades de prestigio, considerando que éstos crean las spin-off con el objetivo de obtener rentas de su capital intelectual. Di Gregorio & Shane (2003) señalan que existe una relación positiva entre la generación de spin-off y el prestigio de las universidades, basándose en que explotar tecnologías cuyo resultado comercial es incierto, es más fácil cuando el prestigio de la universidad respalda la credibilidad del emprendedor académico.

d) La estrategia de apoyo a la generación de spin-off académica, relacionada con la cultura y los objetivos de la universidad. Clarysse *et al.*, (2005) diferencian tres modelos: i) modelo de selección baja, cuyo objetivo es generar un mayor número de spin-off, tanto de alumnos como de investigadores, sin darle importancia al aspecto económico y financiero. ii) modelo de apoyo, que considera la generación de spin-off como una forma de comercializar los resultados de la investigación, de manera alternativa a la licencia de patentes. iii) modelo de la incubadora, cuyo objetivo es buscar oportunidades derivadas de la investigación científica, donde la spin-off es la forma más beneficiosa de explotación comercial, frente al licenciamiento de patentes; e) La disponibilidad de oficinas de transferencia tecnológica en la universidad. Se puede considerar un factor determinante del surgimiento y desarrollo de spin-off universitarias (O'Shea, *et al.*, 2008; O'Gorman, Byrne, & Pandya, 2008) son creadas para mediar entre los investigadores de la universidad y la industria. Sus funciones incluyen la promoción de las spin-off y la difusión de los resultados de la investigación que se lleva a cabo (Siegel, Waldman, & Link, 2003), así como la gestión del valor de la propiedad intelectual o colaborar con los investigadores en la difusión de los resultados de su investigación (Carlsson & Fridh, 2002 ; Jain & George, 2007). Destacan las siguientes funciones (Roberts & Malone, 1995): i) Toma de decisiones durante el proceso de evaluación de las posibilidades comerciales del invento; ii) Planificar la protección intelectual del invento; iii) Relacionar a los empresarios con empresas de capital riesgo; d) Participar en los organismos gestores de la empresa. Estudios han analizado la influencia de las oficinas de transferencia sobre la generación de spin-off y su efectividad como mecanismo de transferencia (Parker & Zilberman, 1993; Jain & George, 2007). Sin embargo, no existe consenso sobre su efectividad en la generación del spin-off, aunque su influencia se considera generalmente positiva (O'Shea *et al.*, 2007). Estas constituyen un elemento más de apoyo en una actividad compleja e influenciada por varios factores, como por ejemplo, la influencia del entorno empresarial (Debackere, 2000); g) Por último, la presencia de incubadoras de empresas. Son centros en los que se sitúan las spin-off durante sus primeros años de actividad (Clarysse *et al.*, 2004; Rothaermel y Thursby, 2005). Steffensen *et al.*, (1999) consideran que son útiles en las primeras etapas de funcionamiento de la spin-off y cuando

existen fuertes relaciones entre los investigadores y la universidad (Rothaermel y Thursby, 2005). Otras investigaciones muestran que, la influencia de las incubadoras universitarias sobre la generación de spin-off, es insignificante, aunque no implica que no puedan favorecer su éxito (Di Gregorio y Shane, 2003).

4.3. Determinantes institucionales

Markman *et al.*, (2008) han tratado estos determinantes y su importancia, identificando a tres como los principales: la misión de la universidad, la cultura y su historia y la tradición, permitiendo identificar a las universidades que se encuentran dentro del paradigma de la “universidad emprendedora”, en las que estos factores se encuentran orientados hacia la comercialización de los resultados de la investigación y la creación de empresas, como son el MIT o la Universidad de Stanford en EEUU (Kenney & Goe, 2004; O’Shea, *et al.*, 2007).

Existen otras universidades en cuya cultura continua predominando el “paradigma científico”, donde es común que la universidad evite la implicación de los científicos en los usos últimos de la investigación, y no se favorece ningún tipo de transferencia tecnológica, y menos aun, la creación de empresas por parte de los investigadores. Ndonzuau *et al.*,(2002) señalan que el paradigma científico ha contribuido al establecimiento de un sistema de recompensas en la universidad, en el que se identifican tres características que no favorecen la transferencia tecnológica: la estrategia de “publicar o morir”, la ambigüedad de la relación de los investigadores con el dinero y la naturaleza desinteresada de la investigación académica. Por otro lado, Kirby (2006) señala que la naturaleza impersonal de las relaciones en la universidad, su estructura jerárquica, el conservadurismo o la inexistencia de métodos de compensación apropiados, pueden ejercer un efecto desincentivador de la actividad empresarial.

4.4. Determinantes externos o ambientales

Impulsan o no, la creación de spin-off académicas. Su importancia radica en que son condicionantes del contexto; un contexto favorable, que incluya i) La existencia de empresas de capital riesgo; ii) La entrada en vigor de leyes que favorezcan la creación de spin-off; y iii) La situación de la universidad en un contexto tecnológico y empresarial, promoverá la aparición de spin-off académicas (Aceytuno y Paz, 2008).

i) Las empresas de capital riesgo financian las nuevas empresas a cambio de participaciones en el capital social de las mismas, financiando proyectos que por diversas causas, como son el ser un productor innovadores, o tener un alto índice de riesgo, o ser de pequeño tamaño, entre otros, no pueden acudir a las fuentes de financiación tradicionales, a un coste aceptable (Sarasa, 1986). Martín (1988) define al capital de riesgo como “un sistema de financiación dirigido esencialmente a pequeñas y medianas empresas, mediante el cual una sociedad especializada en inversiones inyecta capital en una pequeña o mediana empresa en una proporción minoritaria y por un espacio de tiempo relativamente corto”. El capital de riesgo aporta, en la mayoría de casos, fondos propios en lugar de deuda, lo que no sólo mejora la imagen de la empresa, sino que posibilita la posterior

obtención de nueva financiación mediante endeudamiento. Su presencia en la empresa no es permanente ya que abarca un periodo que oscila entre cuatro y siete años, obteniendo los beneficios en forma de plusvalía una vez efectuada la desinversión; donde además de los fondos, las Entidades de Capital Riesgo aportan también un valor intangible materializado en su experiencia, contactos, ayuda y otros (Ramón & García, 2004, 2006); considerando además que la disponibilidad de fondos de capital de riesgo, influye positivamente en la generación de spin-off (Powers & McDougall, 2005). Wright *et al.*, (2004) señalan la importancia del acceso al capital de riesgo, destacando que la obtención de este tipo de financiación es más eficaz para las spin-off universitarias, que toman la forma de "joint venture". Sorenson & Stuart (2001) introducen la variable geográfica y señalan que la probabilidad de que una empresa spin-off reciba financiación de capital riesgo, se reduce a medida que la distancia entre ambas es mayor. Di Gregorio y Shane (2003) consideran al capital de riesgo externo como un factor determinante en la generación de spin-off universitaria y apuntan que el capital de riesgo que proporciona la universidad no genera efecto alguno, fundamentándolo en que el capital de riesgo universitario únicamente supone un sustituto del capital externo en la generación del spin-off.

ii) La legislación vigente en materia de universidades y propiedad intelectual se considera una variable importante para la generación de spin-off. Shane, (2004) señala que la entrada en vigor de la Bayh-Dole Act en EEUU —ley de 1980 que concede a los centros de investigación los derechos de propiedad intelectual sobre los resultados de la investigación financiada con fondos públicos— tuvo efectos positivos sobre la generación de spin-off universitarias. La legislación española, a través de la Ley Orgánica Universitaria (LOU) y sus reformas en el año 2007, fomenta la interrelación entre la universidad y la industria ("Ley Orgánica 4/2007," 2001). En el anterior marco normativo español, la creación de empresas por parte del personal de una universidad se encontraba muy limitado, dada la incompatibilidad existente entre ser partícipe en una empresa privada y el trabajo en la universidad. La Reforma a la LOU elimina esta limitación y establece, entre otras, la posibilidad de que los profesores funcionarios de las universidades públicas, disfruten de un quinquenio sabático para crear una spin-off académica, conservando su plaza en la universidad. Bacchiocchi & Montobbio,(2007) coinciden en señalar la cautela que deben tener los políticos, al diseñar las políticas de innovación, especialmente al intentar imitar las legislaciones de patentes vigentes en EEUU, como la Bayh-Dole Act, sin tomar en cuenta el contexto local.

iii) Finalmente, otro de los factores externos que puede influir sobre la generación de spin-off académica es el contexto tecnológico y empresarial. Algunos autores destacan que el surgimiento de spin-off en una universidad que se encuentre localizada en un entorno altamente tecnológico y emprendedor, será mayor que en otras universidades sin este entorno (Saxenian, 1994; Jong, 2006). El diseño de una política de fomento de las spin-off académicas, se debe basar en un análisis cuidadoso del contexto y de las instituciones que trabajan en el mismo (Aceytuno y Paz, 2008).

5. Metodología de la investigación

La metodología utilizada en esta investigación es el método del caso, con fundamento en el estudio desarrollado por O` Shea (2005), con un análisis de variables como un primer acercamiento a la realidad objeto de estudio (Maxwell, 1996), donde se pretende responder a las interrogantes ¿Existen o no spin-off académicas surgidas del TEC?, ¿Qué tipo de spin-off son?, ¿Cuáles sus características más relevantes?, ¿Qué factores afectaron su creación y evolución?, ¿Cuál ha sido el comportamiento de los factores determinantes de la creación de spin off académicos en el entorno del ITCR? Y ¿cuáles han tenido una mayor incidencia en la creación de las mismas? Se realizó una revisión bibliográfica que incluyó un análisis de planes, programas y políticas de investigación y extensión en el ITCR, así como entrevistas a los emprendedores, funcionarios del sector gobierno y universitario de ciencia y tecnología de Costa Rica.

Como medio de comparación o Pattern Matching (Yin, 2009), con los datos encontrados en el ITCR, se utilizaron los estudios: La creación de Spin-off universitarios en España: Características, determinantes y resultados de Ortín et. al., (2007) y La creación de spin-off universitarias: el caso de la Universidad de Huelva de Aceytuno & Paz (2008).

6. Resultados

El Instituto Tecnológico de Costa Rica fue fundado en 1971, mediante ley No. 4777 de la Asamblea Legislativa de Costa Rica, siendo la primera y única universidad de corte tecnológico creada hasta ese momento, con la misión de “Contribuir al desarrollo integral del país, mediante la formación de recursos humanos, la investigación y la extensión; manteniendo el liderazgo científico, tecnológico y técnico, la excelencia académica y el estricto apego a las normas éticas, humanísticas y ambientales desde una perspectiva universitaria estatal de calidad y competitividad a nivel nacional e internacional” (Gaceta, 1999)

Queralt (2008) reconoce la importancia que da el ITCR, a la vinculación universidad-empresa, impulsada por sus fines y principios, lo que se ha plasmado a través de cursos de capacitación, prácticas de especialidad, investigación contratada y servicios repetitivos, entre otros, realizados a través de instancias que tienen a cargo el promover la vinculación universidad-empresa como lo es el Centro de Vinculación Universidad-Empresa; el Centro de Incubación de Empresas (CIE-TEC); el Programa de Emprendedores -orientado a apoyar la formación de profesionales líderes, capaces de crear y desarrollar proyectos exitosos, así como de descubrir y apoyar a aquellos estudiantes interesados en la creación de su propias fuentes de ingreso, mediante la formación de nuevas empresas que tengan como base de su competencia los factores tecnológicos-; la Fundación Tecnológica de Costa Rica (FUNDATEC) - canal que facilita la prestación de servicios remunerados al sector público y privado; multiplicando el impacto en los sectores científico, tecnológico y educativo y permitiendo al ITCR

generar ingresos adicionales que son utilizados en el financiamiento de nuevos proyectos de investigación y extensión.

Como resultado de la investigación bibliográfica y de campo realizada, se tiene que este es el primer estudio sobre spin-off universitarias que se realiza en Costa Rica, lo que lo convierte en un aporte significativo que permite establecer puntos de comparación, análisis estadísticos, proyecciones y modelos para la creación de spin-off académicas, entre otros.

A continuación se presentan los resultados obtenidos con respecto a: las características generales de las spin off académicas identificadas, los factores determinantes: “emprendedor académico”, “recursos organizativos de la universidad”, “recursos institucionales” y por último, “factores externos o ambientales”. Se irá haciendo la respectiva comparación con las investigaciones mencionadas, según corresponda.

6.1. Las spin off académicas identificadas

- **Las características generales**

Las spin-off académicas en el ITCR, muestran que el 70% pertenece al área de las tecnologías de información; el 30% a las áreas: química/forestal, metalurgia y construcción. Consecuente con Ortín et al., (2007), las empresas del sector de tecnología de información español representan: un 54%; lo que también coincide con la distribución de las spin-off universitarias en Estados Unidos, donde el 70% de las nuevas empresas entre 1986 y 1999 pertenecían al sector de la informática.

El principal problema, al que se enfrentaron; consideran el aspecto financiero, lo cual es consecuente con las investigaciones de Hurst y Lusardi (2003) y Ortín et al., (2007). De tal manera que el 23% de los entrevistados, mencionó como principal problema no contar con recursos financieros. Un 14%, la carencia de equipo; un 12% la tecnología inmadura; 12% la carencia de recurso humano capacitado y los problemas de corte técnico un 12%; con un 27% mencionaron otros problemas.

La inversión en investigación y desarrollo, el hallazgo fue que en promedio, destinan un 14,67% de las ventas. En contraste con las spin-off académicas españolas, destinan un 36,8 %, es decir, invierten un 2,5 veces más.

La edad de las empresas: las spin-off entrevistadas por Ortín et al. (2007), en España el 75% de las spin-off españolas tienen menos de cinco años mientras que el promedio de las spin-off del ITCR tienen 17,42 años,

La cantidad de empleados en promedio las spin-off del ITCR tienen 22 empleados y las spin-off españolas 8,34. El 100% de las empresas del ITCR están bajo la figura de sociedad anónima, lo cual dice que son empresas privadas e independientes de la universidad, mientras que el 89,7% de las empresas españolas son sociedades de responsabilidad limitada. No se indica cómo están organizadas jurídicamente, el resto de las empresas.

El capital con que se fundó la empresa el 46,2% de las spin-off españolas se fundaron con un capital de 5000€ equivalente a precios del 2007, año de la investigación, equivalente a US\$ 6855,00. Mientras tanto, el 70% de las spin-off del ITCR se fundaron con un capital entre los US\$ 2000 y US\$ 3000, lo que es coincidente en el sentido de que fueron fundadas con un bajo capital.

La procedencia del capital social, el 100% menciona que sus socios y ellos aportaron el capital para fundar la empresa. En contraste con las spin-off españolas donde el 90% fue capital de los fundadores.

La cantidad de empleados las spin off académica del ITCR han generado 205 puestos de trabajo de los cuales el 77,07% son hombres y un 22,93% son mujeres. Esto evidencia la desigualdad de género existente en las empresas de ciencia y tecnología según la investigación realizada por Queralt (2008)

- **Factores relevantes en los primeros años de actividad**

- Acceso a recursos financieros: manifestaron no haber recibido ayuda económica, ni por la universidad, ni por el Sistema Bancario Nacional. La justificación de esto es porque la universidad no está facultada para ello y la banca de desarrollo es de creación reciente en el país; y a la fecha aún no existen empresas que brinden capital de riesgo. En contraste, el 40% de las spin-off españolas recibieron apoyo financiero, aunque consideran el proceso de acceso como complicado o muy complicado (Ortín *et al.*, 2007).

- Asesoramiento en la creación y gestión de la empresa: la respuesta fue que no recibieron asesoramiento ni capacitación durante la creación y gestión de la empresa, en contraposición las empresas españolas cerca del 90% tuvieron capacitación

- Experiencia profesional: un 20% mencionó que tenían experiencia en gestión empresarial, lo cual indica que esta es deseable, pero no una condición única para la creación de empresas y su éxito posterior.

6.2. Los factores determinantes

A continuación se expondrán los resultados de los factores determinantes de la creación de spin off académicas.

6.2.1. El emprendedor académico

Acerca de las razones que llevaron al emprendedor académico del ITCR a realizar su emprendimiento: 1) 20% poner en práctica los conocimientos y realización personal, con lo que se observa una alta necesidad de logro, consecuentemente con McClelland (1967), Roberts (1991) y Ortín, et al., (2007) que señalan la necesidad de logro como la motivación clave para la decisión de crear un spin-off; 2) 14% saber que satisface una necesidad de mercado, 3) 11% insatisfacción laboral, aunque el 100% mencionó que laboraba en buenas condiciones laborales, por lo que este aspecto no se considera un motivo para crear spin-off, 4) 9% detección de una oportunidad de

negocio, lo cual Saxenian (1994) apunta como una motivación para crear una spin-off; 5) 5% la calidad del producto o servicio - lo propuso o animó la empresa o instituto donde trabajaba, 6) 2% actitud positiva - afán de ganar más dinero - disciplina y 7) 0% empleo con mejores condiciones y tradición familiar, la cual no es significativa, lo que contradice lo apuntado por Hsu et al., (2007) de que los antecedentes familiares pueden constituir un factor determinante en la generación de spin-off.

A continuación se comparan los resultados obtenidos en esta investigación y los obtenidos por Ortín *et al.*, (2007) en 70 spin-offs académicas españolas, en donde las opciones: a) poner en práctica conocimientos técnicos y b) detección de una oportunidad de negocio, fueron las dos principales razones, tanto para académicos del ITCR como de España, que sustentaron la creación de la spin-off. La motivación que ocupó el último lugar para los académicos del ITCR fue la f) Afán de ganar más dinero que trabajando a sueldo, mientras que para los españoles fue la opción c) Lo propuso o animó la empresa o instituto donde trabajaba. Las opciones c), d) y e) ocuparon el tercer lugar y tienen la misma valoración en los emprendimientos generados en el ITCR, mientras que las opciones f), e) y d) ocuparon el tercero, cuarto y quinto lugar respectivamente, para los académicos españoles.

Además, los emprendedores académicos del ITCR presentan un alto grado de satisfacción por haber tomado la decisión de emprender su proyecto productivo, dado que el 90% mencionó sentirse orgulloso de haberlo logrado y el 80% menciona que la experiencia ha valido la pena en cuanto a desarrollo personal. Un 60% menciona sentirse orgulloso del emprendimiento pues “la experiencia ha permitido mejorar la situación económica”. En comparación con los emprendedores españoles, se puede señalar que estos también manifiestan una alta valoración de la experiencia emprendedora desde la perspectiva del desarrollo personal, mientras que Ortín *et al.*, (2007) menciona que estos no están tan satisfechos en lo que se refiere a mejorar su nivel de renta económica.

Se describen las características más relevantes del emprendedor académico: nivel de educación, sexo, edad, experiencia laboral, así como objetivos y motivaciones para crear la empresa. Con respecto al nivel de educación se encontró que el 70% de los emprendedores contaban con una maestría al momento de desarrollar la empresa, de los cuales un 70% la cursaron en universidades extranjeras; el 20% de los encuestados contaban con un doctorado, obtenido también en universidades extranjeras; y únicamente el 10% tenía el grado de licenciado; lo cual concuerda con las apreciaciones de Roberts (1991), el cual indica que existe una correlación positiva entre el nivel educativo y la decisión de crear una spin-off. Para los emprendedores con grado de doctorado, el incremento en el sueldo por este concepto, concordante con lo manifestado por Ortín *et al.*, (2007), no fue un factor que afectara negativamente la creación de las spin-off, afín con el caso de las spin-off españolas, donde existe una gran cantidad de doctores participando en su creación. En cuanto al sexo, consecuente con Aceytuno & Paz, (2008) y Murray y Graham (2007), el 90% de los emprendedores académicos son varones y solo un 10% es mujer. Esto mismo se manifiesta en las

labores académicas y en el ingreso de estudiantes a las diferentes carreras científicas y tecnológicas del ITCR, pero se observa un crecimiento anual de la participación femenina, que se espera incida también en la creación de spin-off, en concordancia con lo manifestado por Murray y Graham (2007). El factor de la edad ha sido estudiado por Roberts (1991), quien señala que la media de los empresarios es de 37 años, lo que concuerda con Ortín et al., (2007), que indican que los empresarios de las spin-off universitarias españolas suelen tener entre 30 y 40 años. En el caso del ITCR, la edad promedio de los emprendedores académicos fue de 34,6 años; el emprendedor de menor edad tenía 22 años, el de mayor edad 52 años al momento de fundar la empresa y un 80% contaba con menos de 40 años de edad, lo que es coherente con los hallazgos de Roberts (1991) y Ortín et al., (2007). El factor de la condición laboral o a qué estaba dedicado en la universidad el académico, antes de convertirse en emprendedor, se encontró que en el ITCR, en el 60% de los casos estaban dedicados únicamente a labores docentes y en el 40% fueron docentes e investigadores al mismo tiempo. El 60% entrevistado manifestó que mantenían su relación laboral con el ITCR, por los efectos positivos que esto tiene, congruente con lo manifestado por Rappert et al., (1999) y Johansson et al., (2005), de que la universidad es una fuente de reclutamiento de profesionales altamente calificados para sus empresas, que les genera un beneficio a nivel de imagen con sus clientes, la obligación de mantenerse actualizados debido a las exigencias académicas, además de que su desempeño académico ha mejorado, dado que sus lecciones no son repetir lo que los libros dicen, sino que se ven enriquecidas con su experiencia empresarial. Mientras que un 40% estaba desvinculado, dos por motivo de jubilación, dos por renuncia para dedicarse a su emprendimiento. Para la trayectoria profesional, los emprendedores del ITCR, en un 90% de los casos habían tenido adicionalmente, una participación activa dentro de la estructura administrativa de la universidad, ocupando puestos como directores de Escuela, coordinadores de centros de investigación, miembros del Consejo Institucional –órgano directivo superior del ITCR-, liderando movimientos a favor de la apertura de nuevas carreras o centros de investigación, o bien, vinculándose de manera temprana con el sector productivo. En conclusión, todos los emprendedores del ITCR son personas dinámicas e inquietas, que se han caracterizado por ejercer un liderazgo dentro del ITCR, promoviendo emprendimientos orientados al crecimiento y mejoramiento académico de la universidad. No fue posible vincular el desempeño profesional e institucional con el planteamiento de Stuart y Ding (2006), que señalan que los científicos más importantes son los más propensos a la creación de spin-off, por -entre otros- su facilidad para obtener los recursos necesarios para la creación de la empresa. En cuanto a la dedicación al emprendimiento, el 40% de los entrevistados manifestó dedicar más de 40 horas por semana a la empresa y el restante 60% de 11 a 40 horas, aduciendo que su dedicación se iba modificando según la estabilidad, tamaño y madurez que iba alcanzando la empresa, siendo mayor al inicio y disminuyendo con el tiempo una vez alcanzada su etapa de madurez, concordante con Ortín et al., (2007). La literatura ha mencionado los antecedentes familiares como un factor determinante en la generación de spin-off (Hsu et al., 2007),

diferente a lo encontrado con los emprendedores del ITCR, que manifestaron provenir de un ambiente familiar sin tradición emprendedora.

6.2.2. Recursos organizativos de la universidad

En el caso del ITCR, los recursos para la investigación están compuestos por el “Fondo de la Vicerrectoría de Investigación y Extensión (VIE)”, integrado por recursos públicos provenientes del Estado y fondos externos que incluyen aportes de empresas privadas, organismos internacionales y organizaciones no gubernamentales. Los datos de años 2006 al 2008, de fondos públicos y externos, se observa que en promedio, los fondos públicos para la investigación son prácticamente un 80% versus un 20% provenientes de fuentes externas. Este 20% de fondos externos para investigación en el ITCR, es muy inferior, en comparación con el % de fondos externos recibidos por la Universidad de Huelva, ya que para el año 2006, dicha universidad tuvo un aporte privado de un 50%. Aceytuno y Paz (2008), refiriéndose a la Universidad de Huelva, señalan que “el nivel de los fondos que se utilizan para financiar la investigación es reducido, perjudicando tanto a la consecución de resultados como a la comercialización de los mismos, en este caso a través de la creación de spin-off universitarias”. Por lo tanto, se puede decir que las condiciones del ITCR, en comparación con la Universidad de Huelva, son aún más difíciles para el surgimiento de spin-off académicas.

Calidad de la investigación en el ITCR

- Respecto del índice competitividad investigadora la cual se mide proyectos aprobados sobre los presentados, el ITCR no llevaba registro al momento de realizar esta investigación, por lo que no fue posible realizar este análisis y compararlo con la Universidad de Huelva.

- Respecto del índice esfuerzo investigador, se pudo constatar que ha existido un crecimiento marginal promedio anual de 5,6 proyectos nuevos de investigación aprobados y de 11,44 académicos que se han agregado a la labor investigativa - 0,49 proyectos por cada nuevo investigador-, teniendo que se pasa de 70 proyectos aprobados y 92 investigadores participantes en el año 2000, a 120 proyectos aprobados y 195 investigadores participantes en el año 2009.

- El comportamiento marginal en la cantidad de investigadores y en los proyectos de investigación ha sido irregular, con algunas caídas entre los años 2004 y 2007, concordando con caídas en los ingresos externos para financiar la investigación. A partir del año 2007 el comportamiento marginal, tanto en cantidad de investigadores como en proyectos de investigación, tiende a recuperarse mostrando una tendencia creciente .

- Al analizar el esfuerzo investigador y su comportamiento marginal durante los años 2000 al 2009, en promedio se han presentado 0,70 proyectos de investigación por investigador, indicando que la cantidad de investigadores es superior a la cantidad de proyectos aprobados.

- Por otra parte, analizando el comportamiento de este índice, para determinar si ha tenido un comportamiento creciente o decreciente, el análisis muestra que el comportamiento marginal del

esfuerzo investigador ha sido decreciente, dado que se pasó de 0.70 proyectos por investigador en el 2000 a 0.62 en el 2009. El ITCR y en general las universidades costarricenses no cuentan con estos índices por lo que no es posible hacer alguna comparación entre estas y con la Universidad de Huelva.

- Según Aceytuno & Paz (2008), la calidad de la investigación es un factor especialmente determinante. Desde esta perspectiva y para que el ITCR presente mejores condiciones para la creación de spin off académicas, es necesario que mejore estos índices en los años venideros.

Estrategia de apoyo a la generación de spin-off de la universidad

El ITCR no cuenta con una estrategia de apoyo, aunque hay esfuerzos, tales como el análisis de la vía legal para implementar las denominadas empresas auxiliares, el contar con una incubadora de empresas de base tecnológica y múltiples instrumentos para facilitar la vinculación universidad-empresa, tales como la práctica de especialidad como requisito de graduación a nivel de los programas de bachillerato, la venta de servicios a través de Fundatec, el Centro de Vinculación Universidad Empresa, el concurso emprendedor, la incubadora de empresas, entre otros. Desde esta perspectiva, se el ITCR tiene una estructura administrativa y académica abundante, para estructurar una estrategia de apoyo a la generación de spin off académicas.

6.2.3. Determinantes institucionales

Según O'Shea *et al.*, (2004) y Djokovic y Souitaris (2008) los determinantes institucionales de la generación de spin-off académicas son: la misión de la universidad, su cultura e historia y la tradición. Así, las universidades cuya misión, cultura o tradición se han dirigido a la creación de empresas o a la colaboración con ellas, presentan mayor propensión a crear spin-off universitarias como mecanismo de comercialización de los resultados de la investigación.

La misión del ITCR promueve el acercamiento con el sector productivo, lo que se refleja en su tradición y vocación de servicio hacia el sector productivo en particular y hacia la sociedad en general. Como respuesta esta misión, se han creado diferentes mecanismos de vinculación, siendo el más importante la Fundación Tecnológica de Costa Rica (FundaTEC), que administra los recursos financieros, de los proyectos productivos adscritos a las escuelas, lo que ha contribuido a una cultura de emprendimiento interno, y generado importantes recursos financieros que apoyan la investigación.

La cultura, historia y tradición del ITCR, están ligados con la misión del ITCR. Siendo la primer vinculación el programa de prácticas de especialidad de los estudiantes, la cual se lleva a cabo al final de los programas de bachillerato y se hace en una empresa, con el apoyo constante de un docente. Esto promovió un vínculo natural entre las escuelas académicas y las empresas,

de tal manera que se brindan servicios contratado, lo que evolucionó en la formación y fortalecimiento de una cultura de emprendedurismo. Sin embargo, la cultura de creación de spin-off académicas en el ITCR aún no se encuentra desarrollada y los investigadores no consideran la creación de este tipo de empresas, como una opción para explotar comercialmente su investigación.

6.2.4. Determinantes externos o ambientales

La presencia y cercanía de empresas de capital riesgo, las cuales existen en Costa Rica, pero los fondos de capital de riesgo que manejan son de carácter privado (Macaya Trejos & Cruz Molina, 2006; Mayorga, 2010). La probabilidad de una empresa de recibir financiamiento de capital de riesgo se reduce según la distancia geográfica entre ambas empresas (Sorenson & Stuart, 2001). Dado el tamaño de Costa Rica y su infraestructura bancaria, el aspecto geográfico no es una limitante para acceder, en un futuro, a los denominados capitales de riesgo. La no disponibilidad de estos, se considera desfavorable para el surgimiento de spin off académicas en el ITCR.

La legislación vigente, puede constituirse en un freno o en un estímulo a la creación de este tipo de empresas (Golfard & Henrekson, 2003; Bacchiocchi & Montobbio, 2007). En el caso del ITCR, existe legislación en dos niveles: uno institucional y otro nacional. El primero corresponde a la Ley Orgánica de creación del Instituto Tecnológico de Costa Rica. El segundo promulgado por el Ministerio de Ciencia y Tecnología, denominado “Ley para la promoción del desarrollo científico y tecnológico”. A nivel nacional, la legislación estipula que las universidades estatales no están facultadas para hacer transferencias de fondos públicos a entes privados. A nivel institucional. la Ley Orgánica del ITCR, faculta la creación de empresas adscritas al ITCR, lo que implica que serían empresas públicas, lo que difiere del espíritu de lo que constituye una spin-off académica. En contraste con la legislación estadounidense y española, la legislación costarricense es muy diferente, dado que el marco legal del país y la Ley Orgánica del ITCR no favorecen la creación de spin-off académicas.

El contexto tecnológico y empresarial que rodea a la universidad. Las universidades situadas en contextos altamente tecnológicos y emprendedores generan un mayor número de spin-off, en comparación con aquellas situadas en entornos menos favorecedores (Roberts, 1991; Saxenian, 1994). Aunque el ámbito de acción del ITCR es a nivel nacional, el contexto empresarial y tecnológico inmediato es el de la provincia de Cartago, el cual no es especialmente propicio para la creación de spin-off, por lo siguiente: el tejido empresarial de Costa Rica está compuesto por un 72% de microempresas, un 22% de pequeñas empresas, un 4% de empresas medianas y un 2% de grandes. La actividad de las empresas costarricenses se encuentra distribuida de la siguiente manera: el 8% se ubica en la industria, un 10% en agricultura un 28% en comercio y el 55% en servicios, y distribuido por provincias se encuentra que la provincia de Cartago, representa el 6.8% de todo el tejido empresarial en comparación

con provincias como San José que aglutina un 44,29%, Alajuela un 17,41%, Heredia 10,12%, donde se encuentran los principales Parques Industriales del país. Siendo incluso superada por provincias costeras como Puntarenas con un 8,80%, Guanacaste 7,49% y ligeramente superior a la provincia de Limón un 5,01%.

7. CONCLUSIONES

Esta investigación hace un aporte importante al identificar spin off académicas del ITCR y la caracterización de los factores determinantes en la creación de éstas. Se trata del primer esfuerzo realizado en este campo a nivel costarricense, obteniéndose como conclusión general de este estudio, la falta de conocimiento y comprensión por parte de las autoridades universitarias y de gobierno, de este fenómeno tan importante para el desarrollo del país y la calidad de vida de la sociedad costarricense. El método de caso utilizado, se fundamenta en técnicas cualitativas para la obtención de información, de carácter no estructurada, flexible y de tipo psicológico y sociológico; utilizando muestras reducidas de las que se obtiene abundante conocimiento. Evidentemente los resultados obtenidos no son cuantificables ni extrapolables al conjunto total de una población y su utilidad radica en su capacidad para la descripción de hechos y en cómo consigue explicar sus motivaciones con datos (Martínez, 2006).

7.1.1. Sobre spin-off académicas:

Los hallazgos de esta investigación, se expresan a continuación a manera de conclusiones:

Acerca de las spin off del ITCR, su tipo y características: Se concluye que las empresas entrevistadas son spin-off académicas, derivadas de la actividad universitaria; están vinculadas al área de ciencia y tecnología; fueron fundadas por docentes e investigadores y surgieron de forma espontánea impulsadas por la iniciativa del emprendedor académico; comercializan tanto conocimiento tácito como explícito; el 50% se clasifica como ortodoxa porque el emprendedor abandonó la universidad; el 40% se consideran híbridas porque el emprendedor se mantiene vinculado al ITCR; y un 10% son tecnológicas, porque transfirió el conocimiento a través de una patente para su comercialización

Sobre las características generales de las spin-off académicas se concluye que: las spin-off académicas tienen en promedio 17,42 años de estar en funcionamiento, el 70% se encuentra en el área de tecnología de la información; el 40% tiene menos de 20 años; en promedio tienen 22 empleados; y existe predominancia del sexo masculino, se fundaron con un capital entre 1400 € y 2200 €. No recibieron apoyo económico del gobierno para fundar la empresa, por lo que los emprendedores pusieron en un 100% los fondos para la misma.

Acerca de los factores que afectan la creación y evolución en los primeros años de actividad las spin-off académicas del ITCR: Se concluye que el ambiente en que estas empresas surgieron fue difícil porque: el 80% de los emprendedores no tenía experiencia previa en gestión de empresas

al iniciar su emprendimiento y no contaron con apoyo o estímulo institucional. Aunque el ITCR les dio facilidades en el uso de laboratorios y servicios

En cuanto a los **factores determinantes en la creación de spin-off académicas**, las conclusiones relevantes son: Sobre los **recursos organizativos** de la universidad tenemos que a) En cuanto al nivel y naturaleza de los fondos utilizados para financiar la investigación, el ITCR requiere hacer un mayor esfuerzo en la búsqueda de fondos externos para el apoyo de la investigación, ya que en la actualidad el aporte externo representa un quinto de la inversión pública, lo cual no se puede calificar como positivo, comparado con datos de universidades españolas, con valores por encima del 50%. b) La calidad de la investigación en el ITCR, desglosada en dos elementos diferentes e igualmente importantes: i) Calidad de los investigadores. Dado los bajos porcentajes encontrados, con respecto a la cantidad de proyectos nuevos por año y de investigadores participantes, se puede concluir que deben de mejorarse estos aspectos, en conjunto, para favorecer la aparición de spin-off universitarias en el ITCR; ii) Esfuerzo investigador. Los datos recopilados muestran una baja relación entre cantidad de proyectos de investigación presentados y cantidad de investigadores participantes, correspondiente a un promedio de 0,70 del 2000 al 2009, con un comportamiento decreciente a través de los años, indicando que aunque la cantidad de investigadores ha aumentado, la cantidad de proyectos de investigación presentados ha disminuido, por lo que debe incentivarse la generación de una mayor cantidad de proyectos de investigación, para favorecer la creación de spin-off en el ITCR; c) Estrategia de apoyo a la generación de spin-off de la universidad. Se constató que en el ITCR no existe una estrategia de apoyo a la generación de spin-off, por lo que se concluye que sería necesario articular los esfuerzos a través de la creación de una estrategia, de manera que se favorezca la creación de spin-off.

Sobre los **determinantes institucionales** para la generación de spin-off, los cuales han sido identificados en la literatura como la misión de la universidad, su cultura e historia y la tradición, tenemos que en el ITCR se ha promovido un acercamiento con el sector productivo, desde sus orígenes en el año 1977, creándose y fortaleciéndose a través del tiempo una cultura y tradición de servicio a este sector, lo que constituye un aspecto positivo que apoya la creación de spin-off académicas. El ITCR ha avanzado en el paradigma de la universidad emprendedora y del emprendedor académico, a través de varios instrumentos de vinculación, como son la FundaTEC y la incubadora de empresas, lo que constituye un estímulo para la creación de spin-off académicas. A pesar de estos aspectos positivos, se concluye que la cultura de creación de empresas en el ITCR aún no se encuentra desarrollada, principalmente debido a la falta de articulación de estos esfuerzos para apoyar la creación de spin-off y a que los investigadores no consideran la creación de spin-off como una opción viable para explotar comercialmente los resultados de sus investigaciones.

En cuanto a los **determinantes externos o ambientales**, dentro de los cuales están empresas de capital de riesgo, la legislación vigente y el contexto tecnológico y empresarial que rodea a la universidad, tenemos a) Empresas de capital de riesgo. Dado que este tipo de empresas

existen en Costa Rica pero con fondos de carácter privado, que no se pueden ofrecer públicamente, se puede concluir que la carencia de empresas de capital de riesgo es un impedimento para el estímulo y realización de los proyectos de spin-off que surgen en el ITCR; b) La legislación vigente. El marco legal del país y la ley Orgánica del ITCR no contemplan dentro de su normativa el traslado de fondos públicos a iniciativas privadas, por lo que se puede concluir que la legislación institucional y nacional son una limitación para la creación de spin-off académicas; c) El contexto tecnológico y empresarial que rodea a la universidad. Dada la baja dinámica tecnológica y económica de la provincia de Cartago, donde se encuentra ubicado la sede central del ITCR, se puede concluir que es a escala nacional donde el contexto tecnológico y empresarial se ha constituido en un factor positivo para la creación de spin-off académicas.

El ITCR posee fortalezas y debilidades desde la perspectiva de los factores determinantes de la creación de spin off académicas, no obstante gracias al cumplimiento de su misión, a la incursión de este en el sector productivo, a través de las prácticas de especialidad, la venta de servicios y la investigación contratada hacen de esta institución, así como un sector productivo que demanda y ha encontrado cobijo a sus necesidades en el ITCR, es que se puede concluir que esta universidad posee fortaleza natural para la creación de spin off, por lo que requiere de legislación moderna, empresas de capital semilla, incrementar la atracción de fondos externos y ante todo fortalecer la calidad de la investigación, es decir, mejorar el planteamiento de propuestas de investigación, mayor cantidad de proyectos de investigación por investigador y por último plantear estrategia Institucional que abarque los ámbitos administrativo, docente e investigativo para articular todos los esfuerzos del ITCR para la promoción de spin off académicos.

Los resultados de esta investigación pretenden brindar pautas a la academia universitaria latinoamericana y a los tomadores de decisiones relacionados con la universidad pública, acerca de los determinantes que favorecen el proceso de creación de spin-offs. Pretende proporcionar ideas a la academia, para que sus actividades de promoción y divulgación sobre creación de spin-off, tengan un mayor impacto al interior de la comunidad universitaria y sirva de referente para fortalecer una cultura donde se ofrezca una mayor transferencia de conocimiento a la sociedad. A las entidades públicas y privadas de fomento a la actividad empresarial, les ofrece nuevas perspectivas, respecto de la importancia de reforzar sus programas de intervención para impulsar una mayor imbricación de la Universidad en el tejido empresarial de la Región.

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GETTING IDEAS FOR WINNING PRODUCTS

BY CREATIVE TRAINER

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Abstract:

- Ideas and innovations are highly important for the business location Europe.
- New impulses for products and services are the prerequisites for European companies' successful competition on the global market.

Starting from these prerequisites, the project "Creative Trainer" was initiated, during which a course for creativity and innovation management was developed. At the heart of this course is the creativity method "Ideas Machine", which includes teenagers into the idea generation process.

Key words: Innovation, creativity, idea generation, product development, market expansion.

1 Introduction and project background

New ideas and innovations are of great importance for the business location Europe due to the fact that only through constant innovation competitive advantages can be gained against business rivals from Asia and America. Additionally product development times are getting constantly shorter, while the frame conditions are getting worse due to the present commercial crisis and added pressure of competition. According to a survey by the Austrian Research Promotion Agency (FFG) 80 % of the turnover produced in 10 years from now will be made from products, which don't even exist today (i)

Today an abundance of literature exists dealing with creativity, innovation and idea generation, showing the topic's importance(ii) Because of that new ideas for products and services are an absolute necessity for all European companies, enabling them to prevail on the global market and guarantee the lasting existence of the innovative business location Europe.

2 Project descriptions

The project "Creative Trainer" was thus designed according to these high standards. It copes with the educational and contextual preparation and creation of a creativity and innovation management course, the basis of this course being the creativity method "Ideas Machine", a method which is used in Switzerland for idea generation (iv).

One of the basic elements of this method is the inclusion of teenagers into the idea generation process. The method is extended in parts of the project "Creative Trainer", adapted educationally and didactically, transferred into a course (curriculum) and distributed in various partner countries. The project's partnership covers a large regional spectrum (AT, BE, DE, EE, IT, NL, RO, SE, SI, UK), thus creating an ideal basis for a comprehensive and lasting distribution. The partners are on the one hand from the business sector or institutions working closely with businesses, on the other hand from the area of industrial training. This combination is supposed to initiate knowledge transfer between these sectors and also improve cooperation, which is especially important for the area of industrial training, where an orientation towards practical experience plays an important role.

The project's concrete result is the transfer of the method "Ideas Machine" into the course "Creative Trainer" (for implementation in standard training of teaching staff and trainers in industrial training) and the course distribution in partner countries. In addition the training will be promoted in further European countries by the project partners. The course is based on a methodical didactical main concept according to the basic principles and methods of modern andragogy and also contains tele-learning elements matching these standards.

This project makes sure that teaching staff and trainers in the partner countries get well-founded training in creativity and innovation management, which they can then use in the training of their students and apprentices. In addition they can also use their acquired knowledge for the implementation of idea generation projects in companies, giving them additional qualification. This project furthermore makes sure that European companies can constantly improve their competitiveness through new ideas and innovations and thus provide the economy with a greater number of well trained staff with qualifications in creativity and innovation management.

Course CREATIVE TRAINER

The course consists of the following modules:

Module 1: Creativity technique "Ideas Machine"

Description of the creativity technique "Ideas Machine"

(SFG)

Module 2: Creativity methods

Implementation of creativity techniques, especially in idea generation projects

(University of Education Vienna)

Module 3: Idea evaluation

Methods and techniques for the combination and evaluation of ideas

(University of Maribor)

3 Target groups for the project

The target groups for this course are mainly teaching staff and trainers in industrial training. Trainers in industrial training primarily want to communicate content which is relevant for the future work of their students. A repeated demand by European companies for such relevant content is the training of future employees in creativity and innovation.

The course "Creative Trainer" aims exactly at those areas. It provides teachers with compact, up-to-date and practically relevant teaching contents. In addition they are provided with additional knowledge, which they can use well in the implementation of company projects with their students (Knowledge transfer school – business and business – school). This fulfils the demand for a more practical orientation of vocational schools, which is not yet met in all areas.

Trainers from industrial training already possess good practical orientation due to their close contact to the companies their students come from. The main interest of that target group is didactically/methodically well prepared teaching and learning material. Because of that the content of the course "Creative Trainer" is prepared comprehensively and holistically in regards to didactic/method, enabling the trainers also to implement idea generation projects in companies with their newly gained know-how.

Project partners

SFG-Innofinanz, Austria

University of Education Vienna, Austria

University Maribor, Slovenia

Innova, Italy

Unioncamera Veneto, Italy

Philean, Rumania

Technical college Temesvar, Rumania

Drenthe College, Netherlands

Point Europa, UK

Setepes, Portugal

LTC, Sweden

Junior Achievements, Estonia

Init, Germany

The project CREATIVE TRAINER is funded by means from the LEONARDO programme.

4 Excursion method „Ideas Machine“

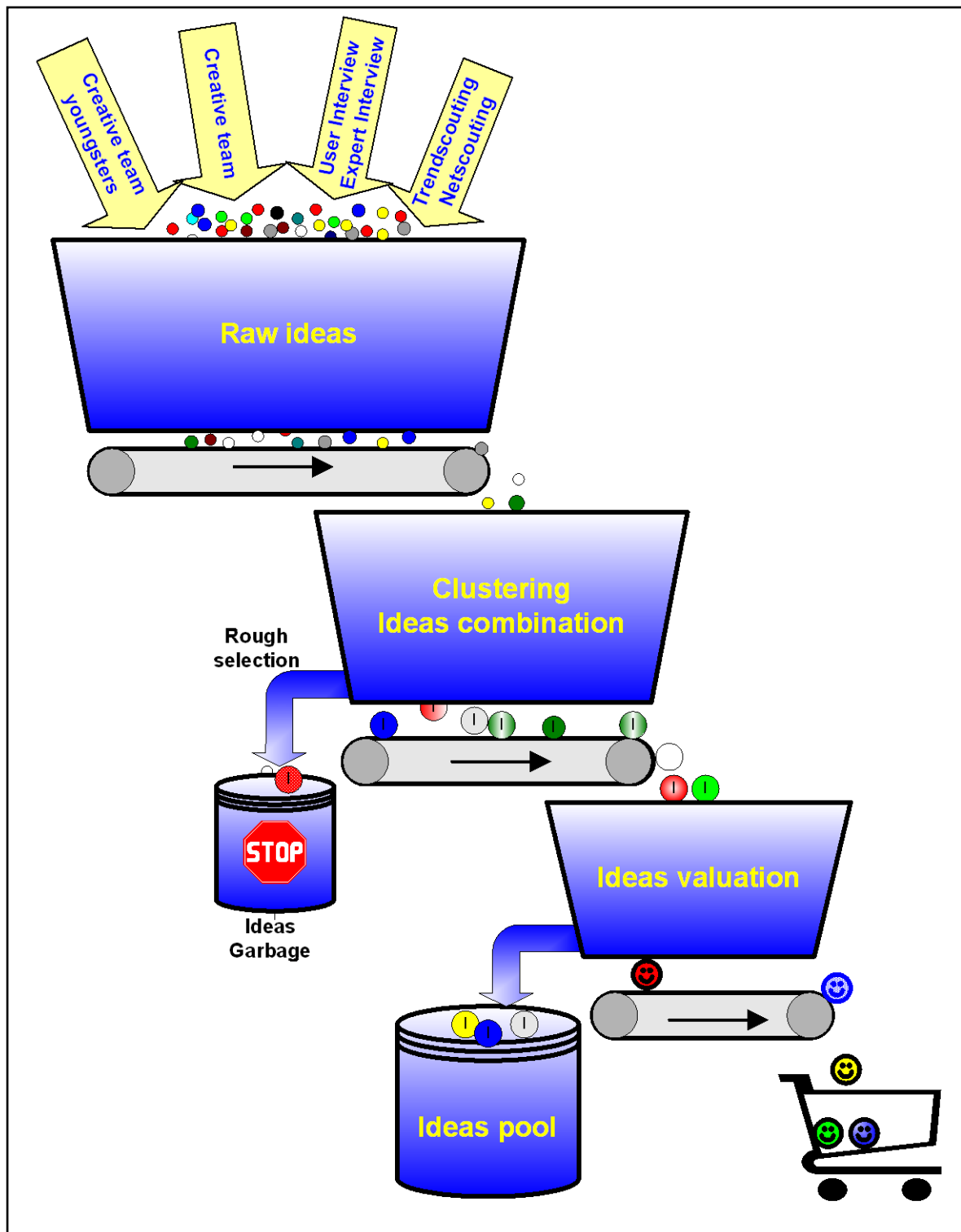
The "Ideas Machine" is a creativity technique, which originated in Switzerland and is attributed to the segment of lateral thinking methods(iii). This means that in as little time as possible as many – also way-out – ideas as possible are generated. One of the method's key elements is the inclusion of teenagers in the so-called "Creative Team". This team consists of "Insiders", people who are familiar with the topic the idea generation deals with, and "Outsiders", people who are not familiar with the topic the idea generation deals with. Teenagers are well suited for the task of outsiders because they often have a more open approach and attitude towards the problems that need to be solved. During the creativity workshops classic creativity techniques like Brainstorming, Brainwriting, etc. are implemented.

The single steps and respectively stages, which all ideas in the "Ideas Machine" have to go through, are:

1. Generation of raw ideas
2. Filtering of raw ideas (clustering, idea combination)
3. Fine finishing of ideas (idea evaluation; dealt with in another module)

The stage in which raw material is produced copes with the generation of as many raw ideas as possible, which can then be used in the further stages. The filtering of raw ideas has the goal to get a manageable number of the most promising ideas into the next stage. In the stage of fine finishing the ideas are further narrowed down so that only the best ideas are selected and evaluated. These stages contain additional steps, which the ideas must pass through, and methods connected to these stages. The chart shows a schematic depiction of the individual stages and respectively building parts.

Overview methodology ideamachine:



3.1 Description of methods used in the creativity technique “Ideas Machine”

Brain Storming

Brainstorming is the classical and best known method for generating ideas and can, if you stick to certain rules, be very successful. In brainstorming the moderator poses a question. All the participants now state what comes to their mind in connection with the question. “Everything” – also seemingly senseless and crazy things are wanted. The following rules should be applied when brainstorming:

- ☐ ☐ State everything that comes to your mind. Even seemingly senseless and useless things.
- ☐ ☐ Don't criticise or comment on any statements.
- ☐ ☐ Everything is written down. If something is not written down, it will be repeated until it is written down.
- ☐ ☐ If something comes to your mind, that already has been said, say it anyway.
- ☐ ☐ Speak loud and clearly!

Good brainstorming lives from its moderator and the dynamic of the procedure. If the dynamic of the participants slows down, a new brainstorming should be started. In any case a brainstorming should not last longer than 15 minutes.

Brain Station

The brain station is a good opportunity to have a look at a question from as many different perspectives as possible in a very short time. For a brain station we need six group working places isolated from each other. The isolation from the other work places is important because now the teams can work undisturbed on six different positions at once. For a brain station exercise we need six questions for which the teams should collect ideas. The questions ought to be designed so that they have a look at the problem from different perspectives.

The brain station is very well suited for questions which must be regarded from different points of view or for creative teams who have little time for collecting inspiration due to the fact that many inputs must be delivered in a very short time.

Brain Race

The brain race reverses the rule learned in school: „Think before talking“. First the participants write, only very much later the thinking takes place. Brain race is a technique that involves a lot of running. You need a lot of space for it. If the weather is nice it is best to stage such a brain race out in the open. In addition you need a large amount of work sheets with space for 10 ideas, writing material, blotting pads and a green seal. The brain race takes place between two stations.

At one station the participants write down at least ten ideas. The moderator is waiting at the other station where he poses a question to the participants. They again write 10 ideas on their sheets and run to the other station. There they will get a green stamp for each filled in work sheet with 10 ideas on it.

The participants now run back to the first station and again write down 10 ideas. The one with the most stamps will get a small prize as reward. The one with the most stamps gets a small award. The advantage of this method is that inspiration comes directly from the gut and is not filtered rationally or interpreted, which makes it most interesting.

Brain Shaping

This technique is used on a technical level and turns the participants into “craftsmen”. It is best suited for the collection of visual and three dimensional ideas. For this exercise groups of three are the optimum.

For the exercise to work we need modelling clay, laminated cardboard, Post its, tooth picks and writing material. The task is to build a three dimensional model based on the question. The tooth picks and Post-its are used to build small flags which are used to label the models. Suitable questions for example would be:

Build the veg stall of the future for a super market!
Build a ski slope for snow that doesn't melt!

The set time for these tasks should be short, so that amazing and unusual items are developed and the groups have not enough time to talk their ambitious works of art over too much, which would only result in too much remodelling. The most important point is that the models are labelled appropriately. In any case we must make sure that the results of this process can be used in further processes either in written or visual form. Brain shaping is well suited for entering a new topic or to top off a topic creatively.

Brain Charting

Visual work is often a good way to make insiders and outsiders work together. Brain charting is a simple and visually stimulating technique. Needed materials are papers and magazines, scissors, large posters and glue. Brain charting is an almost meditative technique. Insiders and outsiders are inspired by the magazines and simply cut out material which they think appropriate for the question. The cut pieces are then put together as a piece of art and presented to the other groups.

To sum things up it can be said that the project offers an ideal basis for companies of all branches and trades, supporting them in their daily basic work in the areas of idea generation and the development of new products, techniques and services. It offers, as already mentioned in the introduction, relevant means to keep European companies competitive through the implementation of most up-to-date creativity techniques and thus helps to ensure a high potential of innovation for the business location Europe also in future years to come.

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HANZEL AND GRETEL

INOVAÇÃO E CRIATIVIDADE EM CONTEXTO EMPRESARIAL – VALIDAÇÃO DE DOIS INSTRUMENTOS DE RECOLHA DE DADOS

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Resumo

Desenvolver a criatividade e a inovação é uma necessidade social e económica, que se afirma na Europa e no mundo, numa forma geral.

A economia moderna dá ênfase à criação de valor acrescentado através de uma melhor utilização do conhecimento e da inovação, exigindo às empresas mais e novas aptidões e competências, que permitam encarar a mudança como uma oportunidade.

Tendo em vista abordar a relação entre as práticas inovadoras e as atitudes face à criatividade, no contexto da gestão empresarial, desenvolveram-se dois instrumentos de recolha de dados: um inventário de práticas empresariais inovadoras e uma escala de atitudes face à criatividade.

Assim, com este artigo pretende-se dar conta da validação desses instrumentos, pelo que a discussão se centra na análise psicométrica dos mesmos, após um estudo exploratório com um conjunto de responsáveis por microempresas e PME portuguesas (N=180).

Palavras-chave: criatividade, inovação, análise psicométrica

Introdução

Na actualidade, onde a regra nas organizações passou a ser a mudança, a criatividade passa a ser não só desejada como procurada, empenhando-se as empresas em incorporá-la na sua cultura. Assim, as estratégias organizacionais estão atentas às mudanças e apostam cada vez mais na criatividade, que está associada a vários conceitos, entre eles a inovação. Em termos práticos os resultados da criatividade e da inovação fundem-se num processo único dirigido ao empreendedorismo e ao alcance de metas muitas vezes focadas em estratégias de sobrevivência e/ou de antecipação de necessidades do mercado. Criatividade e inovação são conceitos que integram o vocabulário do mundo económico e contribuem para a introdução de mudanças na economia e consequente desenvolvimento económico (Schumpeter, 1989).

Nas organizações, a criatividade pode ser um risco ou uma expectativa, mas o desenvolvimento do potencial criativo é um diferencial e uma necessidade actual. Cada vez mais é importante ser criativo no mundo empresarial, pois há carência de trabalhadores autónomos, que queiram correr riscos e se sintam livres para responder com imaginação a uma mudança (Goleman, 2003). A criatividade apoia uma cultura empresarial que encoraje

a expressão livre e segura do seu líder e colaboradores na busca de um objectivo fundamental: a gestão eficaz.

Assim, a atitude criativa poderá constituir-se como factor de promoção das práticas empresariais inovadoras. Neste pressuposto, e tendo em vista abordar esta relação entre criatividade e inovação, no contexto da gestão empresarial, desenvolveram-se dois instrumentos de recolha de dados: um inventário de práticas empresarias inovadoras e uma escala de atitudes face à criatividade.

Com este artigo daremos conta da validação desses instrumentos, pelo que a discussão se centra na análise psicométrica dos mesmos, após um estudo exploratório com um conjunto de responsáveis por microempresas e PME portuguesas.

Da Atitude Criativa às Práticas Empresariais Inovadoras

Associada à imaginação, à originalidade e à capacidade para superar os pontos de vista mais tradicionais, a criatividade pode ser entendida no seu sentido mais amplo, como um atributo fundamental da espécie humana.

Criatividade tem sua origem na palavra criar, derivada do latim *creare*, compreendida como modo de dar existência, gerar ou produzir, sendo também a capacidade de produção do artista, do descobridor e do inventor que se manifesta pela originalidade inventiva a par, da faculdade de encontrar soluções diferentes e originais face a novas situações.

Actualmente, a perspectiva minimalista da criatividade, como algo atribuído apenas a génios e artistas, deixa de fazer sentido e passa-se para uma perspectiva mais abrangente e que contempla também as pessoas comuns no seu quotidiano.

Sem que exista uma perspectiva consensual e clara do conceito de criatividade há, no entanto, consciência de que ela é um fenómeno complexo e multifacetado, (Isaken, 1995) que não pode ser explicado somente por um componente ou aspecto e que envolve sempre novidade.

Por sua vez, a inovação é, talvez, um dos assuntos mais discutidos na actualidade, com expressão em termos políticos, económicos e sociais. Ocupando lugar de destaque no mundo dos negócios, os livros mais modernos de gestão apontam no sentido da inovação, como uma das características essenciais para o sucesso, no século 21. Num mercado cada vez mais competitivo, as organizações em geral e as empresas em particular, têm de obter avanços de produtividade, normalmente decorrentes de uma nova forma de fazer as coisas.

Conceito amplamente utilizado, após mais de 30 anos de investigação, continua a ter diferentes significados e interpretações. Inovar é uma palavra que deriva do latim *innovare*, sendo compreendida como tornar novo, inventar ou criar, sendo também o acto ou efeito de inovar, a introdução de qualquer novidade na gestão ou no modo de fazer algo, mudança ou renovação.

Hoje em dia, o conceito em discussão é cada vez mais entendido como um fenómeno integrado que abrange aspectos económicos e técnicos, mas também aspectos sociais, culturais e organizacionais (Kovács, 1996).

As empresas na sua condição de actores económicos e sociais ocupam uma posição central no debate dos novos desafios e das mudanças do mundo. Prepará-las para esse debate afirma-se essencial e possível, se assente num pensamento estratégico, aliado à vantagem competitiva. A acção económica passará então, por consciencializar os seus responsáveis, independentemente da dimensão da empresa que gerem, para a importância da prática empresarial inovadora e do seu papel enquanto agentes promotores de desenvolvimento. A sustentabilidade do negócio de longo prazo contará assim, com uma atitude à criatividade, que, do nosso ponto de vista, se constitui como factor de promoção da inovação, garantia de uma visão estratégica e de qualidade nas relações com os vários *stakeholders*.

Metodologia

– Amostra:

Trata-se de uma amostra de conveniência, constituída por 180 sujeitos, responsáveis por microempresas e PME sedeadas em Portugal Continental.

A amostra é constituída por ambos os sexos (119 homens e 61 mulheres), com idades compreendidas entre os 23 e os 76 anos de idade, com uma média de 43.19 anos (SD= 10.48).

Quanto à escolaridade, a maioria (62%) possui um grau escolar de nível superior, 25% concluíram o ensino secundário e os restantes possuem um grau de ensino igual ou inferior ao 3º ciclo.

Relativamente à experiência profissional como empresário, o número de anos oscila entre 1 e 55, sendo que 52.8% possui mais de 10 anos de experiência. Quanto à antiguidade das empresas, verifica-se conformidade com a experiência profissional, dado que a maioria das empresas (54.4%) tem mais de 10 anos.

Por fim, os sectores de actividade empresarial percorrem as diferentes categorias da classificação das actividades económicas: 53.1% dizem respeito a actividades de consultoria e dos serviços de apoio, à educação, saúde e apoio social e actividades artísticas, desportivas e recreativas e serviços, 34,4% inscrevem-se nas secções relativas ao comércio, reparação auto, transportes, hotelaria, turismo e restauração e actividades financeiras, imobiliárias e de seguros e 25% operam na agricultura, indústria, electricidade e gás, água, saneamento e gestão de resíduos e construção.

– Procedimento:

Para a realização deste trabalho, foram enviados e-mail informativos e de apelo à participação, dirigidos aos responsáveis por 3250 empresas portuguesas, independentemente do seu sector de actividade. Os contactos foram feitos directamente pela investigadora a 2000 empresas, de base de dados disponibilizada pela Informa D&B, e indirectamente às restantes empresas, associadas da ADRAL - Agência de Desenvolvimento Regional do Alentejo.

A participação dos empresários concretizou-se no preenchimento de um questionário acessível através de *link* criado para o efeito e com ligação ao e-mail da investigadora. Nos e-mail enviados e no próprio instrumento fez-se referência à forma de preenchimento e garantiu-se o anonimato e confidencialidade das respostas.

Os dados foram recolhidos entre Setembro e Dezembro de 2010.

– Instrumentos:

A recolha de dados foi assegurada por dois instrumentos: um inventário de práticas empresariais inovadoras e uma escala de atitudes face à criatividade.

O inventário destinou-se à identificação de práticas empresariais inovadoras e para a sua elaboração foram considerados a estrutura e conteúdos do formulário de candidatura à Rede PME inovação COTEC – Associação Empresarial para a Inovação. Este formulário foi alvo de adaptação e traduziu-se num instrumento que versa quatro dimensões, transversais à inovação empresarial, num total de dez sub-dimensões:

1. Condições – envolve os aspectos estratégicos susceptíveis de influenciar atitudes e comportamentos empresariais face à inovação. Envolve a cultura, a liderança e a estratégia empresariais.
2. Recursos – diz respeito à contribuição dos diversos tipos de recursos da organização no sentido de assegurar uma maior dinâmica e um melhor desempenho inovador. Envolve o capital humano, as competências e relacionamento externo.
3. Processos – diz respeito aos processos organizacionais mais relevantes para a dinâmica inovadora da organização e para o desempenho desta no plano da inovação. Envolve a gestão de actividades de IDI (Investigação, Desenvolvimento e Inovação), a aprendizagem e protecção de resultados.
4. Resultados – averigua em que medida condições, recursos e processos orientados para a inovação se traduzem em resultados. Envolve os aspectos financeiros e operacionais, o mercado e a sociedade.

O inventário é constituído por um total de vinte questões binárias (sim/não), que visaram verificar a existência de determinadas práticas. Os itens foram redigidos pela positiva e distribuídos progressivamente, sendo cinco para cada dimensão.

A escala destinou-se a identificar atitudes face à criatividade. Foi elaborada considerando a Teoria do Investimento Criativo de Sternberg e Lubart (1991, 1996), sendo composta por seis dimensões que se descrevem sucintamente:

1. Inteligência – Diz respeito à habilidade teórica e prática, para redefinir problemas, analisar e reconhecer boas ideias e persuadir sobre o valor das próprias ideias.
2. Estilos cognitivos – Diz respeito ao modo de pensar e à forma como a pessoa usa, explora e utiliza a sua inteligência.
3. Conhecimento – Refere-se ao conhecimento formal e informal, que se adquire pelos livros e afins e pela dedicação, respectivamente.
4. Personalidade – Assenta no conjunto de traços que caracterizam o indivíduo. Envolve aspectos como a predisposição para correr riscos, a confiança em si mesmo, a tolerância à ambiguidade, a coragem p/ expressar novas ideias, a perseverança e a auto-estima.
5. Motivação – Prende-se com a força impulsionadora da performance criativa. Orientada para a tarefa, determina a paixão e a concentração e energia no trabalho.
6. Contexto ambiental – Diz respeito ao ambiente que em interacção com o indivíduo facilita a expressão criativa. Envolve aspectos como a família, a escola, as organizações e a sociedade, na medida em que contribuem, directa ou indirectamente, para a expressão criativa.
- 7.

A escala é constituída por trinta e seis questões, sendo que a resposta aos itens se realiza mediante uma escala aditiva de Likert de quatro pontos, expressos em termos de concordância: 1- discordo totalmente, 2 – discordo, 3 – concordo e 4 - concordo totalmente. Os itens foram redigidos pela positiva e distribuídos progressivamente pelas seis dimensões, num total de nove para cada uma.

Análise e Discussão de Resultados

A análise das características métricas dos instrumentos de recolha de dados é concretizada num estudo piloto que permite avaliar da sua sensibilidade, fidelidade e validade. Para o efeito procede-se à análise descritiva dos itens, à análise da consistência interna, através do coeficiente *alpha* (Alfa de Cronbach) para todos os itens e à análise factorial. De seguida, apresenta-se essa análise por instrumento.

– Inventário de Práticas Empresariais Inovadoras

Estudo de Sensibilidade - para avaliar a sensibilidade dos resultados obtidos, ou seja o grau em que os sujeitos se diferenciam entre si, pelos seus níveis de realização (Almeida & Freire, 1997) recorreu-se às medidas de localização e de tendência central, donde se destacam a média para cada item, e às medidas de dispersão, nomeadamente o desvio padrão para cada item. Consideraram-se ainda, os valores máximos e mínimos por item, conforme se pode observar na seguinte tabela.

Tabela 1 - Análise descritiva dos itens: Mínimos (Min.), Máximos (Max.), Médias (M) e Desvio Padrão (DP) (N=180)

<i>Item</i>	<i>Min.</i>	<i>Máx.</i>	<i>M</i>	<i>DP</i>
1	1	2	1,94	,230
2	1	2	1,97	,180
3	1	2	1,88	,328
4	1	2	1,74	,440
5	1	2	1,61	,489
6	1	2	1,64	,480
7	1	2	1,92	,277
8	1	2	1,86	,353
9	1	2	1,73	,446
10	1	2	1,53	,500
11	1	2	1,63	,483
12	1	2	1,32	,466
13	1	2	1,94	,240
14	1	2	1,87	,335
15	1	2	1,28	,488
16	1	2	1,83	,374
17	1	2	1,91	,293
18	1	2	1,93	,250
19	1	2	1,87	,335
20	1	2	1,76	,431

Verifica-se que os valores oscilam entre 1 e 2, as médias entre 1.28 e 1.94 e o desvio padrão entre 0.18 e 0.50. A maioria dos itens apresenta valores que estão de acordo com os parâmetros da distribuição normal. Não obstante, observa-se em dois itens (12 e 15) que os sujeitos respondem, tendencialmente, não e em quatro itens (1, 2, 7 e 18) que os sujeitos respondem, tendencialmente, sim. Considerando o conteúdo dos primeiros, ligados à existência de processos de gestão e avaliação e registo de patentes, pouco comuns em micro empresas e PME e dos segundos, ligados à performance do empresário, à imagem da empresa e ao desejo que o empresário tem de que a mesma seja positiva, logo carregados de algum efeito de desejabilidade social, optou-se por analisar a sua pertinência através do estudo da correlação do item com o total da escala (excepto o item).

Validade de Construto - O estudo da validade de uma prova procura testar até que ponto ela está a medir aquilo que pretende medir, pelo que se passou ao estudo de validade de construto. Nesse sentido, procedemos à análise da correlação do item com o total da escala.

Tabela 2 – Análise das Médias (M), Variâncias (Var), Correlação do item com o total da escala (Corr) e Alfa caso o item seja apagado (Alfa se) (N=180)

<i>Item</i>	<i>M</i>	<i>Var</i>	<i>Corr</i>	<i>Alfa se</i>
1	33,22	10,227	,252	,756
2	33,19	10,414	,175	,760
3	33,28	9,679	,422	,745
4	33,42	9,296	,432	,742
5	33,55	8,852	,536	,732
6	33,52	9,178	,427	,743
7	33,24	10,108	,264	,755
8	33,31	10,102	,189	,760
9	33,43	9,521	,338	,750
10	33,63	9,632	,247	,760
11	33,53	9,536	,295	,755
12	33,84	9,171	,446	,741
13	33,22	10,096	,325	,753
14	33,29	10,229	,144	,763
15	33,88	9,929	,157	,767
16	33,33	9,417	,477	,740
17	33,26	9,778	,429	,746
18	33,23	9,953	,402	,749
19	33,29	9,927	,289	,754
20	33,41	9,606	,321	,752

Como se pode observar os vinte itens do Inventário apresentam correlações positivas com o total da escala, o que é um bom indicador de validade interna.

Passámos de seguida ao estudo de validade de construto pela análise factorial. Para tal, recorremos à análise factorial dos itens a partir da sua matriz de inter-correlações. A fim de obter factores passíveis de interpretação, fez-se a rotação ortogonal *varimax*, tendo em vista a obtenção de factores independentes entre si, ou factores não correlacionados ou ortogonais, de modo a facilitar a interpretação dos mesmos. Apurou-se uma primeira solução factorial que, pela análise dos valores próprios superiores a um, nos remeteu para a retenção de sete factores, explicando 62,61% de variância.

A retenção de sete factores pareceu excessiva, considerando as dimensões teóricas do instrumento e a análise do *scree plot*. Este sugeriu-nos a possibilidade de uma solução de três componentes, pelo que apurámos nova solução factorial rodada, forçada a três factores. Dessa solução retiraram-se seis itens, com saturações abaixo de 0.50, ou seja, com covariância inferior a 25% entre os itens e o factor.

Numa nova análise factorial com a rotação ortogonal *varimax* verificou-se que o conjunto dos três factores explica 50,67% da variância. Passámos à distribuição dos itens por factor, considerando as saturações factoriais, e verificámos que o terceiro factor seria definido por apenas três itens com conteúdos muito próximos aos do primeiro factor, ou seja, ambos indicadores de estratégia empresarial e inovação participada.

Deste modo, optámos por proceder a nova solução factorial rodada, forçada a dois factores. Dessa solução retiraram-se três itens com saturações abaixo de 0.50. Em nova solução factorial, verificou-se que o conjunto dos dois factores explica 47,36% da variância, sendo que, o primeiro factor explica 24,51% dessa variabilidade.

Tabela 3 - Análise em componentes principais com rotação varimax (N=180)

<i>Itens</i>	<i>Componentes</i>	
	1	2
4		,656
5		,684
6		,583
10		,573
11		,557
12		,754
16	,730	
17	,662	
18	,801	
19	,721	
20	,617	
% de variância	24.513	22.852
% de variância acumulada	24.513	47.365

(As rotações convergiram em 3 interacções)

Estudo de Fidelidade - Tendo em vista averiguar a consistência interna do questionário procedeu-se à análise do coeficiente *alpha*. O presente instrumento tem um coeficiente de 0.746, tendo por factor os seguintes valores: factor 1 – 0.741 e factor 2 – 0.714. A fidelidade é moderada, pelo que se pode confiar que os resultados obtidos não são devido a erros ou ao acaso, mas que o inventário avalia o que se pretende.

Do estudo apresentado resultou um instrumento mais robusto, que converteu as quatro dimensões iniciais, em duas, num total de onze itens. Apresentamos o significado dos dois factores.

Quadro 1 – Interpretação dos Factores

Desempenho Definido pelo desempenho do sujeito, na sua relação directa com os resultados obtidos em termos empresariais. Pauta-se por um conjunto de acções de natureza processual e ligada aos recursos humanos e materiais disponíveis, que concorrem para resultados operacionais de carácter financeiro e social.
Inovação Participada Envolve aspectos estratégicos, a par da orientação do capital humano para um fim partilhado em termos da cultura empresarial: a inovação. Esta entendida como processo organizacional é assumida ao nível duma planificação e gestão de actividades de investigação e desenvolvimento.

– A Escala de Atitudes Face à Criatividade

Estudo de Sensibilidade - à semelhança do procedimento adoptado para a análise do Inventário, nesta escala os resultados obtidos também foram submetidos a uma análise descritiva dos itens, conforme tabela que se segue.

Tabela 4 - Análise descritiva dos itens: Mínimos (Min.), Máximos (Max.), Médias (M) e Desvio Padrão (DP) (N=180)

Item	Min.	Máx.	M	DP
1	1	4	3,57	,540
2	1	4	3,42	,597
3	2	4	3,23	,558
4	2	4	3,23	,570
5	1	4	3,14	,590
6	1	4	2,93	,733
7	1	4	3,03	,700
8	1	4	3,17	,656
9	1	4	3,33	,641
10	1	4	3,32	,574
11	1	4	3,32	,622
12	1	4	3,47	,583
13	1	4	2,11	,747
14	1	4	3,03	,871
15	1	4	3,31	,663
16	1	4	3,04	,765
17	1	4	3,29	,674
18	2	4	3,69	,486
19	1	4	3,25	,587
20	2	4	3,31	,499
21	2	4	3,33	,589
22	1	4	3,07	,631
23	2	4	3,44	,541
24	2	4	3,27	,527
25	2	4	3,18	,609
26	1	4	3,34	,646
27	2	4	3,24	,646
28	2	4	3,49	,554
29	1	4	3,16	,653
30	2	4	3,66	,498
31	1	4	3,19	,691
32	2	4	3,45	,582
33	1	4	3,19	,710
34	1	4	3,39	,611
35	1	4	3,23	,626
36	3	4	3,67	,471

Os valores encontrados oscilam entre 1 e 4, apontam para médias entre 2.93 e 3.69 e para um desvio padrão entre 0.47 e 0.87. Podemos verificar que a maioria dos itens apresenta uma distribuição adequada ao longo dos vários pontos da escala de Likert. Não obstante, observa-se num conjunto de 13 itens (3, 4, 18, 20, 21, 23, 24, 25, 27, 28, 30, 32 e 36) que os sujeitos tendem a não utilizar o mínimo da escala. Considerando o conteúdo destes itens, que dizem respeito, sobretudo, à habilidade que o sujeito tem para resolver problemas, à sua auto-confiança e perseverança e à interacção com o contexto, concluímos

que são itens carregados de um grande efeito de desejabilidade social, pelo que, optámos por analisar a sua pertinência

Validade de Construto – iniciámos este estudo através da análise da correlação do item com o total da escala (excepto o item).

Tabela 5 – Análise das Médias (M), Variâncias (Var), Correlação do item com o total da escala (Corr) e Alfa caso o item seja apagado (Alfa se) (N=180)

<i>Item</i>	<i>M</i>	<i>Var</i>	<i>Corr</i>	<i>Alfa se</i>
1	113,94	105,014	,413	,895
2	114,09	103,795	,470	,894
3	114,28	104,394	,453	,895
4	114,28	103,531	,518	,894
5	114,37	105,194	,358	,896
6	114,58	105,451	,258	,898
7	114,48	104,016	,376	,896
8	114,34	102,897	,492	,894
9	114,18	103,447	,461	,894
10	114,19	102,616	,596	,892
11	114,19	103,875	,442	,895
12	114,04	104,552	,418	,895
13	115,40	108,532	,050	,902
14	114,48	104,664	,250	,899
15	114,20	102,909	,485	,894
16	114,47	107,033	,142	,900
17	114,22	103,925	,399	,895
18	113,82	105,357	,429	,895
19	114,26	104,183	,446	,895
20	114,20	104,675	,485	,894
21	114,18	103,600	,495	,894
22	114,44	102,382	,556	,893
23	114,07	102,738	,624	,892
24	114,24	104,049	,516	,894
25	114,33	103,006	,526	,893
26	114,17	102,575	,526	,893
27	114,27	102,020	,570	,892
28	114,02	102,960	,587	,893
29	114,35	102,698	,510	,893
30	113,85	103,849	,569	,893
31	114,32	103,739	,401	,895
32	114,06	104,907	,388	,895
33	114,32	106,039	,228	,899
34	114,12	104,722	,382	,896
35	114,28	105,833	,283	,897
36	113,84	104,438	,542	,894

Observa-se que as correlações mais baixas ocorrem nos itens 13 e 16 e dizem respeito às competências dos sujeitos, de carácter académico e de carácter prático.

Optámos por não excluir qualquer item e continuámos com o estudo de validade de construto pela análise factorial. A fim de obter factores passíveis de interpretação, fez-se a rotação ortogonal *varimax* e apurámos uma primeira solução factorial que, pela análise dos valores próprios superiores a um, nos remeteu para a retenção de dez factores, explicando 64.48% de variância.

A retenção desses factores seria excessiva, considerando as dimensões teóricas dos instrumentos e a análise dos *scree plot*, que nos sugere a possibilidade de uma solução de duas componentes. Apurámos assim, uma nova solução factorial rodada a dois factores. Dessa solução retirámos vinte e um itens com saturações abaixo de 0.50.

Procedemos a uma nova análise factorial com a rotação ortogonal *varimax* e verificámos que o conjunto dos factores explica 46,13% da variância. Verificamos no entanto que o item 26 satura a menos 0.50, pelo que optámos por o retirar, procedendo a nova solução factorial, cuja análise se apresenta.

Tabela 6 - Análise em componentes principais com rotação varimax (N=180)

<i>Itens</i>	<i>Componentes</i>	
	1	2
2	,573	
3	,595	
4	,545	
5	,572	
7		,821
8		,767
9		,813
10		,651
12	,552	
18	,594	
20	,653	
21	,754	
22	,632	
23	,562	
25		,635
% de variância	26.162%	21.308%
% de variância acumulada	26.162%	47.471%

(As rotações convergiram em 3 interacções)

Estudo de Fidelidade - à semelhança do efectuado anteriormente, averiguou-se a consistência interna do questionário, procedendo à determinação do coeficiente *alpha*, que no presente instrumento é de 0.851, sendo que se verifica no factor 1 um coeficiente de 0.827 e no factor 2 um coeficiente de 0.816. Este valor é indicador de uma fidelidade adequada, permitindo-nos confiar que os resultados obtidos não são devido a erros ou ao acaso e que a escala avalia o que se pretende.

Resultou um instrumento que converteu as seis dimensões delineadas inicialmente, em duas, pelo que apresentamos o significado dos dois factores.

Quadro 2 – Interpretação dos Factores

Liderança Assenta no conjunto de traços que o caracterizam o sujeito e na sua capacidade para se relacionar com os outros. Por um lado dirige-se para aspectos como a perseverança, a flexibilidade e a capacidade de adaptação, e por outro para aspectos relacionais assentes na habilidade para a resolução de problemas, o reconhecimento das boas ideias e persuasão dos outros. Aponta também para o estilo que o sujeito adopta nas relações ético-profissionais, em termos de liderança e da sua abertura a momentos de aprendizagem e conhecimento.
Trabalho Definido pela forma como cada pessoa utiliza a sua inteligência, neste caso, na organização da sua vida profissional e na forma como a entende e dinamiza. Diz respeito ainda, à sua orientação para a tarefa, logo à concentração e energia no trabalho.

A partir dos resultados do estudo psicométrico do instrumento, chegou-se à versão definitiva do questionário que é composto por quinze itens distribuídos por duas dimensões.

Conclusão

Pode-se afirmar que os instrumentos de recolha de dados, alvo deste estudo piloto, constituem-se com provas com uma robustez moderada: os itens apresentam uma distribuição de resultados de acordo com as propriedades da curva normal, revelando sensibilidade; apresenta igualmente um bom grau de consistência interna indicando um grau de coerência existente entre as respostas dos sujeitos a cada item que compõe a prova. O estudo da validade permitiu ainda identificar dimensões factoriais pertinentes, do ponto de vista conceptual e factorial, apresentando um bom nível de consistência.

Deste modo, pensamos poder avançar para um segundo estudo com uma amostra mais alargada, que permita, por um lado, dar maior solidez aos instrumentos em causa e por outro lado, reflectir sobre um conjunto de sujeitos com um papel fundamental em termos do desenvolvimento económico e social das sociedades: os responsáveis por microempresas e PME portuguesas.

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AUTOMATIC

A NEW LEARNING APPROACH IN INDUSTRIAL AUTOMATION

HYPERLINK "<http://www.automatic-project.eu>" www.automatic-project.eu

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Abstract

The topic innovation is addressed twofold in the project AutoMatic: On the one hand a new learning approach in the field of industrial automation addressing the needs of small companies is developed, on the other hand innovation processes supported by information and communication technologies are directly addressed by one of the five modules included in the project and are subject of all modules. The modules ICT based means for automation and innovation, sensors, actuators and the application of PLC in industrial automation, as well as industrial networks and interfaces in automation systems consist of text based materials interactive examples, exercises and a self assessment tool. AutoMatic materials are designed to be used in course based training sessions but at the same time support individual learning. AutoMatic is co-financed by the European funding programme Leonardo da Vinci, transfer of innovation projects. Website: HYPERLINK "<http://www.automatic-project.eu>" www.automatic-project.eu

Introduction

Information and communication technologies, automation and robotics have changed and are changing processes in industry. In parallel also formal education programmes on different levels exist integrating different fields like mechanics, electronics and information technologies (mechatronics).

The project AutoMatic adds a new web based information and learning possibility in industrial automation which addresses especially beginners in the field of mechatronics and reflects needs of people in work-live like practice orientation, flexibility in time and usage of learning

resources, modularity of content etc. It addresses specifically practitioners in SMEs who intend to get an introduction and overview about industrial automation processes. AutoMatic is also targeted to students in vocational education as well as teachers and trainers as intermediates. The materials are designed to be used in course based training sessions but at the same time support individual learning.

The five modules consist of text based materials interactive, web based examples, exercises and a self assessment tool. The automatic web platform (www.automatic-project.eu) also contains additional notes to support teachers who use the material in training sessions.

Following we give a short overview about the five modules of the AutoMatic materials:

M1 - ICT based means for automation and innovation by Casalino, D'Atri, North-Samardzic

M2 - Sensors in industrial automation by Nenova, Ivanov, Nenov

M3 - Actuators in industrial automation by Brindfeldt, Pettai, Hõimoja, Beldjajev

M4 - Application of PLC in Industrial Automation by Müür, Pettai, Lepiksoo

M5 - Industrial networks and interfaces in automation systems by Rashidov, Jordanov

The full materials including interactive examples, tests and exercises can be accessed at the AutoMatic web platform www.automatic-project.eu.

ICT based means for automation and innovation

(Casalino, D'Atri, North-Samardzic, 2011)

There have been significant debates about the impact of new ICTs (information and communication technologies) on economic performance and competitiveness in general, and on productivity, efficiency, and innovation in particular. Notably, in seeking an explanation for the acceleration in productivity and economic growth experienced in many industrialized countries, many economists have looked at the development, application, and utilization of ICT as a critical factor. It has been argued that ICT represents a new General Purpose Technology, with the potential to transform economic processes into a "New Economy," generating a sustained increase in economic growth through processes of technological development and innovation. Hence, at the firm level, the expectations are of greater efficiency, lower costs, and access to larger and new markets, while governments see the application and use of ICT as generating higher national productivity, job creation, and competitiveness.

AutoMatic Module 1, ICT based means for automation and innovation, provides a basic analysis of automation and innovation fields and explains their organizational impact on Small and Medium-sized Enterprises (SME). Besides it analyses what are the main barriers for SMEs with respect to the realisation of their innovative potential and their capacity to create employment (reduced access to external finance, unavailability of wider distribution channels, low internationalisation, etc.).

Moreover, the capacity of continuous innovation has become a key factor in the global competition of high-income regions in order to acquire the additional factors of production and the new value adding processes which are necessary to keep an economy on a sustainable growth path. There is however, a strong normative conviction in most societies that a high and sustainable rising standard of living should be based on the highest possible rate of employment, not only to guarantee the utilisation of economic resources to their fullest extent but also to ensure a broad participation in a society's wealth without having to resort to transfer payments. This view is clearly expressed, for instance, in such important policy documents as the European Commission's Lisbon Strategy and its Social Agenda, respectively.

SMEs seem to be the ideal vehicle to promote both goals – sustainable innovation-based economic growth and employment creation – without trade-offs, given, as frequently assumed, the high flexibility as well as the relatively labour-intensive mode of production in SMEs.

However, the issue as to how realistic these expectations are is anything but resolved. Despite experience with a different number of SME promotion programmes, it is also still debated as to which specific policy measures are really suitable to guarantee undistorted competition by compensating firm-size specific disadvantages, such as the SME's restricted access to public resources.

Sensors in industrial automation

(Nenova, Ivanov, Nenov, 2011)

Sensors serve to obtain information about the condition of the controlled objects. Therefore they are elements of the control systems transforming the controlled quantity (temperature, pressure, humidity, flow, etc.) into a signal convenient to measure, store and process. The primary aim of AutoMatic Module 2, Sensors in industrial automation is to provide basic knowledge to employees in small and medium enterprises in the field of sensors used to build automation systems. The module is divided into ten chapters.

The first chapter deals with classification of sensors and requirements for them. Their major operating principles have been presented. Temperature sensors are considered in Chapter 2 where thermoelectric and thermoresistive transducers are described and thermistors, thermal diodes, thermal transistors and integrated temperature sensors are presented. Chapter 3 describes strength and mechanical stresses sensors. Strain gauges, piezoelectric and magnetoelastic transducers are presented. Chapter 4 covers pressure sensors. Various types of pressure sensors are presented: mutually inductive, capacitive, piezoelectric, strain gauges and optical. Position, displacement, velocity and acceleration sensors are viewed in Chapter 5. Contact, potentiometric, inductive, mutually inductive, capacitive, optical,

permanent magnet and piezoelectric transducers are described. The construction of the sensors is shown. Chapter 6 deals with flow sensors. Rotary sensors are described on the basis of measuring pressure, ultrasonic, magneto-inductive, calorimetric and vortex flow sensors. Chapter 7 presents humidity sensors. The basic definitions of humidity and classification of sensors are given. The various types of sensors are described according to the classification. Sensors for registering objects are presented in Chapter 8. Contact sensors, proximity sensors and optical sensors are considered. Chapter 9 depicts gas sensors. They are classified, various types of gas sensors are viewed and special attention is focused on metal-oxide sensors. Chapter 10 deals with interfaces which are employed in sensors. The main digital interfaces for wired and wireless communications are presented.

Actuators in industrial automation

(Brindfeldt, Pettai, Hõimoja, Beldjajev, 2011)

An actuator is capable of doing physical work. The actuator is a controllable mechanical device for performing manufacturing operations. An actuator uses electrical, hydraulic or pneumatic energy from the external source, converts and transmits it into mechanical movement energy (physical work) of a manufacturing device due which the form and nature of the product material and manufacturing device may alter. The main purpose of AutoMatic Module 3, Actuators in Industrial Automation, consisting of six chapters, is to provide the basic knowledge about the actuators implemented in automation systems.

The first chapter discusses the basic concepts of industrial automation, the nature of actuators, classification of the actuators used in automation and the selection of actuator mechanisms. The second chapter describes electromechanical actuators where the following subjects are discussed: the concept of electrical drive, conversion of electrical energy to mechanical energy, electric motors, protection classes, asynchronous motors, electrical drives with frequency converters, drives with soft starters, stepper motor drives and servo drives. The third chapter looks at electromechanical actuators and their classification. Solenoids with linear and rotary motion and holding solenoids are discussed in subsections. The fourth chapter looks at hydraulic and pneumatic actuators. In addition to pneumatic and hydraulic actuators, their directional control valves are also introduced. The sixth chapter presents the concept of industrial robots, the robot systems, control methods, different ways of movement and finally looks at ways to use industrial robots in various industries.

Application of PLC in industrial automation

(Müür, Pettai, Lepiksoo, 2011)

Today's industrial technology moves towards direction, which allows manufacturing of large amounts of different goods and selling them at higher profits. The evolution is supported by

industrial automation. The programmable logic controllers (PLC) play an important role in industrial automation. They are the elements of the control systems in the automated production system which generates the controlling signals for various technological processes and machines based on written control programs and incoming data signals. The primary aim of AutoMatic Module 4, Application of PLC in industrial automation, is to provide basic knowledge in the field of programmable logic controller, which are used to control automated (production) systems.

The first section covers the goal of automation of industrial applications, automation levels and the meaning of a programmable logic controller. Section 2 describes the PLC hardware parts, the main existing PLC types and how a PLC based on Siemens PLCs works. An overview of the PLC programming languages, program structure, data types and addressing of variables is provided in section 3. Section 4 addresses basic Boolean logic (also called bit logic) operations. Based on that simple control programs for automated processes and machines can be written. Transfer and PLC program control function are presented in section 5. These allow us to perform nonlinear program editing and execute alternative program branches. Section 6 deals with advanced Boolean logic functions. This includes timers, counters, comparators, and shift and rotate functions. Section 7 presents mathematic functions like addition, subtraction, multiplication, division, natural logarithm, sine, arc tangent, absolute value etc. Data type conversion functions are described. Section 8 deals with Proportional–Integral–Derivative (PID) controller types, their control parts and behaviour. Sample applications with the PLC control programs are given in sections 9, 10 and 11. Sample applications are with one pneumatic cylinder, two pneumatic cylinders, and a frequency converter. The final section explains requirements for PLC selection and safety. PLC program commissioning is discussed because the PLC programs are never final and it is always possible to make corrections and subsequent adaptations to the system according to the customer requirements.

Industrial networks and interfaces in automation systems

(Rashidov, Jordanov, 2010)

AutoMatic Module 5, Industrial networks and interfaces in automation systems, provides basic information about utilization of standard interfaces and set up of industrial networks in automation systems. In writing the book the authors have followed the contemporary level of achievements in that particular field and have tried to reduce the number of theoretical formulations and mathematical descriptions to a reasonable minimum. The content of the module is distributed in ten chapters.

Chapter one, entitled "Introduction into Industrial Communication Net-works" dwells upon basic features of contemporary manufacturing and communication systems, automation and

control systems with network communication and their functional distribution. Chapter two makes an overview of the types of communication networks. The next chapter contains a general background of network models and topologies; special consideration being given to devices for physical and logic setup of networks plus network models OSI and DoD. Chapter four contains the special properties and characteristics of industrial field networks as representatives of the lowest level in the hierarchy of industrial systems for control. The next two chapters review the special properties of the field nets specifications Profibus and CAN. Chapter seven includes a bulk of general information about industrial networks at “control” level and the specific features of ControlNet specification. Further the book reviews industrial networks at information level, the Ethernet network specification and the application of wireless communications in industrial automation systems.

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ORGANIZATIONAL CREATIVITY AS A NECESSARY STANDARD OPERATING PROCEDURE IN 21ST CENTURY ORGANIZATIONS

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Abstract

Organizational ingenuity is described as a deliberate, continuous creative process of problem (opportunity) generation and conceptualization, problem solving, and solution implementation and the creative attitudes, behaviors and cognitive skills which make this process work. Deep skill in executing this process is equally important to traditional deep skill in executing traditional efficiency processes. Most of today's managers, trained only in analytical thinking, lack this creative skill and many have turned out to be inadequate leaders, especially in recent times of accelerating change and ambiguity. Many organizations value short-term results above all, and reward successful implementers of routines disproportionately. Many organizations still regard creativity as an irritant, something that gets in the way of the 'real work'. Their response to greater competition is to cut staff, reduce costs, lower service levels and, in some cases, lower quality. Too few respond creatively, thereby increasing motivation and engagement, because they simply do not know how to go about it. Various concepts about organizational creativity, ingenuity and innovation are integrated into a single simplified approach focused specifically on improving organizational performance short and long term.

Introduction

In recent times, management researchers seeking to improve organizations have faced new, more complex challenges. We live and work in an era of rapidly accelerating change with frequent discontinuities and interruptions. Many organizations that prospered during more stable times – times that rewarded routinized efficiency – now find themselves poorly adapted to today's new economic and social realities. Everywhere we look, traditional structures are abruptly being reshaped or falling down. Once successful companies are finding that their sure-hit formulas no longer work. Long revered icons of organizational excellence have been humbled, and even bailed out of bankruptcy and imminent demise by government intervention. Individuals, families and entire communities are finding the world shifting beneath their feet as traditional markets, industries, and sources of employment disappear under the impact of new information technologies, global competition, lack of regulation of financial institutions, uncertainty about global warming, transitioning to new energy sources, and a restructuring of the

world economy. It is not surprising that organizations whose main virtues during previous times were predictability and reliability should find it difficult to adapt to this increasingly dynamic environment. Their employees, too, are struggling to deal with these changing times as the vast scale of change has resulted in an unprecedented need for information processing and problem solving skills. There has been a dramatic increase in psychological research aimed at better understanding the cognitive capabilities of employees, in order to improve employee productivity and well-being (Hodgkinson & Healey, 2008).

This article addresses the need for organizations to develop more creative ways of thinking and behaving in order to succeed in a turbulent world. While many organizations possess ample efficiency and analytical capability, successful organizations must also learn to integrate adaptability, creative capability and ingenuity into their repertoire. We argue that creativity attitudes, behaviors, cognitive skills and process must be learned, and developed such that they are second nature if organizations are to survive and thrive. Creative thinking ability must be made a way of organizational life, side by side with analytical tools, not as "sometimes things" or "once in a while things." We propose a simplifying system of Organizational Creativity comprised of attitudinal, behavioral, and cognitive skills within a multi stage process. This system does not exclude analytical thinking and tools; we position developing organizational creativity competency as enhancing or empowering the already present analytical capability as the essential complement. One of our goals is to help the field of creativity become better understood in its applicability to real world work.

In management research up until the late 20th century, the primary determinant of a firm's performance was perceived to lie *outside* the firm; that is in its external environment. This was the standard industrial organizational (IO) neo-classical economics viewpoint (Porter, 1980; Caves and Porter, 1977; Caves, 1980). In other words, according to the IO perspective, the source of a firm's profits was ultimately determined by its market position and the structure of the industry to which it belonged, and protected by barriers to entry into the market. This perspective led to the notion that leaders need only to design appropriate organizational structures and continue to make well reasoned decisions (Edmondson, 1996) in order to achieve continued economic success. We advocate the opposite viewpoint, which perceives that the source of superior profitability lies *inside* the firm. Known as the resource-based view, this perspective regards the firm as a bundle of resources not dependent on external market and industry structures (Ambrosini, 2003; Rumelt, 1984; Amit and Shoemaker, 1993). It suggests these resources – primarily the people of the firm – are responsible for a firm's sustainable competitive advantage, as they are capable of adapting to changing

external circumstances. Our resource-based approach focuses specifically on the capability of the people inside the firm and how they can use their creativity to handle any situation that comes along, internally or externally, to continuously develop and sustain healthy profitability. One well cited example of this is how Southwest Airlines, which is famous for its people-centered management style, continued to be profitable in the post 9/11 period while most U.S. airlines went into near or full bankruptcy.

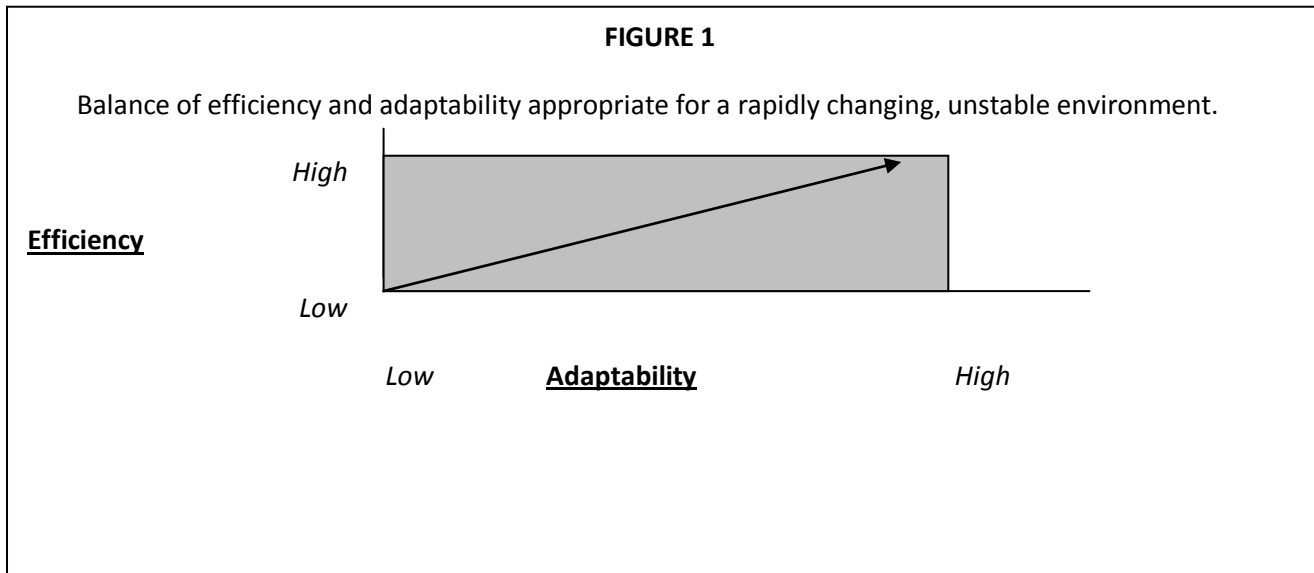
Organizational effectiveness, adaptability and creativity

Research has shown that effective organizations have two major but very different characteristics: efficiency and adaptability. Efficiency means perfecting routines in order to attain the highest quantity and quality for the lowest possible cost. High efficiency means mastery of routine, or standard, prescribed methods by which the organizational unit carries out its main tasks. The efficient organization follows well-structured, stable routines to deliver its products or services in high quantities with high quality and at low cost. On the other hand, adaptability means continually and intentionally changing routines and finding new things to do and better ways to do current work. Adaptability means scanning the environment to anticipate new opportunities and problems and deliberately changing methods in order to attain new levels of quantity, quality, and cost. Adaptability yields both new methods and new products and services. High adaptability means a high rate of positive change of routine.

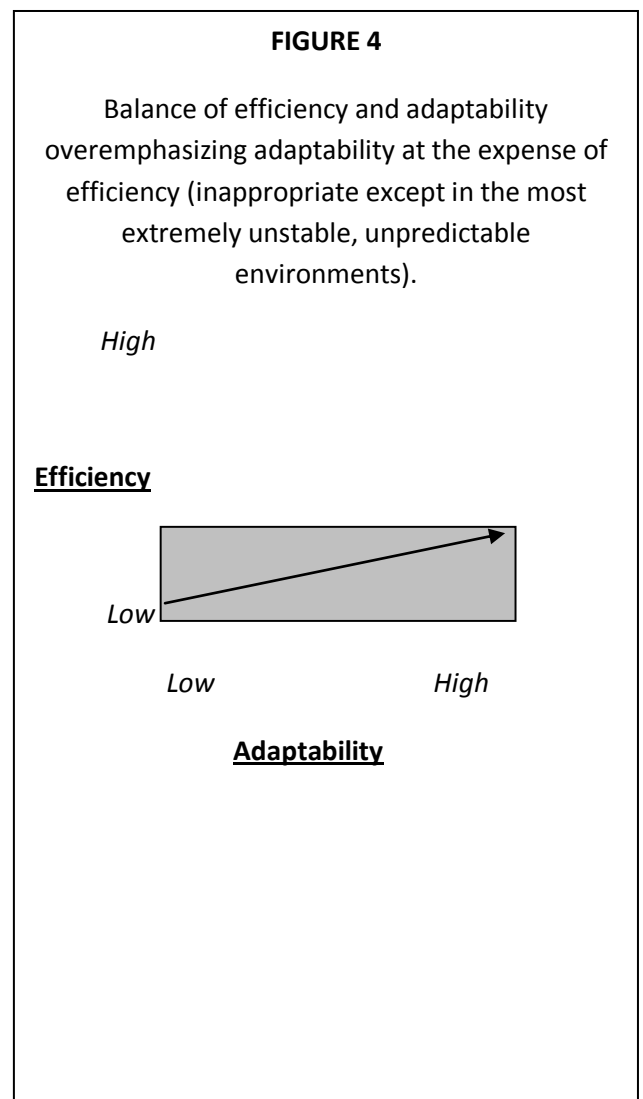
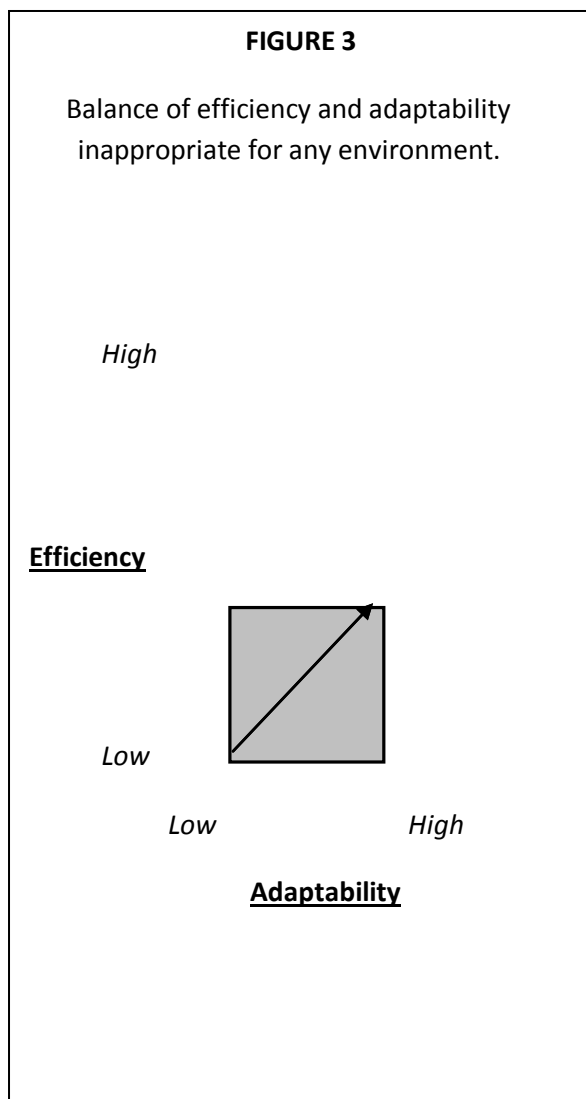
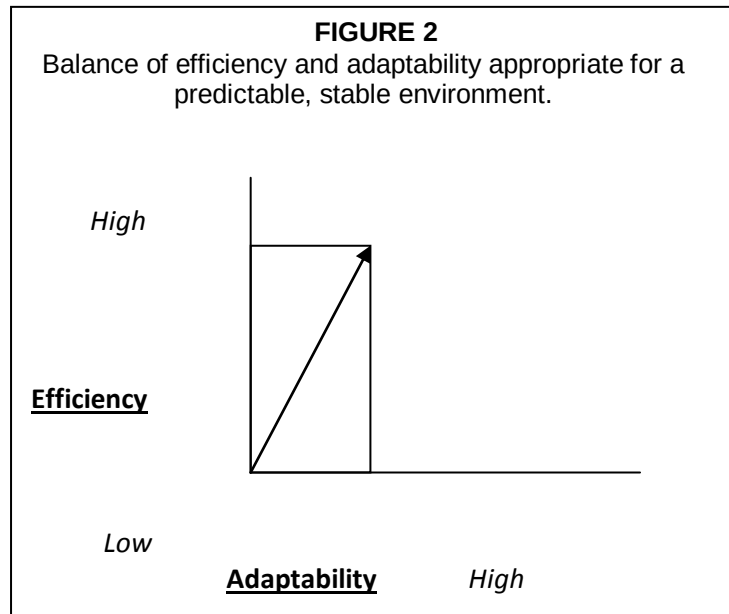
In a stable world, efficient organizations may be successful. But in today's changing world, organizations need adaptability. While efficiency implies mastering routine, adaptability means mastering the *process of deliberately changing* internal and external environments. Adaptable organizations anticipate problems and opportunities, and develop timely solutions and new routines. The people in such organizations accept new solutions promptly and the acceptance is prevalent across the whole organization. While adaptability is a *proactive* process of looking for ways to change, efficiency includes *reacting* quickly to unexpected turns of events and maintaining routines with minimal disruption and without getting mired in organizational bureaucracy. According to Mott's research (1972), the most effective organizations are both efficient and adaptable simultaneously, while the least effective organizations lack the right amount of either or both attributes. The following equation summarizes the findings:

$$\text{Organizational Effectiveness} = \text{High Skill in Efficiency} + \text{High Skill in Adaptability}$$

High skill in adaptability (or efficiency) means the ability to implement higher or lower levels of adaptability (or efficiency) performance as desired. (Figure 1).



Through the years, many organizations whose success was built on predictable technologies, markets, or other environmental factors learned to become highly efficient but neglected to build capacity for adaptability (Figure 2). For example, prior to the 1970s, North American consumers bought almost all of their cars from one of the Big Three domestic automakers. American automakers became accustomed to building large, fuel-inefficient vehicles suitable for a stable environment in which fuel was plentiful and inexpensive. Industry innovation was largely limited to cosmetic style changes each model year (low adaptability). As a result, when Japanese automakers began introducing more reliable cars, better options, and smaller vehicles that addressed new problems such as the 1970's oil crisis, they were quickly able to take advantage of the lack of attention the Big Three had paid to both efficiency and adaptability (Figure 3).



A similar story can be told about the North American tire industry during the same time period. The radial tire introduced by France's Michelin in 1945 was displacing the bias-ply tire everywhere but in North America. Until about 1975, North America's automotive tire industry enjoyed a predictable environment. Consumers bought their tires every 20,000 miles or so from Goodyear, Firestone or any of their well-known competitors. With the tires basically of the same quality, consumers shopped for the best price and friendly service ~ and suppliers concentrated on providing these efficiency factors (Figure 2). However, by failing to adapt to the radial tire innovation, due to management resistance, much of the North American market was lost virtually overnight to Michelin and Japan's Bridgestone, which found a public receptive to the advantages of the new tires. For the North American suppliers, what had appeared to be a predictable environment became anything but. They should have been operating according to Figure 1; instead they were operating according to Figure 2 (efficient enough but not adaptable enough).

It is also possible for an organization to be too adaptable but not efficient enough (Figure 4). Some highly successful organizations - such as 3M, which is famous for continuously creating new products - carefully monitor their own activities so as not to overemphasize adaptability at the expense of efficiency (which would be an appropriate balance only in the most extremely turbulent environment). Microsoft has been criticized for introducing new products too hastily, before ensuring they have been optimized and are error free. Mediocre organizations compromise unnecessarily, trading off efficiency against adaptability in a zero-sum fashion. However, the most effective organizations ensure they have the right amount of both efficiency and adaptability. In today's highly competitive North American car market, many companies - North American, Japanese and German - stress both high efficiency and high adaptability. Their consumers demand high levels of both quality and innovation. In a rapidly changing, unstable environment, both high efficiency and high adaptability are necessary (Figure 1).

While all organizations need skills in both efficiency and adaptability in order to be effective, most organizations understand the concept of efficiency and find it easier to mainstream than that of adaptability. One of the most important factors in determining the appropriate ratio between efficiency and adaptability is the volatility of an organization's environment.

Early approaches to improving organizational effectiveness by researchers and practitioners centered on embedding humanistic ideals and values, including personal development, interpersonal competency, participation, commitment, satisfaction, and work

democracy (French and Bell, 1999; Mirvis, 1998), into the workplace. As the field of organizational development has evolved, additional interventions almost too numerous to mention have emerged.

Many of these interventions have been useful in improving organizations in the short run. But many seemingly successful and permanent changes regress or disappear within a relatively short time after their implementation. This is sometimes called the fade-out effect (Hinrichs, 1978). The specific intervention called total quality management (TQM) has often failed to live up to expectations (Spector and Beer, 1993), partly because it has often been introduced as a grab-bag of tools (and management rhetoric) without any change making skills or process (Basadur and Robinson, 1993). However, TQM has succeeded when installed not only as a tool (intervention), but as part of a continuous process of change-making supported by a comprehensive, well- planned system of skill training, additional tools, management leadership and employee engagement towards well understood, specific, strategic goals (Basadur and Robinson, 1993). Top managers must look at what they practice versus what they preach (Beer, Eisenstat, and Spector, 1990). If they truly want change, they must become proficient in change-making. One of the most obvious examples of the lack of understanding of change making among managers is the inconsistency between organizational rewards and desired behaviors (Kerr, 1995). Table 1 details these examples.

**Table 1 - Examples of Inconsistencies Between Desired Behaviors
And Reward Systems**

operations and resources

High achievement	Another year's effort	We hope for....
But we reward....		
Long term growth; environmental responsibility	Quarterly earnings	
Setting challenging "stretch" objectives	Achieving goals: "making the numbers"	
Commitment to total quality	Shipping on schedule, even with defects	
Teamwork and collaboration	The best team members	
Innovative thinking and risk-taking	Proven methods and not making mistakes	
Development of people skills	Technical achievements and accomplishments	
Employee involvement and empowerment	Tight control over	

While creative strategies abound, many organizations struggle to effectively translate those strategies into action because employees aren't sufficiently equipped to respond in ways that yield positive individual and collective outcomes (Hodgkinson, 2008). Discrete interventions and tools continue to be the mainstay of organizational development work, with interventions perceived as the activities "through which changes in elements of an organizational work setting are implemented" (Robertson, Roberts & Porras, 1993).

We advocate a process of organizational creativity with embedded creativity skills at all levels and across all disciplines to effect ongoing change making as an every day way of life. And, very importantly, we mean equipping internal organizational members with the ability to apply the organizational creativity process and skills for self-sufficiency, that is, without interventionist help from the outside. In our approach, change making is a continuous process of finding and solving problems and implementing solutions, which is synonymous with our Organizational Creativity process. Without a precise change-making process that people can follow, and the necessary attitudinal, behavioral and cognitive skills needed to make the process work, organizations cannot mainstream adaptability, that is, make it an ongoing routine way of organizational life.

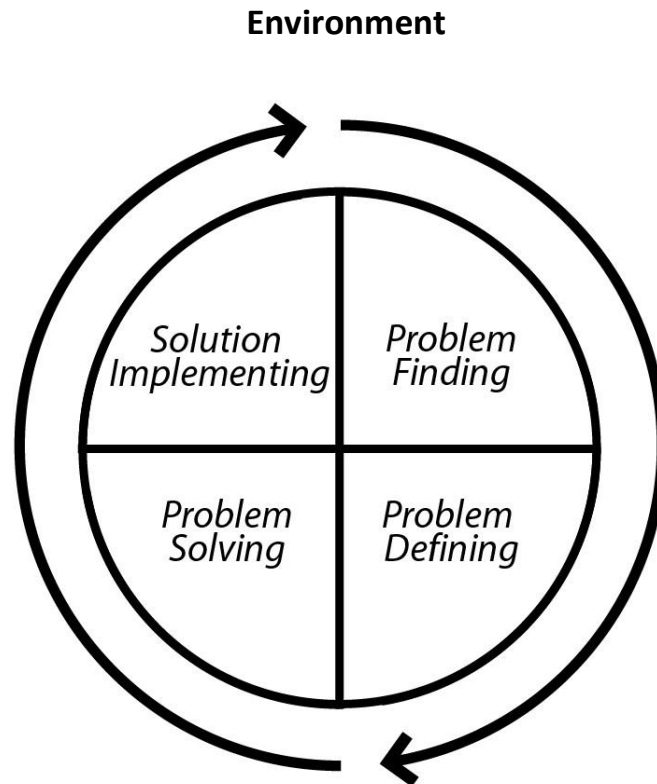
Organizational Creativity – A different approach to adaptability

Organizational Creativity can be defined as a system of knowledge, process, skills needed to make the process work, tools (for example, creativity techniques such as brainstorming) and appreciation of process style differences (Basadur and Gelade, 2006). Unlike traditional OD approaches, which lack a strategic perspective and rely on single or multiple interventions to change-making, Organizational Creativity is comprised of employees at all levels, highly skilled in constantly executing a process of finding relevant internal and external problems, strategic and tactical, solving them, and implementing the solutions for organizational adaptability. In effect, this defines organizational creativity as "implemented change." The most effective organizations know that creative attitudes, behaviors and cognitive skills and a creative process are necessary for successful sustained implemented change (Kriegesmann, Kley, Schwering, 2005; Stein, 1976). Real sustained organizational change comes as a result of a structured process of applied creativity and attitudinal, behavioral and cognitive skills employed by organizational members and modeled by leadership.

Studying and discussing creativity can be quite difficult and complex, because no single, agreed-upon definition of this quality exists and because researchers have taken vastly different approaches to its understanding. We focus on demonstrating a circular process of creativity as part of a continuous system of adaptability (Figure 5). We have

chosen to describe creativity in organizations as a continuous process of deliberate problem finding, problem solving, and solution implementation (Kabanoff and Rossiter, 1994) and attitudes, behaviors and cognitive skills that enable the process to work (Basadur, Graen and Green, 1982; Basadur, 1994). Problem finding means continuously finding new problems to address. This includes addressing things that are going wrong, but also anticipating and seeking out current or future changes, trends, challenges, and opportunities. Problem finding also includes taking the time to explore problems in depth rather than merely finding quick solutions or "fixes" (Senge, Kleiner, Roberts, Ross and Smith, 1994). This permits the discovery of not only underlying issues but also new opportunities and recognition of the interconnectedness of decisions within the organization. This recognition is the essence of systems thinking and the starting point for making long-term, permanent improvements. Problem solving means developing new and useful solutions to identified problems. Solution implementation means making new solutions succeed. Implementation usually leads the organization to find new problems to solve. As Runco (2004) noted, creativity is not only reactive – a response to problems and challenges – but also proactive, as a contributor to change. Thus new problems arise as the system and its environment react to each newly implemented solution. Therefore, organizational creativity can be understood as the fundamental driver of, and virtually synonymous with, adaptability, including a circular process of continuously finding, defining, and solving important problems and implementing new solutions which represent valuable changes that enable the organization to succeed (Figure 5).

FIGURE 5. Creative activity in an organization



This approach also removes any distinction between creativity and innovation (despite views of some researchers who distinguish between creativity as the generation of an idea and innovation as its implementation). Here, creativity is defined as a multi-stage complete and continuous process driven: by attitudinal, behavioral and cognitive creativity skills in each stage, including problem generation and formulation, idea (solution) generation, and solution implementation.

In addition, there are various creativity tools which can be applied in the various stages. However such tools are of little value, and may even be harmful, without the pre-requisite creativity skills to apply them. An example of such a tool is “brainstorming” which is frequently misused due to lack of skill and misunderstanding by researchers who lack experience in real world situations (Basadur and Basadur, 2009).

Effective organizations know how to establish a well-understood process and set of skills for adaptability. They do not expect adaptability to be achieved without effort. For example, 3M sets a corporate objective that every five years, 30 per cent of their products must be new. Effective organizations also create a positive climate toward problems and seek them out as opportunities for disruptive change (Mott, 1972). As solutions are implemented, new problems (or opportunities for innovation and improvement)

are discovered. For example, Basadur (1992) reported that top Japanese corporations place newly-hired R&D scientists and engineers into sales departments to begin their careers. The intent is for them to learn experientially the problems of the customer, and recognize that such learning is the beginning of innovation. Thus, a positive mindset towards creativity begins with a positive attitude towards *problem finding*, meaning the behavior of continuously and deliberately discovering and formulating new and useful problems to be solved.

The four distinct stages of an Organizational Creativity process

The evolution of models of multi-stage creative thinking and problem solving processes began with Wallas's (1926) four main stages: preparation, incubation, illumination and verification. Later process models incorporated additional stages, but all include, as a first step, a process in which a problem is recognized, identified and constructed (Reiter-Palmson and Robinson, 2009).

This is where the problem is formulated. We suggest something different. We suggest that all the pre-existing models tend to assume that a problem, task or goal requiring creativity already exists or has been presented and that a creative process is subsequently applied. This reduces these models to mere tools, or problem solving interventions or episodes which start with a problem and end with a solution. We offer a more complete process of creativity which begins before a problem is available to be formulated (Basadur, Graen and Green, 1982; Basadur, Graen and Wakabayashi, 1990). Figure 5 outlines a continuous circular process that begins with the deliberate seeking out (*generating*) of new problems and opportunities. The second stage of the process is *conceptualizing*, or formulating, defining, and constructing a newly generated problem. In the third stage, *problem solving*, evaluation and selection of solution ideas takes place, while the fourth stage results in *solution implementation*. The process then begins anew, as every implemented solution (action) results in the opportunity to discover (generate) new problems and opportunities. For example, the automobile's invention provided not only a new solution to an old problem (improving transportation) but created many brand-new problems (e.g., pollution, energy and accidents). Each stage of the process requires specific attitudinal, behavioral and cognitive skills in order to be successfully completed.

While effective innovation requires strong performance in each of the four stages of the creativity process, our research has found that individuals, teams and organizations may prefer some stages of the creative process more than others. We call these preferences *styles* and suggest effective leaders must learn to synchronize the different creativity styles (Basadur, 2004). In teams, for example, the members must learn to combine their individual preferences and skills in complementary ways. Basadur and Head (2001)

showed that heterogeneous teams composed of people with different preferences outperformed homogeneous teams whose members had similar preferences.

How Organizations Can Become Skilled in Organizational Creativity

Many shortcomings in attitudinal, behavioral and cognitive creativity skills plague individuals, teams and organizations. As detailed in Basadur (2004), for many individuals, problem finding is a foreign concept. Many people wait for others to find problems to solve rather than actively seeking out problems, or avoid important problems that cross departmental lines ("That's not our problem"). Conceptual skills in defining problems are lacking and much time is wasted "working on the wrong problem". Even after finding and defining problems, some people find it difficult to solve them creatively and imaginatively. Some individuals are also critical of new ideas, which can prevent productive thinking. While many people may be able to implement routine solutions to routine problems, few can implement creative solutions to new, non-programmed problems. Teamwork is also often uncreative. Group members are unable to communicate clearly in simple terms, for example. Unaware of variations in individual thinking styles, groups fail to synchronize these differences, jump into "solving the problem" without first considering what the real problem is, and then flounder. Inter-functional teams become stalled arguing about territorial issues. Meeting leaders steer toward their own points of view rather than facilitating the group to work open-mindedly and cohesively. The design of many organizations remains along bureaucratic, functional lines - a design that itself minimizes creativity. Jobs are programmed for maximum control, highest quality, and lowest cost per unit. Creativity skills and change-making are limited to short-term quick-fixes during emergencies. For organizations without a positive mindset toward creativity, problems and changes stemming from new technology, customer tastes, and foreign competition are viewed as irritants that disrupt well-functioning, established routines, despite the fact that the essence of adaptability and the first phase of the creative process is problem finding. Basadur, Graen, and Green (1982), demonstrated that many of these shortcomings can be overcome by developing specific skills. Training to build these skills is based on two central concepts.

1. Change-making is a process with distinctly different stages:

In practice, it is useful to break the four-stage change process shown in Figure 5 into a circular process of eight smaller steps as shown in Figure 6. These steps include problem finding and fact finding, which collectively make up "problem generation", or Stage 1; problem definition and idea finding ("problem formulation", or Stage 2); idea

evaluation and selection, and planning for implementation (“problem solving”, or Stage 3); and gaining acceptance and taking action (“solution implementation”, or Stage 4).

3. **An Ideation-Evaluation process occurs in each stage:** It is vital to use an ideation-evaluation mini-process within each of the eight smaller steps across all four stages as shown in Figure 6. The mini-process is shown in Figure 6.

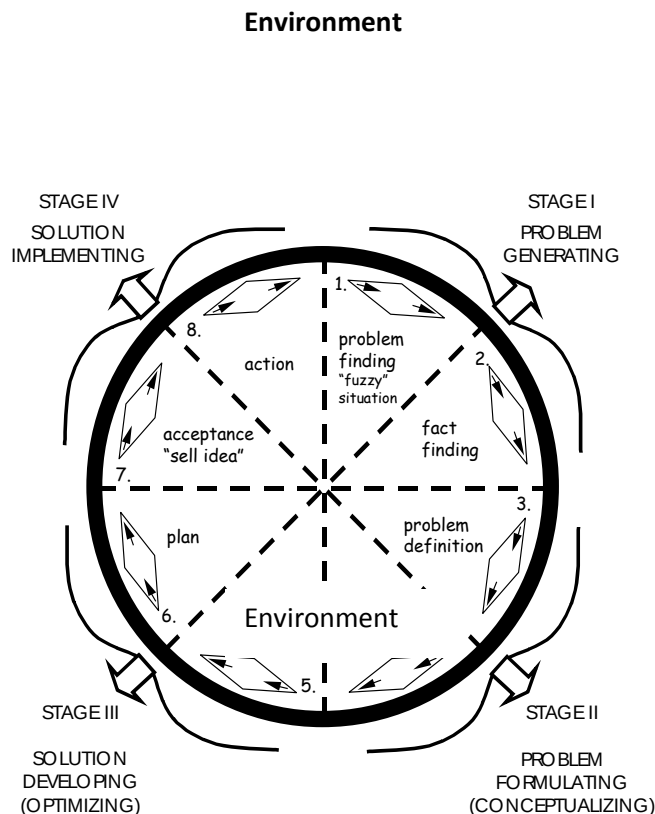


FIGURE 6. The organizational change-making process

Three distinct skills are needed to execute this two-step mini process effectively (Basadur & Finkbeiner, 1985): deferral of judgment, active divergence, and active convergence. By separating divergent thinking from convergent thinking, deferral of judgment resists the tendency to prematurely evaluate and select options, and encourages active divergence. Deferral of judgment also prevents people from leaping to solutions before properly formulating problems, and helps them separate assumptions from facts. Active divergence enables generation of many options without judging or analyzing them. Active convergence, which resists the tendency to linger in divergent thinking, then selects and acts on the options that ultimately lead to implementation of change. These three skills all have attitudinal, behavioral, and cognitive components.

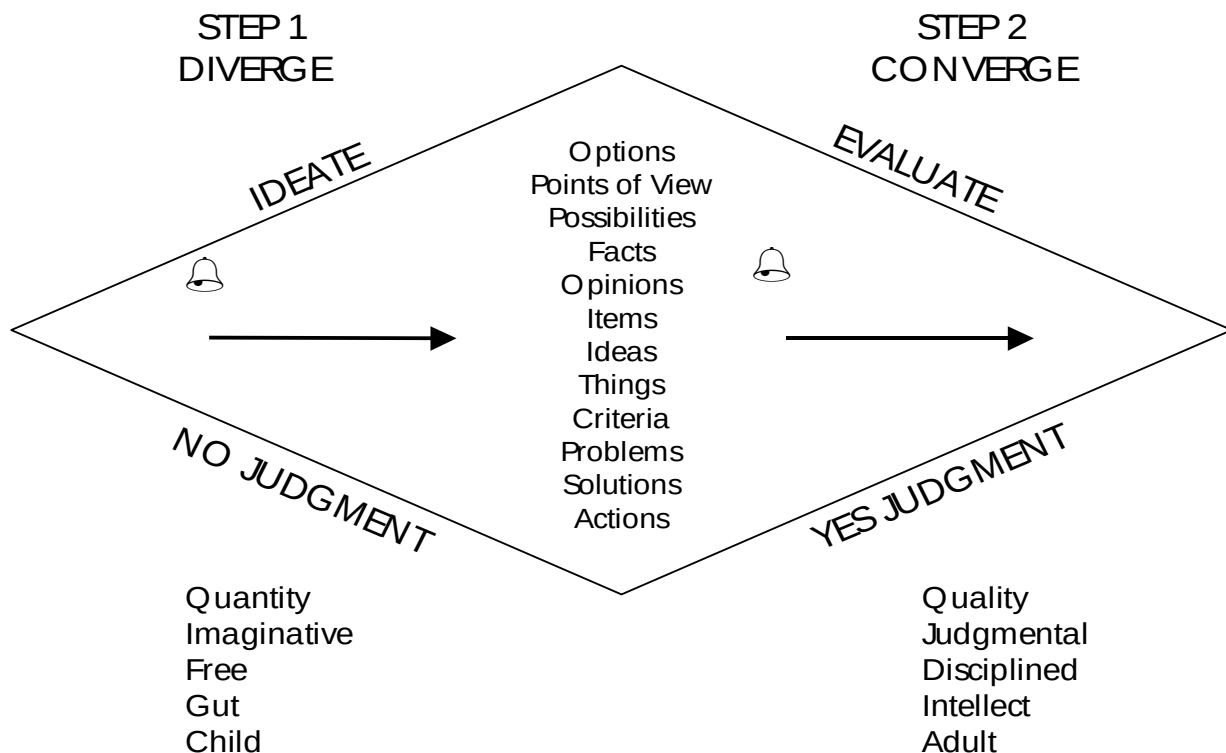


FIGURE 7: Ideation-evaluation: A sequential creative thinking mini-process.

BECOMING COMPETENT

It is much easier to understand the need for a systematic process to achieve organizational creativity and adaptability (as modeled in Figure 6) than it is to become skilled in using such a process. Learning how to use the process involves developing skills in finding, defining, solving and implementing new opportunities. Most managers have undergone rigorous training in analytical, optimizing and efficiency thinking processes in high school and college and on the job training. Creativity requires a different set of skills in which competency must now be built belatedly. Building competency has three main components:

(1) Competency in executing the process as a whole; (2) Competency in respecting and helping synchronize different styles in the process and (3) Competency in executing

each step and stage of the process. Competency in executing the process as a whole includes being able to distinguish the different steps from each other; for example executing, communicating and separating (1) problem finding activity from (2) problem defining activity and from (3) solution development activity and from (4) implementing activity. It also includes avoiding unconsciously leapfrogging the process steps, such as jumping backwards from discovering a fresh new problem (step 1) into immediate action (step 8) only to discover later that the problem was not what it seemed to be at all and regretting the time wasted by not permitting the process unfold naturally from 1 **through** 8.

Competency in respecting and synchronizing different process styles includes understanding how the creative process depends upon different ways of apprehending knowledge and understanding and utilizing knowledge, however apprehended.. Not only are both necessary for creative performance, but frustration and inefficiency in working together can be avoided. For example, if some individuals on a team prefer stage 2, conceptualization, while others on the same team prefer stage 4, implementation, it is important that these individuals understand and respect each others' opposite preferred ways of apprehending knowledge (experientially and concretely vs. theoretically and analytically) and of utilizing knowledge (to create options divergently vs. evaluate options convergently).

Competency in executing each step of the process includes competency in executing the ideation-evaluation mini process described previously which combines the three necessary creativity thinking skills within each step: (1) creating options within the step (divergent thinking); (2) evaluating and selecting the most important options within the step (convergent thinking); and (3) skill in separating divergent from convergent thinking within each step (deferral of judgment). Integrated into early creative problem solving theories and models, including Osborn (1953), Guilford (1967), and Parnes, Noller and Biondi (1977), these skills in the mini-process have been more deeply explored in more recent empirical research which has described them more completely and identified their attitudinal, behavioral and cognitive components. For example, in a multi-method, multi-measure field experiment, Basadur et al (1982) identified attitudinal, behavioral and cognitive effects of training which were readily observable back on the job (along with performance effects). The effects included:

- Attitudinal: More openness to new ideas; more positive reaction when confronted with new unusual ideas
- Behavioral: More likely to pause to try new, unusual approaches to solving problems; less time spent in negative evaluation while creating options; less likely to jump to conclusions as to the nature of the real problem
- Cognitive: Increased quantity and quality of options created; more time spent

in divergent thought prior to evaluating; more options created prior to selecting one as best

Additional examples of the attitudinal, behavioral, and cognitive components of each of the three process skills throughout the complete eight step process are provided in Tables 2, 3, and 4 (Basadur and Robinson, 1993; Basadur, Pringle, Speranzini and Bacot, 2000). It should be noted that the examples below overlap a great deal across attitudinal/behavioral/cognitive distinctions and also across the three process skills distinctions. We do not believe these distinctions are as important as recognizing the various skill components.

Table 2
Examples of Inconsistencies Between Desired Behaviors
and Reward Systems

We hope for.....	But we reward....
✂ Long term growth; environmental responsibility	✂ Quarterly earnings
✂ Setting challenging "stretch" objectives	✂ Achieving goals: "making the numbers"
✂ Commitment to total quality	✂ Shipping on schedule, even with defects
✂ Teamwork and collaboration	✂ The best team members
✂ Innovative thinking and risk-taking	✂ Proven methods and not making mistakes
✂ Development of people skills	✂ Technical achievements and accomplishments
✂ Employee involvement and empowerment	✂ Tight control over operations and resources
✂ High achievement	✂ Another year's effort

TABLE 3. Examples of Deferral of Judgment Skill

ATTITUDINAL

Tackle problems with an optimistic "can do" attitude.

Enter meetings open to ideas that might disrupt one's own department's routine

BEHAVIORAL

Visibly value, appreciate, and welcome other points of view

Avoid making premature, negative judgments of fledgling thoughts

COGNITIVE

Recognize hidden, unconscious, unwarranted assumptions

Maintain an awareness that some facts are more difficult to perceive than others.

Understand that some problems require a longer time to solve, and do not expect immediate results.

TABLE 4 - Examples of Active Divergence Skill

ATTITUDINAL

Deliberately push oneself to create unusual, thought-provoking ideas

Turn premature, negative evaluations of ideas into positive challenges to keep the creative process flowing; when others say "We can't because ..." counter with, "How might we ... ?"

BEHAVIORAL

Show leadership in pinpointing changes, trends, problems, and opportunities for improvement throughout the organization.

Share information and ideas freely with other people and departments.

Share "bad news" as quickly as "good news" to aid organizational problem solving.

Facilitate teams to formulate problems in ways that transcend departmental considerations.

COGNITIVE

Search out many different facts and points of view before attempting to define a problem.

Define problems in multiple and novel ways to get a variety of insights.

The field research by Basadur et al (1982), provided evidence that unless creativity training was sufficiently impactful to successfully *unfreeze and change* participants, no improvement in creativity skills and performance would be achieved. In other words, to achieve meaningful increases in problem finding, defining, and solving, and solution implementation performance, the impact of training must be sufficient to increase acceptance and practice of the attitudinal, behavioral and cognitive creativity skills within the multistage creativity process. However, their research also suggested that to *refreeze* the acceptance and application of the new skills built in training to on the job creativity performance, specific strategic structural organizational factors must be developed and put into place to reinforce and motivate their on the job practice (Basadur, 1994).

Basadur, Graen and Scandura (1986) found that the training effects in creativity process and skills as shown in Figure 7 on manufacturing engineers persisted back on the job were more permanent when they were trained together in intact teams. Team members learn to accept and share their members' diverse experience more completely, support differing viewpoints, and risk implementing novel ideas (Basadur, Graen & Green, 1982). This helps to avoid "group think", the tendency for members to follow the crowd into inadequate solutions instead of offering possibly controversial, superior viewpoints. Applying the process makes participation in problem solving safe and fun because people no longer fear advancing fledgling points of view and do not feel they must be constantly on guard.

Getting Two for the Price of One

Organizations which provide the right skill training, create the right infrastructure, and participate in and reward continuous problem finding and solution implementing, achieve several outcomes. Some creativity outcomes are directly economically oriented and others are not. Creativity leads directly to new and improved products and methods; these are economic outcomes associated with adaptability. However, creativity also leads to specific people outcomes, including motivation and commitment, which serve as intermediate steps leading to economic outcomes associated with efficiency (Basadur, 1993).

Motivation and Commitment are Outcomes of Creative Activity

Workplaces that establish adaptability as a daily, continuous process of problem finding and defining, problem solving, and solution implementation may experience increased employee commitment and motivation. Numerous research studies have shown that curiosity, activity, and exploration are intrinsically enjoyable and motivating. People develop negative attitudes toward repetitive tasks and experience fatigue and boredom. Permitted to engage in finding and solving problems, workers become motivated and desire even more participation in creative activity. They also work harder at perfecting their routine jobs to increase quality and quantity and reduce costs, thus increasing organizational efficiency and short-term organizational effectiveness. Workplace accomplishments improve self-esteem and human need for achievement, while creative activity stimulates team-building as people help each other to solve problems. Some research has also suggested people are more motivated to achieve goals that they have been given a chance to choose, which supports the importance of problem finding as an employee motivator, as well as an organizational necessity.

By giving employees the encouragement and opportunity to find and solve their own challenging problems, and implement their own solutions, organizations can provide intrinsically rewarding work and tap into the need for achievement for motivation.

Reducing turnover, absenteeism and increasing personal development

The link between inducing creativity on the job and increasing job satisfaction and commitment is important not only from the perspective of having happier and more motivated people at work, but in other ways as well. Industrial and organizational psychology research has identified substantial correlations between job satisfaction and commitment and direct economic variables such as lower turnover and lower absenteeism (Locke & Latham, 1990; Organ, 1988). Other outcomes which are both people and economically oriented include better selection, placement, career planning, and personal development for organizational members. For example, if we understand peoples' unique individual thinking and creative problem solving process styles better, we can match them with jobs better (Basadur and Gelade, 2003).

i. SETTING UP THE INTERNAL ENVIRONMENT TO ENCOURAGE CREATIVE WORK

While the commitment of an individual is the prerequisite for the development of expertise, the study of expert performance acknowledges the support structure surrounding individuals as crucial to facilitating eventual success. In developing of the creative competency of employees, the internal environment of an organization and its managers must act like the coaches, teachers, and parents studied in athletic and artistic expert performance. While the motivation and drive of employees to develop creative thinking skills is critical, management must structure the environment so that it enables the continuous growth of employees' expertise, and leaders must monitor the performance of employees and instruct them using methods that challenge them to reach ever higher levels of competence.

Despite research showing that most people at work are multi-motivated, the majority of global business and industry is still organized and managed on the overly simplistic "scientific management" concept made popular in the early 20th century by Frederick Taylor (1967). Taylor believed that employees are motivated by one dominant factor – money. Fortunately, using creativity as a formula for motivation can be almost as simple as using money. There are many straightforward ways to encourage people to be creative on the job and achieve a motivated organization. Top Japanese organizations manage their world-class employee suggestions systems to induce creative behavior and to drive creative output including cost savings and new products and procedures. The primary objective of these suggestion systems is not to improve economic outcomes directly but to motivate people and increase their commitment (Basadur, 1992).

Although adaptability skills are essential, it would be naïve to believe that all that is needed is to train employees at all levels in the Organizational Creativity process and the skills to make it work. This would only be one third of the battle. In order to make adaptability

performance a normal way of life, an organization must integrate creativity thinking skills and process with a clear-cut business need and infrastructure to encourage employees to experience success applying the skills and process. Creativity skills and process must be accompanied by communication and acceptance of a well understood and motivating organizational business need for adaptability. People need to understand why they suddenly need to use their creativity on the job. The business need must be translated into a specific goal(s) to pursue. Measurable adaptability goals must be placed into the corporate strategy alongside efficiency goals. As well, a complementing infrastructure must be created which makes it easy and encourages people to routinely use their skills to pursue the goals. An ideal scenario, for example, might see employees receive creativity training based on application of training to specific company real world problems rather than non-work related “practice” or theoretical problems. Thus, progress is made against the goals during the training itself. Of course the infrastructure must extend beyond the training. Figure 8 illustrates how these three components support each other.

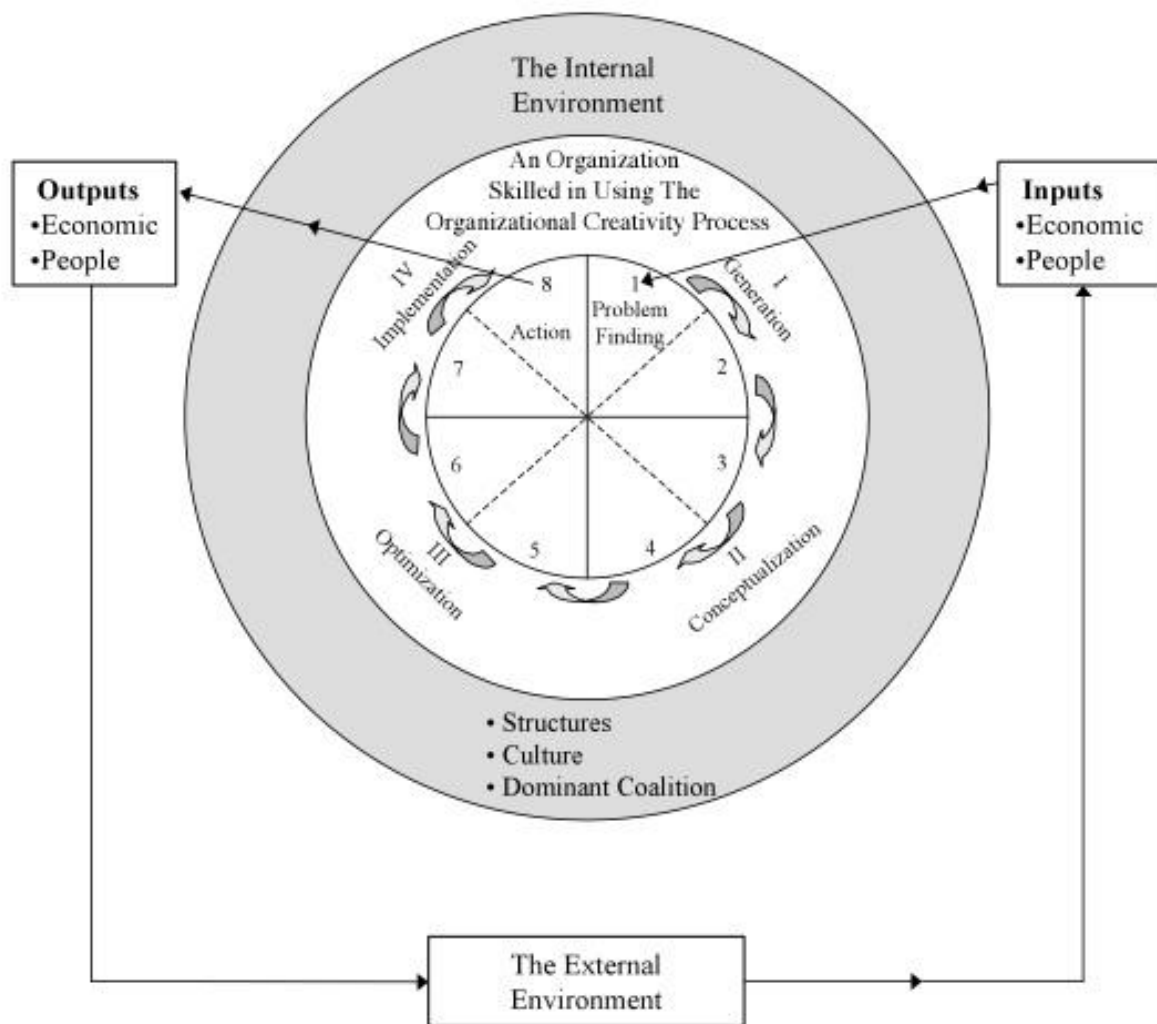


Figure 8.
The Three Necessary Components of a Successful Effort
to Institutionalize Adaptability

Many worthwhile interventions have floundered because the organization lacked at least one of these three components: business need, infrastructure, and change making process and skills. (Basadur and Robinson, 1993) If senior leaders wish to introduce an intervention, they must spell out what specific business need they intend to address (such as lower costs, higher sales, fewer defects or customer complaints, better teamwork, shorter turn-around times or faster time to market, better products or services) to ensure that employees buy in to the intervention and can measure success. The organization must also ensure an effective infrastructure, such as performance appraisal systems or membership on interdepartmental teams, is in place so new philosophies and tools are applied regularly. Along with clear business needs, and infrastructures for implanting new initiatives,

organizations must also avoid underestimating the effort required to establish people's change making skills, attitudes, and behaviors, and must provide adequate training.

Summary and Future Research

We have offered a new approach to organizational adaptability and ingenuity in which deep skill in executing creativity as a standard everyday process is the key, equally important to traditional deep skill in executing traditional efficiency processes. Most of today's executives lack this creative skill and many have turned out to be inadequate leaders, especially in recent times of accelerating change and ambiguity. However in our experience, many organizations are not as effective as others because they value short-term results above all, and reward successful implementers of routines disproportionately. Simply put, organizations favor efficiency at the expense of adaptability.

Many companies still regard innovation as an irritant, something that gets in the way of the 'real work'. They are content to turn out standard quantities of standard products and achieve the sales, cost and profit goals for this month, this quarter, this year. Their response to greater competition is to cut staff, reduce costs, lower service levels and, in some cases, lower quality. Too few respond creatively. Sometimes this is because they simply do not know how to go about it. In this chapter, we have tried to demystify various concepts about creativity and innovation by integrating them into a single simplified approach focused specifically on improving organizational performance short and long term.

Perhaps, more managers would be willing to give this simplified approach to try, especially if they could be shown how it helps them achieve even short term results more efficiently. Perhaps, future research could focus on strategies for helping managers grasp and increase comfort with the innovation process, skills, techniques and style described.

We define Organizational Creativity as a deliberate and continuous change-making system of attitudes, behaviors and cognitive skills driving a process of problem generation, conceptualization, problem solving, and solution implementation, which is virtually synonymous with adaptability. It requires attitudinal, behavioral, and cognitive skills in deliberate change-making and incorporates interventions into the process as tools. Under the new approach, organizations can learn to mainstream adaptability by doing two things: encouraging employees to master new skills which increase their creativity, motivation, and engagement; and creating an infrastructure that ensures that these skills will be used regularly.

More research is needed to reassure innovating organizations that they are on the right track, particularly when the results of emphasizing adaptability may take considerably longer to appear than the results of an emphasis on efficiency. A clue may be found in Japan: whereas much North American decision-making is driven by the next

quarter's results, Japanese organizations favor long-term planning and reporting (Dertouzos, Lester & Solow, 1989). Well thought out strategies that enable organizations to confidently shift the balance between adaptability and efficiency will help them prosper over the long term and prevent their being surprised and damaged by a volatile environment.

An additional avenue for further research is to identify factors which enable an organization to effectively alter its "appropriate" balance of adaptability and efficiency rather than being caught unaware by upcoming environmental changes. What are the signals that prompt senior management to request more creativity, that motivate middle managers to act upon a top management requirement for more creativity, and that encourage individuals in the organization to act more creatively (assuming in each case that they know how to do so)? A clue may be found in several North American corporations that had the appropriate balance for an earlier era but had to drastically change that balance during the 1980s in order to react to changes in their environment or circumstances. While suffering through 13 consecutive quarters of huge losses in the early 1980s, Ford made massive top-down training interventions to become a less authoritarian, more innovative and more efficient organization with higher employee involvement. In order to respond to new competition, Xerox reinvented itself from a copier company into a document company and instituted a continuous process to fundamentally change how its employees work and manage. More recently, IBM reorganized itself after seeing its stock price plummet when smaller competitors capitalized on the market shift to personal computers from mainframes. An excellent research question would be how these organizations might have recognized the need to shift their balance much sooner than they did.

Implications for Leadership

Today's leaders must understand creativity as an ongoing continuous change-making organizational process, not just a sometime occurrence, or a program of discrete interventions and philosophical values of "what's good" for organizations. Effective leadership is really implanting and sustaining a system of organizational creativity that can be learned and mainstreamed to provide continuous and deliberate adaptability. Leaders must learn and adopt the corresponding new skills and new ways of thinking and behaving. To provide effective leadership in the 21st century, managers must become effective change agents in their everyday work (rather than to leave this as a "sometime thing" to others). In future, managers, who may have been accustomed to a command and control style which includes creating strategy and policy by themselves and then passing it down to a waiting organization, will need to learn skills in engaging their subordinates in co-

creating strategy. By engaging a wider range of people in the process of developing new strategies, ownership and successful implementation of the new strategy is more likely to occur (Coch and French, 1948). Porras and Robertson (1992) describe the characteristics of an effective change agent as (1) interpersonal competence (relational skills, ability to support, nurture, and influence others); (2) theory-related problem solving and change skill, (the ability to conceptualize and diagnose, to present options to others), (3) skill as an educator (able to create learning experiences), and (4) self-awareness (ability to have a clear understanding of one's own needs and motivations). These are all different from purely analytical thinking and problem solving characteristics. To supplement these analytical skills, today's managers must learn to think and behave in new ways and to lead others to think and behave in new ways. Mintzberg (1973) documented that most managers operate primarily as short term implementation doers. Our research (Basadur and Basadur, 2010) supports this finding, suggesting many managers are especially under-skilled in problem finding and problem definition, which represent the essence of strategic thinking and adaptability. Thus the training of managers to improve conceptual thinking skills to combine with optimizing and implementation thinking must become an important intervention to improve fundamental leadership skill.

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CINDERELLA

EXPLORING THE BOUNDARIES FOR INNOVATION

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Abstract

This paper is evaluating the prerequisites of an organization for innovation when it comes to assumptions, roles and processes. The reason for the study is that large organizations have difficulties to develop radical innovations. The purpose is to identify boundaries for innovation at the initiation of a multidisciplinary research project to facilitate company advancement. This case study is conducted at a Swedish automotive company examining a bottom up product innovation initiative. The research takes a design perspective based on a systemic approach and builds on 25 interviews. The methodological approach was ethnographic where a multidimensional perspective was created to display interrelations and contradictions of individual, project and company's view. Furthermore the perspective was compared to relevant theories like systems theory, dynamic capabilities and innovation management. Finally, the findings has led to an understanding of the company's capability for innovation and possibilities for organizational renewal as well as the creation of external collaborative entrepreneurship.

CRIATIVIDADE NO ENSINO SUPERIOR: NOVOS CAMINHOS

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RESUMO

Este artigo apresenta algumas reflexões acerca da importância de potencializar e desenvolver habilidades e iniciativas que promovam a criatividade no Ensino Superior, destaca autores, conceitos e a partir desses salienta a importância da criatividade e autonomia na sociedade do século XXI.

Palavras-Chave: Criatividade, universidade e desenvolvimento.

INTRODUÇÃO

Em uma sociedade cada vez mais globalizada, onde a velocidade da informação é extrema e a realidade cada vez mais fluida (BAUMAN, 2001) e volátil, instituições educacionais em descompasso com as inovações tecnológicas não atendem as demandas de seus aprendentes ávidos por conhecimentos e seduzidos pela cultura do nanosegundo. Desta

forma limita-se o desenvolvimento de habilidades e competências indispensáveis ao estudante do século XXI. Nesse cenário caracterizado pela “velocidade” de informações reconhece-se a necessidade de melhor preparo dos estudantes para desenvolver o pensamento crítico e resolver os problemas complexos e emergentes que surgem no cotidiano.

A sociedade do conhecimento provoca exigências de mudanças em todos os setores da vida social. Em contextos educacionais não é diferente. Surgem novos espaços de aprendizagem colaborativa, democrática e criativa por meio das tecnologias ampliando-se cada vez mais o acesso a informação e ao conhecimento.

Nas últimas décadas tem ganhado maior aceitação e aprofundamento a concepção de que o desenvolvimento do potencial criativo e intelectual do estudante constitui um dos

objetivos educacionais de maior importância. Vários autores ressaltam a necessidade de uma educação mais criativa como: Cropley (1997, 2004), Guilford (1950, 1971, 1979), Rogers (1959), MacKinnon (1959, 1970) e Torrance (1965, 1970, 1987, 1993, 1995). Alencar (2007) destaca ainda que uma das razões para o desenvolvimento da criatividade em contextos educacionais refere-se às urgências da atualidade caracterizada *“pela incerteza, complexidade, progresso e mudanças que vêm ocorrendo em um ritmo exponencial, gerando desafios e problemas imprevisíveis, que requerem soluções criativas.”*

Alencar (2004) destaca ainda *“que falhas têm sido constatadas no que diz respeito à promoção da criatividade nos distintos níveis de ensino”* e *“que não é raro a escola desencorajar a expressão da criatividade e mesmo puni-la.”*

A instituição acadêmica de ensino superior, ainda recebe muitas críticas, afirmam Castanho (2000) e Rosas (1985) no Brasil, Paulovich (1993) nos Estados Unidos, Cropley (1997) na Alemanha e Tolliver (1985) no Canadá, devido à limitação e/ou falta de incentivo à criatividade. Nesse nível de ensino parece que fica mais explícito o distanciamento da criatividade nas práticas pedagógicas ocorrentes em salas de aula presenciais bem como virtuais. A ansiedade por notas, força uma memorização de grande volume de informações que impede a reflexão crítica dos assuntos estudados (Paulovich, 1993). Ademais, nesses espaços acadêmicos a prática docente ocupa-se de conhecimentos que nem sempre serão significativos à vida pessoal e profissional do estudante.

Moraes (1997) enfatiza que muitos educadores ainda continuam presos ao pensamento linear e positivista, usando o erro como punição ao invés de transformá-lo em uma oportunidade de acerto e de crescimento para o discente. Acreditam que precisam “depositar conhecimentos” em seus “alunos estáticos”. Assim, o desenvolvimento da criatividade é fundamental. Possibilita aos estudantes terem uma cabeça pensante, bem feita, como Morin (2007) assim sugere.

Em contextos universitários como a criatividade tem sido desenvolvida? O que é necessário ser reconstruído para favorecer o potencial criativo do ser humano? Essas são algumas questões a serem pensadas e aprofundadas.

A CRIATIVIDADE NA UNIVERSIDADE

Por séculos, para Virgolim (2007), criatividade relacionava-se restritamente às Artes e aos artistas, os quais detinham o dom da criatividade. É recente a idéia que a criatividade é uma característica encontrada em maior ou menor grau nos seres humanos.

Os primeiros estudos realizados sobre criatividade tinham por objetivo delinear o perfil do indivíduo criativo e desenvolver programas e técnicas que favorecessem a expressão criativa. Hoje, os estudos voltados para essa área têm apontado para a influência de fatores sociais, culturais e históricos no desenvolvimento da criatividade. Nessa perspectiva, a criatividade passa a sofrer influência de elementos do ambiente no qual o indivíduo está inserido, deixando de ser apenas um conjunto de habilidades e traços de personalidade do ser criador. Essa abordagem individual é substituída por uma visão mais sistêmica do fenômeno criatividade (FELDMAN & CSIKSZENTMIHALYI & GARDNER, 1994).

O pensamento cartesiano, que permeia a trajetória do pensamento humano há muitos séculos ainda persiste em contextos educacionais. Porém, em função dos novos paradigmas, essa maneira de pensar já não atende as demandas da atualidade.

Repensar as práticas educativas, ressignificando-as a partir de uma nova ótica sobre o próprio fazer pedagógico, fundamentado em uma didática transdisciplinar, segundo Araújo (2011), é uma das possibilidades de revisão dos mecanicismos que carregam em seu bojo, pois a reflexão sobre as próprias ações e posturas didático-pedagógicas, permite que a formação ou a prática docente não passe de simples momentos para reprodução de conteúdo, técnicas ou metodologias tornando o profissional da educação tarefeiro de sua práxis pedagógica, seja ela presencial ou virtual, mas profissional comprometido com seu fazer pedagógico com competência e em conformidade com sua identidade docente.

O perfil do novo docente é agora o de um profissional que aprende colaborativamente e em rede, e que reconhece o próprio potencial criador, não mais reproduz a dicotomia ultrapassada do positivismo, mas troca e inspira por meio da cooperação. É um permanente aprendiz, que participa da organização do trabalho pedagógico, consciente, sem deixar de ser sensível. Contribui para o desenvolvimento da aprendizagem autônoma, crítica, e na formação de um aprendiz ativo, co-responsável pelo próprio aprendizado e que tem liberdade para explorar sua criatividade.

Entende-se hoje o papel do educador como o de ajudar o aluno a interpretar as informações, integrando-as e contextualizando-as com informações já apreendidas, possibilitando assim uma ecologia de saberes, tornando-se desse modo a informação significativa e com mais sentido a vida. Isso pressupõe ação docente para um “pensar bem” (MORIN, 2007), em relação ao que se espera por parte do aprendente para a educação do presente. Agindo assim, o educador passará a entender seu papel muito mais como o de mediador e organizador do conhecimento e da aprendizagem, que um mero repetidor e transmissor de informações.

Em relação ao processo criativo, de modo inquestionável, Martínéz (1997) corrobora ao dizer que o professor assume relevante papel no desenvolvimento da criatividade de

seus alunos, quando concebe, organiza e desenvolve o processo docente em um clima saudável e amoroso, tornando a sala de aula favorável para fomentar o desenvolvimento do processo criativo em seus estudantes.

Fleith (2000) salienta que há professores conscientes das características de sala de aula que estimulam a criatividade dos alunos. Entretanto, a transferência para a prática parece ser intuitiva. A informação limitada de como cultivar as habilidades criativas em sala de aula é explicada, por esta autora, pela ausência de conteúdos na área de criatividade na formação do professor.

Para Araújo (2011) quanto mais espaços criativos forem criados, mais possibilidades serão permitidas ao sujeito de se apropriarem de um conhecimento com sentido, mais serão ativados os processos neurocerebrais, e mais as possibilidades para o despertar dos processos criadores.

No Brasil, o pouco espaço para o desenvolvimento da criatividade nos cursos universitários tem sido apontado por autores diversos, como Alencar (1995b, 1996, 1997), Castanho (2000) e Rosas (1985). Neste sentido, Rosas ressalta que: é no terceiro grau onde menos se fala e pensa em criatividade. Excetuando-se as escolas e/ou departamentos de artes, parece que os demais professores têm muito mais o que fazer do que se preocupar com a imaginação, fantasia e criação. (p. 122)

UNIVERSIDADE COMO ESPAÇO CRIATIVO

A universidade enquanto organização complexa e tendenciosa ao status quo, (ZABALZA, 2004), como organização viva e aprendente necessita criar condições para que seus atores possam crescer e expandir seus conhecimentos. Possibilitar mudanças que concorram em direção a uma situação melhor que a anterior, não apenas reproduzi-las.

Inúmeros estudos estão sendo desenvolvidos com o objetivo de investigar variáveis do contexto sócio-histórico-cultural que interferem na produção criativa e favorecem a expressão do comportamento criador. Segundo Alencar, (1995b, 1996, 1997) existe pouco espaço reservado para criatividade no ensino universitário, e estudos apontam para uma universidade pouco ou nada criativa (CASTANHO, 2001).

Caminhando nesse sentido, é preciso que a universidade esteja aberta para acolher o novo, cultivar a imaginação mediante atividades criadoras e ressignificadas a partir da implementação de novos cenários de conhecimento, de liberdade e de resgate da vida, conforme sugere Araújo (2011). Formar pessoas capazes de lidar com os desafios propiciados pela sociedade atual que busquem soluções mais criativas para os problemas cotidianos, de modo a enfrentá-los com mais autonomia, responsabilidade e compromisso.

Que não se limitem à simples reprodução de conhecimentos e memorização, que pouco fazem sentido a vida profissional e pessoal. Preocupando-se com a criação de ambientes favoráveis ao desenvolvimento das múltiplas possibilidades de favorecer processos criadores e criativos por parte dos sujeitos envolvidos na dinâmica acadêmica, pela integração dos diferentes saberes e pelo respeito às multidimensionalidades humanas.

A formação do educador enquanto ser ativo e crítico acontece coletivamente, em interação com o outro, consigo mesmo e com a vida. Na prática cotidiana de sala de aula o docente universitário precisa assumir a postura de alguém que ensina, mas que também aprende com seus alunos, compreendendo os diferentes modos de construção de conhecimentos e rotas cognitivas, conforme, assegura Bolzan e Isaia, (2006). Porém, o preocupante é que a maioria dos docentes não foi educada para trabalhar em rede, de maneira criativa e nem para desenvolver uma inteligência coletiva, (MORAES&VALENTE, 2008), hoje tão necessária em quaisquer contextos de aprendizagem e de vida.

O ensino sem fronteiras é janela aberta para acesso à educação emancipadora, para possibilidades ao educando de construção autônoma do conhecimento e uma formação integral, concebida nos diversos espaços do conhecimento disponibilizados e criados pelas tecnologias contemporâneas. Tudo isso, primando-se pela criatividade, ética e respeito ao mundo global.

Segundo Alencar (1990),

Vivemos em uma sociedade, que nos ensina desde muito cedo, a controlar as emoções, a resguardar a nossa curiosidade, a evitar situações que poderiam redundar em sentimentos de perda ou fracasso. Aprendemos também, desde os nossos primeiros anos, a criticar as nossas idéias e a acreditar que o talento, que a inspiração, que a criatividade são resultados de fatores sobre os quais temos pouco controle e que estariam presentes em apenas poucos indivíduos privilegiados. Aprendemos a não explorar as nossas idéias e a bloquear a expressão de tudo aquilo que poderia ser considerado ridículo ou motivo de crítica.

CONCLUSÃO

A universidade enquanto um ambiente de produção de conhecimento elaborado, científico, mesmo sem perceber, pode contribuir para um ambiente de massificação e reprodução de conhecimentos, visto que seus professores, comumente não recebem a formação para desenvolver o potencial criador de seus acadêmicos, pois muitas das vezes não reconhecem seus próprios potenciais criadores dificultando a flexibilidade e a inovação.

Alencar (2004) reconhece que a criatividade não pode ser desenvolvida isolando-se o indivíduo do seu contexto sócio-histórico-cultural, assim ela deixa de ser um fenômeno individual e passa a ser então um processo sociocultural. Estudos recentes mostram que precisamos de uma universidade crítica, humana e planetária que possibilite aos seus atores, sejam eles professores, alunos ou mesmo dirigentes, espaço para o novo, para a mudança de paradigma.

A importância de se desenvolver atitudes e habilidades criativas desde a educação infantil até a universidade vem urgida pela necessidade de obter uma melhoria social continuada. A riqueza de um país não está apenas nos seus recursos naturais, mas também na capacidade inovadora e criativa das gerações mais jovens (Torre, 2005).

A Universidade precisa ser vista tanto como um ambiente de transmissão do saber consagrado, (GIROUX, 1997), como também um ambiente questionador desse mesmo saber e ainda um ambiente que cria novos saberes. Precisa instigar e ser lugar onde a curiosidade, a ousadia e a iniciativa sejam estimuladas.

A Universidade deve ser um lugar de ação, retro-ação e intervenção da realidade histórica, política e social da qual é fruto. Precisa fomentar a pesquisa, o trabalho colaborativo e inspirar os estudantes a continuarem esse trabalho. Para isso, a formação e o desenvolvimento do potencial criador de seus docentes tanto quanto de seus discentes, merecem atenção especial. Até mesmo porque,

Ambientes de aprendizagem cooperativos têm na interação seu elemento básico e fundamental. Relações cooperativas ativam os processos interativos enquanto que as relações punitivas e coercitivas bloqueiam o desenvolvimento cognitivo e moral ao serem baseadas em imposições, crenças, punições e reproduções de idéias e distorções da realidade. (MORAES, 2004).

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LIFE STORIES

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Abstract

More and more people are discovering the playful yet powerful principles of improvisation theatre. Techniques known as: 'Yes, and..'; status switching; leaders & followers in a story, both constructing the storyline ; learn and love to make mistakes; be and stay in the here and now; defining next steps and so on. It all found its way to the interest of businesses, as a great addition to the set of training tools already existing. Now a new format and method in improvisation is rising, Biographical Theatre. Inspired on Keith Johnstone's wonderful Life Game format and the concept of Playback Theatre, ImProf Training (as the first in the Netherlands) worked for three years with Biographical Theatre. It discovered new principles and created a training method. Biographical theatre is a format in which the life of a guest is honoured (in the past, present and future). Based on what a guest likes to tell, interviewed by a skilled host, scenes are created on the spot by trained actors, director and musicians. Experience has created insight in the impact on a guest, actors and the audience. If done right, the whole theatre performance is experienced as a true gift. Application of biographical theatre besides in the theatre itself, can have value in education, social change and institutions. The impact of seeing one's life performed starts with opening up, recognition, engagement and could end with a shared vision. This paper will illustrate the format, gives an outline and places it against a societal theoretical background

PROVIDING COMMON APPROACHES FOR DIFFERENT NEEDS – CREATIVITY AND INNOVATION IN EUROPEAN PROJECTS

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Abstract:

The Lifelong Learning Programme (LLP) of the European Commission aims at fostering interchange, cooperation and mobility between education and training systems within the Community. Through projects developed within the various LLP sub-programmes, European partners (often organised in consortia) identify and design new solutions to transversal issues, develop innovative tools and transfer best practices. In this process, one of the major challenges is to adjust solutions to the particularities of each country, target group and context. Therefore, when developing an LLP project, several aspects must be observed to ensure adequate common approaches without neglecting specific aspects, such as different languages, stages of development, tools and concepts, local realities, etc. Three LLP projects coordinated by SPI (projects CESSIT, FREE and G8way) illustrate how creativity and innovation are used to provide common approaches to different needs of trainers and jobseekers.

Key words:

Lifelong Learning Programme (LLP), education, training, European, partnership, trainers, jobseekers, creativity, innovation, approaches.

Creativity is seen as such relevant and transversal theme in European Policies, as it is regarded as increasingly important in today's society. Considering that fostering of creative skills impacts positively in one's employability, it is important to explore this aspect in educational contexts. Several definitions of creativity have been proposed over the years, each of them seeking to highlight different aspects. A selection of examples of definitions for this term is provided:

According to the European Commission report on “The Impact of Culture on Creativity”, *“Creativity is a positive word in a society constantly aspiring to innovation and «progress»”*[1].

In a more economical perspective, *“Creativity is the production of new ideas that are fit for a particular business purpose. (...) Creativity generates ideas that have the potential to be turned into successful innovation.”*[2].

Additionally, the European Ambassadors for Creativity and Innovation, European Year 2009, express their understanding of creativity competence as *“To be creative means to imagine something that didn’t exist before and to look for new solutions and forms”* [3].

It is clear that creativity is linked to aspects such as: generation of ideas, analysis of situations through different perspectives and development of something distinct. In this line, innovation can be the result of creativity which is understood as a crucial aspect for economical and social growth.

Over the years the European Commission seeks to promote innovation through creativity in the educational and training areas by promoting a set of initiatives and opportunities where this theme assumes a high degree of relevance. In this sense it’s important to know the Lifelong Learning Programme (LLP), the biggest European Programme focused on Education and Training, covering the period between 2007-2013.

The LLP programme of the European Commission enables people at all stages of their lives to take part in stimulating learning experiences, as well as helping to develop the education and training sector across Europe. The programme funds a range of actions for individual students and learners, but also for teachers, trainers and all others involved in education and training and is organised in four sub-programmes: Comenius (schools); Erasmus (higher education); Leonardo da Vinci (vocational education and training); Grundtvig (adult education). There are thus projects “transversal” to all levels of education, such as: language learning, ICT, policy co-operation; dissemination and exploitation.

More and more, various organizations at a European level build and strengthen consortia to carry out projects within the different sub-programmes. According to the priorities set out every year by the European Commission, consortium members gather to identify and design new solutions to transversal issues, to develop innovative tools and to transfer best practices. In fact, innovation and creativity are key words of these projects, in the sense that these characteristics are essential to bring European Members states at the level set out in the Lisbon Strategy of being a knowledge based economy.

Both in the stages of proposal development and project implementation, one of the main challenges faced by LLP participants is to ensure the adequate balance between a common European approach and the need to respond to the specific needs of each country, target group and context. The initial stage of each project, usually dedicated to the needs

assessment or to the characterisation of the state of the art of the theme envisaged among the participating countries, shows this very clearly: on one hand, there is clearly an “European issue” to be addressed (e.g. need to qualify trainers in a certain area, ageing society, migration, transitions, etc.) but on the other hand, each situation might have very different characteristics in each country (e.g. different national legislation, different public perception, different level of supporting tools, etc.).

Therefore, when carrying an LLP project, several aspects must be observed to ensure adequate common approaches without neglecting specific aspects. It is certainly not enough to provide translations of the products developed to different languages – one must consider all aspects that might influence the access and the acceptance of target groups regarding each project. It is not unusual to have, within the same project, different tools and technologies for each group and/or country, different vocabulary, different requirements and different levels of participation. This challenging balance demands for creative and innovative solutions to address common problems.

In this context, many LLP projects not only include creativity and innovation as main tools for problem solving, but also aim to develop these characteristics among students, trainees, teachers and trainers all over Europe.

Generally one can say that the LLP projects have a common structure. There is always a common “problem” with a European dimension to address too that is the reason for a consortia to come together in a pilot project aimed at developing a new solution or to adapt a given result to different realities or target groups.

The first stage of the project development is in fact a needs analysis (or characterization of the state of the art) conducted in the partners countries aimed at define the real needs of the target groups as well as the main characteristics of the final project result (a training course, an handbook, an interactive tool, a given methodology, etc.). The needs analysis might involve several activities and will lead to a report with the main guidelines for the project development.

After this first stage, the consortia will develop a pilot version of what is meant to be the project result. Very different activities might be conduct at this point. If a training course is the final result, in this stage partners might have to: develop a course structure, the learning contents, the evaluation methodology, etc, accordingly to the needs analysis report conclusions and specification. Note that sometimes, if the LLP project is a transfer of innovation one, the process must involve adaptation of existing contents and development of new ones, both at the same time. Additionally, it's relevant to point out that when the result of the project is, for example, a interactive tool, an interim stage must be perform, where technical and pedagogical aspects must be defined and analysed.

After the completion of the development stage, a draft version will be ready and the consortia will conduct a test phase with representatives of the target groups. The aim of this stage is to test and validate the draft product and to identify a sort of improvements and modifications to be implemented in the final version of the project result. It's a crucial moment in the overall project development where the acceptance of the results will be tested upon the real needs and expectations of the target groups. Even if not compulsory this stage is one of the most important in the development of a pilot project, so partners shall make all efforts to implement it.

After the test and validation phase, and based on its conclusions, there is a final stage of implementation of the improvements and production of the final project products.

In the framework of the LLP pilot projects there are a set of transversal stages, necessary to the management of the project and of the consortia, but also important for the quality of the results and also to generate awareness and exploit the project results and achievements: Project Management, Dissemination and Exploitation and Quality and Evaluation, are usually project phases that have the exact duration of the all project (24 months) and involve relevant activities that should be planned from the beginning and implemented on a regular basis. Project Management aims at ensure an efficient administrative, financial and strategic management in cooperation with the partners. Dissemination and exploitation aims at elaborate and implement a strong and coherent dissemination and exploitation strategy that will generate awareness to the project, project activities and project results and foster the exploitation of the results to future multipliers. Quality and Evaluation, covering the all project duration has two main dimensions: internally it aims to guarantee the efficient implementation of the work plan; externally it aims to guarantee the evaluation of the quality of the results and events of the project.

Three LLP projects coordinated by SPI (projects CESSIT, FREE and G8WAY) illustrate how creativity and innovation are used to provide common approaches to different needs of trainers, jobseekers and other educational agents.

1 - CESSIT – Creativity and Entrepreneurship Seeds for Social Inclusion Trainers (www.spi.pt/cessit), a 2 year-long project, funded by sub-programme Grundtvig under the Lifelong Learning Program, aims at providing educators and training managers with the necessary tools to develop these aspects among early school leavers (ESL), by helping educators to improve their pedagogical approaches and to increase adult training attractiveness and effectiveness. Coming together as a European partnership, this project is in its final stage and is the result of a joint consortia of 7 organizations from different European countries: Austria, Czech Republic, Ireland, Latvia, Poland, Portugal and Switzerland. The partnership has been conducting a number of tasks according to a defined and clear methodology making sure that educators and ESL are actively involved in this

project by providing their personal and professional perspective on how such skills can be fostered.

The partnership has established a set of specific objectives which have resulted in relevant outcomes for adult educators:

- to assess the actual needs of adult educators dealing with ESL - The involvement of the target-groups was without question very important in order to bring a realistic vision to construct a competency model for educators and a general description of ESL. This process was based on interviews and questionnaires applied to 188 educators that work with ESL and 199 early school leavers. The main findings of this survey were gathered in a final report [4];
- to identify training techniques and methods used by educators that has been successful to help their learners to develop new competences (namely, creativity skills). A set of good practices methods and techniques for fostering creativity and entrepreneurship skills [5] were also gathered under the CESSIT project, making sure that such practices are widely available and used and ensuring that characteristics such as critical thinking, becoming a less rigid thinker, managing critique or how to communicate effectively, which are inseparable of the mentioned skills, are passed on;
- to promote practical workshops at national level for educators exchange experiences and to discuss the impact of creativity and entrepreneurship aspects on training and competences development. Partners implemented workshops at national level providing training to over 220 educators and training managers that work with ESL. Feedback from participants showed that the workshops are an effective way to guarantee a long-term effect of what this project aims for and that is important to establish a system of continuous education for teachers / trainers, with emphasis on personal development, new knowledge, and teaching methods; or to keep up to date with professional developments in the field (theory presented at school often lags behind what is happening in practice already).
- to provide a tool to adult educators and training managers which support them in developing transversal competencies such as creativity and an entrepreneurial spirit and having them more aware of the importance of these competences: The Guidebook for Adult Trainers and Managers [6].

By showing educators the tools available for increasing creativity skills in learning contexts, the CESSIT consortium is willing to contribute for a more attractive and motivating lifelong learning initiatives, in general, and those addressed to vulnerable groups, such ESL, in particular.

2 – FREE (Fostering Return to Employment through Entrepreneurship, Innovation and Creativity) is a Leonardo da Vinci Transfer of Innovation project. Started in October 2009 will end in September 2011 the project counts with partners representing Portugal, Spain, Czech Republic, Greece and United Kingdom,

The project is aimed at providing an interactive tool to be used by those who work with the unemployed willing to create their own job, such as counsellors, tutors, trainers and other professionals, allowing them to gain not only hard skills in the areas of entrepreneurship, innovation and creativity, but also new soft skills, such as those required to support individuals who want to start a business.

By improving skills in these key areas, counsellors, tutors and trainers will be able to provide better support to those who are unemployed and wanting to reintegrate into the labour market by starting a new business.

The FREE Interactive Tool is more than a pedagogical resource covering innovation, entrepreneurship and creativity; it is practically focused through the provision of training materials, case studies and interactive exercises on helping counsellors, tutors and trainers provide improved guidance to unemployed people.

As such, in this tool users will find not only training courses, which will help them to assist the entrepreneurs in developing a business plan or creating a business network, but also relevant exercises and tips, which will teach them to apply everything that was learnt in their daily work with potential entrepreneurs. The areas in which the professionals can improve their competences are: Innovation and Creativity; Hard Skills; Soft Skills; Case studies; Programmes and Initiatives.

The section Innovation and Creativity aims to train counsellors on how to develop creative and innovative thinking competences in the unemployed individuals they advise. The objective of this section is that after completion counsellors will have a better understanding of what 'Innovation' and 'Creativity' are, how they can be identified; their importance for entrepreneurship; and where to find more information, such as tools, events and organisations.

The section of Hard Skills aims to provide counsellors with all the essential information needed to assess and evaluate whether a person has the functional skills required to start and develop a business. The second part of this section provides information and tools for counsellors to help clients lacking these 'hard' skills to acquire and nurture them.

The section Soft Skills aims to help the counsellors, who deal with entrepreneurs every day, to assess the soft skills of a person. The section describes in detail what soft skills are and how soft skills can be used to foster entrepreneurship. Soft skills are highly individual

and can be difficult to categorise at such, thus this section is meant as an overview of the most common soft skills and how counsellors can identify these in people.

The section Programmes and Initiatives it is possible for counsellors to find further information about programmes, initiatives and institutions that support entrepreneurship and entrepreneurs.

The section Case Studies provides inspiring case studies from all the partners' countries, which aim to provide real life entrepreneurs that succeed in creating their own business. The case studies vary within business area and profile of the entrepreneurship, in order to show that entrepreneurship can indeed be many different things.

3 - G8WAY ("gateway") to Educational Transition is a Grundtvig project that aims to support young people's learning processes during transitions, focusing on 2 transition periods: from school to work and from higher education to work. Special attention is given to the potential of web 2.0 for managing these transitions. This 2-year project with partners representing Portugal, Germany, Greece Italy, Romania, Sweden and the United Kingdom shows how creative and innovative tools can be developed at European level to support specific issues: partners developed an online tool ([HYPERLINK "http://www.g8way.eu/"](http://www.g8way.eu/) <http://www.g8way.eu/>) based on web 2.0 to provide the target groups an environment that allows them to develop the competencies needed for their transition periods. The G8Way tool has a main interface with a description of the common approach, outcomes and areas and then, within each area, different competences and tools are provided, according to the needs of the different users. The four areas are: information, knowledge sharing, competency management and mentoring. G8WAY provides a flexible solution that brings together the benefits of the internet and of potential interactions between European youngsters, but does not neglect the specificities of each transition.



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LITTLE RED RIDING HOOD

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Resumo

As PME's de todo o mundo estão cada vez mais a organizar-se em consórcios, redes de cooperação, *joint-ventures* e alianças estratégicas permitindo não só reduzir a incerteza e turbulência dos mercados como também conjugar vantagens que as tornem mais empreendedoras. Torna-se importante considerar que os resultados destes relacionamentos são afectados por factores determinantes que podem inibir ou facilitar o Empreendedorismo. É nosso objectivo avaliar a relação entre alguns desses determinantes – Cooperação inter-empresas, Inovação de Métodos de Trabalho e Criatividade e Motivação – sobre o empreendedorismo em 236 PME's de Defesa Nacional. Fez-se uma análise Factorial Exploratória em componentes principais (rotação varimax) e Regressão Linear Múltipla. Os resultados mostram a relação directa dos determinantes avaliados e o Empreendedorismo. E, o efeito mediador parcial da Criatividade e Motivação entre a Inovação nos Métodos de Trabalho e o Empreendedorismo. Estas empresas podem esperar desenvolver novos Métodos de trabalho como uma elevada componente diferencial relativa à concorrência e utilização mais eficiente do conhecimento e das capacidades das pessoas que integram a equipa de trabalho de forma a aumentar a sua competitividade.

Palavras-Chave: Cooperação, Criatividade e Motivação, Empreendedorismo.

INTRODUÇÃO

A crescente complexidade tecnológica e os tempos de ciclo do produto ou do serviço mais rápidos estão entre os factores que têm levado a uma maior especialização da cadeia de valor. Este facto, atrai uma maior colaboração inter-organizações, uma componente crítica da estratégia da empresa em muitas indústrias de base tecnológica (Cukier, 2005). Oliver e Ebers (1998). E, destaca a importância de se perceber os motivos de promoção e manutenção destes relacionamentos, inter-empresas, no contexto das redes. As redes são

uma fonte de competências únicas para as PMEs. As pequenas e médias empresas beneficiam da experiência de outras empresas, a partir de peritos, instituições governamentais, entre outros, que fornecem não um único conselho prático, mas também incentivam, à criação e manutenção de um grupo social (Friedman & Miles, 2002) e à poupança de custos através da partilha tecnológica. As PMEs são a principal fonte de crescimento económico, devido à sua dimensionalidade e agilidade desenvolvem com rapidez novos métodos de trabalho, são mais criativas e motivadas e desenvolvem uma maior empregabilidade nas equipas que integram (Havard Business Review, May 2011), assinalando uma mudança drástica da Gestão para a Economia Empreendedora (Druker, 1985).

Grande parte dos novos empreendimentos que aumentaram drasticamente após a revolução industrial na economia globalizada de hoje deriva do empreendedorismo corporativo (Dess, Ireland, Zahra, Floyd, Janney, Lane, 2003; Stevenson & Jarillo, 1990) ganhando as PMEs uma importância crescente, resultando numa série de cenários que têm sido apresentados na literatura (Burgelman, 1984; Covin & Slevin, 1991; Pinchot, 1985). Muito embora, os estudiosos que têm abordado o empreendedorismo corporativo tenham feito contribuições significativas para a teoria do seu desenvolvimento, há ainda espaço para uma exploração mais centrada nas PMEs, sobretudo porque há uma necessidade crescente de empreendedorismo corporativo e de inovação nas organizações (Hornsby, Kuratko, Zahra, 2002; Ireland, Hitt, Camp & Sexton, 2001; Kuratko, Hornsby, Naffziger, & Montagno, 1993; Sexton & Upton, Bowman, 1991; Zahra, 1995). Neste artigo sobre o tema de empreendedorismo e com referência a redes de cooperação inter-empresas, mais precisamente de PMEs, pretende-se avançar no sentido de um maior entendimento da influência da cooperação interna, da utilização de métodos inovadores de trabalho e da criatividade, no empreendedorismo, resultante de processos de reorganização das empresas e da intensificação dos vínculos inter-empresas, focalizando as diferentes abordagens existentes na literatura que explicam o fenómeno de redes da empresa.

Em primeiro lugar, pretendemos neste artigo clarificar os conceitos de empreendedorismo colaborativo, redes, métodos inovadores e criatividade. Seguidamente passamos ao método por nós adoptado onde apresentamos os participantes, o procedimento metodológico, a operacionalização das variáveis e tratamento dos dados. Por último apresentamos os resultados, conclusões e implicações práticas para as PMEs.

EMPREENDEDORISMO COLABORATIVO

Os vários campos de pesquisa desenvolvidos expandiram o empreendedorismo tradicional em áreas como o intra-empreendedorismo ou empreendedorismo corporativo e

mais recentemente o empreendedorismo colaborativo. Os investigadores no empreendedorismo colaborativo (Miles, Miles & Snow, 2006; Pinchot, 1985; Zahra, 1995, entre outros) referem que as organizações buscam relacionamentos mais colaborativos ao longo de uma rede mundial de empresas, conduzindo a uma estratégia de inovação contínua. Argumentam que as empresas de pequena e média dimensão actuam principalmente de forma colaborativa, porque não têm os recursos para participar de uma inovação contínua por si mesmos vendo a rede colaborativa como um meio essencial para fazer negócios. Gray e Wood (1991) definem colaboração e a sua ocorrência da seguinte forma: “colaboração é um processo através do qual, diferentes partes, vendo, diferentes aspectos de um problema podem, construtivamente, explorar as suas diferenças e, procurar limitadas visões”. A colaboração ocorre quando um grupo de “autónomos *stakeholders*” com domínio de um problema, se envolvem num processo interactivo, usando divisão de papéis, normas e estruturas, para agir ou decidir questões relacionadas com o problema”. Para estes autores (Gray & Wood, 1991), todas as teorias organizacionais enfatizam que a complexidade ambiental, incerteza e turbulência estão entre os problemas enfrentados por uma organização e uma das suas principais tarefas é reduzir tais problemas a preocupações controláveis. Os autores argumentam que para algumas teorias as organizações colaboram para reduzir, controlar os problemas, mas que nenhuma oferece um modelo de cooperação. Uma segunda razão é que trabalhar a partir da visão baseada em recursos da empresa sugere que o capital humano é um recurso, único, inimitável que pode conduzir a longo prazo a vantagens competitivas (Hatch & Dyer, 2004; Hitt, Bierman, Shimizu & Kochhar, 2001; Lepak & Snell, 1999; Wright, McMahan, & McWilliams, 1994). Ahuja (2000) indica duas grandes classes de explicações a partir da perspectiva baseada em recursos, reflectindo incentivos das empresas ou incentivos para colaborar, afirmam que as empresas formam ligações como forma de obter acesso aos bens necessários (Hagedoorn & Schakenraad, 1990; Hennart, 1988; Nohria & Garcia-Pont, 1991), aprender novas habilidades (Baum, Calabrese & Silverman, 2000; Hennart, 1988; Kogut, 1988; Powell, Koput, & Smith-Doerr, 1996), gerir a sua dependência relativamente a outras empresas (Garcia-Pont & Nohria, 1999). Um segundo conjunto de explicações sobre os recursos de rede é que uma empresa tem de colaborar desde que por sua posição na rede antes estrutura, sugerindo que os padrões de negociação e colaboração observada entre as empresas reflectem os padrões anteriores de relações inter-organizações (Gulati, 1995; 1999; Gulati & Gargiulo, 1999; Walker *et al.*, 1997) para apoiar a dependência da trajectória da visão de colaboração sugerida pela visão baseada em recursos, influenciando positivamente o empreendedorismo. No entanto, não é o capital humano mas as relações que os seres humanos estabelecem que são o capital mais importante e inimitável. Assim, aquelas empresas que podem ir além do capital humano e desenvolver o capital relacional de alto

valor serão bem sucedidas, tanto mais que a taxa de variação aumenta o negócio. Supomos que as PME's são actualmente o grupo de empresas mais preparado para aproveitar o capital relacional. É sabido que todas as organizações necessitam de coordenação (Van de Den Delberg (1976). A coordenação interna é inerente à organização, visto que identifica e estabelece prioridades de trabalho e integra as diferentes partes e tarefas para alcançar objectivos colectivos. Para além das barreiras externas estas empresas pretendem também remover barreiras entre as fontes internas de conhecimento especializado. Desta forma, as integrações inter-departamentais são atraentes. A nível estrutural inter-departamentos são igualmente interessantes. A nível estrutural estas criam uma série de mecanismos de coordenação e equipas multifuncionais que promovem o conhecimento colectivo e as capacidades criativas. O Modelo de visão relacional de Dyer e Singh (1998) propõe que o potencial que uma empresa tem de criar uma vantagem competitiva não depende apenas dos seus recursos, mas também dos seus bens relacionais, isto é, das suas relações com outras empresas-chave. Na sequência da linguagem baseada em recursos os vínculos inter-organizacionais também podem ser idiossincráticos e, portanto, podem ser uma fonte de valor acrescentado e vantagem relacional competitiva. O capital relacional é definido como o conjunto de todas as relações de mercado, relações de poder e de cooperação – estabelecido entre empresas, instituições e pessoas que resulta de um forte sentido de pertença e uma capacidade altamente desenvolvida de cooperação típica dos povos culturalmente semelhantes e instituições (Capello & Faggian, 2005). Pode traduzir-se o conceito de cooperação como o conceito de entajuda entre duas ou mais partes que prosseguem um objectivo comum. O conceito genérico aplica-se também à economia e ao mundo dos negócios. A cooperação consiste numa acordo que institui alianças estratégicas as quais permitem aos diferentes actores não só reduzir a incerteza e turbulência, mas também conjugar vantagens numa óptica em que o benefício global é superior ao da acção individual. As mais recentes organizações empresariais no ocidente reforçam modelos de cooperação, alianças, estratégias e redes internas e externas às empresas como já ocorre nos “Keiretsu” japoneses, nos “charbol” sul-coreanos ou nos “quauxi” (as redes chinesas). Valoriza-se mais a empresa flexível, em que as fronteiras da organização ficam menos nítidas (Schwartz, 1997). Para alguns autores como Piore & Sabel (1984) e DeSousa (1993) as novas relações entre as empresas representam um paradigma de “vinculação flexível” às vezes por meio de mecanismos não institucionais e com relações de competência em mercados regionais, mas com desenvolvimento de formas de cooperação perante mercados mais amplos, nacionais ou estrangeiros. A literatura sobre redes também lida com este tema, a partir dos estudos que demonstram a utilidade de uma rede social a fim de sustentar as novas empresas (Birley, 1986), às que analisam a forma como uma rede eficiente pode ser sustentada a longo prazo (Jarillo & Ricart, 1987, 1988; Birley & Lawrence, 1988).

Certamente porque as redes podem ser o caminho para facilitar a busca de oportunidades, gerando a capacidade de obter acesso aos recursos dispersos pela organização, sem necessidade de instalar um rigoroso processo anterior de dotações, esta literatura agora pode ser considerada como relevante para o empreendedorismo.

REDES DE EMPRESAS

As PME's têm-se tornado cada vez mais importantes na prossecução do desenvolvimento económico e social mundial (Nassif, Ghobril & Silva, 2010). Além de serem uma importante fonte de criação de emprego as PME's são também uma fonte poderosa de inovação. As empresas de pequena e média dimensão de todo o mundo estão cada vez mais a organizar-se em consórcios, redes de cooperação, *joint-ventures* e alianças estratégicas. Esses argumentos representam uma maior ocupação dos espaços e aumento do grau de empreendedorismo. Tradicionalmente o sector das pequenas e médias empresas é considerado importante pelas suas capacidades de gerar empregos ou contribuir para a produção industrial. Durante os anos 80, o interesse em estudar as PME's aumentou em razão das dificuldades das grandes em sustentar o nível de emprego em grande parte da Europa Ocidental (Sebrae, 1996). Os fenómenos das redes de empresas não é exclusiva das nações desenvolvidas, o mesmo apresenta-se nos países de recente industrialização do sudoeste Asiático e da América latina. Desde os anos 70 verifica-se uma mudança na organização industrial. Houve, por exemplo, a criação dos distritos industriais da chamada “terceira Itália”, os sistemas produtivos locais na França, Alemanha e no Reino Unido, o Vale do Silício nos EUA e as redes de empresas no Japão, Coreia e Taiwan (Sebrae, 1996). As pequenas e médias empresas começaram a incorporar tecnologias de ponta nos processos produtivos, a modificar estruturas organizacionais internas e a buscar novos vínculos com o contexto sócio-económico, de modo a constituir uma via de reestruturação industrial que pode competir em alguns sectores como as grandes empresas. Isto relaciona-se estreitamente com o carácter das inovações tecnológicas durante os últimos anos, em particular com a indústria electrónica, a robótica e a informática. Os empreendedores tendem a iniciar as suas novas empresas na mesma área onde residem. Desenvolvem redes localizadas geograficamente fortemente enraizadas no contexto regional. A literatura empírica limitada mostra claramente que os empreendedores apresentam inércia geográfica (Sorenson & Audia, 2000). E apoia a hipótese da “matéria regiões” para a investigação de empreendedorismo. De acordo com Leon (1998), as redes de empresas são formadas inicialmente com o objectivo de reduzir incertezas e riscos, organizando actividades económicas a partir da coordenação de redes entre empresas (PME's) existe a possibilidade destas se configurarem como redes flexíveis de pequenas e médias empresas, como clusters de empresas (agrupamentos), ou como redes de

cooperação, geralmente como organizações virtuais, ou ainda com as chamadas “*supply chain management*” ou gestão da cadeia suplementar. Segundo Powell (1990) muitos autores têm concordado que existe uma nova forma de organização económica; outros, admitem que está emergindo uma nova forma de organização social. Para ele, as trocas económicas estão envoltas num contexto particular de estrutura social, dependentes de conexões, interesses mútuos e reputação e pouco guiadas por uma estrutura formal de autoridade.

Para Ribault e colaboradores (1995) a sociedade de empresas por vezes chamada de rede de empresas é um modo de agrupamento de empresas destinado a favorecer a actividade de cada uma delas sem que estas tenham forçosamente laços financeiros entre si. As empresas em rede complementam-se umas às outras nos planos técnicos (meios produtivos) e comerciais (redes de distribuição) e decidem apoiar-se mutuamente sem prioridade, mas a constituição em rede pode também traduzir-se, por exemplo, pela criação de uma central de compras comum às empresas em rede. Trata-se pois, de um modelo de associação por afinidade de natureza informal e que deixa cada uma das empresas responsável pelo seu próprio desenvolvimento. É uma escolha de estrutura bem adaptada às PME's para quem este tipo de associação é uma maneira de concretizar o lema “a união faz a força”. Casarotto (2001) salienta que as pequenas empresas podem beneficiar com a escala de marca regional, escala de produção, escala de tecnologia, escala de logística e da sua vocação e região para se tornarem competitivas. Casarotto (2001) afirma que romanticamente costuma dizer-se que empresas de um mesmo segmento e de uma mesma região não são concorrentes, mas irmãs, e que irmãos devem colaborar entre si. Segundo ele, esse processo cultural é de longa maturação. Mesmo que os empresários tomem iniciativa de criar as suas redes de cooperação, o sucesso somente será obtido se houver um modelo de desenvolvimento local, como é o caso das empresas do presente estudo, com a participação de toda a sociedade. No caso concreto das empresas que foram alvo deste estudo pertencem ao mesmo sector económico relacionado com a indústria da defesa e têm a sua origem e impulso na política de modernização das Forças Armadas e dos sistemas de Defesa. Desenvolvem um trabalho colaborativo concertado, onde o desempenho de qualquer parceiro ajuda toda a rede e os aumentos globais de empreendedorismo. Neste contexto o presente trabalho pretende analisar o papel de uma rede de PME's do sector de actividade de Defesa Nacional como agentes de promoção de cooperação, criatividade e motivação influenciando o empreendedorismo. Ainda mais, o capital relacional é o caminho dependente e as empresas estão limitadas pelos limites da sua rede, no sentido de que elas podem ser incapazes de tirar partido de algumas oportunidades porque os seus relacionamentos não dão acesso a recursos adequados para

fazê-lo. Portanto, os limites do capital social também criam custos de oportunidade (Hitt, Lee & Yucel, 2002).

Em suma, as organizações podem estabelecer relacionamentos inter-organizacionais como forma de se tornarem mais estáveis em face das incertezas ambientais, ou seja, utilizam os relacionamentos como resposta adaptativa ao ambiente incerto. A incerteza ambiental é gerada pela escassez de recursos, que motiva as organizações a estabelecer relacionamentos para alcançar estabilidade e previsibilidade nas relações com outras organizações (Brass, Galaskiewics, Greve & Tsai, 2004; Galaskiewics, 1985; Whetten & Leung, 1979).

INOVAÇÃO TECNOLÓGICA E CRIATIVIDADE

A capacidade de inovar é hoje reconhecida como uma das principais vertentes de vantagem competitiva das empresas. Becattini (1999) afirma que no mercado corrente, caracterizado pelo rápido aumento da saturação da procura, a competitividade das empresas tende a ser mais determinada pela capacidade inovadora do que pela produtividade. O único traço comum a todas as definições relativas à inovação tecnológica é que inovar implica novidade, e o mundo actua como um agente regulador e impulsionador da inovação, contudo requer conhecimentos e destrezas que se convertam numa vantagem competitiva sustentável (Tidd, 2001).

A inovação é um avanço aplicado mediante o desenvolvimento tecnológico, que pode envolver um novo produto, um novo serviço ou novas práticas em processos e novas tecnologias (Shumpeter, 1939) assim como a contribuição de certas fontes de conhecimento. Nos processos inovadores a tecnologia é considerada como uma das entradas de produção, a qual permite adaptar-se, melhorar a posição no mercado e manter uma vantagem competitiva sustentável, pelo menos temporalmente (Chiva & Camisón, 2001). As empresas que necessitam de alcançar um certo crescimento nas suas actividades e dimensão, inclusive não desaparecem em situações de recessão como a actual, devem optar por levar a cabo inovações baseadas em invenções próprias, com vista a marcar distâncias diferenciadoras com os seus competidores (Carbonell, Rodríguez, & Munuera, 2004). Existem estudos de caso como o de Urbano e Toledano (2008:219) que analisam a criação, o desenvolvimento e a implementação da inovação nas PMEs. Concretamente, analisa-se se as PMEs que operam nos sectores tecnológicos têm maior probabilidade de gerar projectos inovadores, encontrando evidência de que o empresário e administrador são os principais catalisadores e inibidores destes processos inovadores. Poder-se-á afirmar que a competição da empresa se vê reforçada pelas suas capacidades de inovação tecnológica em empresas relacionadas com a sua indústria. Apesar do risco e da incerteza, a inovação quando bem sucedida pode produzir um impacto relevante nos resultados económicos das

empresas. Nas empresas, a inovação assume-se cada vez mais como um factor-chave da competitividade empresarial. As empresas conscientes de tal facto devem efectuar esforços no sentido de inovar, procurando assim criar uma vantagem competitiva sustentável, razão porque se torna crucial estudá-la. Porter (1996) afirma que uma empresa só poderá obter melhores resultados do que os seus concorrentes se conseguir criar um factor diferenciador que se mantenha ao longo do tempo, sendo o principal instrumento de criação dessa vantagem competitiva: a inovação ou os actos de inovação. Mollón e Vaquero (2004) referem ainda que são cada vez mais as empresas que, conscientes de que a realização das actividades inovadoras proporciona uma fonte de vantagens competitivas, efectuem esforços no sentido de inovar. Defendem que a observação sistemática da empresa com êxito competitivo tem revelado que tais empresas baseiam a sua competitividade numa capacidade inovadora apoiada numa acumulação de recursos e capacidades difíceis de reproduzir e imitar pelos concorrentes. Para Shumpeter, a inovação é algo intrínseco, espontâneo ao empreendedor. Ele sustenta que o empreendedor tem um papel bastante definido, que se manifesta quando ele realiza mudanças ou revoluções nos padrões de produção, ao abrir novas possibilidades transformando algo que já é conhecido, desbravando novas fontes de oferta, criando novos produtos já existentes. Esse processo, aquele que consegue fazer novas combinações, pois, cada dia que passa, torna-se cada vez mais rápido através da melhoria de produtos e serviços, fazendo com que a obsolescência seja cada vez mais acelerada. Na abordagem de Schumpeter, só pode ser considerado empreendedor aquele que consegue fazer novas combinações, pois, ao passar a dirigir o negócio perde-se essa condição, tornando-se então apenas gestor. Para o autor, compreender e gerir são funções distintas. A diferenciação entre empreendedor e não empreendedor está no acto de inovar. Acredita-se que esta abordagem leva em consideração que ao passar a gerir a empresa e cuidar de processos burocráticas ligados à gestão, o empreendedor deixa de executar novas combinações, função que o caracterizava, tornando-se assim apenas um gestor. Para Cário e Pereira (2001) “as inovações rompem este quadro de equilíbrio lentamente mutável possibilitando o ensejo à expansão económica” (Cário & Pereira). Por isso, o empreendedor para Shumpeter é um agente de desequilíbrio na economia, o agente da “destruição criativa”, inovando, impondo mudanças e quebrando rotinas.

Por outro lado, dado que a criatividade constitui uma característica inerente às pessoas, de maneira inevitável converte-se num elemento que afecta horizontalmente o conjunto de processos próprios da actividade empresarial. A criatividade deve converter-se, neste sentido, em mais um valor no seio da cultura da empresa, num aspecto transversal a toda a cadeia de valor. As empresas mais criativas e inovadoras, para além de uma gestão eficaz são caracterizadas pela utilização sistemática das perspectivas e técnicas criativas, o

que lhes permite alimentar o processo contínuo de inovação e criação de ideais e destacarem-se da concorrência. O processo criativo segue um esquema, procura de alternativas a uma situação existente ou à formulação de soluções que dêem resposta a problemas que possam surgir. A predisposição para encontrar soluções e para a mudança (entendo-a como positiva) implica também a existência de uma atitude criativa. A criatividade está relacionada com a utilização de métodos que não respondem a esquemas e lógicas tradicionais. Para as organizações que usarem a criatividade com mais eficácia, é preciso que conheçam o processo de inovação nas organizações e tomem providências para encorajar esse processo.

Face ao exposto, a investigação deverá desenrolar-se em torno de um conjunto de questões de investigação, nomeadamente: Existe uma relação significativa entre cooperação, métodos de trabalho inovadores, criatividade e empreendedorismo? Sendo a criatividade um atributo do empreendedor, terá a capacidade de exercer efeito mediador entre métodos inovadores de trabalho e o empreendedorismo? Pretende-se assim avaliar a relação entre as variáveis Cooperação intra-empresas, Inovação dos Métodos de trabalho e Criatividade no Empreendedorismo. Adicionalmente, avalia-se o efeito mediado pela Criatividade entre a Cooperação e Inovação dos Métodos de trabalho e o Empreendedorismo.

MÉTODO

PARTICIPANTES E PROCEDIMENTO

No presente estudo participou uma população de empresas relacionadas com a indústria da defesa espanhola, tendo em conta o critério de que foram entidades de importância nas suas relações com defesa e que mantiveram relações comerciais de carácter habitual com o Ministério da Defesa. A base de dados utilizada relativa ao ano 2003 foi oferecida pela *Dirección General de Asuntos Económicos del Ministerio de Defensa* com o objectivo geral de conhecer os determinantes estratégicos com enfoque na organização da Defesa, com base na estratégia de profissionalização e modernização das Forças Armadas Espanholas e dos Sistemas de Defesa e a análise dos processos de cooperação de empresas relacionadas com a defesa. O presente estudo corresponde a uma parcela do estudo central pretendendo focalizar-se na modernização em empresas relacionadas com a defesa nacional.

As empresas participantes responderam a um questionário que foi enviado por correio entre Fevereiro e Agosto de 2004. Foram devolvidos 236 questionários completos, o que corresponde a uma taxa de resposta de 52,44% com um erro de 4,4% para $p=q=50\%$ e um nível de confiança de 95,5. Quanto à Formação Jurídica 57,6% das empresas participantes no presente estudo constituíram-se como sociedades cooperativas e

sociedades empresariais (42,4%). E, muito embora, desenvolvam processos de cooperação relacionados com a defesa, pertencem maioritariamente ao sector terciário (68,2%), seguido do sector secundário (28,8%) e, por fim do sector primário (1%) (*missing system* = 1,5%).

OPERACIONALIZAÇÃO DAS VARIÁVEIS E TRATAMENTO DE DADOS

Os indicadores foram criados para o presente estudo pela colaboração entre o departamento de Economia da empresa da Universidade Politécnica de Cartagena e o Ministério da Defesa com referência às necessidades apresentadas por este ministério e com base na literatura revista sobre esta temática. Todos os indicadores foram respondidos numa escala do tipo *Likert* de 5 pontos em que 1 corresponde ao valor mais em desacordo e 5 ao valor mais de acordo relativamente a cada item. O Alfa de *Cronbach* foi calculado como uma medida de avaliação da consistência interna das escalas. Utilizou-se a análise factorial, como técnica de redução da dimensionalidade dos dados. Aplicámos como método a extracção de factores em Análises de Componentes Principais e elegeram-se os itens com uma carga igual ou superior a .50, aplicando o teste de Kaiser Meyer Olkin (KMO) e a prova de esfericidade de Bartlett. Para determinar em que medida as variáveis independentes incluídas no modelo hipotetizado influenciam a variável critério Transferência da Formação adoptou-se o procedimento de análise de Regressão Linear Múltipla do programa *Statistical Package for the Social Sciences* (SPSS) versão (17.0). Na avaliação do efeito mediador da variável criatividade adoptou-se o teste dos efeitos de mediação seguindo, os procedimentos recomendados por Baron e Kenny (1986). Especificamente, na avaliação do efeito de mediação simples (o efeito de X sobre Y é mediado por M), verificaram-se os passos seguintes: 1) Mostrar que X (preditor) se relaciona com M (mediador) – consiste em estimar o coeficiente de regressão de M em X num modelo de regressão simples (Modelo 1); 2) Mostrar que X (preditor) se relaciona com Y (variável resultado) – consiste em estimar o coeficiente de regressão de Y em X num modelo de regressão simples (Modelo 2); 3) Mostrar que M se relaciona com Y quando X é constante – consiste em estimar os coeficientes de regressão de Y em M e de Y em X num modelo de regressão múltipla (Modelo 3). Se os dados sugerirem que o coeficiente de regressão estimado no passo 1) não é nulo mas que o seu análogo no modelo de regressão múltipla estimado em 3) não difere de zero, então deverá concluir-se que o efeito de X sobre Y é totalmente mediado por M (mediação completa). Se o coeficiente de regressão estimado no passo 1) não for nulo e o seu análogo no modelo de regressão múltipla estimado em 3) atenua-se mas continua a ser diferente de zero, então deverá concluir-se que o efeito de X sobre Y é parcialmente mediado por M (mediação parcial). São ainda realizados os cálculos teste de *Sobel* de Preacher e Leonardelli ([HYPERLINK "http://people.ku.edu/~preacher/sobel/sobel.htm"](http://people.ku.edu/~preacher/sobel/sobel.htm) <http://people.ku.edu/~preacher/sobel/sobel.htm>) para verificar se os caminhos apurados nas equações estruturais são ou não significativos.

APRESENTAÇÃO DOS RESULTADOS

Nesta secção, apresentam-se os resultados obtidos na análise das respostas dadas pelas duzentas trinta e seis empresas inquiridas ao instrumento utilizado para operacionalizar as variáveis em estudo. Inicia-se a apresentação dos resultados com uma análise factorial exploratória das diferentes variáveis do estudo seguindo-se uma análise descritiva das diferentes variáveis para a globalidade dos respondentes. Realizam-se também análises correlacionais e de regressão para efectuar a avaliação das duas questões levantadas sobre se existe uma relação significativa entre cooperação, métodos de trabalho inovadores, criatividade e empreendedorismo. E, se sendo a criatividade um atributo do empreendedor, terá a capacidade de exercer efeito mediador entre métodos inovadores de trabalho e o empreendedorismo, procurando proceder à sua validação.

Realizou-se em primeiro lugar uma Análise Factorial Exploratória, em componentes principais (rotação varimax) dos indicadores que constituem as variáveis do modelo de análise. Esta análise permitiu extrair quatro factores independentes que correspondem às variáveis que pretendemos estudar e explicam 68,9 % da variância. Retendo os indicadores com pesos mais elevados em cada factor, de acordo com a operacionalização descrita, criaram-se os índices para cada variável (Quadro 1).

Quadro 1

Resultados da Análise Factorial em Componentes Principais (rotação varimax) (N=66).

Indicadores	Pesos Factoriais				
	Comunalidades	1	2	3	4
Cooperação intra-empresarial					
Comportamentos oportunistas	.79	.87	.12	.09	.07
Falta de confiança e compromisso	.74	.82	.06	.12	.22
Motivação, conciliação e compromisso	.75	.78	.31	.11	.01
Negociação e coordenação de esforços	.67	.77	.35	.18	-.04
Informação, dedicação e tempo de trabalho	.57	.73	.37	.07	.03
Falta de adequação aos interesses	.71	.71	.04	.24	.03
Inovação em Métodos de trabalho					
Acesso a segmentos de mercado	.71	.19	.81	.14	.06
Pessoal qualificado	.77	.14	.80	.19	.18
Novos produtos e serviços	.71	.30	.79	.24	.10
Investigação e desenvolvimento de tecnologias	.68	.08	.77	.30	.00
Capacidade de adaptação	.45	.29	.56	-.02	.16
Empreendedorismo e criação de empresas					
Spin-off	.70	.00	.30	.77	.04
Cooperação com empresas	.68	.13	.35	.71	.25
Fracasso anterior negócio	.57	.30	.07	.69	.08
Falta de informação		.31	.11	.62	.28
Criatividade					
Realização pessoal	.79	.12	.27	-.05	.84
Personalidade criativa	.76	.05	.17	.20	.83
Espírito inquieto	.79	.02	-.09	.37	.81

Nota: Os pesos factoriais mais elevados em cada factor estão a negrito.
KMO =.82

No Quadro 2 apresentam-se as médias, os desvios-padrão, as correlações e a consistência interna das variáveis que constituem o modelo em análise.

Quadro 2

Médias, Desvios-Padrão, Correlações e Consistências Internas (N=66).

Variável	N	M	DP	1	2	3	4
Cooperação intra-empresarial	66	3,2 ^a	1,0	(.90) ^b			
Inovação em Métodos de trabalho	66	2,9 ^a	1,1	.50**	(.87)		
Empreendedorismo e criação de empresas	66	1,9 ^a	1,0	.44**	.52**	(.78)	
Criatividade	66	3,1 ^a	1,3	.21*	.30*	.42**	(.82)

^a Escala de 1 a 5

^b A diagonal apresenta os valores do *Alpha de Cronbach*

*p<.05 **p<.01

No que diz respeito às correlações constata-se que todas as variáveis estão positiva e significativamente associadas. A variável mais fortemente correlacionada com o Empreendedorismo é Inovação com os Métodos de Trabalho ($r=.52^{**}$), seguindo-se a Cooperação intra-empresas ($r=.44^{**}$). A variável menos correlacionada com a variável de resultado é a Criatividade ($r=.21^{*}$). Todas as variáveis analisadas mostram boas qualidades psicométricas expressas pelos valores de consistência interna de *Alpha de Cronbach* (valores iguais ou superiores a (.78).

Com o objectivo de testar o efeito mediador da Criatividade procedeu-se à análise de modelos de regressão em que se incluiu, para além dos antecedentes a variável intermédia. Para além disso, foram também incluídas na análise as variáveis demográficas mas posteriormente retiradas uma vez que não mostraram poder preditivo no Empreendedorismo. Com o objectivo de perceber se cada um dos antecedentes tem um contributo significativo na variável intermédia, procedeu-se à análise do Modelo 1 (Quadro 3). Os resultados revelam que a variável intermédia Criatividade se relaciona de forma positiva e muito significativa com as variáveis antecedentes Cooperação Intra-empresarial ($\beta = .28$, $p < .01$) e Inovação nos métodos de trabalho ($\beta = .35$, $p < .02$), cumprindo o primeiro passo da mediação de Baron e Kenny (1986).

Quadro 3

Coeficientes de regressão padronizados referentes às variáveis antecedentes sobre a variável de resultado quando se inclui o efeito da variável intermédia (N=66).

Modelo 1		Modelo 2	Modelo 3
	Criatividade e Motivação	Antecedentes	Antecedentes + Criatividade e Motivação
	Empreendedorismo		
Cooperação Intra-empresa	$\beta = .28$, $p = .01$	$\beta = .43$ $p = .000$	$\beta = .36$ $p = .000$
Inovação Métodos de trabalho	$\beta = .35$ $p = .02$	$\beta = .47$ $p = .000$	$\beta = .43$ $p = .000$
Criatividade		$\beta = .31$ $p = .000$	
Cooperação Intra-empresa e Inovação Métodos de trabalho		$B = .34$ $p = .002$	$\beta = .26$ $p = .05$

* $p < .05$ e ** $p < .01$

Como se pode observar no Modelo 2 do Quadro 3, a análise das estimativas dos coeficientes de regressão quando se consideram apenas os antecedentes permite afirmar que tanto a Cooperação Intra-empresa ($\beta = .43$, $p = .000$) como a Inovação dos Métodos de Trabalho ($\beta = .47$, $p = .000$), influenciam de forma positiva com a variável de resultado (Empreendedorismo). O mesmo se verifica com a Criatividade cujo efeito exercido sobre o Empreendedorismo é igualmente significativo ($\beta = .31$, $p = .000$). Estes resultados são consistentes com o passo 2 do modelo de mediação sugerido por Baron e Kenny (1986).

Com o objectivo de perceber se a variável intermédia medeia especificamente o efeito dos antecedentes sobre a variável de resultado, procedeu-se à análise de modelos de regressão em que se incluiu primeiramente cada uma das variáveis antecedentes de forma isolada e depois conjuntamente, e a variável intermédia.

No Modelo 3 pode-se constatar que, na presença da variável Criatividade, o efeito directo desempenhado inicialmente pela Cooperação Inter-empresarial no Empreendedorismo ($\beta = .43$, $p = .000$) e pela Inovação dos Métodos de Trabalho ($\beta = .47$, $p = .000$), mantêm-se significativo ($p < .01$) muito embora baixe ligeiramente de magnitude (de $\beta = .43$ para $\beta = .36$ para Cooperação Intra empresarial; e de, $\beta = .47$ para $\beta = .43$ para Inovação dos Métodos de Trabalho), sugerindo a existência de uma mediação parcial entre estes dois antecedentes e a variável critério. No entanto, a realização do teste de Sobel apenas revelou significância do efeito da Inovação dos Métodos de Trabalho no Empreendedorismo ($Z = 2.05$; $p < .01$). Deste modo conclui-se que a Criatividade e Motivação exerce efeito mediador parcial apenas num antecedente (Inovação dos Métodos de

Trabalho) conseguindo diminuir a magnitude da relação directa entre a Inovação nos Métodos de trabalho e o Empreendedorismo.

O Modelo 3 (Quadro 3) mostra ainda que, na presença simultânea dos dois antecedentes - Cooperação inter-empresas e Inovação - a variável intermédia Criatividade consegue diminuir a magnitude desta relação (de $\beta = .34$, $p = .002$ para $\beta = .26$, $p = .05$). De acordo com o teste de Sobel, este resultado indica a existência de uma mediação parcial significativa ($Z = 1.4$, $p < .01$). Em suma, a presença conjunta dos dois antecedentes é importante para que a Criatividade exerça efeito parcial entre estes e a variável critério (Empreendedorismo).

CONCLUSÕES

É sem dúvida importante ressaltar que com a crescente reestruturação produtiva e os movimentos de “cooperação” as pressões por redução de custos e aumento de produtividade estando a gerar a formação de novos arranjos entre as empresas, com especial ênfase nas PMEs. Estes agrupamentos estão voltados para maior cooperação entre elas, oferecendo novos elementos para uma possível formulação de políticas industriais. Os resultados do estudo permitiram confirmar a relação directa da Cooperação Intra-empresas com o Empreendedorismo, sugerindo que um maior grau de Cooperação percebida Intra-empresas aumenta o Empreendedorismo. Encontrou, também suporte para a influência da Inovação dos Métodos de Trabalho no Empreendedorismo, assinalando que quando as empresas participantes que percebem a existência de métodos inovadores estão mais dispostas a empreender. Portanto, a resposta a uma das duas questões inicialmente colocadas, se existe uma relação significativa entre cooperação, métodos de trabalho inovadores, criatividade e empreendedorismo, é positiva.

Relativamente ao efeito mediador testado, os resultados mostraram que a Criatividade consegue exercer uma influência mediadora parcial na Inovação nos Métodos de trabalho. Este resultado permite concluir que os Métodos de trabalho actuam ao nível de Criatividade que, por sua vez, determinam o grau de empreendedorismo da empresa, significando que quando estas empresas percebem que existem métodos de trabalho inovadores, imprimem criatividade e inovação no sentido de aumentarem o seu empreendedorismo. Os resultados permitem-nos ainda inferir que estas empresas desenvolvem criatividade quando percebem que existe simultaneamente cooperação intra-empresas e métodos de trabalho inovadores. Do que se conclui que a existência de cooperação e de métodos de trabalho inovadores é fundamental para fomentar a criatividade que, por sua vez desencadeia empreendedorismo. Quer dizer que a resposta à segunda pergunta sendo a criatividade um atributo do empreendedor, terá a capacidade de

exercer efeito mediador entre métodos inovadores de trabalho e o empreendedorismo, é positiva, uma vez que, a criatividade tem a capacidade de exercer efeito mediador parcial.

Os resultados fornecem evidência empírica do referido por Nunamaker e colaboradores (2002) na revisão da literatura que realçava o trabalho colaborativo concertado, onde o desempenho de qualquer parceiro ajuda toda a rede e produz aumentos globais de desempenho. Sugerindo que os padrões de colaboração observada entre as empresas reflectem os padrões anteriores de relações entre inter-organizações (Gulatti, 1995; 1999; Guleti & Garginha, 1999; Walker *et al.*, 1997) apoiando a dependência de trajectória de visão de colaboração sugerida pela visão baseada em recursos implicando positivamente o empreendedorismo. Os resultados obtidos estão em consenso com Hosby e colaboradores (2002); Hornby e colaboradores (1993); Irlanda (2002); Kuratko e colaboradores (1993); Sexton & Upton Bowman (1991); Zahia (1995) que evidenciam a necessidade crescente de se explorar o empreendedorismo corporativo e a inovação nas organizações. Os resultados estão coerentes com o referido na literatura de que o capital humano é um recurso único, inimitável que pode conduzir a longo prazo à vantagem competitiva (Hatch & Dyer, 2004; Hitt *et al.*, 2001; Lepak & Snill, 1999; Wright *et al.*, 1994).

Em síntese, as análises efectuadas mostram que a Cooperação intra-empresarial, inovação nos métodos de trabalho e criatividade influenciam positiva e significativamente o empreendedorismo.

No que diz respeito ao efeito de mediação da variável intermédia Criatividade e Inovação podemos afirmar o seguinte:

No que respeita à Cooperação intra-empresa, a sua presença isolada (sem o efeito da Inovação em métodos de trabalho) é insuficiente para produzir efeito mediador. Não consegue reduzir o efeito ou até mesmo anular, continuando a ser significativo. Em relação à Inovação em métodos de trabalho, a sua presença isolada (sem o efeito da Cooperação inter-empresa) é suficiente para produzir efeito mediador parcial, uma vez que consegue reduzir o seu efeito sobre a variável de resultado, muito embora mantendo-se ainda significativo. Na presença conjunta da Cooperação intra-empresa e Inovação nos métodos de trabalho, a redução do seu efeito na variável critério, na presença da variável intermédia, indica a existência de efeito mediador parcial. O que significa que a presença dos dois antecedentes é decisivamente importante para evidenciar o efeito mediador parcial da criatividade.

IMPLICAÇÕES PRÁTICAS

O presente estudo estabelece a importância do empreendedorismo como um factor de desenvolvimento na gestão das redes de empresas e evidencia as constatações de que investir no desenvolvimento do espírito empreendedor e das características necessárias para uma boa gestão, é fundamental. Ele demonstra que algumas características

empreendedoras devem estar presentes como a cooperação, métodos de trabalho inovadores, criatividade e motivação. Um ambiente mais exigente nos mercados globais está a obrigar as empresas e particularmente as PME's a serem quase obrigadas a cooperar em rede. Esta cooperação desenvolve-se para uma relação de longo prazo, de maior confiança entre os parceiros da rede, permitindo uma partilha de conhecimento para a melhoria e a inovação. A procura de rede por parte das PME's deve-se em parte à necessidade de reduzir a incerteza e aumentar a estabilidade; para obter ganhos de oportunidade estando associado à rede, para obter benefícios de rede e por precisar de ser ajudado para crescer. A rede proporciona novos conhecimentos a custos menores. Os mecanismos de controlo da rede impedem acções oportunistas de alguns membros. Para isso, a formação de redes é importante, pois proporciona um meio de troca de informações e articulação de negócios entre os empreendimentos. Tornar mais acessível à promoção de consórcios com o intuito de fomentar estratégias e de evitar o desaparecimento de empreendimentos que sozinhos não conseguem sobreviver. Ao mesmo tempo que empresários defendem que os empreendimentos devem traçar as suas estratégias somente para obtenção do lucro, outros colocam em prática que o desenvolvimento local é da responsabilidade deles. Além disso, o desenvolvimento do empreendedorismo ganha grandes proporções numa ambiente de articulação em rede. As PME's possuem condições de participar do processo inovador e, conseqüentemente, do desenvolvimento económico local. As PME's podem desenvolver processos de criação, apreensão transformação, acumulação e difusão e partilha do conhecimento, elementos fundamentais para o progresso tecnológico e fomento do desenvolvimento. Através do conhecimento social produzido em rede, a ênfase passa a ser na capacidade de aprender e inovar, considerados igualmente importantes para assegurar a competitividade das empresas. Quanto mais avançadas forem as práticas seguidas pelas organizações nas suas actividades de inovação, maior será a sua capacidade de aplicar as inovações. O êxito não depende sempre de se dispor ou não das tecnologias mais recentes, e sim de ter as tecnologias mais produtivas, capazes de serem usadas num grande número de aplicações. Não menos essencial é aproveitar as oportunidades criadas pelas tecnologias desenvolvidas noutros lugares e pelo quadro regulamentar. No entanto, os resultados de investigação e a tecnologia não se traduzem automaticamente em novas actividades comerciais ou num aumento de produtividade. A aplicação da tecnologia requer muitas vezes que a empresa disponha de trabalhadores altamente qualificados. O capital intelectual e os investimentos para o promover devem ser aproveitados de forma mais eficaz. As empresas ainda não compreenderam o quanto têm a ganhar da inovação resultante da melhoria das competências profissionais do pessoal. Infelizmente, segundo um inquérito do Eurofound (*European Foundating for the Improvement of living and working conditions*) sobre as

condições do trabalho e um estudo do CEDEFOP (*The Learning continuity: European Inventory on validating non-formal and informal learning*), as empresas europeias continuam a investir muito pouco no capital intelectual. Somente 26% das empresas que formam o seu pessoal prevêem as competências profissionais que são necessárias no futuro. O interesse no trabalho, as competências criativas e a iniciativa dos trabalhadores são fundamentais (80%) para o êxito e a posição das empresas e das organizações. Só agora começamos a compreender estes factores e a aproveitá-los enquanto tarefas concorrenciais, uma vez que os directores muitas vezes não estão suficientemente bem informados da sua importância. Não obstante, este trabalho pelo interesse que vem suscitando o estudo das capacidades dos processos de inovação, tratou de dar resposta ao porquê que os métodos inovadores, a cooperação e a criatividade podem ser uma ferramenta de êxito, e a sua utilização põe a possibilidade de empreender, conseguindo diferenciar a empresa da sua competência ao ser mais eficiente no processo produtivo via métodos tecnológicos. Seria desejável que em estudos futuros se desenvolvessem estudos comparativos com PMEs provenientes de outros sectores de actividade.

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COLLABORATIVE PROJECTS IN THE FIELD OF ART, CULTURE AND CREATIVE INDUSTRIES

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Abstract

Artistic and cultural projects have always been used to help develop common identities and shared values. However in the last decades, and increasingly with the use of internet and web-based platforms, more and more projects use the term “collaborative” with different meanings and contexts. We propose a typology of “collaborative projects” in the artistic, cultural and creative contexts and present some possible applications other than the artistic and cultural areas

Creative Business Incubators

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Abstract

The paper presents the findings from a survey of Portuguese creative business incubators, as a strategy to promote and support the development of the creative industries at city-regional level. Incubators can create values in the incubation process through its entry and exit procedure and by providing startups with facilities, knowledge and networks. The shifting definitions of the creative industry and sectors adopted are discussed in the context of theory review. Case studies of ABC-Obidos e INSerralves are presented, and show two different approaches of business incubators to support the creative business development. These are non-profit incubators with a regional level model, both related to universities. ABC-Obidos is promoted by the town of Obidos and INSerralves is promoted by the Cultural Foundation of Serralves, in the city of Oporto.

Key Words

Business incubation, creative industries, creative places, creative clusters, creative entrepreneurship, Portuguese incubators, local development strategy.

“The human creativity is the ultimate economic resort” (Florida, 2002)

1- Introduction

In the contemporary world, a new development paradigm is emerging that links economy and culture, embracing economic, cultural, technological and social aspects of development at both the macro and micro levels. Central to the new paradigm is the fact that creativity, knowledge and access to information are increasingly recognized as powerful engines driving economic growth and promoting development in a globalizing world (UNCTAD, 2008). In this context, regions with a future are those who know how to face this enormous challenge, those who can assess their skills, offering distinctive products and creative products to the world market, repositioning in the global production chain, attracting and retaining talent and capital to a sustainable economic development.

The emergence of creative industries, which are founded on intellectual property and creativity to generate wealth and employment, is one of the most representative change phenomena in the economic structure of regions and countries.

This study concerns two different approaches to the incubation of creative business in Portugal and will focus on a specific type of incubation model: the non-profit incubator in the creative industries. The type and focus of an incubator depends heavily on the region it resides in.

This paper presents findings from a comparative study of two incubators: ABC-Obidos and INSerralves. The ABC-Obidos is a nonprofit incubator developed within a technological park structure, of which is an important element, integrated in the development strategy of the town/region of Obidos, "Creative Obidos", focused on creating a "Creative Cluster" in a Low Density Area. INSerralves is a nonprofit incubator developed within the Serralves Foundation structure, located in a High Density Urban Area, in the city of Oporto.

2- Business Incubators

In the creation of new firms, the first few years are critical for their survival. Unfortunately, many entrepreneurs lack the experience, resources and business skills required to launch a new company into success.

A business incubator can help these entrepreneurs in numerous ways, such as assisting them in the development of business proposals or by aiding these clients toward finding the capital required for an initial investment toward a new company.

Incubators are multiform structures. The definitions may differ, depending on the author and the time and location of the study, but all have one point in common: an incubator assists in the creation of a company and its development during the first years of growth (Smilor, 1987; Grimaldi and Grandi, 2005).

Incubators help to create and stabilize the resources and competencies of new entrepreneurs in order to ensure the economic sustainability of their firms through periods of shock and crisis (Rice, 2002; Vohora et al., 2004).

The incubation process has several dimensions (basic services, logistics, advice, financial services and networking), all geared toward creating value (Mian, 1997; Hackett and Dilts, 2004a; Bergek and Norrman, 2008), and the relative importance of this assistance is determined by the liabilities of newness (Stinchcombe, 1965; Sofouli and Vonortas, 2007; Schwartz, 2009; Schwartz and Hornyk, 2010) and the need for resources and legitimacy (Zimmerman and Zeitz, 2002).

These structures could be perceived as sources of competencies, resources and knowledge (Christman et al., 2005; Hackett and Dilts, 2004b).

For governments and other institutional concerns, incubators are tools for wealth creation and economic development (European Commission, 2002; Lalkaka, 2002).

An incubator, naturally, also offers rent space and provides shared equipment, staff, and space among its clients in a flexible environment. By working with the incubator and surrounding network, a client should ultimately graduate from the incubator and be prepared for the general requirements of operating a successful business on his or her own.

Business incubators have the ability to bring creativity, resources, entrepreneurship and workforce together, and thus cause the economy in the surrounding area to flourish.

Each business incubator can be classified under one of four different divisions: Business Innovation Centers, University Business Incubators, Independent Private Incubators, and Corporate Private Incubators. Based on their organizational structures and funding, the first two divisions are public, while the latter two are private (Grimaldi and Grandi, 2005).

These different types all have their own set of characteristics that separate them from the others. Grimaldi and Grandi (2005) state that this variety of incubation models is much needed to respond to the different needs and requirements of companies.

Chinsomboon (2000) uses a different classification in his research on incubators in the new economy. He separates the different types of incubators by their levels of involvement. He segments the venture incubator, venture accelerator, venture portal, and venture network. Another way of categorizing different types of incubators is by looking at the stage of development in which a company enters the incubator; Chinsomboon (2000) also refers to this as 'the point of intervention'. We can distinguish the following stages: Concept (pre-seed), seed, early, mid and late.

According to Lalkaka (2002), the dominant incubation model has been the non-profit incubator; this applies to a majority of the incubators worldwide as well. Lalkaka notes that most incubators in developed and developing countries are non-profit and pursue economic development goals. Their income comes from rentals and providing services, which is further supplemented by subsidies.

History shows that there are two categories of non-profit incubators. The first is the university related model. This incubator directly feeds off of university developed technologies and talent. The second is the regional development model. These incubators usually have developed close ties with the regions they reside in and are not directly related to a university.

An incubator is only of value for entrepreneurs if it is able to contribute something to their ventures. Incubators can provide value in three ways: facilities, knowledge and networks.

Valuable facilities can be assets that are difficult or costly to obtain for start-ups, such as a conference room or a fabrication laboratory, but also something more abstract such as an inspiring place to work because of the vicinity of like-minded people.

Knowledge can be provided in the form of business advice by the incubators management or through other sources.

Incubators also create value by spending more time on building networks and valuable relationships than individual start-ups are able to do. As Peters et al. (2004) point out, start-ups do not generally have all the resources required to make their venture a success. Therefore, it can be expected that the most important values that are provided by incubators are also the ones that are needed most by the entrepreneurs: the ones they cannot provide for themselves.

3- Creative Industries

The creative industries are also frequently referred to as the copyright industries (Flew, 2002). This is because the word creative in creative industries refers to the product that is, for a large part, the result of a creative process. The most important asset that is being created by companies in the creative industries is their intellectual property (IP). This does, however, not mean that other industries are not creative. It is very important to clearly distinguish the product of the industry, which is produced by creativity, and the business practice of being creative.

The most referenced definition of creative industries is that of the UK government's Department of Culture, Media and Sport (DCMS):

'Those activities which have their origin in individual creativity, skill and talent and which have a potential for wealth and job creation through the generation and exploitation of intellectual property.' (DCMS, 1998, 2001)

The creative industries can further be divided in the following sectors: arts, media & entertainment and creative business service. This includes a wide range of diversified activities such as: advertising; architecture; visual arts and antiques; crafts and jewelry; technical design; fashion; film, video and multimedia; educational and leisure software; music; performing arts; press and publishing; television and radio.

The list of these activities emphasized the *breadth* of the creative industries and has become a benchmark for identifying creative industries internationally as well as at regional, sub-regional and city levels within the United Kingdom, Europe and Asia.

Jong, Fris and Stam (2007) also include knowledge intensive services at the most periphery; this covers activities such as IT services and research consulting.

This study mainly uses the definition of the DCMS and also includes knowledge intensive services when referring to the creative industries.

Core elements of the creative industries – entertainment software, film and television, music publishing, book publishing, audio-visual and multimedia – have been grouped together as the 'copyright industries' in the United States of America (Siwek, 2004).

However, Americans for the Arts (2005) promotes analysis of creative industries as 'arts centric businesses', defining creative industries as 'both for-profit and non-profit businesses involved in the creation or distribution of the arts'. They include museums and collections, performing arts, visual arts and photography, film, radio and TV, design and publishing, and arts schools and services.

The World Bank's approach was to identify products and outputs that were 'protectable under some form of intellectual property law' (Weiping, 2005). The most significant creative industries for the World Bank were therefore: software, multimedia, video games, industrial design, fashion, publishing, and research and development (R&D) – all defined by the legal processes of owning creative content.

Jeffcutt and Pratt (2002) discuss the difficult position of the creative industries. They state that it occupies the domain between culture and industry and, therefore, is in a continuing struggle between creativity and management practices. This tension makes the creative industries an especially attractive and interesting field to study.

The creative industries are, in summary, based on individuals with creative talent, combined with managers of economic and technologic resources, producing salable products whose economic value is based on their "cultural" or "intellectual" properties. The creative industries are thus a complex aggregation of creative and industrial sectors and subsectors and its borders are difficult to limit.

The creative products are usually, in physical terms, very simple: a cassette with a movie, a CD, a DVD, a CD-ROM, an MP3 file, a sheet of printed-paper. Its value lies in its contents, in its meaning or on what it represents. The content can be a movie, a story, a picture, a game or a pop song and can be entertaining, persuasive, informative or attractive. It is the content that has value, not the container. Even when we speak of a garment or a jewel, it is the style, the design that counts, not the fabric or metal. Thus, creative industries have in common the ability to generate and trade ideas with "significant value": a value that extends the meaning and the perception (David Throsby, 2001).

The growing importance of content industries as engines of the economic sector with the fastest growth is indelibly associated with the close relationship between the creative industry and information technology and communications, driven by the rapid advance of digital technologies and the globalization of the communication networks. The information and knowledge of a society develops hand in hand with the appreciation of creativity as a key factor of success and competitiveness.

On the other hand, the significant increase that has taken place in the publication of investigation in entrepreneurship is an acknowledgement of the importance that the phenomenon assumes in the development of economies, a fact already underlined by Schumpeter (1949) more than sixty years ago.

Shane and Venkataraman (2000) affirm that it is necessary to study this phenomenon stressing that innovative entrepreneurship is the crucial process for the change and evolution of the economy.

Reynolds (1994) accents the importance of the new enterprises for the innovation in the economy, not only for the quantity of patents registered on behalf of these, proportionally much larger than the registered one on behalf of the most ancient enterprises, but also for the challenges that they set to the already installed enterprises.

Timmons and Bygrave (1986) confirm this situation while concluding that the small companies of technological base are the fountains of most of the technological "radical" innovations.

Hamel and Prahalad (1991) go further and affirm that for large enterprises it is, in general, practically impossible to be truly innovative. In fact, the concern with the short term and the bureaucracy suffocate the innovation in large companies (Drucker, 1985a).

Therefore, for young enterprises, innovation is its motto of development and the systematic search of innovation is a central part of the concept of entrepreneurship (Drucker, 1985a, 1985b, 1998).

It remains difficult to prove that a larger number of entrepreneurs in the creative industry do actually help to stimulate the economy. However, research has shown that innovation can be stimulated by entrepreneurship (Drucker, 1985a) and also leads to growth of the economy (Audretsch & Thurik, 2001). Nevertheless, it must also be noted that the effect of entrepreneurship is difficult to measure and that causality cannot always be proven (Stel, Carree & Thurik, 2005). With this being said, it can be concluded, for now, that a high level of entrepreneurship is something that is potentially of interest to every industry; whether it is entrepreneurship that stimulates growth, growth that stimulates entrepreneurship or the correlation is caused by a third factor.

4- Creative Business Incubation

This study concerns two different approaches to the incubation of creative business in Portugal: the ABC-Obidos and the INSerralves. Both are non-profit incubators in the creative industries and are integrated in business cluster strategies linked to local growth agendas.

The promotion of "creative clusters" strategies is based on the ideas of Michael Porter (1998). From the strategies reviewed, a 'creative cluster' was largely taken to mean a linked grouping of creative industries, firms and/or cultural activities that had a spatial concentration. Geographical proximity was identified as particularly important, especially in clusters dominated by creative small and medium enterprises (SMEs) and micro businesses. These were based on specialized craft or new digital practices, or where work was

predominantly organized around short-term projects or labour flexibility and where labour market information was deemed critically important.

The ABC-Obidos incubator is developed within a technological park structure and is an important element integrated in the development strategy of the town/region of Obidos, ("Creative Obidos"), which focuses on creating a "Creative Cluster" in a Low Density Area. Obidos is a small town located in the center of Portugal and the municipality has a population of approximately 12,000 people. Obidos is also the leading member of the European cooperation network "Creative Clusters in Low Density Areas" supported by the European Union's URBACT II Programme.

Wood and Taylor (2004) note that while much of the attention of those concerned with culture and regeneration has been focused upon the core cities, it would be a mistake to assume that smaller towns and cities do not have a role to play. The understood wisdom on the essentially urban nature of the creative industries is complemented by their significant role in the economic development of rural areas (BOP, 2008).

In this context, attracting and retaining talent, particularly from the creative class, for low-density areas, highly depends on the quality of life and the quality of places, which appear as the main factors behind the so-called "urban exodus" (ESPO, 2006).

MacGranahan and Wojan (2007) state that, despite an urban affinity, the creative class – perhaps more able to and apt than others in the workforce to choose where to live based on quality of life considerations – can be drawn out of cities to high amenity rural locations.

On the other hand, INSerralves is a non-profit incubator developed within the Serralves Foundation structure, located in a High Density Urban Area, in the city of Oporto.

The Serralves Foundation is a cultural institution at the European level in the service of national community, whose mission is aimed to raise public awareness of contemporary art and environment, through the Museum of Contemporary Art as a multidisciplinary center, the Park as natural heritage involved in environmental education and animation, and the Audience  as a center for reflection and debate about contemporary society.

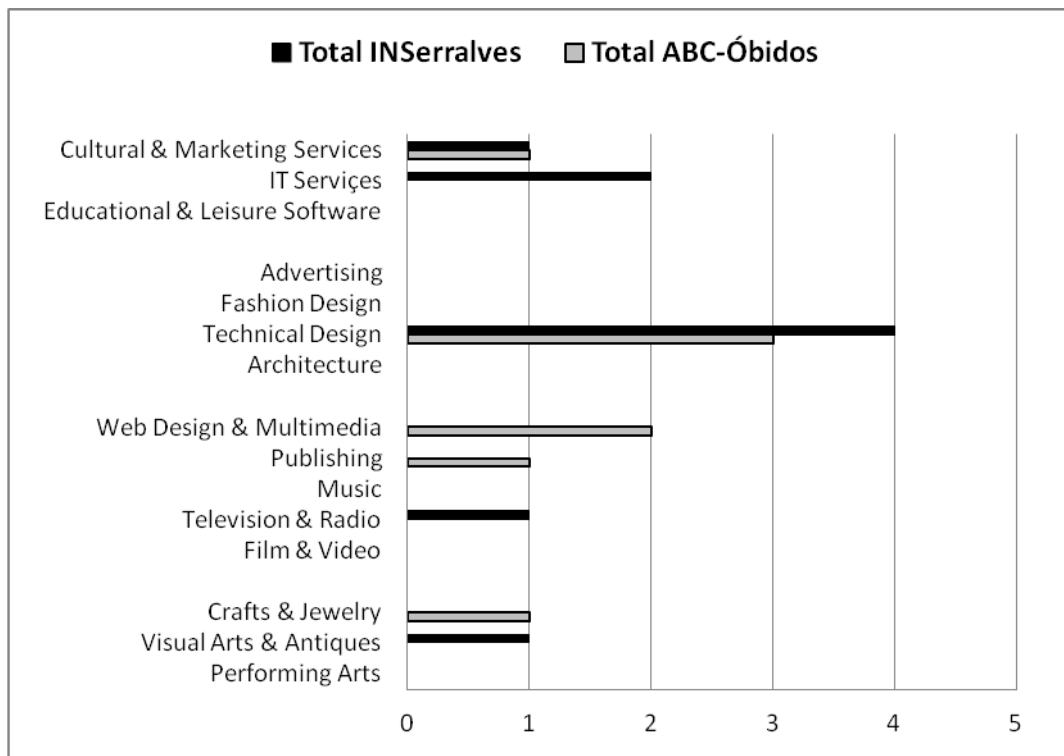
The Serralves Foundation, aware of the growing importance of creative industries in modern economies and convinced that their mission includes support for these activities, mobilizing talents and encouraging creativity and innovation, has promoted a study (Serralves, 2008) with the strategic goal of developing a cluster of creative industries in Northern Portugal.

In parallel with this study, the Creative Industries INSerralves is developed, aiming to stimulate creativity, innovative and entrepreneurial individuals and companies through the creation and management of an incubator that is part of the physical environment of the Serralves Foundation.

ABC-Obidos started its activities in September 2009 and is supported by a technological park structure, in a low-density area. INSerralves started its activities in July 2008 and is supported by a cultural foundation structure, in a high-density urban area.

In the first half of 2011, ABC-Obidos had eight incubated start-ups and INSerralves had nine incubated start-ups, as shown in Figure 1.

Figure 1 Incubated start-ups (June, 2011)



The turnover achieved by start-ups of the two incubators in 2010 is very similar: the start-ups of ABC-Obidos with €370,933 and the start-ups of INSerralves with €376,916. However, in the case of ABC-Obidos, one of the companies represents about 64% of the total.

Figure 2 shows that ABC-Obidos has two companies with great prospects for growth (more than 30%), both in the field of Web Design & Multimedia (start-ups 2 and 8).

INSerralves has five start-ups (5, 6, 7, 8, 9) with great prospects for growth (more than 30%), two in the area of IT Services (7, 8), one in the area of Cultural and Marketing Services (6), one in Television (5) and one in Technical Design (9). The INSerralves start-ups have a higher growth potential in more diversified areas.

Figure 2 Turn over of each start-up as a percentage of total

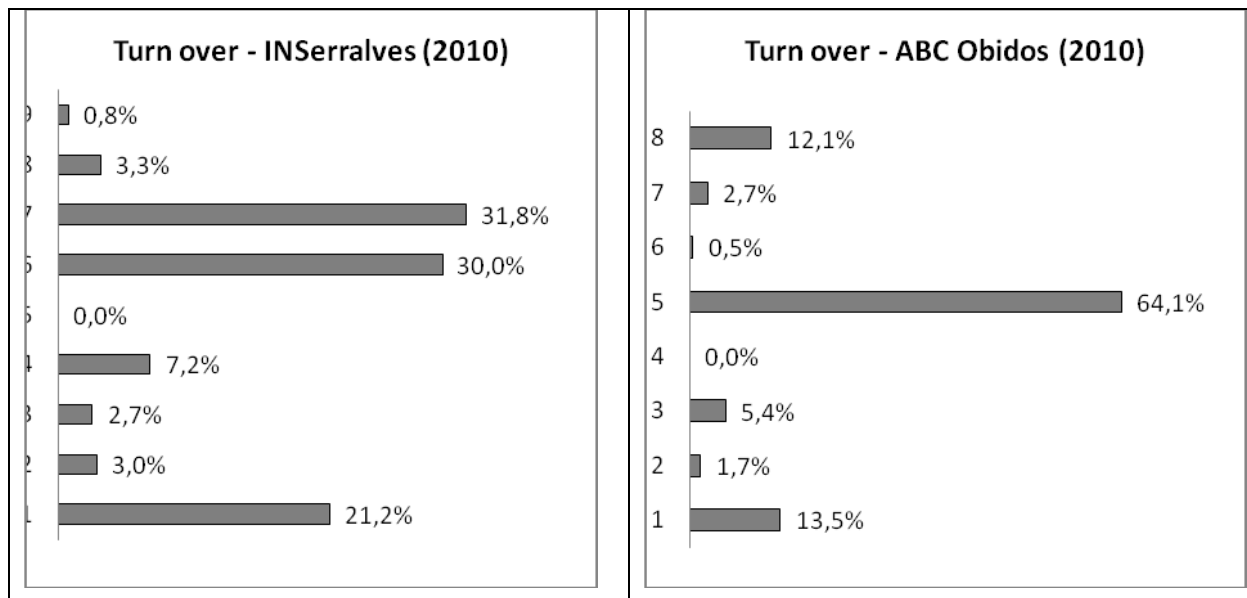
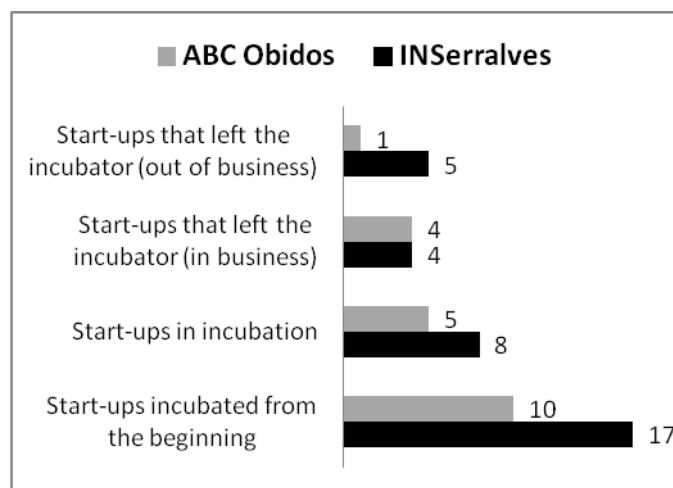


Figure 3 highlights the data on incubated start-ups since the beginning of the activity of INSerralves, in 2008, and the activity of ABC-Obidos, in 2009.

Figure 3 Incubated start-ups



These figures relate to the situation in September 2011, since the end of the first half of 2011, two start-ups left ABC-Obidos and one start-up left INSerralves.

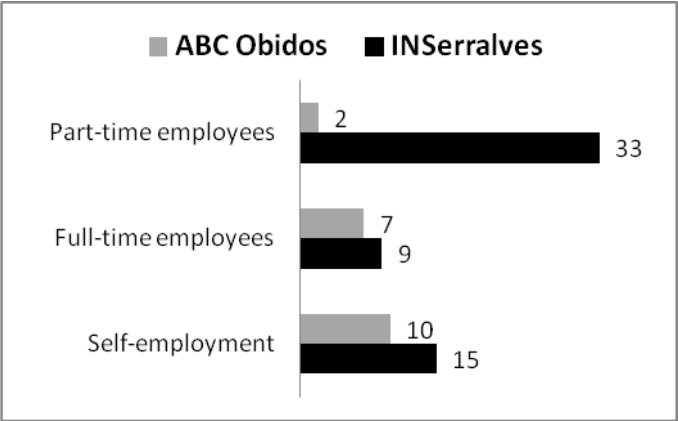
It appears that, since the beginning of its activity, eight start-ups left the incubators and are still in business.

In terms of jobs created, we distinguish between the self-employment (owners or shareholders of the start-ups) and employees hired full time and part-time. The greatest

prospects for job creation are in the areas of Web Design & Multimedia, IT Services and Cultural & Marketing Services.

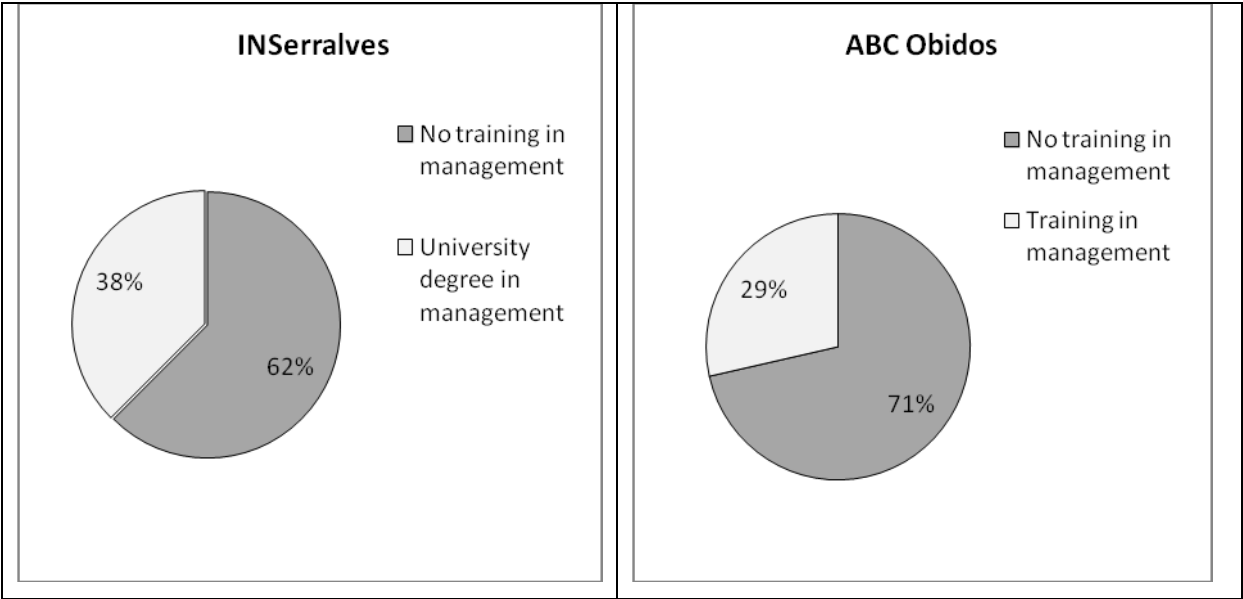
In Figure 4 we have the data on the jobs created by start-ups in the incubator at the end of 2010. In relation to part-time jobs created by the start-ups from INSerralves, 27 of them are for temporary activities associated with cultural events and fairs.

Figure 4 Incubated start-ups (2010)



In INSerralves there is a higher percentage of entrepreneurs with management training, particularly with university degrees in management. In turn, in ABC-Obidos, management training of entrepreneurs is professional in nature (see Fig. 5).

Figure 5 Management training of the entrepreneur before entering the incubator

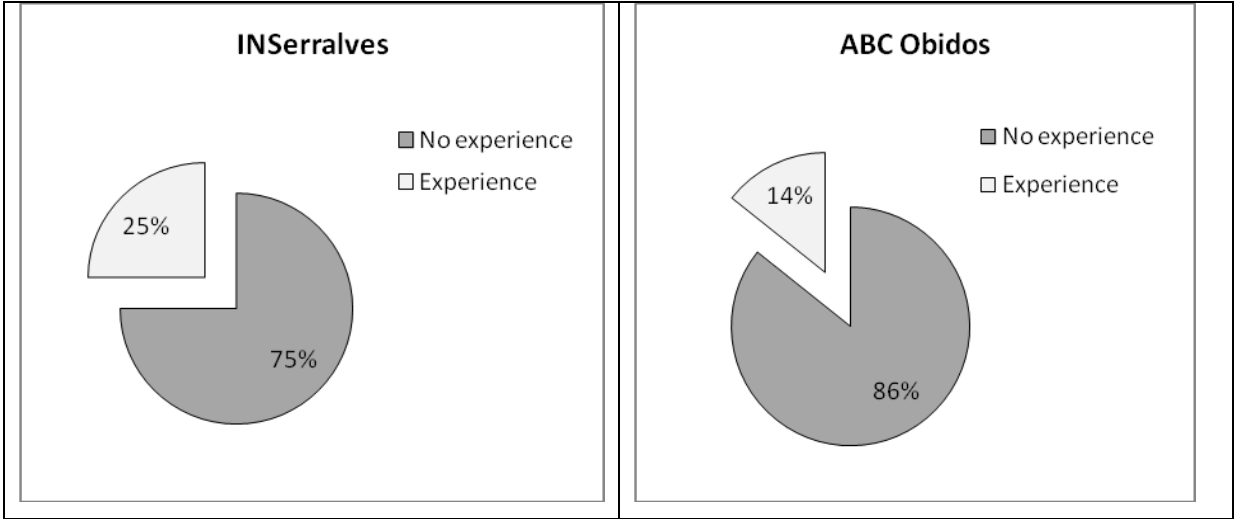


It also appears that the initial level of management training is very low, especially in ABC-Obidos with 71% of entrepreneurs with no management training.

Along with training in management, previous experience in creating companies is another relevant factor to the success of start-ups.

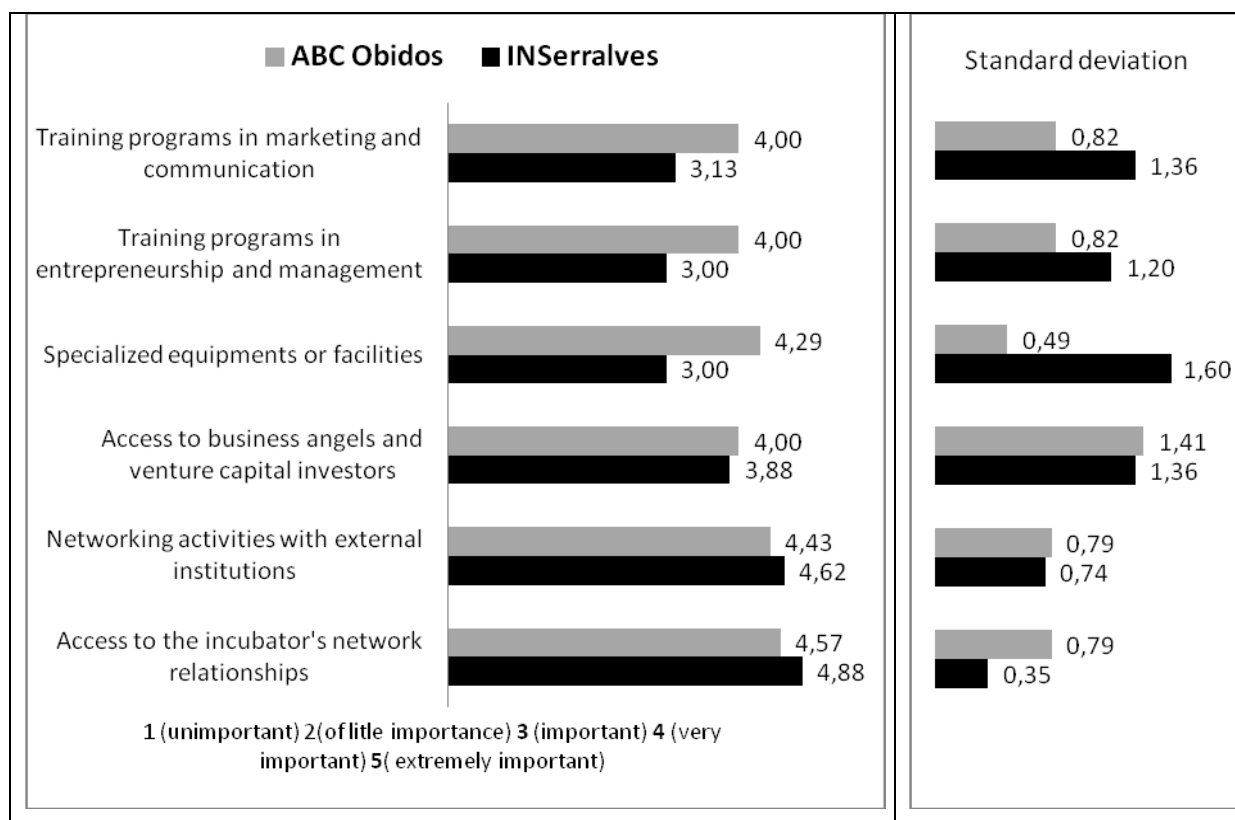
In this area, the number of entrepreneurs with previous experience on enterprise creation is also lower, particularly in the case of ABC-Obidos, with a percentage of 86% of entrepreneurs with no experience in creating start-ups (see Fig. 6).

Figure 6 Entrepreneur’s experience on enterprise creation before entering the incubator



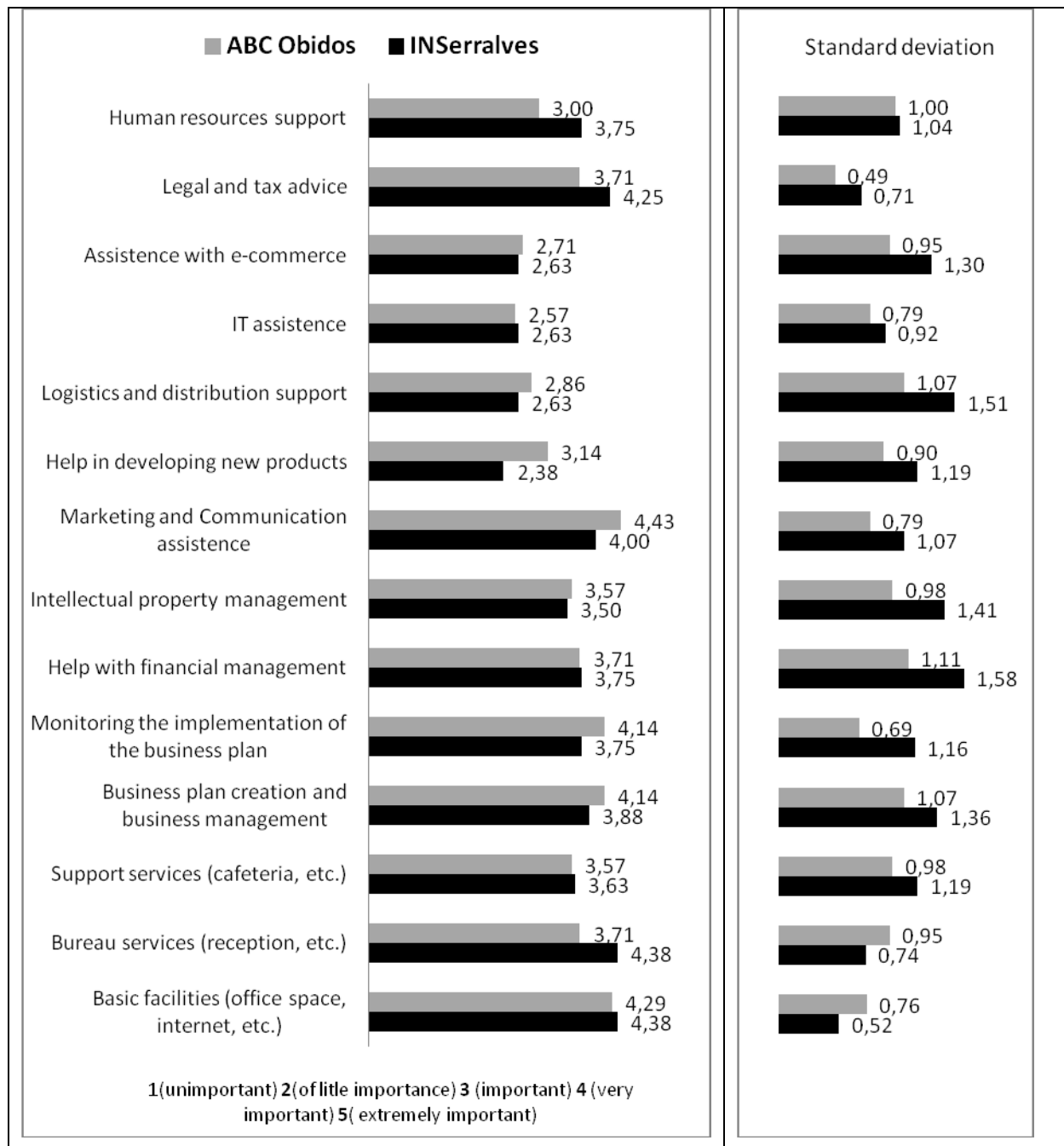
As for the importance of the business incubation activities, it appears that the networking activities and the access to the incubator's network relationships are those most valued by start-ups (see Fig. 7). Entrepreneurs also report that the image and prestige of the incubator is a very important asset; that is, the image and prestige of the Technology Park of Obidos and the image and prestige of the Serralves Foundation.

Figure 7 Assessing the importance of business incubation activities



In this context, by national and international projection of the Serralves Foundation, INSerralves has a privileged position, particularly in the field of artistic and cultural activities. Figure 8 shows the average response from start-ups on the importance they attach to various services that can be provided during the incubation process.

Figure 8 Assessing the importance of business incubation services



For start-ups of ABC-Obidos the most important services are "Marketing and Communication assistance", followed by "Facilities", "Business Plan Creation and Business Management" and "Monitoring the implementation of the Business Plan"

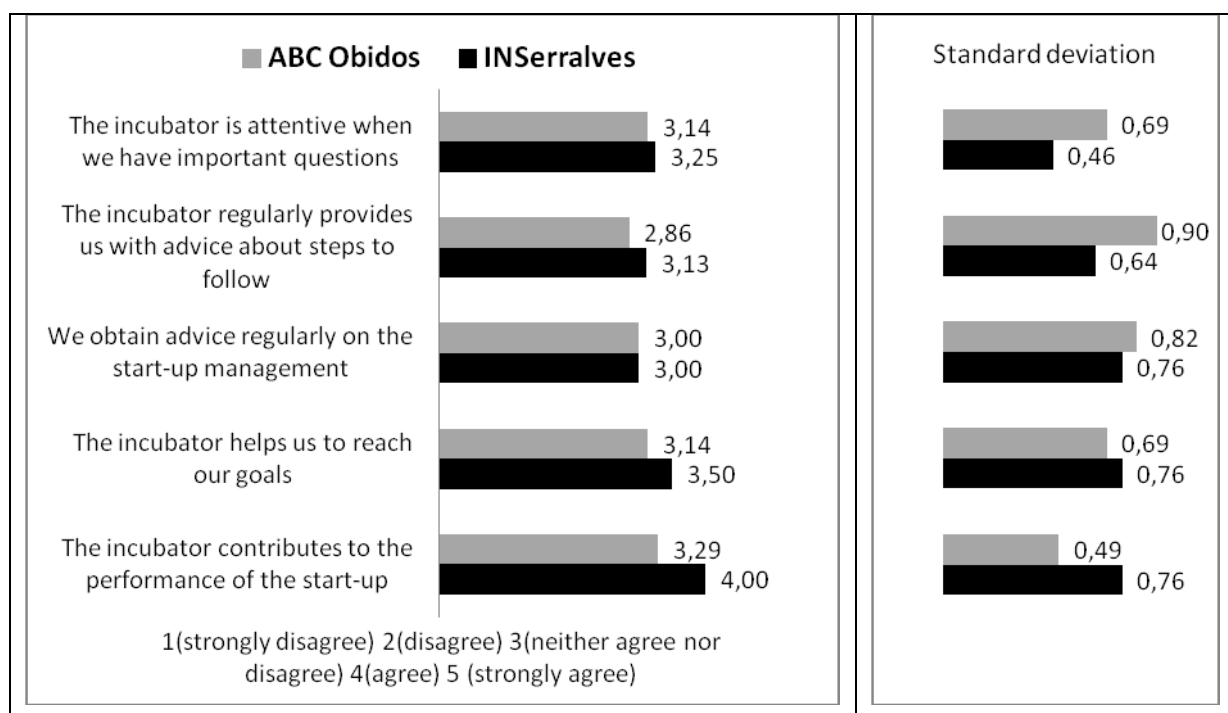
At INSerralves the most important services are "Facilities" and "Bureau Services" followed by "Legal and Tax advice", "Marketing and Communication assistance" and "Business Plan Creation and Business Management".

“IT Assistance”, “E-Commerce Assistance” and “Logistics and Distribution Support” are considered the least important services by the start-ups of ABC-Obidos.

In turn, at INSerralves the less important services are “Help in Developing New Products” followed by “IT Assistance”, “E-Commerce Assistance” and “Logistics and Distribution Support”.

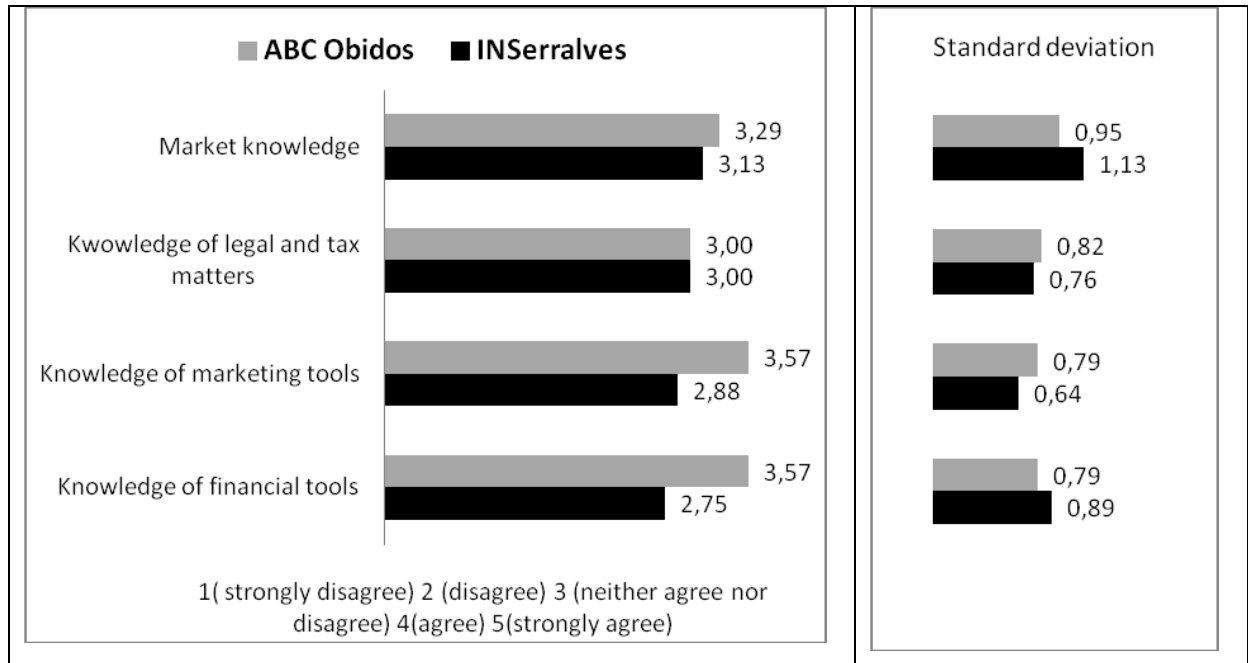
In Figure 9 we can observe the answers concerning the advice service and the impact of the incubator activity in the objectives and performance of start-ups. The perception of support in business management is similar in both incubators and is considered neither positive nor negative. As for the impact on the objectives and performance of startups, the answers are more positive in the case of INSerralves, but with room for improvement.

Figure 9 Goals, performance and advice



In Figure 10 we have the answers of the start-ups regarding the impact of the incubator in improving the market knowledge and the knowledge of legal and tax matters, financial and marketing tools. The perception regarding the impact of the incubator in this area is neither positive nor negative, however, the responses are more positive in the case of ABC-Obidos. Thus, we notice the existence of gaps in the incubators performance, particularly due to the importance given by start-ups to support services in marketing and communication, business management and legal and tax matters.

Figure 10 The incubator helps us to improve



Finally, in order to attract start-ups for incubation, ABC-Obidos, in collaboration with the University of Coimbra, promotes the contest of ideas and business plans “Arrisca.C 2011”. With the same purpose, the Serralves Foundation promotes the contest “PNIC 2011”, Creative Industries National Award, and the contest “POPs”, Original Portuguese Projects.

5- Conclusions

Support for ‘creative clusters’ that bring together public and private institutions with enterprise growth and social (regeneration and inclusion) goals proved to be increasingly popular at the city/town level.

The creative business incubators are important parts of the local development strategy, particularly nonprofit incubators supported by public structures (municipalities, universities, etc.), like ABC-Obidos, or by nonprofit institutions, like INSerralves.

Its importance also derives from the fact that the success of a development strategy is measured, among others, by the number of start-ups and jobs created.

The ABC-Obidos incubator is developed within a technological park structure integrated in the development strategy of the town/region of Obidos, focused on creating a “Creative Cluster” in a Low Density Area. On the other hand, the INSerralves incubator is part of the Serralves Foundation structure, located in the High Density Urban Area of Oporto city, integrated in a development strategy aimed to develop a cluster of creative industries in Northern Portugal.

The outcomes and dimension are similar in both incubators. However, the management, services provided, focus and strategy are different.

Due to high percentage of entrepreneurs with no management training (71%), we can conclude the need for greater action from the incubator in this area. This implies not only the development of effective training programs in management, but also support for the initial management of start-ups.

This is an area where incubators have to improve their performance because of the importance given by entrepreneurs in the development and monitoring of the business plan and the initial management of start-ups. For the success of these actions, experience in managing start-ups from the support team of the incubator is fundamental.

The low percentage of entrepreneurs with management training also raises the issue of management and entrepreneurship training in university courses, in areas covered by creative industries.

On the other hand, in terms of service, the incubators should develop support services and advice in marketing and communications, the most important in the opinion of entrepreneurs. On the other hand, the incubators must give more attention to the development of their network relationships, as this is the asset most valued by start-ups.

This conclusion is in line with other studies that highlight the network relationships as the main reason why the small technology-based start-ups look for a business incubator (Abduh *et al.*, 2007).

Another key factor for the development of incubated start-ups is the image and prestige of the incubator and the infrastructure where it is based. This is clearly an asset to preserve and enhance from the perspective of the local development of creative industries.

Thus, all actions aimed to create awareness and enhance the reputations of the Technological Park of Obidos and the Serralves Foundation are beneficial for incubated start-ups. In this context, by national and international projection of the Serralves Foundation, INSerralves has a privileged position, particularly in the field of cultural and environmental activities.

Overall, we conclude that, despite their differences, the strategies of incubation of creative start-ups are feasible either in a low-density area as in a high-density area.

An incubator is also in a constant process of incubating itself. Not only does it have to assess and adjust the process of incubation itself, it also needs to be aware of and, perhaps even more important, be able to adjust its position in the educational field.

It is therefore likely that future creative strategies will require a more sophisticated and realistic consideration of the role of the incubators and the creative industries within the knowledge economy, including a deeper understanding of the innovation and production

linkages between the creative industries and other sectors of the (not-so-new) knowledge economy.

They would also benefit from a greater consideration of the different outcomes that can be anticipated from creative enterprise and cultural development programs. Finally, if the objective is to facilitate creative places, then more attention needs to be paid to the particularities of the locality. Creativity may be found everywhere, but perhaps not all localities can become 'creative places' with the competitive advantages that this implies.

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THE UGLY DUCKLING

A COLLABORATIVE WAY OF MOTIVATING THE CREATIVE CAPACITY IN BIOTECHNOLOGY

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Abstract

Biotechnology is a business sector based on sciences. The scientific knowledge used to create new or improved products, services and processes comes from different sources and pursues particular centers of interest. To bring an idea into the market a company has to hire people from distinct backgrounds and has to make use of a variety of connections with the external work environment. Biotechnology is thus about being creative on high collaborative ways. However, the literature about creativity in the sector has shown that none or very few attention has been given to the development of the creative capacity in biotechnology. To help in solving this gap, we propose the interactive exposition of case studies in a world-wide dimension, so that people could be exercising together the capacity of solving scientific or commercial biotechnological matters. We have make use of this methodology in hope of motivating the creation of breakthrough biovalues.

Keywords: biotechnology; creativity; collaboration.

Intrdouction

Since the beginning of the 21st century the biotechnology has been pointed out as one of the most important sectors for the social and economic development (Thumm, 2001; Hine & Kapeleris, 2006). The application of science and technology to living organisms/elements makes possible the knowledge production and the origin of products and services (Van Beuzekom & Arundel, 2009). However, the creation of the different in biotechnology is not a simple task and requires the contribution of a diversified network (Powell et al., 1999). The establishment rate of alliances and partnerships is higher than in any other sector (Hagedoorn, 1993). Audretsch & Feldman (2003) underline the vital importance of working in collaboration, specially in case of new biotech firms (NBFs). The biotechnology sector is characterized by a well-structured network of inter-organizational contracts which rules the interaction between new companies, established firms and scientists (Liebeskind et al., 1995).

Considering the variety of activities in biotechnology, being them clustered in three main areas called human and animal health, agriculture and industrial biotechnology (Hine & Kapeleris, 2006), the knowledge flow from the discovery until the commercialization is

characterized by the collaboration of people specialized in different research areas and in many non-scientific issues (Collingham, 2004). Baranano, Bommer & Jalajas (2005) identified the importance of external sources for innovative ideas, while researching high-tech SME's from the US, Canada and Portugal. In the US, for example, external sources rated higher than the internal ones.

Biotechnology is a business sector based on sciences (Gertler & Levitte, 2005). Without the dedication of “ highly creative, appropriately motivated and organized scientists” (Finegold & Frenkel, 2006, p. 4), the research and development (R&D) around breakthrough values will difficultly happen.

Adams, Beniston & Childs (2009), having as focus biotechnology companies and faculties situated in the UK, identified that the training in creativity has received poor (or none) attention by the large majority of them. Considering the relevance of the United Kingdom in the European biotechnology context (EuropaBio, 2006), the findings of Adams, Beniston & Childs (2009) deserve high attention. The authors pointed out to the significance of driving people from different disciplines and with distinct viewpoints to interact together and generate unexpected connections.

Rickards & Moger (2000) identified that the training in creativity has a positive impact in the performance of teams involved with creative goals. Nevertheless, a group leader interviewed in Hemlin (2009, p. 283) provides indiciums that the relationship between creativity and the work environment is a complicated matter: “ (...) as soon as a research is conducted in a company, creativity drops quickly”.

Pollack (2004) exposed that biotechnology firms have experienced periods where the taking of high risks – specially in case of doing research around radical innovations – is not the main priority anymore. In accordance with Sawyer (2008), the competition pressures together with long and expensive R&D cycles have driven biotechnology enterprises to stronger focus on stability and efficiency. However, Gwynne (2008) and Bonetta (2009) demonstrated that being a leader in new discoveries and innovation still represent a strong goal for many of the most remarkable biotechnology companies. Some authors have highlighted the relevant roles of creativity, growth and renewal for reaching success in biotechnology (Hawken, Lovins & Hunter Lovins; Rayman; Bomemann & Leithner; Acquaah; Friedman; Vitale *cit. in* O'Donnel, Kramar & Dyball, 2009).

This disparity of priorities is relevant to urge in all biotechnology enterprises the importance of working creatively not only to be capable of solving a bigger variety of problems and challenges, but also to make possible the origin of innovative products and services. In this paper we introduce a creative problem solving approach destined to people in the biotechnology field. Results indicate the existence of constraints to it.

Methods

Landuyt Consultancy is an independent start-up with activities in creativity and innovation for the biotechnology sector. In the 15th of June 2011 the company created in its website a new section denominated “ Study cases in collaboration”. The purpose of this activity is the exposition of fictious or real defiances in biotechnology. Each study case, available both in English and in Portuguese, affords people all around the world to introduce different possible solutions for the same problem or challenge.

On the same day previously cited, the company posted in its website a study case (table 1) about the leadership in the sector. The creator announced it in a world-wide professional network with access to thousands of people in the biotechnology area:

Table 1: Study case in biotechnology

Objectives: introduce students and scientists to possible challenges present in the commercial biotechnology environment.
The case: John is an American senior scientist in the biopharmacology area. He moved out of the university to be the “head” of a multicultural team of 9 PhD's in a well-recognized private company situated in India. John's function will involve the planning, organizing, leading and controlling of procedures, systems and people to develop a variety of recombinant proteins (factors VIII, IX and G-CSF) in a determined period of time. Despite of his brilliant career as a scientist, John is not quite sure about his skills to work in the industry. However, the company has provided him different courses to empower his management abilities.
Eight months later: John has been viewed by his collaborators as an excellent task focused manager. Each goal has been well transmited to the team members and each step has been well organized and controlled, but the performance levels have not been as high as John had expected they would be. John is feeling the pressure! These “invisible” constraints have decreased his motivation capacity and because of this he has not been capable of boosting enough his team. John is going to have an up-front meeting to discuss the reasons of such a poor performance. A people management expert will carry out a brainstorming with John and the team to find possible solutions. Let's suppose you are a team member, which ideas would you suggest? Think creatively!

Source: <http://www.landuytconsultancy.com>

Results

From the 15th of June until the 14th of July, Landuyt Consultancy's website got a total of 112 visitors from 15 different countries or territories. These values represent an average of 3.73 visitors/day and of 7.46 visitors/location. The level of interaction in the section “ Study case in collaboration” got an average of 0.1 respondents/day.

Discussion

Considering the results previously exposed, it is possible to verify the low levels of collaboration to this methodology. Considering the importance of being creative in the biotechnology sector, we had expected higher levels of interaction. We have two main hypothesis for this effect:

- the young company's character;
- the creative capacity of people in the biotechnology field.

Regarding the first supposition, the literature around the capabilities and constraints of start-ups underline the relevance of having a favorable position in the market to access information, resources and knowledge (Powell, Koput & Smith-Doerr, 1996; Stuart, Hoang & Hybels, 1999 *cit in* Zheng, Liu & George, 2006). This suitable position, however, requires a period of time to be obtained, specially in case of companies founded by young entrepreneurs (Kushell, 1999; Schröder, 2009). Biotech start-ups started by “ star scientists” have privileged position due the access to an extensive network of contacts from the academia and industry (Corolleur, Carrere & Mangematin, 2004). Taking into consideration that the exposition of a solution to a determined biotechnology problem would be a demonstration of knowledge, it is possible that creative attitudes with strong collaboration needs have to face an intrigate web of defiances if developed by start-ups .

The second hypothesis could be firstly supported by the findings of Adams, Beniston & Childs (2009) about the lack of creative training in the higher education and industry environments in the UK. The authors point out to the tendency of universities to motivate the constant absorption of knowledge and to put aside the significance of generative approaches. They make use of the term “ ill-prepared” to underline the creative difficulties students will experience in the future. In case of companies, they highlight the common mistake to select team leaders based on their individual research skills and not on their dialogue and encouragement ones. Both approaches are indicated by them as desfavorable to the creative development. A variety of features have been identified as positive to the empowerment of scientists, including freedom and encouragement (Amabile & Gyskiewicz, 1987); motivation and inspiration (Binder & Bashe, 2008); vision, flexibility and commitment (Sawyer, 2008); group climate (Hemlin, 2009). The low level of interactivity in case of the section “ Study cases in collaboration” could thus represent an important signal of an “ill-prepared” community in biotechnology. It probably indicates the contact with desfavorable features to the creative development.

Conclusion

In accordance with Hemlin (2009), few studies have been focused in the understanding of the relationship between creativity and biotechnology. It is not possible until now to precise how and when biotechnology faculties and companies make use of creative technics and if there is a real interest to employ such methods. However, it is well known the necessity of being innovative as a way of getting competitive advantages in the sector.

The results achieved from the methodology “ Study cases in collaboration” give evidence of low acceptability to some kinds of approaches developed by biotechnology start-ups founded by young entrepreneurs. They also evinces problems in the creative willingness of people in the biotechnology sector.

Taking into account the relevance of breakthrough discoveries and innovations, it is high recommended the development of empirical researches to identify in-depth the creative context in biotechnology.

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SOCIAL SKILLS AND EDUCATION ON DRUGS OF ABUSE FOR HEALTH PROFESSION STUDENTS

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Abstract

Telephone services for drug abuse intervention are effective to a widespread population. However, counselors demand extensive training. We describe the performance of health sciences undergraduate students at training in drug abuse and in motivational brief intervention as counselors in a call-center. Undergraduate students were presented with the Education Model in three phases: crash-course, on-site course and on-duty training. From 121 students, cognitive testing after the crash-course and after the on-site training showed differences between graduations. After the on-duty training, all students performed equally well in motivational interview skills, in patient protocol skills and professional attitude. In a smaller group, social skills were related to drug problems interventions. In conclusion, the training for undergraduates of health sciences courses enhanced professional skills and behaviors when addressing drug use problems from social and biological perspectives. Higher social skills are more related to better work skills necessary for counseling in a call-center for drug users and their families.

Keywords: adult education, drug abuse, drug dependence, health sciences professionals.

Introduction

Telephone services for information and interventions for alcohol, tobacco and illicit drug abuse are an effective way of providing resources to a widespread population (Brown et al., 2007, Mensinger et al., 2007, Fernandes et al., 2010). In Brazil, VIVAVOZ is a nationwide toll-free telephone service to inform and emotionally support drug users and family members, based on scientific evidence. The service provides screening and brief interventions regarding drug use or family codependency. The call-center results from a partnership between the Brazilian government and Universidade Federal de Ciências da Saúde de Porto Alegre. The counselors performing telephone interventions at the call-center are undergraduates pursuing degrees in health professions. Graduate students act as immediate supervisors of the undergraduate counselors during their training in the call-center. The graduate students are professionals that had already received extensive education in brief intervention and drugs of abuse neuroscience, prior to starting to and during activities as counselors.

In general, health professionals are expected to screen and intervene in drug issues and to provide services to these patients and their families. Interdisciplinary activities with the participation of different health professionals may promote better care to drug dependent patients and social skills are important for interventions for difficult patients. However, little clinical exposure to addiction problems and a lack of focused teaching of addiction behavior are common in most health profession programs (Stimmel, 1998).

The objective of this paper is to describe the education model to train health sciences students as counselors in a drug abuse call-center, and their knowledge and skills performance at each training level. Additionally, we started investigations on the relation of social skills interference in training outcomes as counselors.

Material and Methods

The Health Sciences Student Interdisciplinary Education Model for Drug Abuse Prevention and Treatment is based on three-stages where the educational approaches are collectively planned: a) repetition and reinforcement of main ideas, content and skills; b) group integration and linking of ideas during of the course; c) constant supervision; d) learner-focused training strategies; e) beginning skills teaching in small-group utilizing role-play of simulated or real cases; f) thorough practice sessions in the call-center under supervision; and g) continuous testing and feedback. These education methods were previously described (Barros et al., 2008).

In brief, the *first stage*, *Crash-Course* offers 40 h of training mainly in the fields of epidemiology and neurobiology of drug abuse. After, this course a written test performance was demanded by the university students, in which they should obtain grades greater than 50 % to be invited to receive additional training.

The *second stage* is the *on-site motivational interviewing and brief intervention training course*, with 20 hours of theoretical information and initial practices on the interview style to develop motivational interviewing skills in the call-center using standardized patient protocols (Stimmel, 1998). At this time, themes of brief intervention, transtheoretical model of stage of change and drug abuse and dependence diagnostic scales were debated. After this training the students were submitted to a motivational interview written test.

The *third stage* was the *on duty continuous feedback training*, with the students already at the call center practiced motivational brief intervention with a focus on the translation of scientific facts into everyday language to Brazilian clients through phone interviews. The evaluation was meant to verify if the students (counselors) could achieve competencies and

skills in drug abuse intervention and drug-related knowledge, while practicing in the call-center.

A subgroup of the counselors were also evaluated with the Social Skills Inventory - HIS (Del Prette & Del Prette, 2001). To systematically measure the motivational brief intervention skills in the call-center the Behavior Change Counseling Index (BECCI) was used after mathematical transformation to a 0-10 scale (Lane et al., 2005). A competencies checklist (ethics, professional attitude, personal interactions with staff members, verbal communication, problem resolution and completion of patient protocols) was developed and monthly applied by the supervisors. The counselor received continually feedback about their performance and reaching a score 80% or higher was the objective of the objective continuous training in the call-center (Fernandes et al., 2010). This training was the first contact for most undergraduate students with the subject of drugs.

Statistical Analysis

Quantitative data analysis was conducted. Initially descriptive analysis using the testing scores were performed, followed by One-Way Analysis of Variance and post-hoc Tukey test were employed to examine to differences for each training phase and in respect to graduation course. Results from the Social Skills Inventory were used to rank the students and compare groups in respect to knowledge, work performance and motivational interviews skill with the Student's t Tests. Statistical significance was set at $p < 0.05$.

Results

There were fifteen small groups of students receiving the educational Model in three phases, held from June 2005 to May 2011. There were from 70 to 80 college students enrolled in each one of the beginners' crash-courses offered. In total, 1161 university students from health sciences courses from different universities in the region enrolled and attended the *crash-courses*; 407 students completed the written test and had a score of 5 (out of 10) or more, and only 237 enrolled for the *on-site course* and were selected for the *on-duty training*. A group of the 121 students completed all program and evaluations, lasting around one year- 190 female (80%) students and 49 male students. The students were majoring in psychology (n=95); biology (n=37); medicine or nursing (n=26); biomedicine or pharmacy (n=27); social service (n=13); physical education or pedagogy (n=7); occupational therapy, physiotherapy or speech therapy (n=18); nutrition (n=16).

Of all 1161 university students enrolled in the *crash-courses*, around 35% finished the multiple choice written test (mean score 8.0 ± 1.0). Among the group that passed the test, 58% students pursued the next training phase and enrolled in the second stage *on-site*

motivational interviewing training (mean score test of 7.0 ± 1.0). Statistical difference was seen the post crash-course evaluation in respect to the graduation. Social service showed lower average than psychology, medicine or nursing and biomedicine or pharmacy. Physical education and pedagogy showed lower average than medicine or nursing. Even though the comparison of the evaluations of motivational interview knowledge testing after the on-site training showed differences between the courses ($p < 0.002$), the post-hoc test did not detect the statistical difference, probably due to great variability between the individual in each major.

Overall, the mean time of training was around eight months, with 20 hours of activities per week. The students from the different graduation courses performed equally well when motivational interview skills were evaluated (BECCI scale - 6.75 ± 1.25 ; $p = 0.402$). The group majoring in occupational therapy, physiotherapy or speech therapy presented significantly lower scores for patient protocol skills than the majors in medicine or nursing, psychology and biomedicine or pharmacy ($p < 0.001$). On the other hand, evaluation of professional attitude, during the on-duty training showed equal performance between graduations ($p = 0.439$).

High HIS scores regarding relationship to strangers, like asking questions, public speaking, talking to unknown person, asking for a favor, differentiates the students as better in applying questionnaires to drug abusers and their families and registering completion of patient protocols ($p < 0.05$).

Discussion

There is need of more human resources trained to promptly recognize and efficiently treat patients with drug-related problems. It is also necessary to increase the number of health-care professionals that are motivated and capacitated to deal with substance abuse disorders using state-of-the-art techniques to convey evidence-based research results. The training for undergraduates attending a health profession course described here indicates that the proposed model can enhance health professional skills and behaviors when addressing drug use problems from a social and a biological point of view. We also present evidence that students with higher social skills will more easily achieve the educational outcomes.

Our results demonstrate that the educational model proposed for health sciences students at a drug call-center is useful to develop competence skills in neuroscience of drug dependence and using motivational brief intervention for individuals who abuse drugs and their family members, regardless the major the graduation students are pursuing. We propose that this model may be adapted and used in other countries in which there is need to include more education on drugs for future health care professionals. The main elements

for success of the model proposed included training based in context learning and using learner-centered teaching strategies in small group settings and collaborative interactions between teachers, supervisors and students. The complexity and diversity of activities and elements included in the training have also been seen to motivate interest in drug abuse knowledge and improve the number of future professionals who are qualified to work or research in the area, as already pointed out (Barros et al., 2008).

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CREATIVE PEOPLE IN PORTUGAL

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Abstract

Numerous studies have been done about creative people. Some of these studies point to the importance of cultural differences between countries that might enhance or block creative achievement. The authors study Portuguese people whose work has been recognized as creative in the past 6 years, looking for particularities in their psychological makeup and work style. The current work presents the preliminary results that point to great similarities with the reviewed literature (teamwork, informal relationships, peer feedback, mentors or inspiring figures, action centred, intrinsic motivation, constant dedication, work life balance, match between the challenges and the growing competences, error acceptance, domain knowledge and humility). However the participants also refer that the quality of their work is much more easily recognized abroad.

Keywords: creativity, Portugal, culture, individual characteristics, work recognition

Cultural Creativity

Several authors point to the relevance of the cultural environment for the development of creativity. Amabile (1983, 1996, cited by Weisberg, 2006) was the first to clearly recognize social and environmental factors in creativity development. The author recognized these factors not as confounding variables, but as factors must be understood and looked at if we are to fully understand creativity (Weisberg, 2006). Sternberg & Lubart (1995, cited by Weisberg, 2006), recognize the environment as resource that has to be taken into account in creativity. For Csikszentmihalyi (1996) and Woodman, Sawyer e Griffin (1993 cited by Shalley & Zhou, 2008), the creativity of the individuals is something that both emerges from and transforms the environment. On the other hand, it is the environment's response that evaluates and recognizes the quality of the creative ideas and acts (Simonton, 1999 cited by Shalley & Zhou, 2008; Shalley & Zhou, 2008; Sternberg & Lubart 1991, 1995 cited by Shalley & Zhou, 2008; Weisberg, 2006). Monteiro, Caetano, Marques and Lourenço (2006) tell us that it is the culture that allows the individual to construct a personal meaning for what he lives and experiences. The cultural environment is therefore part of the factors that might be at the birth of creativity, but that also act as the sphinx that decides what gets through.

Kim (2010) has extensively studied creativity in different cultures, namely eastern (Korean and Taiwanese) and western (north American). She has found some relationships between the type of culture and creativity, namely that adaptive creative style (creativity that coexists in the actual paradigm) and creative strengths suffer the influence of the culture and society where the individual lives and works. The same relationship was not found regarding innovative creative style (creativity that challenge the current paradigm), which apparently develops in a more independent and free way. The creative strengths considered were emotional expressiveness, storytelling articulateness, movement or action, expressiveness of titles, synthesis of incomplete figures, synthesis of lines or circles, unusual visualization, internal visualization, extending or breaking boundaries, humor, richness of imagery, colorfulness of imagery and fantasy

Mason, Beltramo and Paul (2004) have also verified differences in positive and negatives aspects related to fostering organizational creativity (eg. openness and stability) between Britain and France. Therefore, Martin, Allwood and Hemlin (2004) suggest that different countries might need to take different measures to that respect – some cases might benefit from greater openness and flexibility, others from more stability allowing an economy of resources so that a focus on creativity can exist.

Despite these cultural differences, there seem to be a tendency to homogeneity between organizations and cultures (the convergence hypothesis). However, as Child's studies suggests, there seem to be cultural differences that still hold ground – this might be so because of the different variables taken into account in each study. Works on organizational variables (eg. structure and technology) tend to show homogeneity, whereas the ones focusing on attitudes, beliefs and behaviors generally show cross-cultural divergence (Child, 1981 cited by Wagner & Hollenbeck, 2009).

The globalization occurring today seems not to be enough to homogenize the differences encountered by Hofstede's study on national cultures (Hofstede, 1980, 1983 cited by Wagner & Hollenbeck, 2009). Hofstede's model, based on a study with 116000 individuals from 40 different countries, encountered four axes along which we can classify cultures: uncertainty avoidance (degree of comfort with uncertainty and ambiguity), masculinity–femininity (degree of independence, aggressiveness and dominance versus interdependence, empathy and emotional openness), individualism–collectivism (main emphasis on individual versus group needs), and power distance (degree of acceptance of differences in status and power). A fifth dimension, long term-short term orientation (orientation towards the present versus the future), was later added to this model, according to the development introduced by Bond (Wagner & Hollenbeck, 2009).

The Portuguese values obtained in this model are: uncertainty avoidance = 104; masculinity–femininity = 31; individualism–collectivism = 27 and power distance = 63 (no

measurement available for the fifth axis). As a term of comparison, we list the highest and lowest scores in the study mentioned in Table 1. Portugal has clearly a high level of uncertainty avoidance, a more masculine-type and individual- type culture, and a medium power distance culture.

Table 1. Comparison of Portugal's scores on Hofstede's model with extreme scores

Dimension	Minimum score		Portugal's score	Maximum score	
	Country	Score		Country	Score
Uncertainty avoidance	Singapore	8	104	Greece	112
Masculinity–femininity	Sweden	5	31	Japan	95
Individualism–collectivism	Venezuela	12	27	USA	91
Power distance	Austria	11	63	Russia	95

Based on the results presented in Wagner & Hollenbeck, 2009.

Methodology

Sample

Our sample consists of Portuguese individuals who have already been recognized as creative, either through creativity or innovation awards, as owners of patents or any prize or award in any achievement or activity that is inherently creative.

So far 3 creative Portuguese individuals were interviewed – one winner of the BES Inovação 2010 award, a winner of MedImmune Oncology Research Competition 2010 and a winner of the 2005 Peugeot Design Competition (in their citations referred as DC, AT and AC).

Procedure

The participants were interviewed face to face, in a time and place of their own choosing. The interview was conducted based on an interview script that consisted of open-ended questions, developed by Csikszentmihalyi (1996). It contains four major topics around which questions were developed – Career and life priorities (e.g. of the things you have done in life, what are you most proud of? To what do you attribute this success? Any personal qualities?), Relationships (e.g. Has there been a significant person that has influenced your thinking about your work?), Working habits/ Insights (e.g. Where do your ideas from your work generally come from?) and Attentional structures and dynamics (e.g. What present task do you see as most important. The script was translated to Portuguese by Portuguese psychologists. However, even accordingly to the original use of the interview script, the interviewer was free to pursue clarification to any data provided by the participant, maintaining an open, flexible and empathic attitude (Moustakas, 2001). The objective of the

interviews was to obtain clues to possible relevant aspects of Portuguese culture to creative work.

The interviews were analyzed according to a humanistic methodology, the adequate for the search of understanding of the complexity and detail of the theme (Churchill & Wertz, 2001; Schneider, Bugental & Pierson, 2001). A heuristic research was done, looking for the 'qualities, conditions and relationships' at the heart of our question, according to the proposal of Moustakas (2001). This way, the analysis of the interviews included keeping an open mind and not limiting the results to what the literature presents, but instead extracting from the data the relevant topics, according to what the participants referred.

Results

During the interviews, several aspects that are well documented in literature were cited by the participants as relevant to their work: teamwork, informal relationships, peer feedback, mentors or inspiring figures, action centred, intrinsic motivation, constant dedication, work life balance, matching challenges and growing competence, error acceptance, domain knowledge and humility.

Besides those common points to the literature, other aspects appeared as pertinent in the Portuguese society, which are particularly important to the purpose of the study.

Here, There, Everywhere

Teamwork

The participants noticed teamwork as relevant to their achievements. Even in the cases when they have to develop solo work, they look for ideas exchange and information sharing:

'(...) I started to realize that some things I couldn't do all by myself. And that I really needed to ask for help, and when I did ask for help, then it was all done in a flash. (...) It's teamwork, it's very important.' (DC)

'Work is always done in a group, be it internally or in terms of collaboration [with others outside the workgroup] (...) it is never the work of a single person, that does not exist, nowadays. Someone has to coordinate the work, but it is group work. (...) The team is absolutely essential.' (AT)

'If someone asks me how I've done it (...) I usually yes, give some clues, explain more or less how I've done it (...). Information sharing is always good, because some people have done the same to me too. And there is a community nowadays (...) and it is great, it's the good thing about Internet, you can share everything.' (AC)

Informal relationships

The value of good informal relationships and a shorter power distance is recognized by the participants. At a minimum level, a non conflictual relationship is pursued, in order to keep the team involved.

‘There [abroad] we talked to a Professor (...) and we are on a first name basis. And they avoid that hierarchical barrier. If the idea is good, it does not matter who’s idea it is (...) that [hierarchical] barrier harms the free idea interchange and makes growth difficult.’ (DC)

‘On a personal understanding level, people functioning in the same type of mode, and therefore managing to communicate more easily, and understand each other.’ (AT)

‘By getting along, the project was good. I have learnt (...) to work with the person you are [working] with (...) even if you don’t like them.’ (AC)

Peer feedback

Peer feedback is sought and considered relevant and crucial. It is used both as a validation of the work quality, but also as inspiration.

‘I was surrounded by very, very intelligent people (...). I have learnt what I was good at, and what I wasn’t good at, that made me know better my abilities.’ (DC)

‘I went to a large congress in Los Angeles and that was important because I was presenting my work and therefore get feedback from the specialists in that area, (...) it is important to hear their opinion.’ (AT)

‘It is good to have plenty of personal contacts with people from the area, that can advise you, (...) [it’s] excellent. (...) I talked to some people to advise me (...) What should I change? (...) If feedback is possible, it’s good to have feedback.’ (AC)

Mentors or inspiring figures

Having someone to guide junior’s work, or someone more experienced is highly treasured. The seniors also set high standards which the participants strive to achieve.

‘A mentor is highly important (...) or even more than one, if possible. (...) who you can call asking for advice. (...) To have a good network, people to ask questions (...).’ (DC)

‘A mentor is essential (...) someone to do the finishing touch. A mentor is essential to any professional path.’ (AT)

‘I keep some designs of other people in my computer for inspiration.’ (AC)

Action centered

The participants recognize the importance of ‘putting ideas into action’, to build it in the real world. There also seems to be a constant impulse to do it.

‘When you have an idea the first thing you should do is to test the idea. (...) testing as soon as possible, things, to move forward. (...) And fight this feeling of being happy with the idea inside your head. (...) To do, do, do.’ (DC)

‘You always have to have a practical side (...) always.’ (AT)

'If there isn't a practical side (...) making projects as if it was a real project (...) you get bored. (...) What I really like to do is to draw, to create, to imagine new things, if possible to make them real.' (AC)

Intrinsic motivation

Work inspiration and motivation seems to be internal, coming from an inner will - from what makes personal sense, not from what is expected.

'It's not a job, it's something you really, really want to do. That's why passion is important. Because it helps to overcome (...) obstacles. (...) To put something of my own in the world.' (DC)

'It has to come from inside. There are things that people like to do, and things people don't like to do. And that is completely different for each person.' (AT)

'If you like to do it [projects] come out more creative. (...). It came out that way, I liked it, I go on. Rationality sometimes blocks you, because you start to think (...) maybe they won't like it. (...) that is what motivates me, to do more and better.' (AC)

Constant dedication

There is a main focus on learning and keeping up to date with the field of work.

'(...) you should keep developing yourself professionally (...). ' (DC)

'You have to keep up with the latest literature, every day. We have to keep ourselves up to date.' (AT)

'The creative process has to be continuous over time. (...) new programs keep popping up, and keep up with them.' (AC)

Work life balance

The participants strive for an equilibrium between personal life and work life. Some have learned over the years how important it is to allow time for non-professional activity.

'Now I take off all weekends, or almost, which I didn't before. (...) You have to have boundaries, things like not to work on weekends (...) and you have to make it a rule, otherwise you'll do it less and less and work more and more and after a while you have no personal life.' (DC)

'The more you are organized the better you can balance both worlds [work and family]. So my advice is, do a good planning. And try (...) to dedicate some hours a day for other things [other than work], that's essential, otherwise you get exhausted. (...) it is absolutely essential for people's sanity to have some time for other things, like the family (...) to have that discipline. It is essential and very easy to lose that control.' (AT)

'[Nowadays my biggest challenge] is to balance love life and work life.' (AC)

Match between the challenges and the growing competences

The participants' work is well suited to their psychological makeup. They recognize their strengths and have a work in which they profit from them. They appreciate challenges that make them evolve professionally, and continually look for improvement.

'(...) I have truly realized while I was doing all this, and today I'm even more certain of that, that my profile, my personal profile, and my talents, are much more in line with [this]. (...) yes, I think I am good [at this]. (...) I have been realizing that this is something I think I do well.' (DC)

'Everything I do has to be on a good level. (...) Those colleagues of mine were good, I had to rise up to their level, then from then on, this is the level I want to be in' (DC)

'To follow an investigation of my own is a landmark.' (AT) (the participant has just been awarded a grant for his first investigation as the coordinator).

'A creative person wants to go further. For example, you want to design a fantastic scenario, and (...) you find out that that are things you don't know how to do. From then on you have to learn to do them, to get to your goal. (...) you always want another goal. I have learnt that. Now I want to do that, learn a bit more.' (AC)

Error acceptance

Error is seen as an opportunity for learning, as part of the process, and not especially important to avoid it.

'Yes, I deal a lot better with error, I deal better with uncertainty (...) Those difficulties made me much more... to begin with, the ego is not so... fragile, right? When you fail – that is different from person to person, but – but when you fail, there's always a big ego crush, and my ego is no longer so attached to the things I do. I do it because it has to be done. (...) It is no longer a threat (...) Less and less so.' (DC)

'To do something, and from those 10 ideas that came up, you choose one, go along that path and see if it fits. If not, go back and try with another. An error can generate another idea.' (AC)

Domain knowledge

Having found the work domain they enjoy, the participants dedicate themselves to it and try to keep up to date with the latest knowledge and techniques. They wish to be very proficient in it.

'This is the area I know best. (...) specialization, in my view, should never stop, it is a professional growth that, in the end, you end up with a set of very, very unique characteristics of your own, and that distinguish you professionally.' (DC)

'You have to keep reading the new literature, every day. You have to keep yourself updated.' (AT)

'I have won several awards, several first prizes, otherwise I reach top ten in the competition.' (AC)

Humility

In spite of considering themselves very good professionals, it is recognized that learning and personal development is a never ending process, that can benefit from others, even from juniors, or from people outside their field.

‘(...) I still have a lot to learn. (...) I don’t think I do all well, there are things I am terrible at.’ (DC)

‘Each investigator is as good as its team. Just.’ (AT)

‘From all people you’ll learn something.’ (AC)

Only at home

The participants also cited what, according to their perception, are the Portuguese particularities which inhibit our difficult their work and These include difficulty in working as a team:

‘(...) one thing that Portuguese people could well learn, there are no heroes, I mean, no... that story about wanting to be a hero and take all the glory for yourself, and do all the work, that doesn’t exist. It is teamwork, it’s very important. (...) what I see here, which is problematic, its cultural, obviously (...). That hero story, for instance, in Portugal people prefer to take all the credits of something small that does not fully reach the goal, than sharing glory of a project that becomes big and fulfills the goal. Which is something very self centered.’ (DC)

Also the early noted importance, of peer and mentor feedback, seems not to be so easily achieved in Portugal:

‘They [in Boston] are always criticizing ideas. You get there, present your idea, they criticize it back and forth, back and forth, it’s an exercise, they always do that, here it is harder. People (...) here in Portugal don’t like to criticize; they think “oh, maybe they take it personally”. No, no, no, if the idea is bad, you have to know. (...) I think that would be good, here.’ (DC)

‘That [hierarchical] barrier harms the free idea interchange and makes growth difficult. (...) it is something common to southern Europe.’ (DC)

Education, fundamental for proper domain knowledge from early on, seems not be to be as adequate as in other countries:

‘Education abroad is more focused and they leave much better prepared than in Portugal. The courses in Portugal (...) are too generic.’ (AC)

Creativity requires some perseverance and support from others, which seems not to be so usual in Portugal:

‘And I see that here in Portugal, very often you say you want to do this fantastic thing, and they don’t even know how to do it, or if it is going to be difficult to do it or not, and they

tell you right away no, it is too difficult. When abroad very often they don't say it, they say let's see how much it costs and then we talk. I mean, they don't cut it right away (...).' (AC)

Their work, and its quality is much more easily recognized abroad, and national recognition never preceded international prizes:

'It is also curious because following that award in the beginning of this year the university dean gave me a merit diploma, which means that internal recognition ends up coming after the external recognition (...) it is easier to be recognized outside than inside, which is a shame. (AT)

'You go abroad, get some recognition, and from that moment on everybody tells you you're the best thing that happened to Portugal.' (AC)

Therefore, participation in international trainings, congresses or competitions has been highly motivational, and pivotal in their careers. Even so, despite being internationally recognized as good professionals, apparently work quality is not so crucial when it comes to find work in Portugal:

'Favoring someone on personal grounds (...) it is not a meritocracy. (...) with a good curriculum, and if your dynamic, you can do a lot in Portugal. But with good political connections, a terrible curriculum, you can do much more. This is my experience. It's a little disappointing. (...) that is almost a cultural pillar.' (DC)

Discussion

From the gathered data, it seems that Portuguese society nowadays is not the best type of culture to recognize creativity. Selection and evaluation of creative efforts, which is critical for creativity's survival, is an important role of cultural environment (Shalley & Zhou, 2008; Weisberg, 2006). Apparently Portuguese society is not well suited to fulfill its part in nurturing creative individuals, when highly creative individuals are not recognized as such, prior to international awards. The somewhat collectivistic society shown by Hofstede's model (Wagner & Hollenbeck, 2009) is perhaps not so conducive to support of individuals that stand out.

The free interchange of ideas and feedback, crucial to creativity (Hargadon & Bachky, 2006 cited by Shalley & Zhou, 2008; Paulus, 2008; Simonton, 1999 cited by Shalley & Zhou, 2008; Zhou, 2008) and domain knowledge (Csikszentmihalyi, 1996; Sternberg & Lubart, 1991, 1995 cited by Shalley & Zhou, 2008), seems to be difficult to happen often. The level of power distance type society as reflected in Hofstede's model (Wagner & Hollenbeck, 2009) is apparently still real in Portugal, and doesn't help in this respect.

A good work team is important to develop and support creativity (Gully, Devine, & Whitney, 1995 cited by Paulus, 2008; Paulus, 2008; West, 2003 cited by Paulus, 2008). The fact that the participants cite Portuguese culture as not prone to this type of work might be

related to the more masculine type of society as reflected in Hofstede's model (Wagner & Hollenbeck, 2009)

Intrinsic motivation is clearly cited by several authors who study personal characteristics regarding creativity (Amabile, 1996; Csikszentmihalyi, 1996; Shalley & Oldham, 1997 cited by Shalley & Zhou, 2008), and that is shared by all participants so far.

Domain knowledge, or domain skills are important in successful creative efforts (Amabile, 1983 cited by Shalley & Zhou, 2008; Csikszentmihalyi, 1996; Sternberg & Lubart, 1991, 1995 cited by Shalley & Zhou, 2008), and this seems to be clearly persecuted by the participants.

Being action centered allows individuals to bring their efforts into the real world and according to Robinson (2001), it is by acting that you become creative. This characteristic, along with error acceptance, constant dedication, searching for a good match between their growing competence and the challenges chosen, a good work life balance and a humble stance was also found in Csikszentmihalyi's 1996 study.

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CONSTRUIR EL CONOCIMIENTO: LENGUAJES Y CREATIVIDAD (CREARTE)

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Resumen

El año 2009 fue el “Año Europeo de la Creatividad y la Innovación” y el año 2010 el “Año Internacional de Acercamiento de las Culturas”. Con tales referentes, en el curso escolar 2009/2010 se diseñó y se concretó un Proyecto de Innovación e Investigación que uniera los dos años, el europeo y el internacional, en un centro de enseñanza. Fue denominado “*Un país más su cultura, dos ilusiones educativas*”; se puso en práctica en el “*CEIP Inocencio Sosa Hernández*”, un centro público cuyo titular es la Consejería de Educación, Cultura y Deportes del Gobierno de Canarias situado en el municipio de La Orotava (Tenerife, España).

Este texto describe el proceso del trabajo colaborativo entre personas e instituciones (profesorado, alumnado, dirección del centro, unidades familiares, Comunidad Escolar y el profesor de la Universidad de La Laguna que actuó como asesor), y analiza la integración de competencias básicas y áreas curriculares en el trabajo escolar: es un ejemplo vivo que da sentido a la celebración de la era de la colaboración.

Este proyecto se presentó en junio de 2010 a los Premios “*CreArte 2010*” convocados por el Ministerio de Cultura en la Modalidad C: *Métodos de enseñanza, proyectos, trabajos o actividades realizadas en centros financiados con fondos públicos*. El proyecto ha obtenido el Premio Nacional del Ministerio de Cultura de España, en la Modalidad de Educación Primaria, en octubre de 2010.

Palabras clave: Lenguajes, creatividad, innovación, construir el conocimiento, competencias básicas, Premio Nacional “CreArte”, Ministerio de Cultura, España.

1. Antecedentes. Marco de referencias

Diferentes investigaciones y estudios (Brown,1997; Reigelutch,2000; García,2003, Sánchez,2010) han analizado las relaciones (y los problemas derivados) entre la enseñanza, el aprendizaje y la construcción del conocimiento; y han sido también descritas las diversas formas de aprendizaje para el desarrollo de la mente infantil (la del ser humano en general), los distintos vehículos de transmisión de conocimientos y la diferencia entre el aprendizaje escolar y el aprendizaje para la vida. Las razones y conclusiones son esenciales:

“Los humanos necesitan aprender para adaptarse al medio y sobrevivir, y tienen unas enormes capacidades para hacerlo y también para enseñar a otros. No debemos despreciar o minimizar la importancia de formas de conocimiento distintas del conocimiento científico pues posiblemente forman parte del camino hacia aquel. Pero tampoco debemos limitarnos a ellas, sino que tenemos que tratar de llevar a los aprendices hacia esa otra forma de conocimiento.” (Delval, 1999:113).

Hemos de anticipar algunas ideas clave sobre la importancia que tienen la lectura y la escritura en las sociedades actuales, las cuales se basan en la creación, la aplicación y la distribución del conocimiento (García, 2006). En estas sociedades, la lectura y la escritura son los vehículos de acumulación y transmisión de información de manera precisa y permanente, y por lo tanto resultan esenciales para la formación de la conciencia personal y social del mundo en el que los aprendices han de integrarse. Se trata de que la escuela proporcione la instrucción necesaria para saber leer y escribir, pero con la intención de consolidar el dominio de las habilidades de lecto-escritura para comprender y organizar los conocimientos que se consideran básicos en el mundo actual. Estos son los fines de la alfabetización, de la enseñanza reglada y de la capacitación precisa para poder desenvolverse en la sociedad.

En el *II Congreso Nacional leer.es (Leer para aprender. Nuevas alfabetizaciones)*, celebrado en la Biblioteca Nacional de España en Madrid los días 22 y 23 de noviembre de 2010, se asumen una serie de conclusiones que son un punto de partida para profundizar en la lectura y escritura en entornos digitales ([HYPERLINK "http://www.leer.es"](http://www.leer.es) www.leer.es). Se concluía que la competencia para leer, entender y utilizar de forma reflexiva los documentos escritos de muy diverso tipo es una competencia básica para cualquier ciudadano en la sociedad actual de la información y el conocimiento, y condiciona su desarrollo personal y profesional, por lo que elevar la competencia lectora ha de ser una prioridad en la acción de las administraciones públicas.

Es en este contexto social y de enseñanza-aprendizaje en el que han de ser considerados prioritarios los factores esenciales de crecimiento personal y social: la creatividad, el aprendizaje colaborativo, la autonomía e iniciativa personal y la construcción del conocimiento, pues son estos factores esenciales los que dan sentido a una enseñanza-aprendizaje que capacite a los aprendices para ser competentes, autónomos y creativos; y por tanto más libres.

En relación con la enseñanza-aprendizaje (de la lingüística, de la lengua y la literatura...) suelen distinguirse dos modalidades de aprendizaje:

- Uno primero que suele denominarse “aprendizaje espontáneo” que se va consolidando por inmersión en el medio. Así, por ejemplo, la lengua se va adquiriendo sin intención ni esfuerzo sensible, a través de lo que el aprendiz oye en su familia, en la calle, en los juegos...; y
- El denominado “aprendizaje intencional”, el que se produce en el seno de las instituciones educativas. Aquí se incluyen al profesorado, los planes de estudio, las orientaciones formativas...

Este doble acceso, *espontáneo* y *escolar*, requiere y hace posible la única solución coherente en el proceso: construir el conocimiento escolar a partir del conocimiento

espontáneo (Delval,1999:99), para lo cual son precisos los elementos personales, materiales y metodológicos que los hagan viable; es necesario conocerlos y actuar sobre y con ellos. Los métodos que se utilizan servirán para modificar y completar las distancias entre los dos. Así tendrá sentido una institución que dé respuestas y unidad a los diversos elementos requeridos, que responda a los problemas vitales, que programe una intervención útil y que se constituya en práctica consciente y eficaz, además de creativa.

Delors (1999) elaboró un informe para la UNESCO (*La educación encierra un tesoro*) en el que se trazan los rasgos de un sistema educativo más humanizado, democrático y solidario para combatir el fracaso escolar, asentado en un aprendizaje de calidad, para lo cual se requiere una reformulación de los distintos niveles educativos. Propone una orientación del currículo más allá de las clasificaciones tradicionales de los contenidos cuyos cuatro pilares son los siguientes: aprender a *conocer*, aprender a *hacer*, aprender a *convivir* con los demás y aprender a *ser*.

También por encargo de la UNESCO, Morín (2001) realizó una propuesta en 1999 para contribuir a reflexionar sobre cómo educar para un futuro sostenible que está contenida en la publicación *Los siete saberes esenciales para la educación del futuro* y que son, según él, estos:

- Enseñar un conocimiento capaz de criticar el propio conocimiento. La búsqueda de una verdad con flexibilidad, crítica y corrección de errores.
- Una educación que garantice el conocimiento pertinente, propiciando una “inteligencia general” apta para comprender el contexto, lo global, lo multidimensional y la interacción compleja de los elementos. Esta inteligencia general se construye a partir de los conocimientos existentes y de la crítica de los mismos.
- Enseñar la condición humana para que todos se reconozcan en su humanidad común y, al mismo tiempo, reconocer la diversidad cultural inherente a todo ser humano.
- Enseñar la identidad terrenal. Es necesario introducir en la educación una noción mundial más poderosa que el desarrollo económico: el desarrollo intelectual, afectivo y moral de la escala terrestre.
- Enfrentar las incertidumbres. La educación debe hacer suyo el principio de incertidumbre, tan válido para la evolución social como lo es la formulación del mismo por Heisenberger para la física.
- Enseñar la comprensión, tanto la interpersonal e intergrupal como a escala planetaria, mediante la apertura empática hacia los demás y la tolerancia hacia las ideas y formas diferentes, mientras no atenten a la dignidad humana.
- La ética del género humano válida para todos.”

A partir de los referentes anteriores (y de otros que iremos explicitando) se articuló el proyecto puesto en práctica y que aquí se describe. En esencia se trata de una enseñanza-aprendizaje *no centrada en la transmisión de saberes* (y menos a partir de un solo libro de texto en el aula) sino en *disponer las condiciones para que los aprendices escolares*

construyan su propio conocimiento; el fin es ayudar a *conocer* para saber *hacer*, ayudar a *convivir* y así llegar a *ser*, lo que hace posible construir mentes y personalidades, no llenar despensas de saberes perecederos y en continuo cambio, y favorecer la autonomía e iniciativa personal en la modulación de cada mente, de cada mundo personal, de cada creatividad, de cada sensibilidad y de cada escolar a través del trabajo colaborativo e interpersonal: que los escolares construyan los saberes aplicables y consoliden la iniciativa y empatía personal para conocer, comunicar, convivir y ser.

Robinson (2009) aporta elementos de reflexión en torno a la creatividad que también hemos relacionado con la enseñanza y con este Proyecto de Innovación e Investigación. En la creatividad, para él, hay *tres términos* clave: El primero es la *imaginación*, la fuente de la creatividad. La imaginación es la capacidad más extraordinaria de los seres humanos, la que nos permite traer a la mente todo aquello que no está disponible para ser captado por nuestros sentidos. Con la imaginación podemos revivir el pasado, ponernos en el lugar de otra persona y sentir empatía con ella. O anticipar el futuro; no preverlo, pero sí anticipar distintas posibilidades. Todo lo distintivamente humano proviene del poder de la imaginación. La creatividad consiste en poner la imaginación a trabajar. Hay una *segunda manera* más formal de definir la creatividad: el *proceso de generar ideas originales que tienen valor*. Se puede ser creativo en matemáticas, música, artes, gestión de una empresa, consolidación de una familia...Todo es una posible fuente de pensamiento creativo. *Innovación* es el tercer término clave. Es llevar las buenas ideas a la práctica. Se trata, por tanto, de generar con imaginación ideas valiosas que se han de comprobar en la práctica:

“Las concepciones psicológicas de la creatividad han sido superadas con nuevas concepciones del pensamiento complejo y de la transdisciplinariedad. [...] El otro concepto clave es el carácter transversal, transcultural y transdisciplinario del aprendizaje creativo. El aprendizaje creativo no es lineal, secuenciado, sino espiral, recursivo y zigzagueante.” (De la Torre, 2009:13).

También estas conclusiones han aportado conceptos y perspectivas al proyecto, como se describe en la metodología y en la actuación docente. El fin esencial del trabajo que se llevó a cabo era que la creatividad “dejara una huella constructiva personal, institucional y social” (*ídem*, p.15) en el trabajo docente, institucional y universitario. Así se propone también en los principios metodológicos y en la actuación docente. Ya el Marco Común Europeo de Referencia (MCER) y el Consejo de Europa, Estrasburgo (2001) indican: “*Nuestro alumnado debe ser capaz de crear estrategias de aprendizaje y de ser consciente de su propia evolución en el proceso de aprendizaje.*” Este proyecto persiguió para ello esos fines: hacer protagonistas de su propio crecimiento y construcción intelectual, creativa, social y moral a escolares, profesorado y familias.

2. Contexto. Responsabilidades e implicaciones

El proyecto y la experiencia de aprendizaje “*Un país más su cultura, dos ilusiones educativas*” depende de *dos*: dos protagonistas y constructores, el profesorado y el alumnado; dos implicaciones, la del alumnado y la de las familias; dos gestores, el profesorado y la dirección del centro; dos competencias, aprender a aprender y autonomía e iniciativa personal; dos geografías, física y humana; dos modulaciones, la mente de los escolares y los conocimientos; dos años significativos: dos creaciones y dos perspectivas sobre los lenguajes, la creatividad y las artes.

El CEIP “Inocencio Sosa Hernández” es un centro escolar situado de la isla de Tenerife, en las afueras de la villa de La Orotava, en la Barriada de San Antonio. Su entorno social ha pasado por varias fases, del problema de la toxicomanía al problema del desempleo. La población escolar es en torno a unos 140 alumnos que viven todos en los alrededores inmediatos, por lo que no se cuenta con transporte escolar. El centro presta los servicios de “Atención Temprana” para las familias que necesiten dejar a sus hijos en el centro a partir de las 7 de la mañana (el horario escolar es de 8 y media a 2 y media); aparte del personal docente, trabajan en el centro un conserje, el servicio de limpieza y el de comedor. El centro ofrece su biblioteca escolar al público por las tardes; también por las tardes oferta distintas actividades al alumnado: baile, informática, ajedrez... en coordinación con el AMPA (Asociación de madres y padres de los alumnos).

A partir de las características del centro y del contexto se plantearon objetivos diversos: fortalecer los vínculos entre enseñanza, educación y arte; valorar la diversidad cultural y propiciar el desarrollo entre pueblos; fomentar la creatividad desde el proceso de enseñanza hacia el del aprendizaje, para adaptarse a los constantes cambios producidos en la sociedad actual y conseguir una educación y una escuela inclusivas, según recogen los documentos institucionales del centro en el que el proyecto se inscribe (y también en las orientaciones didácticas para guiar del trabajo escolar).

Las profesoras María Asunción Fueyo Fernández (Coordinadora del proyecto), Carmen Pereña Velasco, colaboradora e implicada en su puesta en práctica y la Directora del Centro, Magdalena Arce, fueron las gestoras directas de su aplicación, profesionales responsables de la enseñanza, educación y la formación del alumnado, concretando en la práctica las orientaciones para una conformación y confirmación activa y eficaz de la vida escolar. La construcción del conocimiento tiene como objetivo modelar y modificar la mente de los escolares: la innovación no pretende *adoptar* modas sino *adaptar* soluciones eficaces de mejora. Ellas lo llevaron a cabo (de manera especial la Coordinadora, junto a los escolares y las familias); y con éxito reconocido.

El profesor de la Universidad de La Laguna el Dr. D. Manuel Abril Villalba, desde el inicio del proyecto en el mes de septiembre de 2009, actuó como asesor, dio sugerencias y

orientaciones relativas a la secuenciación de los objetivos, pautas de actuación y correcciones y llevó a cabo el seguimiento del mismo a lo largo de todo el curso y del proceso.

El número de alumnos que han participado es de 34, 16 de Tercero de Educación Primaria y 18 de Cuarto. El número exacto de sesiones empleadas resulta difícil de cuantificar, pero sí se puede afirmar con seguridad que el Proyecto se diseñó para llevarlo a cabo en todas las sesiones de las actividades generales que implicaban a diferentes áreas: *Conocimiento del Medio Natural, Social y Cultural y Lengua castellana y literatura*; pero las actividades específicas se abrían además a las Áreas de *Matemáticas y Educación Artística*, y el resto de las áreas curriculares aportó un trabajo paralelo a éstas, en actividades complementarias y extraescolares.

Ha de reconocerse la implicación de las familias del alumnado con su colaboración, tiempo destinado, trabajo, estímulo, dedicación y compromiso. El aprendizaje colaborativo requiere implicar a personas, estamentos y organismos: lo personal y lo oficial conforman la eficacia. Se involucró a las familias en el proyecto, pues era uno de los objetivos del Plan de Acción Tutorial del centro, y a los otros miembros de las unidades familiares; y en momentos de dificultad a lo largo del proceso de aprendizaje se llegó a acuerdos con ellas.

El aprendizaje -el hecho educativo en sí- es un hecho mágico. Nuestros alumnos presentaban una atención muy dispersa que les dificultaba el aprendizaje, por lo que pusimos en práctica algunos “trucos neuronales” que usan los magos para combinar “entretenimiento más conocimiento”: la atención conjunta (“presto atención a lo que otras personas prestan atención también”) y la distracción mental (orientar la atención del alumnado sin que sea consciente, guiándola según la programación y las experiencias de aprendizaje, generando en ellos un diálogo interno). *Conocer y valorar para hacer y ser* da sentido a construir el conocimiento en torno a “Un país más su cultura”: estas son las dos ilusiones educativas planteadas.

3. Principios y fines educativos

Para superar “la posible contradicción que puede producirse, al considerar las competencias como elemento de integración y ampliación de los ilimitados e inoperantes contenidos de los currículos actuales” (Gimeno, 2009:11), dedujimos derivaciones prácticas de los planteamientos teóricos, es decir, aunando la teoría con la práctica generamos constructos e ideas, manejando y adaptando ejemplos y buenas prácticas: este es el modo de enseñanza que fortalece y avala las acciones del proyecto.

Nuestra intervención, como formadores y gestores, asumió varios *principios educativos*: la *flexibilidad*, para adecuar la educación a la diversidad de aptitudes, intereses, expectativas y necesidades del alumnado; la *adaptación* a los cambios que experimentan el

alumnado y la sociedad, porque la diversidad se manifiesta también en las formas de aprender y en las características personales que condicionan el propio aprendizaje; y la promoción de la *investigación, experimentación e innovación educativa* para poder conseguir los objetivos propuestos y organizar la enseñanza y el aprendizaje por senderos nuevos y no recorridos tradicionalmente.

En paralelo perfilamos los *finés educativos* perseguidos: El fomento y la promoción de la investigación; la experimentación y la innovación educativa; el esfuerzo individual y la motivación del alumnado; el esfuerzo compartido entre alumnado, familias, profesorado, administraciones, instituciones y el conjunto de la comunidad escolar; el pleno desarrollo de la personalidad y de las capacidades de los alumnos; la educación en la responsabilidad individual y en el mérito y esfuerzo personal; el desarrollo de la capacidad individuales para regular el aprendizaje, confiar en sus aptitudes y conocimientos, así como para desarrollar la creatividad; la iniciativa personal y el espíritu emprendedor; la adquisición de hábitos de intelectuales y técnicas de trabajo, de conocimientos científicos, técnicos, humanísticos, históricos y artísticos, junto al desarrollo de hábitos saludables; y el ejercicio físico y el deporte..., tal como propone la Ley Orgánica de Educación 2/2006, de 3 de mayo (y que deberían ser los objetivos prioritarios del Proyecto Educativo y del Proyecto Curricular de todos los centros de enseñanza) como modelo para la innovación metodológica en el proceso de enseñanza-aprendizaje, y adaptarse así a los cambios sociales, mentales, afectivos, culturales y artísticos que requiere el siglo XXI).

En el documento *Marco común europeo de referencia para las lenguas, aprendizaje, enseñanza y evaluación* se definen las competencias como “la suma de conocimientos, destrezas y características individuales que permiten a una persona realizar acciones”. Tanto las informaciones (conseguidas por medio de comunicaciones orales, de los textos escolares, de los libros de conocimientos y de otras fuentes) como las posibilidades de navegar por la red, de saltar de una información textual a otra, de prestar atención o no a los enlaces que se ofrecen (de manera especial en el hipertexto o en la red)... hacen que el receptor y el lector se vean obligados a desarrollar nuevas estrategias y habilidades, entre las que destaca la capacidad de seleccionar e integrar informaciones por lo general diversas y fragmentadas, y la capacidad de resistir distracciones que pueden entorpecer su labor. La posibilidad y flexibilidad del hipertexto son, por tanto, enormes, pero al mismo tiempo las dificultades y peligros que se plantean son también notables (García, 2006:30). Favorecer esa capacidad crítica fue otro de los referentes planteados como fines en el desarrollo del proyecto.

Derivadas de la consideración común europea, las Competencias Básicas que se priorizaron fueron -y en este orden- *Competencia para Aprender a Aprender, Competencia en Comunicación Lingüística, Competencia en Autonomía Iniciativa Personal, Competencia*

Social y Ciudadana, Competencia Matemática, Competencia Cultural y Artística y Competencia en el Tratamiento de la Información y Competencia Digital. El resto de las Competencias Básicas ayudó a integrar los aprendizajes -tanto formales como informales-, al ponerse en relación con los distintos tipos de contenido estudiados para utilizarlos de manera efectiva, pero de forma tan activa como las citadas. Añadimos otra competencia, la *Competencia Emocional*, para que los alumnos aprendieran a regular sus emociones y llegar a ser competentes interactuando con personas distintas y de otras culturas, y que sus emociones les llevaran a preocuparse por el bienestar de los demás.

4. Aprender: a *conocer*, a *hacer*, a *convivir*, a *ser*

4.1. Objetivos generales planteados

- Desarrollar la capacidad y la aptitud de los alumnos para regular su propio aprendizaje a través de la creatividad.
- Promover la actividad creadora de los alumnos en su aprendizaje general -y de la literatura en particular- a través de textos, artes y elementos multimedia.
- Promover la puesta en valor y estímulo de las capacidades creativas de los alumnos aplicadas al proceso de aprendizaje.
- Utilizar las tecnologías de la información y la comunicación como fuente de investigación, formación y desarrollo de un espíritu crítico.
- Utilizar la biblioteca como acceso a la investigación y a la información.
- Reconocer los derechos de propiedad intelectual y la educación en el respeto a los derechos de autor.
- Estimular y respetar la creatividad y el sentido artístico en los alumnos como muestra de su hacer estético.
- Adquirir las habilidades intelectuales relativas a la comprensión y expresión oral, a la lectura, a la escritura y al cálculo.
- Trabajar de manera cooperativa para beneficiarse del crecimiento propio y ajeno.
- Desarrollar hábitos de trabajo individual y de equipo, de esfuerzo y responsabilidad en el estudio, así como actitudes de autoconfianza, iniciativa personal, curiosidad e interés.
- Adquirir habilidades para la prevención y para la resolución pacífica de conflictos, que les permitan desenvolverse entre los grupos sociales a los que pertenecen.
- Adquirir técnicas de trabajo y hábitos intelectuales instrumentales, científicos, humanísticos, históricos y artísticos, así como el desarrollo de hábitos saludables en su tiempo de ocio.
- Conocer, comprender y respetar las diferencias culturales y entre las personas.
- Formarse en el respeto y reconocimiento de la diversidad cultural.
- Conocer y valorar el entorno natural, social y cultural propio.

- Poner en práctica los valores que favorezcan la libertad personal, la responsabilidad, la ciudadanía democrática, la solidaridad, la tolerancia, la igualdad, el respeto y la justicia que ayuden a superar cualquier tipo de discriminación.
- Valorar el esfuerzo individual e implicar a sus familias y a la comunidad escolar.
- Utilizar diferentes representaciones y expresiones artísticas e iniciarse en las construcciones de propuestas visuales, analizando modelos de comunicación y creación audiovisual.
- Fomentar y promover la investigación, la experimentación y la innovación educativa.

4.2. Aprender a conocer

De las cuatro áreas esenciales citadas se seleccionaron con precisión los contenidos correspondientes a cada una de ellas (no consideramos preciso incluirlos en el presente documento). Pero, tal y como se puntualizó en el primer apartado, el *carácter transversal, transcultural e interdisciplinario* del aprendizaje y de la construcción del conocimiento (y no solo en el aprendizaje creativo y colaborativo) debe articular todas las acciones docentes en las tareas de los escolares. Así se decidió en el proyecto y se define en su puesta en práctica. (De manera indirecta pueden contrastarse en el apartado de evaluación -aprender a ser-, en la medida en que han sido consolidados o iniciados, tanto las competencias como los objetivos y los contenidos.)

De cuatro áreas esenciales del currículo (*Conocimiento del Medio Natural, Social y Cultural, Lengua castellana y literatura, Matemáticas y Educación Artística*) también se seleccionaron los objetivos específicos correspondientes. En el proyecto están definidos con precisión; no se recogen en este análisis, pero es imprescindible que se tengan en cuenta sus conexiones en cualquier programación: las competencias básicas han de articular la organización de las enseñanzas y de los aprendizajes; ningún objetivo se alcanza si no es a través de los contenidos correspondientes relacionados; y las actividades -y tareas- no permiten aprendizajes que se construyen y se comunican con rigor si no se mantiene la sinergia entre los cuatro elementos. La consolidación de los procesos y dimensiones en el aprendizaje (identificar elementos, aplicarlos, sintetizar y crear, y enjuiciar) configura la construcción de los conocimientos: solo así tendrá sentido su evaluación.

Los objetivos específicos planteados en el proyecto y en la programación interdisciplinar podrían resumirse en los siguientes, sin citar todos ni estar clasificados por áreas o por dimensiones. Están nombrados como objetivos, pero son a la par las dimensiones de los contenidos abordados: Identificar (por ejemplo identificación de nombres, términos y características de los países y culturas); respetar; participar; conocer y reconocer; apreciar; valorar; analizar; aplicar; entender y apreciar; desarrollar habilidades; comprender y expresarse; usar los medios; buscar, recoger y procesar información; utilizar el conocimiento matemático; resolver; usar los medios tecnológicos y disfrutar con su uso y

con los textos; reconocer el valor de actitudes; afrontar situaciones diversas; disfrutar de los aspectos creativos, estéticos o utilitarios; utilizar y elaborar instrumentos y estrategias; explorar y conocer materiales e instrumentos diversos; adquirir códigos y técnicas específicas; aplicar los conocimientos; mantener una actitud de búsqueda personal y colectiva; articular la percepción, la imaginación, y la indagación; reflexionar; realizar; conocer recursos, materiales y manifestaciones artísticas y disfrutar con ellos; desarrollar una relación de auto-confianza; realizar producciones artísticas de manera cooperativa; colaborar... y otras muchos.

4.3 Aprender a hacer

Dadas las características sociales del alumnado, poco favorables para el aprendizaje, se propusieron actividades dinámicas, ágiles, atractivas e innovadoras para que les resultaran sorprendentes, frente a las tradicionales a las que estaban acostumbrados. Se programaron por trimestres para que tuvieran tiempo suficiente de automatizar e interiorizar las estrategias aplicadas. Las actividades fueron *progresivas, variadas, suficientes y gratificadoras*; esto significaba que deberían ser de diverso tipo: *Introducción*, que sirvieron como presentación y anticipación; *Motivación* para despertar el interés y la curiosidad; *Conocimientos previos* para saber el nivel del alumnado y la implicación familiar; *Desarrollo* para elaborar la información, exponerla y consolidar los contenidos (por ejemplo se sugería *siempre* si alguien podía explicar cómo había encontrado una información y qué resultado había obtenido); *Consolidación* para afianzar e integrar la información desde distintos puntos de vista (relacionando ésta con otras áreas de conocimiento); *Profundización y refuerzo* que permitieran atender a la diversidad y a quienes van a un ritmo distinto; *Ampliación* para abrir el abanico de posibilidades que ofrece el aprendizaje (por ejemplo se visitó y se organizó en el aula una exposición de esculturas para relacionarlas con el volumen en el Área de Matemáticas); *Aplicación* para que se pudieran poner en práctica todos los conocimientos adquiridos (por ejemplo presentar un libro y citarlo en la bibliografía del tema que se estaba trabajando); *Transparencia* para proyectar los conocimientos a otras situaciones útiles y comprobar la funcionalidad de su aprendizaje (por ejemplo estudiar los animales vertebrados y describirlos; así cada alumno estudiaba un animal -el que eligiera- y lo comunica al resto de sus compañeros); *Síntesis* para integrar varios contenidos básicos y favorecer la capacidad constructiva; *Fomento de la creatividad* frente a sus creaciones y a las ajenas.

Para que todas ellas fueran y sean posibles, ha de contarse con los recursos (medios materiales y personales) y con los soportes didácticos idóneos. Forma parte del arte de la enseñanza integrar estos elementos en las unidades de aprendizaje.

De entre la diversidad de modelos de enseñanza-aprendizaje, citamos algunas que dan sentido a la variedad de situaciones, experiencias y unidades que han hecho posible la

construcción del conocimiento en las distintas áreas del currículo. Analizando y adaptando la diversidad y la riqueza de las mismas, no parece tener sentido seguir reproduciendo modelos tradicionales uniformes y que, a la larga, han demostrado la inutilidad de mantener un solo modelo: Secuencia didáctica; Secuencias de aprendizaje por quincenas; Unidades de aprendizaje; Centros de interés; Proyectos; Proyectos de trabajo globales; Análisis de casos; Resolución de problemas; Otros (unidades didácticas, etc.) son los más comunes.

Nos decantamos en nuestro proyecto por *unidades de aprendizaje en proyectos de trabajo* entre las que destacamos las siguientes:

- Elegir un país y buscar en Internet (y en otros medios y espacios) informaciones del mismo.
- Elaborar un dossier de investigación con los datos recopilados (situación, superficie, clima, historia, geografía, religiones, paisajes, lengua -lenguas-, cultura, transportes, deportes, música y folclore, gastronomía, personas ilustres, arte, flora y fauna...) para comunicarlos al grupo y a la comunidad escolar.
- Enseñar formas de recoger informaciones para organizarlas de manera adecuada, citando la bibliografía y otras fuentes al final del proceso.
- Construir y comunicar los conocimientos de manera crítica y con soportes diferentes (oralmente, el programa PowerPoint de Microsoft, el aula Medusa -acceso a informaciones en multimedia- transparencias, mapas, murales, folletos, textos orales, canciones...).
- Preparación de la visita a museos y galerías de arte (de esculturas, de pintura...) anticipando el análisis de la observación requerida para orientar la descripción y la recepción (con posterioridad se llevaba a cabo y se analizaba la experiencia).
- Alentar la visita a las aulas de personas de otras culturas (familiares o miembros de la comunidad escolar) para vivir la experiencia del contraste.
- Degustar productos alimenticios de otras culturas (países, comunidades, pueblos, islas...) para percibir y contrastar la riqueza de la variedad.
- Analizar y elaborar recetas culinarias con productos propios de la diversidad cultural.
- Escuchar y analizar ritmos folclóricos de otras culturas, para practicarlos (por medio de la expresión corporal, rítmica y musical) a través de la enseñanza de los propios alumnos que habían llegado a conocerlos.

4.4. Aprender a convivir

Reconocer otras culturas, aprender a valorarlas, estimarlas y respetarlas supone un proceso de aprendizaje creativo con el fin de llegar a un constructo psicológico y social equilibrado. Habremos logrado “una pequeña obra de arte mental y cordial” y el esfuerzo y la voluntad de empeño habrán fructificado en manifestaciones artísticas del folclore, la gastronomía, el arte, la literatura, los aspectos lúdicos y todo aquello que tiene de propio un país y su desarrollo cultural y artístico. Con ello llegaremos a una valoración creativa de todas las

manifestaciones de dicha cultura. Y lo que es mejor, si creación y arte van íntimamente unidas, intentamos lograr una educación personal y social creativas, pues es lo que en definitiva se pretende: educar el espíritu de los escolares para despertar y educar en ellos una sensibilidad por todo lo que les rodea -incluso lo que les está más lejano, pero que un día podrán conocer- valorándolo desde una visión crítica. Leyendas, mitos, poemas, canciones, cuentos... son también el material y el soporte en el que están contenidas las diferencias culturales.

Con el trabajo por proyectos no se pretende abarcar todos los contenidos, sino desarrollar las capacidades necesarias en los alumnos para promover aprendizajes autónomos. Los recursos didácticos usados han sido: la Biblioteca del Centro y las TIC como medios de búsqueda y recogida de información; los carteles, las etiquetas...; también los recursos culturales de la villa (galerías de arte, museos, exposiciones, fotografías...). A estos recursos didácticos se añadieron otros materiales no considerados tradicionalmente como "didácticos", para que el alumno pudiera comprobar que todo se puede manipular y ayuda a crear ("Uso interactivo de herramientas", según la denominación del proyecto DeSeCo, 2005). Los materiales didácticos elaborados han sido las leyendas, los cuentos, los adornos navideños, el noticiario, y construir el mapa, la bandera, los ritmos, el cancionero, el traje típico... de cada país estudiado.

Escuchar, comprender, contar, leer, escribir y analizar son las tareas que hacen posible el reconocimiento de la diversidad cultural y de la pluralidad. Aprender a convivir significa conocer para desarrollar la dimensión crítica de la persona, la capacidad de valorar otras formas de vida, otras creaciones literarias, otros valores (Ruiz, 2003). Y significa también modificar la conciencia de la tolerancia por la aceptación, el permitir por el acoger, el valorar por el integrar. Se pretende, en definitiva, "enseñar la comprensión, tanto la interpersonal e intergrupal como a escala planetaria, mediante la apertura empática hacia los demás y la tolerancia hacia las ideas y formas diferentes, mientras no atenten a la dignidad humana": es una de las siete *bases esenciales de la educación para el presente y para el futuro*, según las palabras citadas de Morín (2002).

4.5. Aprender a ser

De las Competencias Básicas seleccionadas (*Competencia en Comunicación Lingüística, Competencia Matemática, Competencia para Aprender a Aprender, Competencia Social y Cultural, Educación Artística, Autonomía e Iniciativa Personal, Competencia en el Tratamiento de la Información y Competencia Digital*, en esencia) y en torno a las cuales se orientaron las tareas y actividades puestas en práctica, el proyecto da cuenta de la adquisición de los dominios evaluados en cada una, junto a la *Competencia Emocional*, también priorizada en la aplicación. Podemos aquí resumir algunas adquisiciones, pues este *trabajo cooperativo ha permitido conseguir en el alumnado*:

- Sensibilizarlos sobre otras culturas y países.
- Hacerles conscientes de que el mundo -su mundo propio- no termina en unas islas. Es decir, hemos ampliado fronteras juntos; y junto con sus familias.
- Se ha trabajado la transversalidad de los diversos aspectos y contenidos.
- Se ha desarrollado la educación para la convivencia.
- Se ha tenido muy en cuenta el crecimiento competencial adecuada a su edad y a su desarrollo mental y psicológico.
- Se ha trabajado de manera cooperativa.
- Se ha logrado que muchos países y culturas “empiecen a existir para ellos”, según la definición de “crear”.
- Se han contrastado los valores culturales, artísticos, históricos y humanos de nuestra región y país con los de otros países de la comunidad europea y del mundo, lo cual ha ayudado a abrir su mente a otras realidades.
- Se ha conseguido que “hagan cosas”, las *creen* ellos mismos, para que su actividad sea “artística” y además *crean* en sus propias posibilidades y confíen en su talento. En definitiva, fueron capaces de confeccionar una red de conocimientos entre todas las áreas implicadas, teniendo una visión globalizada de su propia formación.

5. Conclusiones

a) Hemos constatado una implicación familiar mayor a la que existía en nuestra realidad. Implicar a las familias en el esfuerzo compartido ha resultado útil y alentador.

b) Hemos constatado un cambio de actitud de nuestro alumnado ante su propio proceso de aprendizaje teniendo como referente el hecho creativo, en todas sus dimensiones, y el trabajo colaborativo y cooperativo para compartir los conocimientos adquiridos.

c) “Las nuevas alfabetizaciones -saber leer y escribir en la red- requieren insistir en los cambios metodológicos que se vienen reclamando para el desarrollo de las habilidades lingüístico-comunicativas: saber leer y escribir en general, y en los nuevos formatos y contextos, requiere unas habilidades y estrategias que sólo se pueden desarrollar si se incorporan la lectura y la escritura como principal instrumento de aprendizaje en todas las áreas.” (HYPERLINK "http://www.leer.es" www.leer.es , conclusión 6).

d) Se ha logrado orientar la atención de forma voluntaria hacia la participación, la motivación, el aprendizaje, la empatía y la colaboración. Las neuronas están activas al movimiento, así hemos movido a nuestros alumnos hacia el “movimiento creativo”, hacia el del arte, hacia las culturas..., alentando su interés por aprender, las ganas de colaborar y cooperar, y sobre todo de activar la empatía. También los docentes nos hemos movido

hacia un cambio metodológico: la ilusión y un nuevo foco encendido son los bastones para reforzar lo mucho que nos queda por recorrer.

e) Las habilidades emocionales forman parte de la educación del siglo XXI y han de incluirse en los programas educativos. La Competencia Emocional, la capacidad de atención y la conciencia (no siempre contempladas en el Currículo oficial, aunque sí priorizadas en nuestra acción) fueron otros referentes, para que los aprendices llegaran a ser conscientes de las necesidades de los demás, sumando conocimientos y medios de comportamiento responsables.

f) El arte (pintura y escultura) ayuda a liberar las emociones; por ejemplo, representando sus impresiones del país que habían elegido estudiar o aprendiendo a “leer” las imágenes y las historias de los cuadros y esculturas observadas y analizadas (Manguel, 2002). Y sirve como modelo de referencia, creación o recreación.

g) Aprendieron y aprendimos con la diversidad, diversión y disfrute (liberando tensiones y el cansancio de estar toda la jornada escolar “atados” a un mismo pupitre, moviendo su cuerpo y desarrollando la coordinación) alternando el estudio con la relajación y, sin darse cuenta, educando también disciplina y sensibilidad.

h) A las tutoras les tocó alimentar la curiosidad del alumnado, consolidando repeticiones y rutinas en un ambiente de seguridad y apoyo para que, cada uno a su ritmo, fuera capaz de aventurarse a descubrir y construir mundos. Las rutinas y la repetición crean procedimientos y ayudan a grabar los contenidos en la memoria a través de la modificación de las estrategias cognitivas, artísticas y emocionales. Nuestros alumnos repetían desde la creatividad individual y grupal, para lo que se organizaron grupos flexibles.

i) El aprendizaje cooperativa va más allá del trabajo en equipo, por lo que requiere y por lo que significa: “El aprendizaje colaborativo y creativo supone modificar creencias docentes y revisar metodologías” (Alsina, P. y otros. 2009).

j) Defenderemos y buscaremos las condiciones para poner en práctica la necesidad de la renovación y la formación permanente del profesorado, para romper la inercia de un sistema educativo que exige la preparación y los medios más adecuados, pero también la ilusión personal y el trabajo colaborativo que lleguen a construir la eficacia, el compromiso, los conocimientos, la interrelación y la creatividad.

6. Proyectos de actuación en el futuro

Se pretende, en cursos próximos, proponer a los alumnos una reflexión sobre los posibles conflictos que los países estudiados para alentar soluciones pacíficas. El objetivo es construir con ellos una obra de teatro que refleje las posiciones de los países y sus posturas ante los conflictos. Esta obra de teatro se representará en otros centros educativos de nuestro entorno próximo, empezando por el propio.

El dinero obtenido se destinará a diversos fines: construir espacios culturales en el centro (teatro o escenario, aula de Educación Artística) y adquirir medios audiovisuales que ofrezcan alternativas para hacer crecer, a través del análisis y de la creación, la educación artística y la creatividad.

Alentar el fervor intelectual y favorecer el placer de aprender supone la *integración de los conceptos, actitudes y competencias clave en un paradigma de acción educativa y formativa* que incluye competencias y habilidades: el aprendizaje creativo y colaborativo, la innovación, la convivencia, el pensamiento crítico y divergente, el aprendizaje comprensivo, la autorregulación, la autonomía e iniciativa personal, la mediación, el bienestar docente, la inteligencia emocional, las buenas prácticas, la atención a la diversidad, el desarrollo de las capacidades y el cultivo de las inteligencias múltiples (Gardner, 2003), la educación en valores y el esfuerzo personal. Esta es la manera de dar vida (y hacer eficaz) a esta construcción (y a este trabajo) llamado aprendizaje y que debe ser *innovador, colaborativo y creativo*.

En el BOE del 12 de noviembre de 2010 del Ministerio de Cultura (España, en la Orden CUL/2009/2010 de 29 de octubre) aparece publicado el Premio Nacional “Crearte” obtenido. Ha sido distinguido como “Centro educativo creativo”. Hemos diseccionado el proyecto y descrito el pasado, y a partir de él organizaremos elementos para su futuro. Este no es un proyecto definitivo.

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DESENVOLVIMENTO DE UMA METODOLOGIA PROJECTUAL PARTICIPATIVA: ESTUDO DA SUA APLICABILIDADE NUM CENÁRIO TIPO

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Resumo

Este trabalho reflecte uma abordagem teórico-prática a uma metodologia projectual participativa concebida com o intuito de concretizar em simultâneo dois objectivos específicos: contribuir para o aumento da motivação e do interesse dos alunos no progresso da sua aprendizagem escolar e social, utilizando como processo o acto de design; e recolher dados sobre um determinado tema com o objectivo de beneficiar o designer na fase de conceptualização dos seus projectos. O resultado prático desta metodologia projectual participativa é a geração de um conjunto de directrizes para a realização de um workshop composto por sessões participativas, nas quais se adapta um alinhamento destinado a participantes dos 8 aos 14 anos.

Esta metodologia projectual participativa é também um exemplo de como o acto de design se pode transformar num objecto em si, constituindo-se no próprio produto/serviço que se pretendia criar. O produto final desta transformação sobressai também como um exemplo prático da utilização do design para gerar valor social e pedagógico.

Palavras Chave: design participativo; processo criativo; técnicas de geração de ideias

Abstract

This work consists of a theoretical-practical approach to a participatory project methodology conceived with the goal of fulfilling two specific aims simultaneously: to foster motivation and interest on the part of young students in the development of their academic and social learning, using the act of design as a process; and to gather data about any given topic with the goal of benefiting the designer during the conceptualization stage of their projects. The practical outcome of this participatory project methodology is the generation of a set of guidelines for the creation of a workshop made of participation sessions, in the course of which a sequence of exercises aimed at 8-14 year-old participants is adapted.

This participatory design methodology is also an example of how the act of design can turn into an object in itself, becoming the very product/stroke meant to be created in the first place. The final product of this transformation also stands out as a practical example of the utilization of design to generate social and pedagogical value.

Keywords: *participation design; creative process; idea-generation techniques*

Introdução

Se pedíssemos a um grupo de crianças para desenharem um quarto de brincar ideal ou um brinquedo especial, quais seriam os resultados?

Naturalmente, os hipotéticos resultados dos desenhos das crianças não serviriam como conceito final, mas, para um designer, surgiriam certamente como fonte de inspiração ou como alavanca para o despontar de outras ideias. No entanto, os benefícios que pode trazer este tipo de experiência não são exclusivos para os designers; o uso de metodologias participativas utilizadas no processo de design pode beneficiar inúmeros casos em diferentes

áreas.

Hoje em dia a participação activa de crianças e adultos “não-designers” no processo e na investigação nesta área é prática comum em diversas franjas do design. Estes “não-designers”, também denominados utilizadores ou usuários, fazem parte de um processo no âmbito do qual se implementam e estudam metodologias e técnicas participativas, as quais se enquadram no campo do design participativo.

As metodologias participativas vão ser essenciais no futuro, na área da aquisição de conhecimentos em geral e, em particular, na área do design, sobretudo na vertente de pesquisa de inovação.

A componente prática revelada na experiência, levada a cabo pela autora, dá conta do potencial destas metodologias para se transformarem numa ferramenta de exploração de outras áreas de conhecimento, nomeadamente, como no caso vertente, a área das metodologias pedagógicas nas fases precoces e mais formativas do ensino escolar.

Este artigo descreve uma proposta prática de uma metodologia projectual participativa que se construiu com base na informação recolhida no âmbito de uma investigação teórica sobre o processo criativo e sobre o design participativo. Aqui apresentam-se as descrições e os resultados de uma experiência prática, da qual derivou uma proposta metodológica. Descreve-se o alinhamento desta MPP (Metodologia Projectual Participativa) e os seus resultados práticos observados em sete sessões participativas, realizadas para este efeito. Depois de descritas e analisadas as experiências que envolveram mais de 52 participantes dos 9 aos 16 anos, descrevem-se também as metodologias quantitativas e qualitativas utilizadas na experiência: inquérito aos participantes; inquérito aos professores através da realização de uma sessão participativa adaptada para o efeito; execução de exercícios com Grupos de Controlo e de Experiência; e avaliação dos resultados obtidos. O artigo encerra com o resumo da experiência prática e com a conclusão final da investigação.

Proposta Prática

Com base na informação recolhida sobre o processo criativo e sobre as metodologias participativas numa fase anterior (esta informação poderá ser consultada no artigo completo em [HYPERLINK "http://metodologiapp.blogspot.com/"](http://metodologiapp.blogspot.com/) <http://metodologiapp.blogspot.com/>), avançou-se com uma proposta prática de uma Metodologia Projectual Participativa (MPP). Foi necessário, no entanto, enquadrá-la num contexto específico, ou seja, criou-se um propósito; definiu-se um grupo-alvo; e criaram-se metas a atingir com a sua realização. Neste caso específico, a proposta teve como alvo principal a concretização de três propósitos gerais:

- 1) Informar e inspirar uma equipa de designers na fase inicial do processo de design

para a criação de um conceito novo: produto ou serviço para a promoção da eficiência energética;

2) Contribuir para o aumento da motivação dos alunos ao proporcionar alternativas de aprendizagem e promover o uso da criatividade para a resolução de problemas;

3) Sensibilizar os participantes para a “cultura de pensar” [Conceito inspirado no estudo de Perkins (2003), a “cultura de pensar” (“culture of thinking”, no original) define-se como sendo o processo de criação de hábitos de visualização do pensamento ou do raciocínio.], tendo em conta a percepção e a geração de ideias.

Com a definição destes objectivos, a proposta prática encaminhou-se para uma estrutura com um alvo concreto, sendo necessária a criação de um cenário experimental para a sua implementação. Foi também necessário definir um enquadramento com um contexto específico e definir um formato de apresentação.

Cenário e formato

Para pôr em prática a MPP, criou-se um cenário de acção no contexto do qual a mesma será utilizada. Este cenário foi composto por:

Definição do *brief* (onde se inserem os objectivos propostos pelo cliente ao designer):

- Criar um conceito de um produto, serviço ou actividade para o Centro de Ciência Viva de Tavira (CCVT), dirigido a um público dos 8 aos 14 anos;
- Enquadrar o produto, ou não, nas outras actividades que já existem no centro;
- Permitir a actividade em grupo;

Os principais objectivos do produto são:

- » Sensibilização para a importância da redução do consumo de energia;
- » Promoção da eficiência energética;
- » Simplificação da leitura do consumo de energia;
- » Contribuição para a criação de novos hábitos de consumo de energia

Conjunto de objectivos específicos dos exercícios

Os principais objectivos da utilização de uma metodologia participativa neste cenário são os de gerar ideias, disseminar informação e avaliar propostas.

Ferramentas (técnicas e métodos já existentes adaptados ao propósito)

Técnica de *Brainstorming* e adaptação das técnicas *Pin Card*, *Nominal Group Technique* e *Ringii process*.

Expectativas:

Em termos de motivação: conseguir perceber qual das técnicas, aplicadas em actividades funciona melhor em termos de adesão à participação. Perceber com que técnicas surgirão as ideias mais interessantes e em que fases das sessões. Conseguir informação suficiente para criar e direccionar um conceito de produto.

Formato

Para aplicar a MPP optou-se por usar como método de participação o *workshop* composto por sessões participativas. Estas são compostas por um alinhamento de actividades pré-definidas que serão orientadas por um facilitador, um elemento não participante que coordena as actividades (neste caso será a própria autora). Embora esta função de facilitador não seja intervencionista, compete a ele orientar as actividades e manter o espírito motivacional indispensável na condução dos resultados.

Inerente à implementação de um *workshop*, como no caso presente, está a necessidade de realizar um conjunto de procedimentos e acções como a criação de uma imagem para promoção, o contacto com os professores, a realização de parcerias com as escolas, a calendarização das sessões e a gestão das inscrições dos participantes.

Metodologia (experiência-piloto)

Na fase antecedente à experiência, criou-se um alinhamento de exercícios provisório para a experiência-piloto composto por três sessões distribuídas por três dias. O alinhamento inicial previa a realização de exercícios com uma complexidade gradualmente crescente: os exercícios iniciais serviriam o objectivo de promover desinibição, criação de espírito de equipa e motivação; os desafios seguintes seriam exercícios práticos de geração de ideias e resolução de problemas, sendo os últimos exercícios a realizar os mais exigentes em termos de complexidade de raciocínio. O alinhamento criado permitia também que estes exercícios mais exigentes, ao serem intercalados com exercícios de desinibição e de motivação, não provocassem desgaste nos participantes.

Os exercícios práticos de geração de ideias e de resolução de problemas adoptados para este alinhamento foram baseados em propostas de De Bono (1970), publicadas no contexto da promoção do pensamento lateral e numa das técnicas generativas vistas em Visser *et al* (2005). As restantes actividades (jogos de cooperação) que intercalam o alinhamento foram publicadas pela Associação para a Promoção Cultural da Criança (2004) [Adaptação portuguesa, com o título “Jogos de Cooperação”, da edição publicada pela “The Woodcraft Folk”].

Descrição da experiência piloto

Antes da realização das sessões foram feitos contactos institucionais com o Centro de Ciência Viva de Tavira (CCVT), no sentido de agendar o espaço para a realização do *workshop* e gerir a divulgação e os procedimentos de inscrição dos participantes. Depois da formalização destes contactos foi iniciada a divulgação do evento, o qual se designou “*saidak aska*” - *workshop de criatividade e design* (fig. 01), junto da comunidade escolar local. Verificou-se como método mais eficaz para angariação de participantes o contacto directo com os professores das escolas. Foi possível desta forma garantir a realização do *workshop*, previsto para três dias.



SAIDAK ASKA

WORKSHOP DE CRIATIVIDADE E DESIGN

cria, desenha e constroi

O workshop será constituído por três sessões de 3 horas cada.

1º dia // 1ª parte
Apresentação
Jogos de cooperação
Actividades de estimulação de criatividade
Aprender a registar e desenhar ideias
2ª parte // oficina
Desenhar, recortar colar e explorar os materiais
Aprender a fazer protótipos com materiais reciclados

2º dia // 1ª parte
Jogos de cooperação e de estimulação
Geração de ideias em grupo (técnica de brainstorming, Pin Card, Nominal Group Technique e Ringii process)
2ª parte // oficina
Projectar e planear ideias
Elaboração de protótipos

3º dia // 1ª parte
Jogos de cooperação e de estimulação
Geração de ideias (técnica de Storytelling)
Avaliação e selecção colectiva
2ª parte // oficina
Pinturas e acabamentos finais
Apresentação dos projectos finais

Destinatários:
Adultos e crianças a partir dos 8 anos

Nº de inscritos:
Máximo 10 participantes

Local:
Centro de Ciência Viva de Tavira

Participa! Faz parte da equipa que irá criar um novo projecto para o Centro de Ciência Viva de Tavira!

dia 9, 16 e 19 de Junho 2010

Inscrições e informações:
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A realização da experiência-piloto teve quatro objectivos concretos: (a) testar a funcionalidade dos exercícios e dar particular relevância à reacção dos participantes às tarefas propostas; (b) verificar se o tempo previsto para os exercícios era compatível com as tarefas exigidas e se o material utilizado era o mais indicado; (c) verificar a funcionalidade prática do sequenciamento do alinhamento; (d) verificar se o tipo de registos utilizados para anotar as sessões-piloto era suficiente e adequado.

O tipo de registo adoptado para anotar as sessões-piloto foi composto por gravação de vídeo e por anotações resultantes da observação por um assistente exterior à sessão.

A primeira sessão-piloto realizou-se no espaço destinado à instalação do futuro projecto (de acordo com o *brief* referido anteriormente).

Alguns dias antes do evento foi convidado para o registo de vídeo e para a elaboração da acta das futuras sessões um elemento não integrante das mesmas, o qual foi incumbido de registar na acta com particular detalhe as reacções dos participantes a cada exercício, garantido-se assim que na impossibilidade de estas serem registadas no vídeo, ficassem anotadas. Foi pedido também a este observador que anotasse o tempo decorrido para cada exercício.

A autora assumiu-se como a facilitadora do *workshop*, e a sessão teve início na sala já adaptada com espaço suficiente para mais de 20 crianças, sendo que as mesas foram retiradas para permitir que os participantes se sentassem em círculo. Foi disponibilizada também nesta sala uma parede com dimensão suficiente para afixar os trabalhos realizados. Foi então dado início à sessão com a presença de 9 participantes com idades compreendidas entre os 13 e os 15 anos.

No geral, em todos os exercícios realizados, observou-se entusiasmo e curiosidade da parte dos participantes. A duração das actividades previstas no alinhamento para a primeira parte ultrapassou o tempo definido, não tendo sido possível a concretização da segunda parte da sessão onde se realizaria a componente de “oficina”. No entanto observou-se, no último exercício executado (“Máquina engenhoca”), para além do facto de este ter excedido largamente o tempo previsto, uma forte componente prática, envolvendo desenhos e elaboração de mapas de ideias, os quais acabaram por substituir os objectivos pretendidos com a “oficina”.

No fim desta primeira sessão foi dada aos participantes uma tarefa para realizarem em casa que deveriam trazer na sessão seguinte. Esta tarefa tinha como objectivo a construção de um guião elaborado através de desenhos, recortes ou outras técnicas à escolha dos participantes.

Nas sessões seguintes, foram realizados os exercícios práticos de geração de ideias e de resolução de problemas, considerados pela autora como aqueles que trariam particular mais-valia para a experiência da MPP.

Metodologia (proposta final)

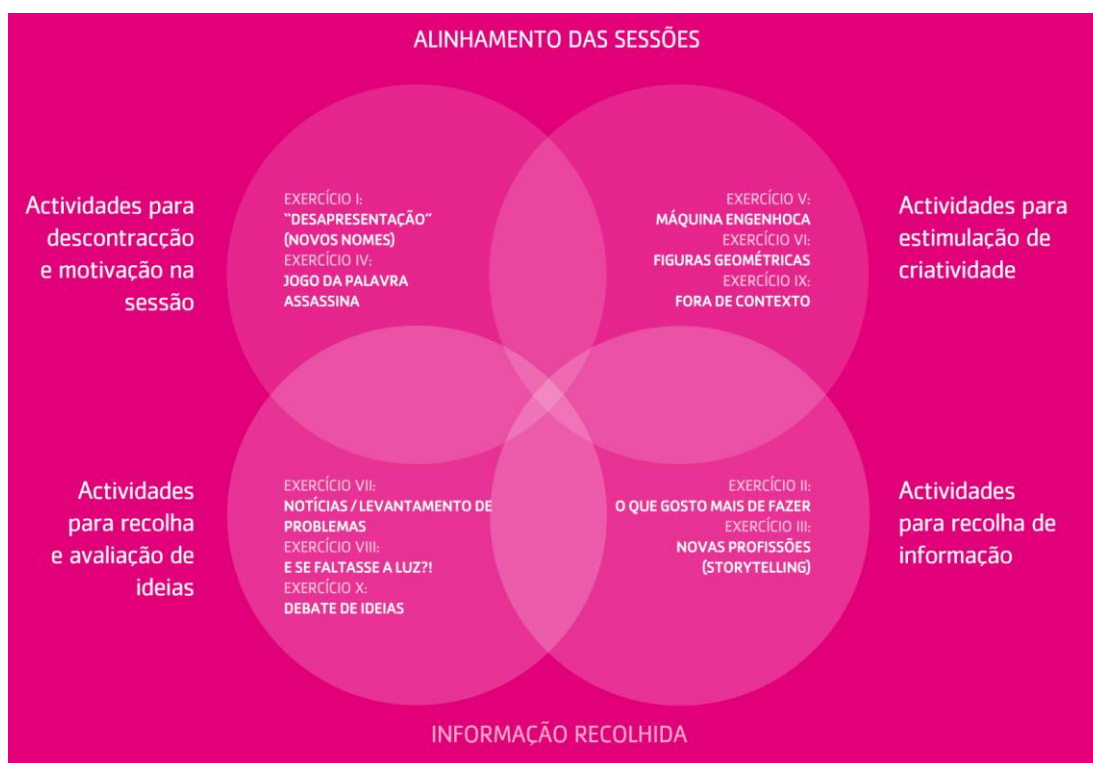
Após a verificação da funcionalidade dos exercícios nas sessões-piloto realizadas previamente, concebeu-se um alinhamento final mais flexível. Este novo alinhamento, numa ponderação equilibrada entre a importância a atribuir ao plano sequencial pré-estabelecido, por um lado, e, por outro, às sinestrias criadas no próprio desenrolar do funcionamento da sessão, privilegiou atribuir maior ênfase, em termos relativos, a estas últimas.

A dedução fundamental é a de que a sessão participativa, independentemente do plano

formal a que obedece, deverá ter em conta alguma flexibilidade na sua sequência, em função do contexto envolvente (o número e a idade dos participantes, bem como o estabelecimento de origem – p. ex. ensino público ou privado; género – proporcionalidade de rapazes e raparigas – dos participantes; nível de escolaridade; estatuto sócio cultural; espaço geográfico onde se realiza a sessão; condições físicas da sala; desgaste e outras características envolventes do contexto geral da sessão).

De forma a tornar as futuras sessões exequíveis em termos de garantia da assiduidade dos participantes, o tempo de duração das sessões neste alinhamento final tornou-se mais reduzido, para a duração de quatro horas. No entanto, este alinhamento contempla as mesmas actividades referidas na experiência-piloto, à excepção da “oficina” e da tarefa “trabalho de casa”. As razões das alterações foram fundamentadas, conforme se verifica com mais detalhe na tabela 1 abaixo, na experiência adquirida nas sessões-piloto.

Algumas destas actividades foram, no entanto, reformuladas para que, além de induzirem descontração e motivação no decorrer da sessão e estimularem a criatividade, servissem também para o coligir de informação e o recolher e avaliar de ideias conforme se verifica no organograma do alinhamento final (fig. 2).



O número de sessões previstas na experiência-piloto para cada *workshop* reduziu-se neste alinhamento final. Se por um lado esta redução permitiu a realização da experiência em cenários com diferentes variáveis, como iremos constatar mais à frente (permitindo a realização de cinco *workshops* com oito sessões participativas), por outro lado reduziu-se o tempo de trabalho educativo dos exercícios, nos quais, à excepção das actividades de descontração e motivação, seria necessário um trabalho pedagógico contínuo para validar a MPP como sendo uma actividade extra-curricular. No entanto, considera-se importante constituir algumas linhas de orientação, baseadas nas competências essenciais do currículo nacional do ensino básico publicadas pelo Ministério da Educação para as actividades extra-curriculares educativas, as quais, com o complemento de outras possíveis investigações nesta área, possam vir a contribuir para a concretização desta MPP como sendo um processo pedagógico a integrar-se num projecto educativo mais abrangente.

Enumeram-se assim os seguintes objectivos gerais que definiram as linhas de orientação da selecção dos exercícios neste *workshop*, comuns em todas as actividades:

- » Desenvolver iniciativa e criatividade;
- » Estimular o espírito de grupo;
- » Favorecer o desenvolvimento pessoal, relacional e social;
- » Desenvolver a capacidade de adaptação a novas situações;
- » Criar condições favoráveis ao equilíbrio afectivo e emocional;
- » Ajudar a resolver problemas e a tomar decisões assertivas;
- » Estimular competências cognitivas

Definiram-se também os seguintes objectivos específicos para cada exercício/actividade seleccionada:

Tabela 1

Exercícios da sessão:	Objectivos específicos:
Exercício I: “Desapresentação” (novos nomes)	Quebrar relações estabelecidas entre os participantes já conhecidos; induzir desinibição; desbloquear; estimular o surgimento de ideias.
Exercício II: “O que gosto mais de fazer”	Desinibir e aproximar os participantes; criar cumplicidades.
Exercício III: “Novas profissões”	Estimular e provocar a geração de ideias.
Exercício IV: “Jogo da palavra assassina”	Descontrair, provocar diversão e estimular a imaginação
Exercício V: “Máquina engenhoca”	Aprender a registar e desenhar ideias; resolver problemas; desenvolver a capacidade de fundamentar as ideias apresentadas; criar espírito de equipa.
Pausa / intervalo	
Exercício VI: “Figuras geométricas”	Conseguir gerar várias alternativas para uma mesma solução; provocar e estimular a percepção.
Exercício VII: “Notícias / levantamento de problemas”	Conseguir visualizar diferentes pontos de vista; desenvolver a capacidade de percepção e o sentido crítico.
Exercício VIII: “E se faltasse a luz?!”	Conseguir visualizar diferentes cenários; estimular a capacidade de imaginação.
Exercício IX: “Fora de contexto”	Conseguir visualizar diferentes cenários; estimular a capacidade de percepção.
Exercício X: “Debate de ideias”	Desenvolver a capacidade de percepção e sentido crítico

A metodologia passo-a-passo (alinhamento)

Poderá ser consultada, de forma mais detalhada, a descrição das actividades e dos exercícios que compõem o alinhamento final da MPP, descrevendo-se o desenvolvimento da acção, o propósito da sua inclusão na sequência e os resultados esperados, e a referência relativa à origem de cada um dos exercícios no artigo completo em completo em HYPERLINK "http://metodologiapp.blogspot.com/" <http://metodologiapp.blogspot.com/>).

Descrição e análise da experiência

Para a análise da experiência foram considerados os dados recolhidos a partir de cada sessão, compostos por desenhos dos participantes, actas do observador exterior e registos vídeo. Com base nos dados destes elementos foi possível organizar uma síntese de

informação que se registou numa ficha de análise. Para a análise da experiência foram considerados os dados recolhidos a partir de cada sessão, compostos por desenhos dos participantes, actas do observador exterior e registos de vídeo. A partir dos dados sintetizados nesta ficha de análise resumem-se dois tipos de informação: o registo dos dados sobre o decurso da experiência (considerando-se aqui os aspectos positivos e menos positivos da mesma) e a anotação das variáveis que podem ter interferido nos resultados; e a informação recolhida nos trabalhos realizados pelos participantes.

Em relação ao segundo tipo de informação, foi possível compilar um resumo de variáveis mais significativas observadas por sessão. Embora este tipo de variáveis seja inerente à experiência em si, elas interferem directamente na informação recolhida como se observa na fig. 3.



Da informação recolhida e observada mais significativa, deduzem-se os seguintes tópicos conclusivos, tendo em conta a especificidade do grupo-alvo (8 a 14 anos):

- » Número ideal de participantes é de entre 6 a 8 elementos;
- » A localização influencia de forma significativa a assiduidade em sessões com

intervalos de tempo alargado;

- » A diferença de proporcionalidade no género masculino/feminino nas idades entre os 13-14 pode afectar significativamente o ambiente participativo de cada elemento;
- » O estatuto sócio-cultural e o meio cultural de origem dos participantes podem influenciar o nível participativo das sessões, sendo que a influência cultural dos mesmos foi observada apenas no ensino privado;
- » O momento do ano lectivo pode influenciar o ritmo da sessão e a assiduidade (as sessões realizadas coincidiram com o final do ano lectivo de 2009/2010), tendo sido observado este fenómeno com maior relevância, no entanto, no ensino público;
- » A predisposição natural dos participantes para o conhecimento influencia significativamente a assiduidade e o nível de participação;
- » O intervalo de tempo reduzido mostrou-se ser eficiente na assiduidade dos participantes.

Validação e resultados obtidos

Para validar a experiência foi necessário obter dados concretos em três frentes: sobre a reacção e disposição dos participantes aos exercícios propostos; sobre a validação pedagógica; e, por último, sobre o impacte dos dados recolhidos junto de um grupo de designers. Para obter estes elementos realizaram-se os seguintes passos: inquérito aos participantes; inquérito a profissionais da área pedagógica; e exposição dos dados recolhidos a grupos de controlo.

O inquérito aos participantes foi realizado com distanciamento temporal de seis a sete meses da sessão realizada. O objectivo deste distanciamento foi o de verificar se o *workshop* no seu todo, ou algum dos exercícios realizado nas sessões participativas, em particular, ficou registado na memória implícita dos participantes, detectando-se desta forma o impacte positivo ou negativo da experiência nos mesmos.

Para além deste objectivo específico, inquiriu-se se os participantes consideraram a experiência útil para o desenvolvimento de outras actividades na escola; se existia predisposição para repetir experiências similares; e se consideraram importante realizar este tipo de actividade na escola.

O inquérito realizado teve também o propósito de recolher dados que comprovem: a noção do grau de importância da experiência (individualmente e colectivamente) nos participantes e o impacte da mesma, ou de alguns exercícios em particular, na memória dos intervenientes. As respostas a estas questões permitiram a formulação dos indicadores sobre o grau de satisfação dos participantes e sobre o impacte emocional relativamente à experiência no seu todo e a cada exercício, em concreto. Estes indicadores permitiram, por

sua vez, fundamentar a existência de *marcadores somáticos* [Termo técnico definido por Damásio (1996) para classificar a influência do uso de sentimentos gerados a partir de emoções sentidas. Estas emoções e sentimentos foram interligados em determinados acontecimentos vividos, pela aprendizagem, a resultados *futuros previstos para determinados cenários*. Quando um marcador somático negativo é justaposto a um determinado resultado futuro, a combinação funciona como uma campanha de alarme. Quando, ao contrário, é justaposto um marcador somático positivo, o resultado é um incentivo], provocados pela experiência.

Inquérito a professores

Para validar a importância da experiência participativa no contexto pedagógico, optou-se por realizar um workshop com o mesmo alinhamento, destinado a professores. O intuito do mesmo foi o de mostrar aos professores os exercícios realizados e o seu alinhamento, fazendo-os experienciarem, eles próprios, os exercícios. Desta forma, garantiu-se que os profissionais sujeitos à experiência tomavam conhecimento integral das actividades sócio-educativas desenvolvidas nas sessões realizadas anteriormente com as crianças, podendo desta forma formular uma opinião fundamentada e válida sobre a experiência realizada pela autora com os jovens. Assumido este pressuposto, inquiriu-se junto destes professores a sua opinião, enquanto profissionais com responsabilidades pedagógicas, relativamente aos objectivos de cada exercício, no contexto dos princípios orientadores do projecto educativo elaborado para o efeito.

Adaptou-se então a MPP para uma sessão participativa intitulada “Workshop de Criatividade para Professores”. As diferenças entre as sessões participativas realizadas com os alunos e a presente sessão foram essencialmente a redução de tempo de alguns exercícios e a substituição da realização de algumas das actividades pela sua explicação detalhada, em conjunto com apresentação de notas tomadas sobre algumas reacções mais significativas das crianças observadas nas sessões anteriores. Esta adaptação permitiu que a experiência fosse enquadrada no horário disponível da instituição de ensino contactada para o efeito e, para além de reforçar a informação sobre a experiência vivida com as crianças, permitiu também que os professores pudessem adaptar estas actividades a possíveis aulas ou actividades de projecto na instituição de ensino desses mesmos profissionais, servindo assim como contrapartida motivacional à participação dos mesmos.

Importa referir que a experiência adquirida com a realização deste workshop, para além do propósito de recolha de resultados, revelou a MPP como um possível método de formação a professores com potencial para melhorar as actividades de projecto realizadas com os alunos, como se verifica nas respostas à questão oito. Para além deste facto, a MPP

revelou-se também como um processo eficiente para melhorar as relações entre alunos e docentes - através do exercício X “debate de ideias”, foi possível aos professores participantes tomarem consciência de detalhes particulares das suas próprias experiências com os alunos. Isto foi possível porque a autora canalizou aquele exercício para o tema: “como melhorar a motivação dos alunos”: os participantes elegeram, entre as várias ideias que surgiram, o aumentar o número de momentos de avaliação, dispersando o stress dos alunos, e o conversar com os alunos individualmente sobre os aspectos negativos, antes de atribuir a nota correspondente a cada momento de avaliação.

Consideram-se os resultados obtidos muito positivos tendo em conta os critérios do projecto educativo criado pela autora, revelando-se a MPP como um projecto com possibilidades de adaptar-se a uma actividade complementar educativa.

Resultados da experiência dos Grupos de Controlo /Experimental

Foi possível através desta experiência recolher cerca de 15 ideias geradas por 5 elementos diferentes no grupo 1 (grupo controlo) e 12 ideias geradas por 4 elementos no grupo 2 (grupo experimental). Para incentivar a participação dos elementos convidados para a experiência, foi dado aos designers pouco tempo para a elaboração dos conceitos. Por este motivo não se considera relevante o facto de não se encontrar nas ideias geradas qualidade criativa significativa. A qualidade criativa seria também difícil de avaliar, uma vez que se teriam de criar critérios específicos para o fazer.

Ao analisar as ideias geradas por cada grupo consegue-se observar que os conceitos gerados pelos participantes do grupo 02 envolvem a utilização de mais espaço, tanto no próprio local de implementação do projecto a idealizar (CCVT) como para além deste centro, surgindo, neste grupo, ideias para projectos que envolvem a cidade na qual o centro está inserido, e ideias que envolvem objectos do quotidiano, ultrapassando a barreira física do centro. Embora se encontrem ideias com algum grau de originalidade vindas do grupo 01, constata-se, no entanto, que estas são mais restritivas no uso físico de materiais e espaço, sendo também menos diversificadas.

Não se tendo verificado diferenças significativas (tanto quanto tal possa ser objectivamente avaliado) entre a qualidade das ideias produzidas pelos elementos do grupo 1 e do grupo 2, torna-se no entanto óbvio que o conjunto de ideias geradas pelo grupo 2 é mais diversificado por vias das múltiplas abordagens que propõe de utilização de espaços e objectos. Tal parece indiciar que existiu uma influência sobre os elementos do grupo 2 da exposição aos dados recolhidos nas sessões participativas.

Estes resultados poderiam ser mais expressivos se a experiência com os grupos de controlo e de experiência fosse elaborada com um protocolo mais rigoroso. Esse protocolo permitiria o contacto presencial com os elementos dos grupos exigindo à partida uma maior dedicação

dos elementos. Essa dedicação poderia levar a uma maior expressividade nos resultados. Na experiência efectuada, ao utilizar meios como a Internet [Protocolo utilizado: O convite aos elementos para a participação nesta experiência foi feita por telefone individualmente. Após a confirmação da aceitação de cada elemento de cada grupo, foi enviado via *email* um pacote com a informação das regras, o anexo respectivo ao grupo e o *link* para o questionário on-line], para contacto com os grupos poderá ter influenciado o empenho e dedicação necessária à experiência, reflectindo-se nas ideias geradas.

Resumo

Neste artigo descreve-se a componente prática deste trabalho e é construída uma proposta metodológica participativa enquadrada num contexto com um propósito e um grupo alvo específicos. Para a sua aplicabilidade, foi necessário seleccionar técnicas e definir um formato. Criou-se para esse efeito o conceito: “saidakaska - workshop de criatividade e design”, composto por sessões participativas interactivas com participantes com idades entre os 8 e os 14 anos.

Após a verificação da funcionalidade do alinhamento das sessões participativas, testadas numa experiência-piloto, foi possível concretizar a experiência activa tendo em conta os principais elementos: redução do formato e do intervalo entre as sessões, e realização no ambiente escolar, o qual se revelou mais propício à adesão por parte dos alunos. Também decorrente da observação na experiência-piloto, foi feita uma readaptação do alinhamento dos exercícios, tornando-se este mais flexível em função do contexto envolvente, e tendo em conta as variáveis detectadas. Este alinhamento final foi constituído por actividades e exercícios que tiveram em conta três tipos de objectivos: estimular a criatividade; coligir informação; e avaliar ideias.

Para a análise das informações recolhidas foi definido um conjunto de regras, as quais direccionaram os tópicos que concluem o capítulo. Destes tópicos destacam-se a localização (a qual influencia de forma significativa a assiduidade); a predisposição natural dos participantes (influencia significativamente o nível de participação, confirmando desta forma a necessidade da autora de introduzir no alinhamento das sessões as actividades de cooperação); e o número de participantes (o qual deverá ser inferior a 10).

A validação dos resultados foi fundamentada por inquéritos realizados aos participantes, a um grupo professores sujeitos previamente a uma sessão participativa e a um grupo de controlo e de experiência composto por designers de produto. Os resultados do inquérito aos participantes revelaram o exercício “máquina engenhoca” aquele que mais impacte exerceu na memória de longo prazo. Este facto, em conjunto com a apreciação positiva dos docentes inquiridos perante o projecto educativo exposto, é indicador da eficiência do processo de design no registo da aprendizagem dos alunos. Em relação à experiência com

os grupos de controlo e de experiência não foi possível, com o grau de objectividade desejado, mostrar a influência dos dados recolhidos nas sessões como sendo úteis ao designer na fase de conceptualização; no entanto, a diversidade de ideias geradas pelo grupo de experiência indicia uma possível influência desses dados recolhidos.

Conclusão

Os resultados da proposta prática confirmam a riqueza das potencialidades existentes na utilização do acto participativo e do acto de design para o aumento da motivação e do interesse dos alunos. Também se verifica o potencial contributo que estas práticas poderão trazer ao sistema de ensino e ao progresso da aprendizagem escolar e social dos participantes. Este facto é visível sobretudo nos resultados obtidos relativamente ao impacte positivo que o exercício de design “máquina engenhoca” teve na memória de longo prazo dos participantes, comprovando assim que a utilização do processo de resolução de problemas utilizado em design pode constituir-se como uma ferramenta útil para os projectos educativos sobretudo na área de projecto. A confirmação deste facto é reforçada com os resultados positivos obtidos no inquérito efectuado aos profissionais pedagógicos consultados. Por outro lado, o método utilizado neste trabalho para a verificação dos benefícios para o designer, enquanto processo inspirador na fase inicial do seu projecto, não revelou de forma suficientemente expressiva as potencialidades dos dados recolhidos para esse efeito. No decurso deste trabalho, a procura da resposta para os dois elementos da hipótese focou-se sobretudo na investigação do processo criativo e na prática participativa, mais do que na recolha e análise dos dados para benefício da geração de conceitos no acto de design.

Por outro lado, no âmbito desta investigação, constata-se outros resultados, os quais, apesar de não constarem na hipótese, importa aqui serem registados pela sua relevância:

» A MPP criada, revelou-se ela própria um serviço de benefício social e cívico, servindo os propósitos do produto/serviço que se pretendia conceber (definido no *brief*); ou seja, a execução da MPP com o grupo de participantes (52) cumpriu os objectivos propostos, transformando-se no produto em si. A MPP tornou-se assim um exemplo prático de como um objecto metodológico, baseado no acto de design, se pode tornar adequado para outros propósitos, enriquecendo o já alargado campo de actuação do design.

» A MPP foi utilizada para promover o ensino da criatividade, enquanto processo de pensamento, promovendo o design como uma ferramenta junto de profissionais da área pedagógica e reafirmando a posição do designer no rol dos actantes que

reforçam a “cultura do pensar” no contexto educativo.

» O processo participativo fez sobressair, pela experiência vivenciada pela autora enquanto designer, as vantagens práticas do referido processo participativo através da relação e da envolvimento estabelecida com o ambiente e grupo-alvo do projecto de design. Neste tipo de experiência, o designer, tem mais a ganhar ao posicionar-se no núcleo da acção participativa, do que enquanto receptor indirecto dos dados empíricos recolhidos pelo processo participativo.

Não se pretende deduzir com esta afirmação que os dados recolhidos e interpretados não sejam benéficos para o propósito da geração de conceitos; pelo contrário, existe ainda muito por descobrir nesta área, reforçando-se a necessidade de maior investimento na investigação das metodologias e nas sinergias criadas por outras áreas inerentes ao design participativo, como a psicologia, a sociologia e a antropologia. A falta de intervenção específica de conhecimentos destas áreas, constatada na experiência com grupo de controlo e de experiência realizada pela autora, poderá ter contribuído para a pouca expressividade dos resultados, confirmando desta forma aquela necessidade.

A linha de orientação seguida pela autora, na adaptação e criação do alinhamento que se constituiu na MPP, permitiu comprovar as potencialidades do processo de design como ferramenta. No entanto, para melhor perceber esta correlação e para provar de forma efectiva a relação causa-efeito do acto de design e o progresso cognitivo necessário à aquisição do conhecimento, seriam necessários meios de investigação mais alargados. Uma das várias hipóteses a considerar em futuras investigações decorrentes deste trabalho será uma investigação sobre este impacte num grupo-alvo mais específico, de modo a controlar as diversas variáveis que naturalmente ocorrem. Um dos cenários possíveis seria a realização de uma experiência com a participação de alunos com dificuldades de aprendizagem provenientes da falta de motivação, utilizando-se para isso uma adaptação da MPP para um período alargado e com uma correlação directa com um determinado projecto educativo integrado num determinado estabelecimento de ensino. O cenário-tipo poderia ser enquadrado no ambiente extra-curricular (aulas de apoio) já existente no sistema educativo nacional. Os resultados subsequentes seriam confirmados na constatação com as prováveis diferenças quantitativas de sucesso entre os resultados do ano experimental e do ano seguinte.

Este é apenas um exemplo prático do vasto campo de acção inerente aos princípios participativos e cooperativos que se aliam à necessidade urgente de mudança para um caminho onde impere a sustentabilidade.

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CRIATIVIDADE E INOVAÇÃO NO TURISMO

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RESUMO

Criatividade e Inovação no Turismo podem apreender-se com recurso a processos e metodologias sistémicas, estruturais e funcionalistas. Linhas de força que estabelecem tensões construtivas entre movimentos de ida e retorno, circulação e sedentarização, integração e diferenciação estão na base do entendimento do que é o Turismo e dos seus modos institucionais de criação e acumulação de riqueza. Planos de negócios e projectos de empreendedorismo turístico podem ser viáveis e sustentáveis se forem eficientes. Na criação de componentes que estabeleçam relações de acção/reacção entre características da produção e atributos do consumo ou na sua implementação através de acções de coordenação/integração combinadas com segmentação e especialização. Porque Turismo é processo.... interactivo e relacional.

Palavras - Chave: Eficiência, Organização, Processo, Interactividade, Relação.

1.Introdução

A capacidade do ser humano em determinar objectivos, planear o futuro, de o fazer com o menor dispêndio de energia para o maior retorno, por si, ou em conjugação com outros indivíduos no seio de organizações, respeita um princípio fundamental, qual seja, que o resultado final seja eficiente.

O Turismo, enquanto actividade produtiva, de planeamento e gestão orientada para uma actividade humana básica: o consumo de um tempo de lazer, deve ser entendido como um processo, tecnologia de organização das relações sociais, humanas e económicas tendo em vista um resultado de eficiência, ou seja, uma combinação entre uma maximização de estímulos, prazer, rendimentos e/ou a minimização de perdas/sofrimento.

O estudo dos pontos de contacto entre a biologia e as organizações, a compreensão sistémica dos comportamentos do ser humano enquanto produtor e/ou consumidor devem merecer a máxima atenção no Turismo, em particular, em sede de criatividade e inovação, entendidas enquanto processos que assentam na dignidade e liberdade da pessoa humana, seja no direito à iniciativa económica e criação cultural, seja na sua fruição, enquanto consumidor com direitos, designadamente, à qualidade dos bens e serviços consumidos, formação, informação e protecção da sua saúde e segurança.

Assim, procurar-se –à , neste artigo, identificar linhas de investigação para a criatividade e inovação do Turismo, enquanto processo interactivo e relacional entre acções/reacções de produção/consumo, rendimentos e sofrimentos ou componentes sensoriais/emocionais e cognitivas racionais de comportamento, sempre entendidos enquanto processos sistémicos que mantêm em equilíbrio o funcionamento de um ser vivo ou de uma organização, enquanto sistemas complexos, segundo Norel (2004).

2. Desenvolvimento.

De uma maneira geral, comportamento é definido como um conjunto de acções ou reacções de um sistema dinâmico, vivo, em face às interacções e realimentações propiciadas pelo meio onde está inserido, de acordo com Camargo (2009). A economia comportamental tem como premissa fundamental a ideia que o ser humano tende a fazer coisas pelas quais é recompensado e não pelas quais é punido, pelo que, defende, é a acção entre o estímulo externo e a reacção que provoca na armazenagem de lembranças emocionais, tanto positivas como negativas, que explica os nossos comportamentos.

Os estímulos e a reacção a esses estímulos podem ser enquadrados num processo compreensivo, um modo de estar que melhora a funcionalidade de indivíduos e /suas organizações em ordem a uma adaptação progressiva favorável. Como diz Soares (2011), a falta de estímulo é a atrofia, estimular é um modo de estar de indivíduos e/ou organizações.....para viverem e sobreviverem.

Criatividade e inovação em qualquer área de estudo do comportamento humano pressupõem o estudo de processos, de combinações relacionais entre estímulos externos e locais de memória, entre emoções positivas e reacções negativas, entre acções de produção e reacções de consumo, enquanto modos institucionais de criação e acumulação de riqueza aplicáveis significativamente ao Turismo, enquanto actividade económica e de profundo significado social.

Richards *et al* (2000) definem Turismo Criativo como “Turismo que oferece aos visitantes a oportunidade de desenvolver seu potencial criativo através da sua participação activa em cursos de formação e experiências de aprendizagem que são características do destino de férias onde estão localizadas”.

Richards (2010) identifica ainda Turismo Criativo como um processo de reacção/evolução a um Turismo Cultural massificado e estandardizado, a que apelida de “MacCulturalização”, caracterizado por um consumo rígido, reproduzido em série por temas (ex: parques temáticos ou roteiros culturais), megaeventos (ex: Capitais Europeias de Cultura, Exposições Internacionais) ou estruturas “ícone” (ex: Museus Guggenheim) não adequado a novas correntes de Turismo Cultural em que os turistas são mais experientes, sofisticados e capazes (vulgo, via internet) de estruturar suas próprias experiências turísticas.

Assim, Turismo Criativo, fundamenta, é caracterizado por providenciar aos turistas ferramentas de estímulo para desenvolver o seu próprio potencial criativo em envolvimento activo e troca com experiências locais e genuínas com a cultura local em compromisso com a sua população, o que envolve co-criação (entre produtor e turista) e criatividade dos próprios produtores do destino turístico.

A aplicação deste conceito a experiências ligadas a redes de turismo criativo como identificadas por Raymond (2007) na Nova Zelândia (ex: artesanato, dialectos locais, gastronomia) ou por Richards (2007) a espaços criativos (ex: Universidade do Café em Itália como identificada em HYPERLINK "http://www.illy.com/wps/wcm/connect/us/illy/the-world-of-coffee/universita-del-caffe" <http://www.illy.com/wps/wcm/connect/us/illy/the-world-of-coffee/universita-del-caffe>), eventos, itinerários culturais sugerem a necessidade de se entender o Turismo Criativo como um processo de co-produção ou de acção/ reacção entre a criatividade das populações locais e dos próprios turistas, segundo Richards (2010), movidas por princípios de qualidade e autenticidade, reinterpretação e inovação na tradição. Em comentário ao designado Turismo Criativo, importa transmitir que se trata de uma criação (o que, em marketing, se designa por produto turístico) orientada para uma lógica de segmentação/especialização de outro produto turístico (o Turismo Cultural), a que um determinado mercado, denominado turístico, atribui valor, pagando um preço pelo respectivo consumo.

Até aqui, dir-se-ia, nada de novo, pois o Turismo é negócio que não vive/sobrevive sem o seu consumo. O turista é o alvo que se pretende com a criação de uma produção denominada turística, o que se denomina produto turístico. Sem turista não há Turismo.

O Turismo Criativo é mais um produto turístico resultante de uma tecnologia de organização das relações económicas, sociais, e neste caso, culturais, que alinham eficientemente produção com consumo. Enquanto esse alinhamento for eficiente e efectivo existirá Turismo Criativo. Como existirão outros produtos turísticos, como o golfe, o turismo de caça, o jogo ou o designado “sol e mar”.

O Autor deste artigo, não obstante todos os méritos científicos à volta do trabalho e dos conteúdos relacionados com o conceito de Turismo Criativo, considera a utilização deste conceito aplicado ao Turismo Cultural como redutor e não abrangente quanto aos processos de criatividade e inovação que subjazem ao Turismo.

Importa mais investigar e operacionalizar processos e instrumentos, ferramentas, utensílios e interacção de conteúdos que desenvolvam a Criatividade e Inovação no Turismo. Porque criatividade e inovação em Turismo podem existir em qualquer produto turístico. E não só no Turismo Cultural. Prefere-se a utilização científica dos conceitos de Criatividade e Inovação no Turismo e não de Turismo Criativo. Daí o tema do artigo e potencial pertinência de apresentação de linhas de investigação para o seu conteúdo.

3. Linhas de investigação sobre Criatividade e Inovação no Turismo.

Turismo pode e deve ser entendido como processo sistémico de acção/reacção entre componentes opostas, que visa manter em equilíbrio, regular, assegurar o funcionamento de um sistema complexo, segundo princípios de eficiência (Machado,2010).

Assim, a um movimento de ida para um local que não corresponde ao local de residência habitual corresponde uma compensação de regresso a esse mesmo local; a uma acção de deslocação, seja por transporte, seja por estímulos de animação, correspondem reacções de sedentarização no local de alojamento ou de restauração.

Igualmente, a acções de colectivização de recursos (ex: paisagens, monumentos históricos ou culturais, gastronomia) a que se denomina património turístico, correspondem reacções de venda e empacotamento em unidades divisíveis dessa paisagem ou monumento, seja sob a forma de postais ou recordações (*souvenirs*),seja sob a oferta de refeições individualizadas a cada cliente.

A combinação, a relação entre unidades de alojamento autónomas e a existência de uma recepção que centraliza reservas, comunicações e informações dos clientes é uma tecnologia de organização tão natural e sistémica em Turismo, como a que centraliza no profissional de informação turística a responsabilidade de informação, assistência e condução das visitas a turistas individuais no âmbito de uma viagem organizada.

O recurso a combinações, relações entre acções de coordenação/integração e de divisibilidade/ segmentação, designadamente, no alojamento, transporte e viagens e entre processos de criação exclusiva de riqueza no seio de organizações que são transferidos a turistas que neles reconhecem valor pelo pagamento de um preço, fazem parte de uma tecnologia organizacional movida por princípios de eficiência nos sistemas de turismo e dos seus negócios.

Uma questão fundamental que se prende com o tema do artigo é esta: tal tecnologia pode ser objecto de conhecimento e aplicação à inovação e criatividade em Turismo? E aos seus negócios? Ou é reservada a certos conhecedores do “saber turístico”? O processo de inovação e criatividade em Turismo pode ser entendido e empreendido por qualquer pessoa? Ou só aos titulares de uma formação em Turismo ou nalguma das suas componentes (ex: alojamento, restauração, animação)?

O entendimento proposto e que serve de base às linhas de investigação adiante propostas é que o processo empreendedor, incluindo em Turismo, pode ser ensinado e entendido por qualquer pessoa, secundando Dornelas (2008).

Na verdade, existindo a necessidade de um equilíbrio, uma harmonia entre componentes opostas em Turismo geradoras de um consenso, uma troca de valor entre produção e consumo turístico com eficiência, secundando Machado (2010), todo e qualquer ser

humano, portador de estímulos positivos e reacções negativas a imagens (ex: de trabalho e de lazer), a comportamentos (ex: positivos de colectivização e negativos de individualização) ou acções (ex: de negativos de produção e positivos de consumo), pode ser estudado e incentivado a um perfil produtivo, numa ligação interactiva e eficiente entre componentes opostas que traduzem um potencial criativo e inovador.

Por exemplo, se uma pessoa tem prazer em aspectos relacionados com a colectivização do património turístico, através de imagens de paisagens, classificação como de interesse nacional ou local e protecção do ambiente, em Turismo, deve ser incentivado, enquanto ligação produtiva, a colocar tal património em unidades divisíveis junto dos turistas (ex: portabilidade de informação turística em unidades móveis, miniaturização de exemplares do património, ambiente e qualidade de ar ou água colocado em pequenas garrafas ou frascos de perfume).

Ao invés, uma pessoa estimula-se positivamente na prestação de informações especializadas sobre estadia ou relaxamento em unidades de alojamento ou postos de informação turística ou venda de *souvenirs* e pequenas recordações de artesanato aos turistas deve ser incentivada em Turismo a procurar contrários, ou seja, ligação dessa informação a uma experiência de mobilização (ex: animação, conhecimento) ou a uma articulação em artesanato de conjunto entre o material e o imaterial.

Esta linha de investigação, porventura surpreendente, da aplicação das teorias sistémicas, funcionais e estruturalistas ao Turismo, nada mais resume que uma ideia fundamental, qual seja, que o Turismo é interacção, ligação, relação de compromisso entre uma liberdade pessoal de consumo e uma produção a que uma organização reconhece como representativa e integrante de um tempo de lazer em Turismo, compromisso que é percebido individualmente e organizado colectivamente como turístico.

Assim, tudo o que um individuo valoriza/desvaloriza ou é indiferente como integrante de um direito ao consumo ou que emociona positivamente/ reage negativamente ou não valoriza nem desvaloriza, como fundamental e representativo para a existência de um património e recursos turísticos organizados colectivamente, são importantes para identificação e potenciação de linhas de investigação e criatividade em Turismo.

Na verdade, para além de se indicar um perfil, diríamos psicoturístico, sobre a percepção/reconhecimento de um individuo ao que associa como positivo ou negativo em Turismo, podem ser percebidas as relações, os consensos que identificam as linhas de força de uma tecnologia de organização de relações sociais e económicas, a que atrás identificamos como Turismo, e que exprimem o potencial criativo e produtivo dos projectos e planos de negócios desse individuo nesse sistema.

A identificação das linhas de força, de relações que exprimem potenciais criativos e produtivos eficientes de indivíduos no seio de organizações, também são muito importantes para a análise da sua viabilidade enquanto sistemas eficientes de Turismo.

Assim, qualquer empregador que tenha um novo projecto ou área de negócios no Turismo deve poder contar com um sistema de avaliação do perfil produtivo e eficiente dos seus empregados ou candidatos a emprego. Igualmente, tais candidatos ou empreendedores de projectos, estratégias ou planos de negócio em Turismo devem saber como construir produtiva e eficientemente os seus currículos, em atenção e adequação ao seu perfil produtivo e eficiente nos sistemas de turismo.

Podemos exemplificar e aplicar estas linhas de investigação, através de uma figura que exprime preferências colectivas de organização de património turístico (ligadas a uma experiência de produção representativa, de identidade, orgulho sensorial e emocional) e preferências de consumo individual de qualquer produção turística (ligadas a uma componente racional/cognitiva de experiência avaliada em termos de benefícios).

Esta figura corresponde a parte de um inquérito de avaliação feito em Agosto de 2011 a um cliente, cuja identidade não se revela por motivos de confidencialidade dos dados tratados, da empresa Empreender Turismo, Lda. ([HYPERLINK "http://www.empreenderturismo.pt"](http://www.empreenderturismo.pt) <http://www.empreenderturismo.pt>), empresa que desenvolve investigação aplicada e operacional em empreendedorismo turístico aplicando metodologias sistémicas, estruturalistas e funcionalistas dos sistemas de turismo à avaliação do perfil produtivo e eficiente de clientes em projectos e planos de negócios no Turismo (Figura 1).

FIGURA 1
RELAÇÃO PRODUÇÃO/CONSUMO TURISTICO

Prevenção de danos/manutenção/conservação		Justiça pronta e acessível	
Autenticidade		Assistência Pós-venda	
Serviços de assistência/acompanhamento		Prevenção de acidentes	
Originalidade		Obtenção de respostas rápidas e adequadas	
Representativo de uma época		Formação/Educação para o consumo	
Valorização ambiental/enquadramento paisagístico		Protecção da Saúde	
Antiguidade		Informação	
Testemunho de eventos históricos/culturais/científicos		Preço	
Memória		Tranquilidade/Privacidade	
Classificação de interesse histórico/arqueológico/arquitectónico		Segurança pessoal/dos seus bens	
Educação/formação ao público/transmissão a futuras gerações		Higiene e limpeza nos serviços	
Informação e acessibilidade ao público		Facilidade de uso/comodidade	
Raridade/singularidade/exemplaridade		Garantia do Contrato	
Integração no conjunto		Manutenção/Conservação dos equipamentos	
Classificação de interesse artístico/social/etnográfico		Aptidão fins/funcionalidade do uso	
Classificação interesse científico/técnico/industrial		Prevenção contra abusos/ética do fornecedor	
Identificação/Inventariação		Participação representativa	
Ligação material/imaterial		Livre rescisão do contrato sem penalizações	

Esta figura exprime quais são as relações, ligações entre estímulos positivos (identificados a verde) de produção e de consumo turístico, também as reacções negativas (identificadas a vermelho) entre essa produção e tal consumo e as áreas intermédias (indiferença ou inércia de estímulos e identificadas a branco) em que o sujeito avaliado se percepçiona.

Em análise ao perfil psicoturístico do indivíduo avaliado, verifica-se que a componente de informação interage favoravelmente, quer em sede de produção, quer em sede de consumo turístico, aquela ligada a componentes de classificação de interesse histórico/arqueológico/arquitectónico, memória, antiguidade e testemunho de eventos históricos/culturais/científicos e o consumo ligado a componentes com características de sedentarização (tranquilidade, privacidade, segurança pessoal e higiene e limpeza dos serviços) em interacção com alguma mobilidade (educação/formação e informação) e acessibilidade ao público.

Linhas de força que exprimem um potencial emocional favorável não devem esquecer, todavia, a acção/compensação no Turismo, devendo ter-se em conta as áreas em que a sedentarização deve interagir com mobilidade e aquelas em que não reage nem

favoravelmente nem desfavoravelmente como portadoras de um potencial criativo que deve ser explorado e incentivado (ex: como interagir segurança pessoal e de bens do turista com prevenção de danos/manutenção/conservação ou como interagir sedentarização com valorização ambiental ou serviços de assistência/acompanhamento).

Estas linhas de investigação devem ser complementadas com análises de perfil sensorial/emocional e cognitivo-racional do indivíduo, acompanhadas de indicação das suas habilitações literárias ou profissionais, preferência por determinadas actividades profissionais ou áreas de negócio, territórios e actividades de consumo. Todas estas análises em conjunto vão permitir avaliar com maior eficiência a capacidade produtiva e empreendedora do indivíduo em relação ao Turismo.

A linha de investigação proposta é útil para identificar as características fundamentais de posicionamento e movimentação, o que é a base do pensamento estratégico (António, 2006), do perfil do indivíduo em relação aos sistemas de Turismo e aos seus princípios de eficiência, o que traduz um avanço na investigação científica sobre criatividade e inovação no Turismo.

Por último, e antes das conclusões finais, dir-se-á em relação à figura escolhida para integrar um grupo de trabalho nesta Conferência Internacional, que o “patinho feio” que exprime uma diferença, uma individualidade, uma singularidade em relação a um conjunto não é um défice, nem um obstáculo em Turismo para a criação e implementação de uma actividade criativa e inovadora no seio de organizações.

Por um lado, não existem “patinhos feios” em Turismo; qualquer pessoa portadora de acções e reacções, estímulos positivos e negativos entre componentes de produção/consumo; memórias e aprendizagens, tempos de trabalho e tempos de lazer; pode ser compreendida nos sistemas de Turismo e seus princípios de eficiência. Pode ser portadora de potencial produtivo e criativo a ser instrumentalizado no âmbito desses sistemas.

Por outro lado, o “patinho feio” em Turismo é uma energia mobilizadora de cargas emocionais positivas e negativas em relação à procura do que é diferente e ao que é igual (“o patinho feio” era, afinal, um cisne!), ou seja, a experiência de um tempo de lazer por oposto a um tempo de trabalho, a um local fora da nossa residência habitual e o local dessa residência. Nessas cargas reside a essência do Turismo e compreensão dos seus processos sistémicos, incluindo a criatividade e inovação. Também por essas causas (de sofrimento *versus* prazer) reside a essência da causa humana e o sucesso imemorial de um conto de histórias infantil.

4. Conclusões Finais

São conclusões deste artigo:

- a) O Turismo é um sistema, um negócio que se move por princípios de eficiência, tendo como resultado o alinhamento equilibrado de uma produção e de um consumo, enquanto componentes opostas desse sistema;
- b) Criatividade e Inovação em Turismo baseiam-se na identificação e caracterização das componentes opostas de um sistema e da relação, ligação interactiva entre eles, enquanto relação causa-efeito entre uma perturbação e a sua anulação, da qual resulta o referido alinhamento;
- c) O Turismo, enquanto sistema baseado na contraposição entre liberdade de consumo individual /responsabilidade de produção e organização colectiva interacção entre tempo de trabalho e tempo de lazer, exprime preferências individuais e colectivas organizadas numa sociedade relacional, sendo aberto a qualquer indivíduo e/ou organização em termos de projectos, estratégias e/ou planos de negócios;
- d) Processo empreendedor em Turismo, enquanto sistema aberto, pode ser ensinado e entendido por qualquer pessoa, no âmbito de afirmação da sua personalidade livre, do seu direito à iniciativa económica, criação cultural e capacidade produtiva individual.

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SNOW WHITE AND THE SEVEN DWARFS

WINDOW DISPLAY AS INNOVATION FOR THE SUSTAINABILITY OF OPORTO'S TRADITIONAL COMMERCE

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ABSTRACT

The traditional commerce in Oporto's city centre is in accentuated decay since the 1980's, partly for its inadequacy to consumption models. The urgent need to 'reinvent' it and improve its communicability, along with its historical and identity importance to the city, made us research for a solution through Design.

According to our previous research, 'Window Display' is nowadays recognized by the global brands business as a competitive factor in consumer attraction, responding for a sales increase. Therefore, innovating in traditional commerce's window displays may make a contribution to its revitalization. In a networking solution we preview different participations, in the creative process, of the diversified actors already involved, and eventually new ones, to achieve innovation and sustainability. Through design methodology, if achieved the expected results, a unique model of a creative process for window display in such commerce will be available to share with a larger area of the city.

KEYWORDS

Consumer, creative, Design methodology, innovation, traditional commerce, window display.

INTRODUCTION

The era of accelerated changes in which we are living forces us to search for quick answers to our context' problems in order to face the concurrence, and, for that, innovation might be the only antidote (Skarzynski, Gibson, 2008).

According to several experiments in the last decade, design and its methodology allow the development of better solutions for social problems, fostering innovation and producing added value. In this case study, it may also add richness to the quotidian, with profound reflex in urban landscape, consumer habits and the preservation of architectural and cultural references.

In the paper we will expound our starting PhD research case study, considering the potential contribution of window display design (visual merchandising) in the improvement of daily urban scenery and the empowerment of place identity in general, particularly for the development and innovation of traditional commerce in Oporto's historical centre.

Since the mid-1990s, creative industries have increased their importance in post-industrial economies, both to society and urban life, playing the creative class an important role in fostering social change and cultural diversity, contributing to job creation and economic growth (Florida, 2002), and being their activity even more promising when creative people tend to concentrate in the same area and taking the present juncture not as a crises but as an opportunity to reset (Florida, 2011).

On the one hand, shop windows are an aesthetic and a symbolic reference in urban landscape. Window display, which, at first sight, might be seen as a minor and very specialized sector of commercial activity, is nowadays referred to as visual merchandising design or retail design. Recently, it has been recognized for its value in attracting the potential consumer, and for the reinforcing of a brand image, thus increasing sales.

On the other hand, in Portugal, the traditional commerce is in accentuated decay since the mid-1980s due to changing consumption models and mostly to the proliferation of big commercial areas (supermarkets and shopping centres) in the suburban areas of most of the cities. For being a kind of commerce which, opposite to chain stores of internationally known brands, cannot afford a significant budget for the branding purpose (as window display), our goal is to achieve an innovative but cheaper solution for their window displays, through collaboration in a win-win situation of networking.

BACKGROUND

According to our previous research (Guimaraes, 2010), 'Window Display' is nowadays recognized by the global brands business as a competitive factor in consumer attraction. Responding for a sales increase, besides the products' exhibition, it is one important kind of branding, acting as a vehicle of communication of the brand's/store's values and identity. Considering window presentation's dynamics as a communication act (Jakobson, 1960) we understand the importance of its main elements – window display designer ("sender"), consumer ("addressee"), urban, economical and sociological context ("context"), shop window ("contact"), "message" and "code", – and their potential as an interactive system. Having a closer comprehension of the principles of a more effective window display, we take into account that the passerby not only often feels attracted by a lifestyle communication but also by an original and arresting display, which promotes it as a competitive factor.

Lately the brands with chain stores and those which have been investing in retail design (as window displays and the stores' architecture) have shown a preference for specific areas in the cities – the main commercial and tourist streets – trying to benefit from each other's presence.

Window display design is still a theme of few researches, starting to slowly gain academic and company research, but creating each day richer and more seductive spaces, artistically and culturally, with the goal to attract the potential consumer and reinforce the brand's image and identity. Most global brands, especially the luxury ones, aware of the window presentation potential, have been investing in artists from different domains to create their attractive window displays. Therefore, whether the windows' displays are carefully designed or not, most neighborhoods end up reflected in its stores' windows, revealing their particular identity, their context, and becoming at times important touristic references or the first impression of the tourist arriving in a new city (Demetresco, 2005).

OBJECTIVES

Through Design methodology, we intend to verify if by applying the same main principles of known brands to the so called traditional commerce (whose budget is much more restrained than one from a major brand) we can also attend the goal of inducing the potential consumer, turning him to a real one and benefiting him with a more meaningful and pleasant urban scenery, and so, within a creative city context, contribute to the revitalization of Oporto' historical centre's traditional commerce.

OUR MAIN ELEMENTS

OPORTO'S TRADITIONAL COMMERCE AND ITS DOWNGRADE

In Portugal, the billing volume of the traditional commerce in 1985, when the first big commercial areas started appearing and proliferating, was of 86% and, 25 years later, the billing volume of the same commerce is only of 12%, loosing for supermarkets and shopping centers (Lima, 2010).

The city of Oporto has followed this trend and the number of stores that cannot resist to the concurrent market and the present economical situation has been rapidly increasing, what makes urgent to find the means to avoid their disappearance. Besides that, according to an exhaustive survey (Branco, 2009), a great part of the traditional commerce stores in Oporto's city centre (downtown) is considered of architectural value, historical and cultural, due to the city's urban development as "City of Commerce".

In the scope of window display design as communication, the "context" has a *referential* function, it emphasizes the message content and, directing to the circumstance and surround aspects, it informs. For most global brands, the context, in means of location, brand and trends, works often as selling argument, as for its own gives "signs" about the brand, its kind of consumer and the moment trends. It influences the window presentation

and the consumer. The window location, concerning to urban space, may assure it a better visibility and a predisposition of the potential consumer to pay attention to it. It may also work only as a way to sell the brand's concept, that is, as branding. Therefore, location, brand and trends must be part of the research and analyses for intervening in window presentation. So, to work as selling arguments and attraction factors will have to correspond to the characteristics of a specific market sector, implicating an adjustment between what the consumer wants, his or her preferential locations and the sociodemographic characteristics, which determine habits and consumption preferences.

Therefore, the traditional commerce in Oporto's city centre should try to use its advantageous "branding" characteristics in its own favor and prosperity, such as location and architectural character (aspects with great touristic potential), as well as a typical familiar attendance, emphasizing its particular identity.

THE CREATIVE CITY AND ITS CREATIVE CLASS

Creativity is an essential tool for urban development and success; when "reinventing" what intends to be a creative city, its image improvement and the preservation of the cultural identity of the place are the core issues, regarding renovation and regeneration of the public space for a consequent revitalization (Landry, 2000). This idea matches in a symbiotic way with the rise of the creative class (Florida, 2002) and the concept of a creative cluster, that is, in a logic of creative economy, as means of developing an urban area through a synergetic net of entities and policies where the creative industries play an important role for the common wealth of the society.

Oporto's University is one of the oldest and most renown in Portugal, including in its Arts Schools, where in the last decade the number of graduated students has considerably grown in most of the creative industries (architecture, design, painting, sculpture, photography, cinema, etc.), a human capital which is underused and having great difficulty to find its place in the labor market.

Nevertheless, the 2008's survey "*Desenvolvimento de um Cluster das Indústrias Criativas na Região do Norte*" (Development of a Creative Industries Cluster in the North region of Portugal) formalizes the political evaluation about the importance of these activities in the north region (Martins, 2009), following Landry's and Florida's theories. Also the strategic study "*Masterplan*" (Porto Vivo – SRU, 2005), for Oporto's development confirms the relevance of its traditional commerce revitalization, as well as tourism, as one of its main vectors, supported by its identity and unique characteristics to increase competitiveness and sustainability. According to the "*Masterplan*", revitalizing the historical centre should evidence characteristics that foster the return of economic activity to that area, supported in new principles and factors of competitiveness as administration, design, marketing,

communication, research and product development, knowledge and innovation. The area defined as prior in this plan is the one where our research by project will intervene.

WINDOW DISPLAY DESIGNER, a.k.a. VISUAL MERCHANDISER

Image and communication have a massive presence in our daily life. Mere functional answers are not enough to satisfy the consumer, who tends to be more attracted by its senses and emotions. The industry wants to sell and the public wants to consume, each day expecting more beside the product itself. That is when the spatial relations of the individual with the store/city gain importance, showing how the public retains images through a connection between material space and personal *imaginarium*. In those relations the city gets shaped through its windows and commerce (Demetresco, 2005) and then is when the designer's activity and creativity may make the difference.

“Statistics show that the consumer's glance at the shop window doesn't take longer than ten seconds. Still, the window display is responsible for 70% of the sales” (Demetresco, Maier, 2004).

The window display designer (“sender”) has the *emotive* function in communication, which, as a result of its personal attitudes and choices, is subjective. The window presentation designer of a preeminent brand is usually a qualified professional with skills which differ widely from the traditional window displayer (who is the technician, not the creator). A decisive and creative part is trusted to the first, who is more and more determinant in the brand's message communicating process, convincing the client and inducing him to consumption and satisfaction through the products exhibition. This professional must build a seducer and strong message, which contains a narrative that allows to each passerby a personal/individual reading in a way that a “contract” and an emotional bound take place between product/brand and consumer. Such product, with an individual and cultural meaning must, in some way, represent the store's content and the brand's (store) identity and values, being synthetic and characterizing a lifestyle to which the consumer feels identified. Therefore, in such brands, the window presentation designer is usually an arts professional (designer, architect, set designer, etc.) with considerable visual arts and semiotics knowledge.

CONSUMER

The consumer (“addressee”) has the *conative* function in communication, which tries to involve him and make him adopt a certain behavior. He is seduced by stimulus, usually at sells point, through the perception process, being the lighting design also an attraction factor. The products exhibition as well as the packaging and promotional materials in the store can be stimulus. Therefore, as many buying decisions aren't made until the consumer is at the

store, the stimulus at the sells point are important as selling instruments, especially useful to promote the shopping impulse, by provoking in the consumer a rapid need to have the product. To stimulate consumption, sensory marketing is very used, for it makes the consumer live the buying experience according to his own knowledge universe. Semiotics study is important to understand the consumer behavior because it examines the correspondence between signs and symbols and its part in meaning attribution, that is, how to communicate with the consumer when creating relations between the products and the desired attributes, existing a correspondence between stimulus and meanings of signs. The consumer uses products (with learnt meanings) to express his social identity; the memory process has a fundamental role as it is through recognition that the potential consumer gives meanings to the signs being possibly induced by them to shopping. The potential consumer projects his emotions on the window, his or her identity and a new proposal on lifestyle in terms of use. For this reason, consumption can be understood as identity creation (Solomon, 2008).

INSIGHTS

The traditional commerce stores in Oporto's city centre demand for an urgent solution that allows them to 'reinvent' themselves, to improve their communicability and so attract the consumer, in order to resist the present juncture. Therefore, our PhD research intends to find a solution through innovative window displays, improving the urban scenery and empowering the place identity in general – a contribution to a place which intends to be integrated in a Creative Industries Cluster. For such reinvention, design methodology, according to the reflective-practice paradigm (Dorst, 1997) is predestinated, for being an approach for the creation of systemic solutions, the kind of solution necessary to social innovation challenge (Brown, Wyatt, 2009).

Our first insight is that we should "bring things together". The above referred elements (creative city, creative class, traditional commerce, window display design and consumer), seem to have a possible link, in the present juncture, for their purposes, difficulties, needs and goals. Our ambition is to achieve a possible "plan" for them, to structure these elements (or related entities), and eventually new ones, in a synergetic and multidisciplinary net. We foresee the involved elements as rich sources of inspiration for the innovation through the creative process, in return adding value to themselves.

Field research will play an important role in our design methodology on this research by project. From the narrative that we will be able to construct, with the collected data on the traditional commerce of Oporto's city centre, we expect to emerge significant information, questions and inputs to work on/with. We will gather, select and combine diversified inputs

throughout the creative process, to ideate, test and implement a model of window display which proves to give a positive performance feedback on Oporto's traditional commerce.

This design methodology consists of a way of thinking with multiple perspectives, connections and variety, through proceedings which challenge known solutions and substitute old strategies, stereotyped and preconceived perceptions, in a creative process which is iterative and flexible. In a holistic and systemic perspective of ideas emergence in the creative process (Tschimmel, 2009), each participating element, according to its knowledge and experience, may contribute with different kinds of inputs (tangible or intangible) for a sustainable solution of networking.

This creative process, "administrated" by the designer (who is also the researcher), considers, in a win-win situation, several possibilities (among others) such as: the enhancement of the theme's reflection; the establishment of relationships with the media, economical, cultural, political and social entities; the promotion of other economical, cultural and social projects that enrich the studied area; the creation of a new training pole for further technical advisory to the solution's sustainability.

Taking its first steps, we may say that our network already started with the agreement and interest of collaboration of the advisor professors on the author's PhD research in Design, as well as with FCT's fellowship, for considering it a research of interest to the city of Oporto. Nevertheless, our ambition is to conquer other entities' interest for financial or material sponsorship in return for publicity; also the participation in the creative process of other professional or students in the creative industries is considered valuable, resulting for them as means of getting professional experience and portfolio.

Within the nature and constraints of a scientific research and design methodology, that considers the co-evolution of problem-solution (Cross, Dorst, 2001), we expect to contribute to a significant solution for the traditional commerce's problem, and so to the society.

"being creative does not mean that someone is only concerned with the new. Instead, there is a willingness to review and reassess all situations in a flexible way. At times, one needs the courage to either change things if required or to have the sound judgment to keep things as they are after reconsidering things openly. Therefore, history and creativity can be great partners: often great achievements are combinations of the old and new." (Landry, 2000)

NEXT STEPS

Taking these insights into account, we are now reviewing a range of methods and tools at the designer's disposal, which stimulate the fluidity and originality of his creative

thinking (Baxter, 1995). Then, we will soon start the first stage of the field research – observation *in loco*, and consequent analysis of the collected data in order to make a selection of our pilot stores: the ones to which we will create and implement new window displays, in order to test and verify their impact on the potential consumer. If achieved the expected results, we expect to define a model (or set of principles) to share with a larger area of the city and so contribute to the revitalization of Oporto's traditional commerce, and further to Oporto, as a creative city, a creative industries cluster in the north of Portugal.

In order to impart the kind of questions that may emerge from such an iterative process, a natural consequence of such researches by project within the reflective-practice paradigm of design methodology (Dorst, 1997), we intend to publish our next steps as well as our final conclusions.

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INSPIRING A COLLECTIVE VISION: THE MANAGER AS MURAL ARTIST

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Abstract

The global marketplace demands an organization that can quickly innovate and respond to new opportunities. This requires ways to unify diverse ideas and perspectives around the world. The opportunity to use art as a process for creating global understanding and support is based upon the ability to encourage individual reflection and collaborative exchange. Visual forms can bridge cultural differences in order to improve sense-making and connection. Since mural art is based on the development of a shared vision, it can help facilitate team interaction and collaboration across functions and cultures. This paper discusses the potential of the mural art process as a group facilitation method in developing a collective vision for innovation initiatives. In addition to promoting idea generation and consensus-building, this art form can provide a collaborative space for aligning and inspiring global team members to envision and create successful results for the innovation journey ahead.

Keywords: shared vision, cross-cultural collaboration, team-building, group facilitation, creativity, art-based methods, idea generation, consensus-building

Introduction

When leading change, leaders are often faced with the challenges of building trust, understanding, and support throughout the organization. How to align teams and capture commitment becomes a continuous question. In IBM's global study (2008), a majority of companies (60%) stated that changing mindsets and attitudes were the biggest challenge to implementing change. Senge (2006) views a shared vision as the first step in building trust and to working together in order to create a common identity. However, shared visions need to emerge from personal visions in order to ensure commitment. According to Kotter (2007), vision plays a key role in producing useful change by directing, aligning, and inspiring the actions of many. Innovation effectiveness, team dynamics and shared vision are closely related as research suggests that shared vision occupies a core role in the team innovation process (Pearce and Ensley 2004). The way a manager delivers and communicates a vision often influences its successful acceptance, understanding, and relation to the innovation project.

The role of art in organizational learning and change

As we face an increasingly chaotic and complex business world, managers need to master new ways of learning and understanding in order to innovate in the global marketplace. Creativity is thus becoming an important process for accelerating innovation and mobilizing change throughout the organization. With the growing focus on innovation and creativity, arts-based methods have attracted more interest from organizations who are seeking to better prepare their managers for a dynamic market (Adler 2006). In offering a universal language, the art form is becoming a way to unify diverse ways of thinking and creating new meaning. Reckhenrich et al. (2009) emphasize that creativity is a key skill for leaders and organizations to adapt to change and to proactively shape industries and markets. As organizations pay more attention to innovation and creativity, art practices have increased as a way of facilitating learning and communication. This paper addresses the potential of mural art as a process for building a shared vision for organizational initiatives. In addition to facilitating the exploration and development of new ideas, this art form provides a collaborative space for participants to envision and create new opportunities and solutions.

The opportunity to facilitate sense-making and understanding

Art is increasingly being used as a way to develop identity and understanding for the organization, team, and individual. According to a study by Kottasz et al. (2008), more than half of the Fortune 500 companies and around 2000 other major enterprises in Europe and North America are using art as a process for corporate identity management in communicating the organization's vision and values to employees. The opportunity to use art as a process for creating global understanding and support across cultures is based upon the ability to encourage individual reflection and collaborative exchange. Linstead (2006) suggests that aesthetic forms play an important role in making tacit knowledge more visible for cultural concepts. According to Grisham (2006), leaders and managers can use art to facilitate sense-making across cultures. There is an opportunity to evaluate and understand the interdependencies within the organization. Art can effectively show essential aspects of a subject and guide our actions through its visual elements (Taylor & Ladkin 2009). The process of working with visual elements enhances our understanding of the overall purpose and the path needed to achieve successful results.

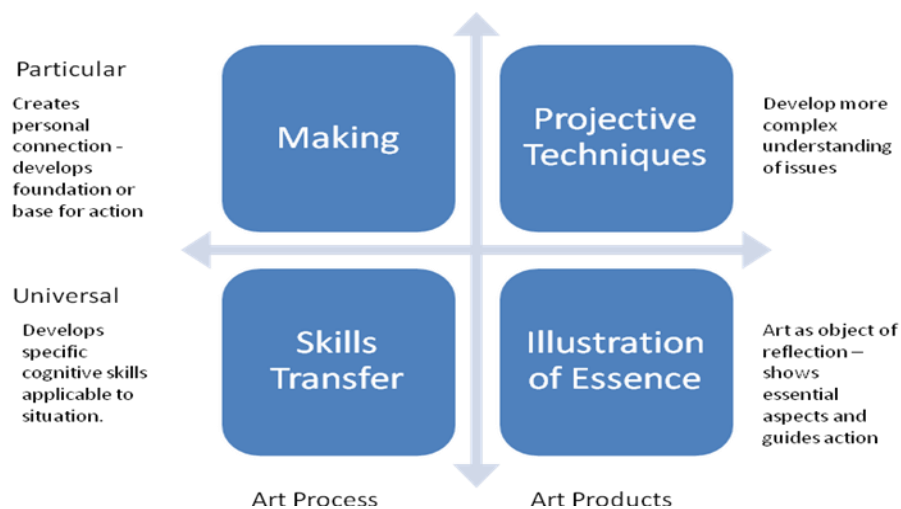


Figure 1: Typology of Arts-Based Processes (Taylor and Ladkin 2009)

In order to effectively use art in organizational learning and change, it is important to understand the arts-based method process typologies. Reckhenrich et al. (2009) note that managers first need to understand the principles of creativity and develop the mindset, attitude, and knowledge of where, when, and how creativity will emerge in order to find new solutions. Taylor and Ladkin (2009) have developed a theoretical framework that demonstrates four key elements in the creativity process found in various art forms (as shown in Figure 1): Skills transfer, projective techniques, illustration of essence, and making. Skills transfer refers to the development of artistic skills that can be applied to organizational situations. Managers can learn to perform their roles more effectively by experiencing specific skills. In using projective techniques, the output of artistic initiatives allows participants to express their thoughts and feelings. This technique is especially useful in helping managers understand meaning making for complex organizational issues. Illustration of essence helps participants to understand the “essence” of a concept, situation, or tacit knowledge in a particular way. Art can help managers personally connect with universal aspects of a management issue. Finally, the making of an art can foster a deeper experience of personal presence and connection for managers and leaders.

We have seen how art can be used to facilitate understanding and communication within the organization. In a cross-cultural context, it is especially useful in bridging cultural gaps in order to facilitate sense-making and connection within a global team. Since mural art is based upon the development of a shared vision, it could help managers facilitate team collaboration and interaction across the organization. It is therefore of great interest to examine mural art as a process for developing a collective vision.

Research Question

This paper intends to evaluate the mural art process as a vehicle for developing a collective vision. In addressing this purpose, the following research question emerges:

- How can the mural art process facilitate the development of a shared vision across cultures and functions?

Methodology

The methodology used in this paper is a theoretical approach based upon a review of literature in arts-based methods. In addition, the author has used her own experience in mural art painting projects to define the process. The Taylor & Ladkin typology of arts-based processes is then used to demonstrate the learning benefits of the key phases of mural art making. By mapping the mural art process to the typology of arts-based processes, we will explore the opportunities for mural art to contribute to the collaboration required in facilitating the development of a collective vision. A special focus will be placed upon the needs for creating a global vision and facilitating communication within teams and across the organization.

Mural Art as Inspiration for Creating a Collective Vision

Throughout the ages, mural art has served as a means for communicating significant historical events as demonstrated by the religious fresques by Michelangelo to the political mural paintings by Diego Rivera. As a public art form, mural art has evolved throughout the last century to represent visual expressions painted on public, commercial, and historical buildings in various neighbourhoods and cities throughout the world. It is an art form that has managed to capture the imagination of artists, participants, and the public by inviting the creation of a shared vision. In the last two decades, mural art has become increasingly popular as a way to restore community identity and pride. Small, historical towns from North America to Europe to Tasmania have used mural art to revive their economies and establish their towns as tourist attractions. While mural art has existed for centuries, it is still an art form with little formalization as only a few professional associations and art schools offer courses worldwide.

Mural art has been selected as a highly suitable art form for collaboration due to its focus on developing identity and community. The process of creating a community mural involves the development of a vision and a group identity. This art form favours self-expression and group exchange among its actors in developing a socialization process from concept to execution. Mural art facilitates participation and communication through a visual artefact, the

mural painting. In referring to the Taylor and Ladkin model, the mural art form applies both creative and reflective processes that support all aspects of skills transfer, projective techniques, illustration of essence, and making.

The Mural Art Process

Mural art has several stages that move the artist or actor from theme development to image development to the art of painting. This process has been summarized and organized into four key phases based upon the author's experience and insights from working with mural art instructors, artists, and art projects. The following are based upon the interpretation of the instructor as well as the student in creating a mural art project within a team:

Concept Phase – Skills Transfer and Illustration of Essence

The concept phase involves theme development and intense team interaction. The participating team is invited to initiate an interactive discussion in order to generate new themes as a group. This process facilitates the synthesis of individual and group visions. The session is guided by several questions in order to identify what is relevant and valuable to the community, personal identity, and group culture. Who is the audience and who does it reflect? What is important to the individual, the group, and the community? What are social, economic, cultural, and political concerns? The process employs various methods and phases involving brainstorming, graphing, list-making, and drawing associations.

The process of brainstorming and visual mapping of themes unites the team around a common method of evaluating and defining their vision. This particular phase makes effective use of the 'illustration of essence' and 'skills transfer' elements presented in the arts-based methods model. Through the brainstorming and concept mapping processes, each team member participates in the communication process in order to evolve their understanding and identification of the concept. By creating and relating through imagery, the team learns to relate in a new way that helps identify interdependencies and connections that ultimately result in a common vision. During this process, team members learn new skills for developing and communicating ideas that can facilitate teamwork and collaboration within the organization.

Design Phase - Making

Upon entering the design phase, the main objective is to develop imagery and form based upon the theme (from pictures, symbols, and shapes). Group members need to think visually and develop sketches from the selected images. The overall visual layout is determined through a discussion on placement, scale, and image for visual impact, flow, and

unity. A sketch is developed through observational drawing, thumbnail sketching, and tracing. The design phase makes use of the 'making' phase of the arts-based methods model. By participating in the development of the design and layout of the theme, team members develop a deeper personal presence and connection with other members. They are involved in the development of the final images, the design of the layout, and the selection of colors. This develops engagement and commitment to the mural art process. In transitioning from the concept phase to the design phase, each actor has a role in exploring, visualizing, communicating, and developing the final mural art drawing. This creates a renewed sense of fulfilment for the mural art team.

Creation Phase – Projective Techniques

The creation phase brings the team together for the implementation of the mural art project. Prior to painting the wall, there is a brief preparation period required to prime the surface and ensure the day can be devoted to the actual painting of the image. In order to successfully execute the project, it is important to ensure that every team member understands their role and their responsibility in painting a specific image within the mural. In order to maintain unity and cohesiveness in painting the images, the team needs to coordinate and integrate their actions very carefully. In creating the mural art painting, the team creates an artistic output which translates to the arts-based method 'projective technique'. The team has the opportunity to express the common theme and vision as a true artefact. The process of discussing and integrating their painting methods allows the actors to consider different perspectives and communicate different points of view. In painting the global vision and theme, actors are able to process the multiplicity of meaning making concerning organizational elements and issues that surround the theme.

Reflection Phase – Mural Art Process

The conclusion of the project is a time for reflection and celebration of the team process required to create the shared vision reflected within the mural art piece. The team has the opportunity to review the process of sense-making from concept to implementation. It becomes important to review and discuss the process and skills learned and applied during the concept, creation, design, and reflection phases. The mural art form applies creative and reflective processes that support skills transfer, projective techniques, illustration of essence, and making. The team has thus experienced a complete project process where it has the opportunity to reflect and improve facilitation and communication skills necessary for successful teamwork. The mural art process finally provides the team with an artefact that serves as a group identity and visual reminder of the organizational mission.

As discussed in the previous section, mural art can be used for the development of identity in creating a shared vision. Mural art has succeeded in reviving communities and cities through renewed dialogue and participation in the development of a meaningful artefact – the mural painting. It is therefore interesting to consider this art form as a facilitation process for managers in strengthening team collaboration for organizational initiatives. Mural art requires the team to seek inspiration and to imagine the common goal necessary for creating change. This helps align the team by integrating diverse perspectives and ideas in order to build support and consensus for the new project. The entire team is highly interdependent on each other to develop imagery that will create a mural. In moving from inspiration to creation, the process helps build team collaboration and commitment for improved performance. When the work is completed, the team has a true artefact and a visual identity that provides a common vision and road map.

Limitations and Opportunities

Since the integration of arts-based methods with business practices is an emerging field, there is limited formal research available to validate current theories and practices. Although Taylor and Ladkin (2009) have developed a clear theoretical framework, they also admit there is much research needed to test their conceptualization and to refine it. There is also the question of context and how the four processes are enhanced or inhibited by a specific process. The Taylor and Ladkin model also refers to individual development and has not fully explored group development. In order to fully test the effectiveness of the mural art process, there would need to be experiential research with a specific situation involving a global team working on a change initiative. The proposed mural art facilitation process has been applied within the classroom in facilitating a team project. We could further apply this process within a classroom or workshop context in testing and evaluating the activities that apply to facilitating a collective vision in enhancing success for organizational initiatives.

Conclusion and Discussion

As discussed in this paper, business leaders and managers can learn to navigate change more successfully through the influence of artistic thinking. In order to successfully manage innovation and change, leaders and teams are increasingly looking toward design and art for new solutions. The mural art process brings a rich integration of the artistic practices needed for conceiving, managing, and solving innovation projects. It is therefore interesting to consider this art form as a facilitation process for managers in strengthening team collaboration for organizational initiatives. Mural art requires the team to seek inspiration and to imagine the common goal necessary for creating change. This helps align the team by integrating diverse perspectives and ideas in order to build support and consensus for the

new project. Mural art is an art form that can serve managers through its ability to create vision and develop community identity. In moving from inspiration to creation, the process helps build team collaboration and commitment for improved performance.

Could mural art be considered an approach for developing successful innovation initiatives? Would it be an effective team development vehicle for establishing a new vision and commitment to the project? It has been demonstrated as a highly successful approach to transforming ailing communities through the creation of a renewed vision and group identity. It is yet to be seen whether this approach could be as successful within an organization. This paper provides a theoretical view of the mural art process as a tool in facilitating collaboration for teams and the organization. This can also stimulate thought upon the use of various artistic practices in organizational learning and change.

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THE COMPARISONS OF GENDER DIFFERENCES IN PLAYFULNESS, HUMOR AND CREATIVITY OF POSTGRADUATE STUDENTS BETWEEN MAINLAND CHINA AND TAIWAN

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Abstract: This paper aims to study influences from regional cultural differences and gender differences on fostering creativity in postgraduate level education between Mainland China and Taiwan. From the departure of viewing creativity as a socio-cultural conception, playfulness and humor are focused as two main aspects influencing creativity in this study. The findings lead some discussions on how gender differences in creativity are influenced by socio-cultural environment.

Keywords: Gender differences; Regional cultural differences; Playfulness; Humor; Creativity

1. Introduction

Creativity involves the ability to offer new perspectives, generate novel and meaningful ideas, raise new questions, and come up with solutions to ill-defined problems (Amabile, 1983; Sternberg, & Lubart 1995; Simonton, 2000). It has been viewed as the ultimate economic resource (Florida, 2004) and as essential for addressing complex individual and societal issues (Runco, 2004; Plucker, Beghetto, & Dow, 2004; Beghetto, 2007). Though the ideas, questions or solutions originate in minds, there are a growing number of studies suggesting creativity is fundamentally a socio-cultural conception, affected by shaping forces from social and cultural environment (e.g. Csikzentmihalyi, 1999; Sternberg, 1999; Paulus, 2000; Claxton et al., 2006).

Inspired by the socio-cultural perspective, the social psychologist began to focus on factors of creative personality such as humor, playfulness, attitude, and confidence, etc., as well the reflections of individuals from the environment where they are such as climate (Ekvall et al. 1987; Amabile 1996; Ismail, 2005). There are also studies showing how these factors influence each other within a given context (e.g. Amabile 1996). Accordingly, some

instruments such as Torrance Test of Creative Thinking (TTCT) (Torrance, & Ball, 1984), Creative Climate Questionnaire (CCQ) (Ekvall, 1996), and Idea Producing Scale (Basadur, & Hausdorf, 1996), etc. have been developed and employed practically for examining the different aspect factors and their relationships (Fu, & Luo, 2000)

Relating these findings to the educational context, a series of studies on creative thinking skills, creative teaching, creative learning, creativity training, and creativity assessment, etc. have been explored during the past years (e.g. Amabile, 1983; Csikszentmihalyi, 1996; Craft, 2005; Persaud, 2007; Kazerounian, & Foley, 2007; Grossen, 2000, 2008). With a broader view, many studies on regional, cultural or gender differences and creativity have been discussed in order to deepen understanding of creative teaching and learning (Felder et al, 1995; Craft, 2005; Grossen, 2000, 2008). These issues have also drawn much attention by researchers and educators in Asia especially different areas in China (e.g. Luo, 2001; Zeng, 2002; Wu, 2004; Yu, 2006; Cheung, & Yue, 2007; Yang, 2009; Chen, & Hui, 2010).

The theoretical research has facilitated governments to formulate educational policies on creativity. For example, the recent emphasis on the development of creativity in Chinese students across various educational levels is highlighted in both areas of Mainland China and Taiwan. Creativity has been encouraged in higher education in Mainland China (Ministry of Education of the People's Republic of China, 1998) and stressed as the major theme in educational reform of China in the 21st century (Zhou & Kao, 1999). Similarly, an official white paper on Creative Education: Establishing a Republic of Creativity for Taiwan, published in 2003, advocates a multi-level approach to fostering creativity at the individual, school, societal, industrial and cultural levels in Taiwan (Chen, & Hui, 2010).

The aim of this paper is to study influences from regional cultural differences and gender differences on fostering creativity in postgraduate level education between Mainland China and Taiwan. Employing the psychometric instruments revised and developed by researchers in Taiwan, this study surveyed some postgraduate students on playfulness, humor and other relating factors to creativity in both areas. A series of important results are found from the comparisons between the two areas, which lead to the further discussions on gender differences and regional cultural differences in creativity. Therefore, this study has contributions to deepen understanding of creativity as a socio-cultural conception, and get implications for creativity development in higher education.

2. Literature Review

2.1. Understanding of creativity, playfulness and humor

During the past years, the development of scientific thinking about creativity has followed a trajectory that: an early emphasis upon isolated individuals and their internal

traits and capabilities, followed by a developing focus upon the interaction between the individuals and the environment (Sternberg, 1999). Furthermore, the analysis of creativity in diverse cultures shows that creativity is context dependent. Culture provides a set of facilitating and inhibiting conditions for creativity that influence the general levels of creative activity (Lubart, 1999). These points have driven researchers to focus more on “where creativity is” and “how creativity happens” than “what creativity is”, especially for those who are working within the framework labelled with socio-cultural.

Accordingly, social psychologists began to emphasize the “internal traits and capabilities” relating to creativity such as personality, cognitive style, sense of humor, attitude, and playfulness, etc. should be examined in a given culture context (e.g. Amabile, 1983, 1996). Correspondingly, “climate” has been used to describe “the recurring patterns of behavior, attitudes, and feelings that characterize life” in organizational environment (Ismail, 2005). It was also pointed out that these factors affect on creativity interactively within the context system (Amabile, 1996; Fu, & Luo, 2000).

“Playfulness” and “humor” have been discussed as main psychological characteristics influencing creativity in previous studies. According to Webster (1999), the earlier understanding of playfulness was the traits that personal tendency to freedom demonstrated in games or leisure activities. Thus “freedom” is embedded in nature of playfulness. As one of the relatively stable characteristics, it has been found with some positive impact on academic achievement, working performance and creativity development (Taylor, & Rogers, 2001). Therefore, researchers suggested that persons should achieve more learning experience with playfulness during childhood in order to improve problem-solving skills in the following periods in education (Barnett, & Fiscella, 1985).

Humor can be seen as a trigger stimulating reactions from cognition or emotion (Fu, & Luo, 2000). It has also been suggested as the ability to appreciate humor, which means to be able to understand information of humor created, and the ability to create humor as well. Thus the humorous individuals are good at building connections skillfully among persons, objects or perceptions seemed irrelevant, and sharing the connections with others simultaneously (Zeng, & Wu, 2003). Humor therefore is beneficial to collaboration, communication and learning. It may influence creativity directly or indirectly (Fu, & Luo, 2000). Holmes (2007) conducted a study on humor and creativity in workplaces, which led findings that humor created by persons could promote their working relationships and stimulate motivation and intelligence associated with the goals of work.

There are also studies emphasizing the similarity of playfulness and humor when their influences on creativity are examined. For example, as being “the perceived ease and spontaneity, a relaxed atmosphere with laughter and joke”, they are proposed as one

common factor of creative climate in Ekvall's research (1996). Meanwhile, the common factor "playfulness/humor" is interacted with other factors such as challenge, ideas support, risk taking, conflict and so on in organizational environment. Furthermore, there are studies to explore how the two factors interact with other factors from aspects of academic achievements, creative attitude, behavior, or life experience (Ai, 1999; Zeng, 2003; Yu, 2006; Yang, 2009). However, ways of expressing or understanding humor and playfulness should be diverse among people across areas, for characteristics of personality are shaped by cultures to some extent (Fu, & Luo, 2000).

2.2. Studies on regional differences in playfulness and humor of Chinese

The sense of humor and creative humor abilities of the Chinese might be different from the other nationalities, due to the cultural differences (Fu, & Luo, 2000). Thus a model named "Chinese Humor Scale (CHS)" was developed by researchers in Taiwan (Hsieh et al., 2005), which includes four factors that "humorous creativity", "tendency to laugh", "perceptivity to humor", and "humorous attitude." A total of 405 participants including students in medical colleges, doctors and nurses were tested for the model development. Even within the Chinese context, studies have demonstrated the regional differences of playfulness and humor.

Rudowicz and Yue (2000) surveyed 451 university students who came from Peking, Guangzhou, Taipei and Hong Kong on their understandings of creativity by using 60 adjectives included in Likert Style Questionnaire. Besides the common perceptions found, there were differences in perceptions on "innovative", "dynamic", and "intelligence" of the participants from the four cities; the most interesting finding was that "artistic" and "humorous" were missing in the Chinese perceptions of creativity.

Yu Bin, a professor in Taiwan Gaoxiong Normal College, carried out a comparative study (2006) by "Adult Playfulness Scale" (Zeng, 2002) among Mainland China, Taiwan and Hong Kong. Aspects of playfulness of teachers, organizational playfulness climate, teaching innovation, work satisfaction, and work performance of general situation were focused on in comparisons. From analysis on its prediction role between individual level and organizational level, it was found that playfulness was the important predictor to teaching innovation, work satisfaction and work performance in all three areas. However, the different influences from two the levels indicated cultural difference between the East and the West, as well the teacher differences among three areas.

Yang (2009) employed "Adult Playfulness Scale" and Cartel-16 Personality Factors Test and Symptom Self-Test (Yu, 2006) as instruments, selected students from 8 universities in Nanjing as samples, and aimed to survey the status of playfulness among Chinese university students, as well the relationships among playfulness, creativity and personality. The survey showed that factors of "humor to relax" and "playful spirit" had

negative correlations with creativity, however, the three factors of “humor to relax”, “be happy to create” and “persistence” may predict creativity.

2.3. Studies on regional differences in creativity related to Chinese

By using a metaphor, Wu (2004) described the creativity of Chinese students currently is waiting for the right moment to “let the dragon take off into the sky and the tiger spring into the wilderness”. In other words, though creativity of Chinese students has been found to be improved in education, but the general level is still lower than in some other countries. For example, in a comparative study conducted by Wu and his research team, they found that Taiwanese students were less creative than counterparts in U.S. Therefore Wu emphasized some barriers should be broken for Chinese students to develop creativity. In his further studies, the barriers were pointed out as “emphasizing examination outcomes and ignoring the process of learning”, and “stressing creativity taught as knowledge and neglecting creativity inspired through the process of involvement” in Chinese educational environment (Wu, 2004).

Wu's points are matched with the results from a study of Luo (2001). By Torrance Test of Creative Thinking (TTCT) (Torrance, & Ball, 1984), Luo found that the scores of “resistance to premature closure” from Chinese college students and middle school students were lower than American standard deviations ($P \leq 0.01$). As Torrance (1988) believed that the creative persons are able to keep enough time to delay the tendency to closed thinking, thus their abilities of rejecting closed minds are stronger, which drive them to be more creative. However, the less creative persons tend to get conclusions so quicker that they have no time to exchange information. Therefore the underlying perception and attitude that “thinking faster is better” drive them to pursue thinking speed much more than novelty of ideas.

Cheung and Yue (2007) carried out a survey with a large number of samples by asking students to point out the famous creator according to their fame, creativity and social contributions. The results showed samples had similar perceptions that persons like scientists and the other professionals were more creative with better fame and more contributions. However, influenced by the commercialism in Hong Kong to a great extent, the perceptions on the sustainability of fame were different between Hong Kong and Mainland China.

2.4. Studies on gender differences and creativity

Gender differences in creative behavior and personality are related to both physiology and socio- culture (Reis, 1999). The researchers therefore have concerned more about influences of gender differences on females' academic achievements and social contributions. For example, Ai (1999) researched the relationships between creative thinking characteristics and academic achievements in 2264 students from 68 schools in

Spain by TTCT. He found creativity was related to academic achievement for both boys and girls. But “flexibility” was the predominant factor for boys, which related to 6 subjects. This is different from what was found from girls – “elaboration” was related to 4 subjects and “fluency” was related to natural science and mathematics.

Besides creative thinking characteristics, gender differences in motivation have been discussed (e.g. Amabile, 1983, 1996). It has been thought as being caused by external factors to a larger extent and also has effect on differences in academic achievements (Ai, 1999; Weisman, 2000). For example, Baer (1997) asked some middle school students to write poems and stories in his experimental studies on conditions of intrinsic and extrinsic motivations. The experts were invited to assess students’ products for creativity. The results showed that the Gender x Motivational Condition was significant ($p = .01$). Girls’ creativity was decreased much under extrinsic constraints, but boys’ was not. This demonstrated that the girls cared more about external evaluation than boys thus they have stronger scene existentiality. However, the boys have stronger scene independence. For girls have been always be educated with dependence since they were born, these differences are highly related to social and cultural environment,

There are also researchers focusing on creativity by taking departure from academic achievements, thus some women with creative contributions were selected as samples for studies on their physiological traits. For example, Helson (1996) compared a group of women mathematicians with counterparts who were less creative. There were no differences in intelligence, cognition, and masculine traits. But the creative samples had more vitality, flexibility, originality, and better in rejecting outside influences. Moreover, half of them were born in foreign countries, and most of whose fathers were mathematicians, too. Therefore influences of family and society are more than their physiology on their academic achievements.

However, studies on self-assessments on these differences showed the females tend to attribute the causes of differences to themselves. Few of women thought the causes were from external environment (Baer, 1997). Thus the females are self-contemptuous seriously in general. Felder et al. (1995) found that in engineering education context, the boys always expressed higher self-assessments on their abilities of solving basic problems, creative problems and computer problems than girls. For those who were more closing to graduation, their abilities to solve problem creatively were better. Compared with boys, girls tended more to attribute poor performance to lack of abilities and thought their success as help from outside. However, when boys failed in doing something, they tended to think it was due to lack of hard work or being treated unfairly. In addition, boys always regarded success as their abilities.

3. Method

3.1. Samples

Data in this study was collected from postgraduate students in areas of Mainland China and Taiwan. The samples in both areas were from fields in higher education including science, engineering, agriculture, art, law, management, medicine, and education etc. Overall, the two groups of samples have similar information on age, educational level and sex proportion with each other.

A total of 1000 students from 14 universities and centers in Academy of Sciences in Mainland China participated in the questionnaire surveys in 2004 and 831 (484 males and 347 females) of them offered valid data. The data from samples in Taiwan is achieved from on a research of master thesis (Zeng, 2002). 703 students involved themselves in the survey and 684 (340 males and 343 females) of them are valid samples. They came from 13 universities and centers in Academy of Sciences in Taiwan.

3.2. Instruments

With the aim to study relationships of playfulness, humor, and gender differences in creativity, six research questionnaires including Playfulness Scale, Humor Scale, Creative Life Experiences Scale, Creative Attitude Scale, Innovative behavior Scale, and Creativity Climate Scale (Zeng, 2002) were employed in this study. The former five scales aimed to explore psychological factors of playfulness, humor and other related aspects; the last one Creative Climate Scale was used to examine the environmental influences. All the instruments are revised or developed by researchers in Taiwan. They have been shown the high reliability and validity from previous studies (Zeng, 2002; Wu, 2004). Owing to the different expressive manner for the different linguistics habit between Mainland China and Taiwan, some of words in questionnaires were revised necessarily before they were used in Mainland China.

3.2.1. Playfulness Scale

The Playfulness Scale (Zeng, 2002) employed in this study includes 6 factors that “enthusiasm sharing, climate producing”, “intrinsic motivation, working pleasure”, “risk-taking, multi-experience” , “relaxed attitude, full of fun”, “humor, entertainment”, “naïve, romantic and free”. This scale hasn’t been through the test of convergent validity; however, some questions were deleted in 2003 due to their factor loadings were less than 0.30 (Wu, 2004). The test of internal consistency coefficient of this scale shows α of total scale is 0.86, α of subscales are between 0.76 and 0.85, and α of each question more than 0.87.

The reliability of this scale from surveys in Mainland China is 0.84 (N=831). The correlations between each factor and total scale are from 0.64 to 0.72 (N=831, $P < 0.001$), which shows high internal consistency. The correlations among each factor are from 0.19

to 0.45($P < 0.001$), which is less than the correlations between each factor and the total scale.

3.2.2. Humor Scale

The Humor Scale employed (Zeng, 2002) in this study includes 3 subscales: (1) Sense of Humor Questionnaire (SHQ), which includes factors of “enjoying humor”, “embedded information sensitivity”; (The original definition of “cognition for past set up information” by scholars of Taiwan is that according to the questions setting, the understanding on a sentence containing double meanings and the mastery of humor are mainly testified. Owing to the different expressive manner for the different linguistics habit between two areas, it has been revised as “embedded information sensitivity” in Mainland China.) (2) Frequency at Humor initiation (HI), which includes factors of “the general life creation”, “social communication occasion creation”; (3) Coping Humor Scale (CHS), which includes factors of “the general life tackling” and “difficulties tackling”. (The original definition of difficulties tackling by scholars of Taiwan has been revised here for the different linguistics habit.) All the factors in the subscales are with higher reliabilities and validities.

According to the reliability tests of this scale from surveys in Taiwan, SHQ's Cronbach α is 0.77, and the Cronbach α of its two subscales are 0.77 and 0.75 respectively; HI's Cronbach α is 0.85, and the Cronbach α of its two subscales are 0.78 and 0.76 respectively. Its reliability in Taiwan in this study has been recognized by the other studies. For example, the CHS was confirmed that it has a significant positive correlation with the subscales of mate-message sensitivity and personal liking in Sverbak Humor Scale. The reliability of HI could be showed the significant correlations by “peer assessment questions”. The high validity of this scale also was found when “Self Verify Scale”, “Coquetry Scale” and “Mood Scale” were chosen as validity standards respectively (Zeng, 2002).

For the data collection by The Humor Scale in Mainland China, the reliability is 0.86 ($N=831$). The correlations between two factors in CHS and the total scale are from 0.78 to 0.93 ($N=831$, $P < 0.001$), which shows high internal consistency. However, the correlation of the two factors is only 0.23, and less than the correlations between each factor and the total scale. The correlation between two factors in CHS and the total scale is from 0.78 to 0.80 ($N=831$, $P < 0.001$), which shows the high internal consistency. The correlation of the two factors is 0.64, and less than the correlations between each factor and the total scale. The outcomes of reliability test of SHQ are similar to HI and CHS, which show that the correlation of two factors in CHS and the total scale is from 0.83 to 0.88 ($N=831$); the

correlation of the two factors is 0.46, and less than the correlations between each factor and the total scale.

3.2.3. Attitude Arisen from Ideas Scale

The Attitude Arisen from Ideas Scale (Zeng, 2002) was revised based on the Ideas Producing Scale (Basadur & Hausdorf, 1996). It has 17 questions organized by factors of “negative attitude arisen from the ideas”, “valuing new ideas” and “team creativity”. A series of empirical studies conducted after revision (Zeng, 2002) showed its validity can be accepted. It was also found the higher validity when chose Creative Behavior Scale and Creative Life Experience Scale as validity standards respectively.

The survey in Mainland China by this scale showed its reliability is 0.68 (N=831), which can be just accepted. The factor “negative attitudes arisen from the ideas” has negative correlation with the scale ($r=-0.68$). The correlation of the other two factors is 0.45, which is less than correlations (0.70, 0.78) that between each one and the scale. Four-point system is chosen in this scale, which represents how accurate each statement is from 1 to 4. The “1”, “2”, “3”, and “4” represent “disagree strongly”, “disagree”, “agree”, and “fairly agree” respectively.

3.2.4. Creative Life Experience Scale

The Creative Life Experience Scale (Zeng, 2002) was employed in this paper. It has 49 questions included in 9 factors that “scientific creative problems solving”, “keeping improvement for using new knowledge”, “innovation of performing arts”, “design of visual life”, “changes of life style”, “open-minded state”, “creating a pleasant surprise”, “old bottles with a new looking”, “computer programming”. According to reliability tests in previous studies, Cronbach α between each factor and the scale is 0.95; Cronbach α between each factor are from 0.55 to 0.86, which show the high internal consistency. According to the analysis of data in Taiwan in this study, Cronbach α of reliabilities of each factor are from 0.79 to 0.86 (Zeng, 2002).

The survey carried out in Mainland China with Creative Life Experience Scale showed its reliability is 0.93(N=831).The correlations between each factor and the scale are from 0.37 to 0.82 (N=831, $P<0.001$), which shows the high internal consistency. The factor “open-minded state” is the one which has the lowest correlation with the scale. The correlations among each factor are from -0.08 to 0.66, and less than the correlations between each factor and the scale. All the factors have significant correlations with factors in Creative Behavior Scale ($r=0.25\sim0.52$, $P<0.001$) when the later scale is chosen as validity standard. Four-point system is chosen in this scale which represents how accurate each statement is from 1 to 4. The “1”, “2”, “3”, and “4” represent “never do it”, “seldom do it”, “do it sometimes”, and “always do it” respectively.

3.2.5. Innovative Behavior Scale

The Innovative Behavior Scale (Zeng, 2002) employed in this study is revised based on Creative Behavior Scale (Scott, & Bruce, 1994). It includes 7 questions. According to studies on its reliability in Taiwan, the Cronbach α of the questions are from 0.67 to 0.84 (Zeng, 2002).

The survey in Mainland China by this scale showed the reliability is 0.77(N=831). The correlations of each question with the scale are from 0.58 to 0.68 (N=831 $P < 0.001$), which show the high internal consistency. The correlations among each factor are from 0.25 to 0.50 ($P < 0.001$), which are less than the correlations between each factor and the scale. Four-point system is chosen in this scale which represents how accurate each statement is from 1 to 4. The “1”, “2”, “3”, and “4” represent “not match strongly”, “not match”, “match”, and “fairly match” respectively.

3.2.6. Creativity Climate Scale

The Creative Climate Scale (Zeng, 2002) employed in this paper was revised based on the Creative Climate Questionnaire (CCQ) (Ekvall, 1996), which includes 10 factors. After revision, the Cronbach α of each factor are as following: “time of thinking” ($\alpha = .68$), “ideas support” ($\alpha = .91$), “challenges” ($\alpha = .76$), “freedom” ($\alpha = .82$), “trust / open” ($\alpha = .80$), “playfulness/ humor” ($\alpha = .75$), “lively” ($\alpha = .72$), “risk taking” ($\alpha = .81$), “debate” ($\alpha = .82$), “conflict” ($\alpha = .66$).

By choosing Creative Life Experience Scale as validity standard, the survey in Taiwan showed factors in this scale have highly significant correlations with factors in Creative Life Experience Scale ($r=0.19 \sim 0.33$, $P < 0.01$).

The surveys in Mainland China by this scale showed its reliability is 0.92(N=831). Except the factor of “conflict” which has negative correlation with the scale ($r=-0.18$, $P < 0.001$), the other factors have positive correlations (from 0.72 to 0.82) with the scale (N=831). Since $P < 0.001$, it has high internal consistency. Meanwhile, the correlations among each factor are from 0.06 to 0.66, which are less than correlations between each factor (except “conflict”) and the scale.

4. Results

4.1. Gender differences in playfulness of postgraduate students in Mainland China and Taiwan

From the data in Taiwan (Zeng, 2002), we found there are gender differences in playfulness between male and female students. The female students think they have more personality traits such as “enthusiasm and sharing, climate producing”, “relaxed attitude, full of fun”, “humor, entertainment” and “naïve and romantic, freedom”. However, the male students think they are better in “intrinsic motivation, working pleasure” and “risk-taking,

multi-experience”. Based on the analysis of the data in Mainland China, it is shown that the female students think they are more “naïve and romantic” than the males, but the male students think they are better in “risk-taking, multi-experience”. There aren’t significant correlations among the other variables. Meanwhile, the advantages in playfulness of female students in Taiwan aren’t found from females in Mainland China (Table 1).

Table 1: Comparisons of gender differences in playfulness of postgraduate students between Mainland China and Taiwan

	Mainland China (Wilks' $\lambda=0.931^{***}$)					Taiwan (Wilks' $\lambda=0.79^{***}$)				
	Male(n=484)		Famle(n=347)		F	Male(n=340)		Famle(n=343)		F
Factors	M	SD	M	SD		M	SD	M	SD	
enthusiasm										
sharing,	2.76	0.54	2.80	0.47	0.78	3.21	0.85	3.84	0.71	3.25*
climate producing										
intrinsic motivation,	3.14	0.53	3.09	0.50	2.09	3.86	0.71	3.02	0.63	19.80*
working pleasure										
naïve and	2.83	0.62	3.04	0.56	24.82***	2.46	0.74	2.92	0.76	13.09**
romantic, freedom										
relaxed attitude,	2.80	0.52	2.74	0.49	2.74	2.66	0.76	3.25	0.69	13.31*
full of fun										
humor,	2.86	0.52	2.84	0.49	0.18	2.41	0.69	2.98	0.70	3.65***
entertainment										
risk-taking, multi-	2.87	0.56	2.78	0.53	5.37*	3.15	0.71	2.68	0.74	26.20***
experience										

Note: Single-factor multivariate analysis of gender differences, * $P \leq 0.05$, ** $P \leq 0.01$, *** $P \leq 0.001$; Italics show the higher mean of female.

4.2. Gender differences in humor of postgraduate students in Mainland China and Taiwan

The female students in Taiwan are found that they are more humorous than the males by single-factor multivariate analysis (Zeng, 2002), for they get higher scores than males on Coping Humor and Humor Creation except factor of “embedded information sensitivity”. From analysis of data from Mainland China, the female students think they are more “enjoying humor” than males. However, the male students get much higher scores in “difficulties tackling”, “the general life creation” and “social communication occasion creation” than the females (Table 2).

Table 2: Comparisons of gender differences in humor of postgraduate students between Mainland China and Taiwan

Factor	Mainland China(Wilks' λ =0.85 ^{***})					Taiwan(Wilks' λ =0.81 ^{***})				
	Male(n=484)		Female(n=347)			Male(n=340)		Female(n=343)		
	M	SD	M	SD	F	M	SD	M	SD	F
difficulties tackling	2.65	0.57	2.55	0.49	6.102*	2.21	0.74	2.74	0.70	3.25*
general life tackling	3.09	0.56	3.10	0.47	0.084	2.22	0.74	2.73	0.63	12.40*
general life creation	2.79	0.46	2.72	0.41	6.446*	2.21	0.76	2.36	0.74	13.09**
social occasion creation	2.66	0.61	2.55	0.51	7.068**	2.25	0.69	2.56	0.76	12.24*
enjoying humor	3.15	0.55	3.24	0.54	5.984*	2.98	0.71	3.11	0.69	56.31***

Note: Multi-factors multivariate analysis of gender differences; * $P \leq 0.05$, ** $P \leq 0.01$, *** $P \leq 0.001$; Italics show the higher mean of female.

4.3. Gender Differences in creative life experience of postgraduate students in Mainland China and Taiwan

From the analysis of data in Taiwan, it is found that the gender differences in creative life experience are significant. The female students have more experiences of “innovation on performing arts”, “design of visual life”, “changes of life”, “open-minded state” and “creating a pleasant surprise” (Zeng, 2002). However, the male students in Mainland China are better in “scientific creative problem solving”, “computer programming” than females. There aren’t any significant differences among the other variables. The advantages of female students in Taiwan aren’t found in counterparts in Mainland China (Table 3).

Table 3: Comparisons of gender differences in creative life experience of postgraduate students between Mainland China and Taiwan

Factor	Mainland China (Wilks' λ =0.85 ^{***})					Taiwan (Wilks' λ =0.86 ^{***})				
	Male(n=484)		Female(n=347)		F	Male(n=340)		Female(n=343)		F
	M	SD	M	SD		M	SD	M	SD	
scientific creative problems solving	2.46	0.57	2.22	0.54	38.77 ^{***}	2.56	0.76	2.25	0.62	3.25 [*]
innovation of performing arts	2.05	0.67	2.04	0.62	0.06	2.11	0.69	1.98	0.71	11.09 [*]
design of visual life	2.39	0.59	2.43	0.50	0.99	1.56	0.76	2.25	0.59	13.31 ^{**}
changes of life style	2.25	0.71	2.22	0.65	0.54	2.11	0.67	2.48	0.71	4.55 [*]
open-minded state	3.03	0.64	3.05	0.62	0.36	2.44	0.73	2.64	0.68	56.2 ^{***}
creating a pleasant surprise	2.55	0.58	2.41	0.49	11.84 ^{***}	2.56	0.76	2.85	0.65	39.21 ^{***}
computer programming	2.38	0.93	1.90	0.87	54.68 ^{***}	2.01	0.69	1.98	0.70	23.4 ^{***}

Note: Single-factor multivariate analysis of gender differences; ^{*}P $\leq$ 0.05, ^{**}P $\leq$ 0.01, ^{***}P $\leq$ 0.001

4.4. Gender Differences in creative attitude of postgraduate students in Mainland China and Taiwan

From the analysis on gender differences of in creative attitude of postgraduate students in Taiwan, it is found that the males are better in “valuing new ideas” than females. For the males, M is 3.86 and SD is 0.76; for the females, M is 2.25 and SD is 0.69; F is 119.3 (P $\leq$ 0.001) (Zeng, 2002). However, we get the different results from data in Mainland China that the males are better in “negative attitude arisen from the ideas” than the females. For the males, M is 2.33 and SD is 0.57; for females, M is 2.25 and SD is 0.48; F is 5.25 (P $\leq$ 0.05) (Table 4).

Table 4: Comparisons of gender differences in creative attitude of postgraduate students between Mainland China and Taiwan

Area	Wilks'λ	F (Negative attitude arisen from the ideas)	F (Valuing new ideas)	F (Creativity)
Mainland China	0.99***	5.25*	0.07	0.62
Taiwan	0.75***	0.20	119.3***	1.09

Note: Single-factor multivariate analysis of differences; *P≤0.05, **P≤0.01, ***P≤0.001

4.5. Gender Differences of creative behavior in postgraduate students between Mainland China and Taiwan

From the analysis on gender differences of creative behavior, we get similar findings from surveys in both areas. The male students are better in creative behavior than the females and the difference is significant (Table 5).

Table 5 :Comparisons of creative behavior in postgraduate students between Mainland China and Taiwan

	Gender	M	SD	N	F	Sig.
Mainland China	Male	2.84	0.49	484	22.21***	.000***
	Female	2.69	0.42	347		
Taiwan	Male	3.12	0.56	360	34.50***	.000***
	Female	2.22	0.78	343		

Note: ***P≤0.001

4.6. Gender differences in creative climate of postgraduate students in Mainland China and Taiwan

According to the data in Taiwan, there aren't any significant gender differences on perceived creative climate (Zeng, 2002). However, the analysis of data from Mainland China show that the male students are more positive in "ideas support", "lively" and "risk undertaking" than females from the climate survey. In addition, they are more sensitive on "conflict" than females (Table 6).

Table 6 :Significance of gender differences in creative climate of postgraduate students in Mainland China

Wilks'λ=0.96	Male(n=484)		Female(n=377)		Differences	
Factor	M	SD	M	SD	F	Sig.
ideas support	2.83	0.51	2.75	0.46	5.85	0.016*
Lively	2.80	0.52	2.68	0.50	11.77	0.001***
conflict	2.33	0.63	2.21	0.54	8.63	0.003**
risk taking	2.64	0.51	2.56	0.46	4.73	0.030*

Note: a summary table; *P≤0.05, **P≤0.01, ***P≤0.001

4.7. Relationships of playfulness, humor and climate

In order to explore how playfulness and humor are influenced by the environmental factors, we had the Pearson two-tailed tests among the two aspects and climate. From the data analysis, it is found that there are significant correlations among the total scores of Creative Climate Scale, Playfulness Scale, and three subscales in Humor Scale (CHS, HI and SHQ) in surveys in Mainland China (Table 7). Thus it indicates that the strong perceived climate is consistent with recognition of playfulness and humor.

Table 7 :Correlations of creative climate, playfulness and humor in Mainland China

N=831		Score of Playfulness Scale	Score of CHS	Score of HI	Score of SHQ
Score of Creative Climate Scale	r	.363(**)	.291(**)	.233(**)	.309(**)
	Sig. (2-tailed)	.000	.000	.000	.000

Note: Pearson two-tailed test; ** Correlation is significant at the 0.01 level (2-tailed).

5. Discussion

5.1. Common characteristics of gender differences in creativity of postgraduate students in Mainland China and Taiwan

From the surveys in this study, we find some common characteristics of female students in both areas. For example, they have weakness of “scientific creative problem solving” and “computer programming” in the creative life experience; they have worse self-assessments than males in innovative behavior surveys. These findings demonstrate the common characteristics of gender differences in both areas – the females are less confident than males in abilities of scientific research and innovative behavior.

We can understand why the females tend to alienate the computer programming from their physiological characteristics. Weisman (2000) found the females preferred to touch those natural materials that may appease and stimulate the senses when they were asked to paint their ideal housing environment in the workshops. It is therefore no surprising that the males dominate the computer fields, since the females are not as interested in frigid artifacts as males.

For the reasons of the females are unconfident in assessments of innovative behavior, they are also related to the social roles and cultural values to some extents (Reis, 1999; Fu, & Luo, 2000). Although gender cultures are diverse in countries and areas, there is a common problem for females that they are difficult to enter the mainstream of society (Fu,

&Luo, 2000). It is due to their marginalized social status oppressed by patriarchalism in the past thousands of years. Even for those who have entered the society, most of them are isolated from the fields related to technology (Weisman, 2000). Some studies have suggested that the basic understandings of artifacts and activities characterized by gender can be developed from 2 years old for the children (Raat, & Marc, 1985). The experiences achieved in early stage during childhood may set up the gender differences in recognition, personality and emotion permanently, and also shape this pattern stiff and steady relatively. According to social standards constructed by patriarchalism, the females are more appropriate for family instead of technology fields. Thus the females have been infused with all kinds of the “ritual behavior in line with” what a “good” woman should be in the process of socialization (Fu, & Luo, 2000). Accordingly, the interests in technology and science of boys and girls may be influenced invisibly by social values that females are not applicable in the professions of science and technology. Raat and Marc (1985) studied the students’ attitudes toward technology and their understandings on conceptions related to technology in a project of “Pupils’ Attitudes Toward Technology (PATT)”. They found the understandings of conceptions related to technology were ambiguous for the children at 13 years old or so; the girls’ interests in technology and their assessments on the importance of technology were worse than boys.

From the historical perspectives, the current models and concepts of genders are inherited and developed from traditional systems in the past such as marriage, gender division of labor, inheritance and so on. Although the traditional values of genders have been washed away by modern civilization in different areas of China, they are still radiating to all aspects of modern society and influencing on people’s ideologies and actions invisibly. It is because of the characteristics of stabilities in culture transmission and influences form values which are always delayed relatively (Fu, & Luo, 2000). Therefore it is thought that women’s chances of career successes are significantly less than men’s, as well the chances of innovative behaviors will be less than men’s. Thus it is certain for females to have the unconfident assessments in both areas.

5.2. Regional differences and gender differences in creativity of postgraduate students in Mainland China and Taiwan

5.2.1. Female postgraduate students in Mainland China are less confident in playfulness and humor

From the Playfulness Scale, we know that the female postgraduate students in Mainland China are not as confident in “enthusiasm sharing, climate producing”, “relaxed attitude, full of fun” and “humor, entertainment” as their counterparts. But for females in Taiwan, their assessments on these factors even higher than males. Similarly, from the Humor Scale, the female postgraduate students in Mainland China don’t think themselves

as humorous as those in Taiwan. But the scores of factors in CHS and HI of the females in Taiwan are higher than the males. Furthermore, scores of most factors in this scale assessed by females in Mainland China are lower than males; three factors “difficulties tackling”, “general life creation” and “social occasion creation” in males that are significantly higher than females. In addition, from Creative Climate Scale, the female students in Mainland China have worse assessments on climate than males.

These findings show that female postgraduate students in Mainland China are more stiff and unpleasant to share with the others and less humorous when they are in difficulties, in daily and social life. Meanwhile, their creativity is restricted by certain personality traits and factors from climate and environment. Therefore although the personality traits are the inherent driving forces of creativity, environment is the condition to make the personality traits to display (Amabile, 1983, 1996). It is also matched with the results in Table 7, which demonstrates the correlations between individual personalities and environmental factors.

According to Baer and Kaufman (Felder et al. 1995), it is difficult to show how innate gender differences in creativity could possibly explain later differences in creative accomplishment. At the same time, the large difference in the creative achievement of men and women in many fields make blanket environmental explanations inadequate, and the explanations that have been proposed this far are at best incomplete. In other words, these explanations from environmental aspects are not sufficient. Thus they proposed that studies on females’ creativity should be focused on three dimensions of innate differences, acquired creative achievements and environment. These proposals are matched with the findings as mentioned in this study.

Accordingly, more attention to foster creative personalities for female students should be paid in education in Mainland China. For researchers and educators, a series of issues should be focused on in the future such as how to shape ideas that “humor and playfulness are beneficial to creation” and how to help female students to face troubles positively with humorous attitudes and humorous techniques. Some measures also should be done in order to construct a relaxing social and cultural environment without rigid rules, in which the females may be more open-minded, full of fun and humorous.

5.2.2. Female postgraduate students in Mainland China are less confident in creative behavior and life experience

According to data from the Creative Life Experience Scale, the female students in Mainland China have fewer advantages in this aspect than their counterparts in Taiwan. Compared with the females, advantages of the males in Mainland China are very significant. Meanwhile, from the Innovative Behavior Scale, the female students in

Mainland China get lower self-assessments. Thus we get the similar findings from the two scales.

There is no conflict existing between the everyday creativity and abilities of talents (Paulus, 2003), thus the correlation between creativity in life and in academic should be recognized. According to Reis (1999), “originality is ‘habitual’ with highly creative persons; scientists do not turn their originality off when they leave the laboratory, nor artists when they leave the studio; they tend to encounter the world in more transforming ways than another person might do.” As the similar findings from Creative Life Scale and Innovative Behavior Scale are found, the assessments of creative experience in life therefore are coherent with creativity in academic fields for females in Mainland China.

Although chances for the females being educated have been improved since the founding of New China, however, the females’ abilities haven’t been developed well generally (Fu, & Luo, 2000). “Because we live in a world in which our realities and daily experiences reinforce certain roles and obligations for women, there are many people who have never recognized that the opportunities of innovation for women have being deprived (Reis, 1999).” Because the modernization in the Mainland China was later than in Taiwan, the education level of females and the extent of their open minds are a bit less than those in Taiwan. Especially in current context, females need more efforts to enter the professions due to the increasing pressure on employment in Mainland China than in Taiwan (Access China Communication Network, 2009). Thus many female students will lose to males as soon as postgraduate from bachelor and have to go to the master education, which may cause them more inferiority. The tiredness of competition may oppress creativity development in their daily life, which might be one reason that the self-assessments of creative life experience from them are less than in Taiwan.

In addition, the distinctive cognitive styles of the females haven’t been recognized by their professions which are dominated by males mostly. As suggested by Fu and Luo (2000), for the fields where are more closing to the forefronts, the power of male-dominated is stronger, thus the gender differences of cognitive styles and conflicts become more significant. As the excellent group in the professional training, female postgraduate students are easier to be frustrated the confidence due to not being recognized well by society, especially in current context of Mainland China.

5.2.3. Female postgraduate students in Taiwan are more masculine with a certain personality characteristics

It is similar with their counterparts in Taiwan that the female students in Mainland China think they are more “naïve and romantic”. However, the female students in Taiwan are better in three characteristics of “enthusiasm sharing, climate producing”, “relaxed attitude, full of fun”, and “humor, entertainment” than the males.

According to the traditional values, characteristic of “naïve and romantic” was thought as being more related to girls. However, the three characteristics in which the female students in Taiwan are better were usually thought as being more related to boys. The data in Taiwan therefore demonstrates the barriers of traditional values have been broken by female students to some extent. According to the studies on personality psychology, the characteristic which has high correlation with creativity is precisely so-called “androgyny” temperament model. In other words, whether “masculinity” or “feminine”, each model may be helpful to creative achievements. Therefore, if one person who has advantages of both models and characteristics of “androgyny”, for example, both “independence” characteristic of men and “sensitivity” characteristic of women, he will be more creative than the others (Helson, 1996; Etaugh, & Bridges, 2003). However, as Fu and Luo (2000) pointed out that people always neglect or even exclude the importance of “feminine characteristics” with the perceptual tendency in scientific creativity. Because the tendency to “gender played down” in current society has been fostered by “androcentrism”. In short, since gender differences in creativity are caused by social recognition to some extent, females can’t develop creativity freely until they don’t need to exchange the recognition of their creativity with the characteristics of men.

6. Limitations and ongoing study

One limitation of this study is the family factors aren’t involved in surveys and discussions. As discussed in literature review, females’ creativity has a close link with family. According to Reis (1999), many women have to give up career in which they are interested due to lacking of their parents’ supports, and have to change plans. Only a small percentage of women can rebel when their parents try to steer them away from their dreams and become eminent in their selected fields finally. Reis therefore proposed that family factors should be discussed more. This might be why we can’t find stronger evidence from the data analysis.

Inspired by the results of this study, we suggest that it is more important to recognize the distinctive methods or perspectives of females used in solving professional problems than to encourage their confidence in creative activities. But the latter also should be done better. Accordingly, the ongoing study will focus on creative and cognitive styles of female, and a broader system view to creativity.

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THE BEAUTY AND THE BEAST

COMPETENCIAS EMPRENDEDORAS Y MODELOS DE CONDUCTA: UN ANÁLISIS EMPÍRICO EN ESTUDIANTES DE SECUNDARIA

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RESUMEN

Durante los últimos años los distintos organismos europeos y nacionales han manifestado la necesidad de fomentar el espíritu emprendedor desde las etapas formativas tempranas. En este contexto este trabajo pretende identificar las fortalezas y debilidades de los estudiantes de 3º de Educación Secundaria Obligatoria respecto a sus capacidades personales y habilidades sociales en relación con el emprendimiento teniendo en cuenta el papel desempeñado por los modelos de conducta empresariales "Role Models". Los resultados evidencian debilidades en competencias de aquellos estudiantes no emprendedores en relación con los considerados emprendedores. De forma concreta, observamos especiales diferencias sobre las capacidades de creatividad y comunicación. Además, cuando segmentamos la muestra por estudiantes emprendedores y no emprendedores comprobamos que en el grupo de estudiantes no emprendedores existen diferencias estadísticamente significativas entre las capacidades y habilidades desarrolladas por los alumnos y alumnas. Mientras que no se aprecian diferencias de género entre estudiantes emprendedores. También se confirma la importancia que tiene para el estudiante tener un Role Model Emprendedor y tener más desarrollados aspectos de creatividad. Las evidencias encontradas pueden ser muy útiles para el diseño de nuevas actividades educativas tanto para estudiantes como para padres y así fomentar el espíritu emprendedor desde edades tempranas.

O ESTUDO DA RESPONSABILIDADE SOCIAL NA ÁREA DA SAÚDE EM PORTUGAL

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RESUMO

Tomando como referência o sector da saúde, o objectivo deste artigo é o de analisar a lógica de inserção da RS. A nível prático constitui igualmente o objectivo de analisar o exercício da RS no sector público, privado, público-privado e em Instituições Privadas de Solidariedade Social IPSS.

A responsabilidade social (RS) tem sido estudada fundamentalmente em ambientes de contexto empresarial, sendo quase inexistentes os estudos sobre o sector público. Acresce ainda que com as alterações que se têm verificado no sector público no quadro das transformações do capitalismo e do Estado-Providência, bem como com a incorporação de modelos da gestão privada no sector público, importa analisar como a Responsabilidade Social tem sido considerada nestes casos.

Neste artigo apresenta-se o enquadramento teórico de referência e a matriz de análise que permite operacionalizar a investigação em curso.

Palavras-chave: *responsabilidade social, organizações da saúde, sector público, sector privado.*

1. INTRODUÇÃO

O estudo que pretendemos desenvolver visa tentar perceber quais são as lógicas de acção, sentidos e valores que os actores da área da Saúde atribuem à prática da Responsabilidade Social tal como em que medida estes são influenciados por factores tais como os estatutos das organizações, os valores éticos dos gestores, as políticas de incentivo público e os valores morais das redes de parcerias em que se encontram inseridos.

De um modo geral, pode-se dizer que o referido estudo contempla quatro momentos distintos:

No primeiro momento tentaremos perceber quais são as lógicas de acção, sentidos e valores que os actores da área da Saúde atribuem à prática da Responsabilidade Social tal como em que medida esta é influenciada por factores como os valores éticos dos gestores, o estatuto das organizações, as políticas de incentivos públicas e os valores morais das redes de parcerias das quais fazem parte. As informações levantadas serão analisadas a partir da Grelha Taxonómica de Boltanski & Thèvenot (1991) através da qual tentaremos perceber em que medida as lógicas de justificação propostas por estes autores respondem às necessidades de justificação da área da Saúde.

No segundo momento buscaremos analisar os tipos de Responsabilidade Social desenvolvidas pelas organizações de Saúde tal como procuraremos identificar o nível de maturação desta a partir da Grelha de Análise à Responsabilidade Social que estamos a construir em conjunto com a grelha de análise proposta pelo MIT (*Massachusetts Institute Technology*).

No terceiro momento da investigação tentaremos perceber em que medida a implementação da Responsabilidade Social gera dinâmicas de formação de redes de parcerias tal como em que medida estas articulam-se em clusters. Para alcançarmos este objectivo, analisaremos as informações extraídas dos projectos de RS, dos relatórios de sustentabilidade, dos *sites* das organizações e das entrevistas aos actores, com base no suporte teórico de Zadeck (2003), Granovetter (2003), Uzzi (1996), Burt (2004), Porter (1996).

No quarto momento pretendemos fazer um estudo comparativo dos modelos de Responsabilidade Social desenvolvidos na área da Saúde em Portugal e no estrangeiro com vista a elaborarmos um modelo mais actualizado de Sustentabilidade e de Responsabilidade Social para a área da Saúde.

2. PERTINÊNCIAS

A pertinência científica deste estudo decorre da importância de tentarmos perceber como as lógicas de justificação para a implementação da Responsabilidade Social se manifestam num sector cuja actividade foi consagrada como um bem de cidadania na Carta Universal dos Direitos do Homem (Declaração Universal dos Direitos do Homem, Artigo nº 25, Resolução 217A (III) das Nações Unidas de 10 de Dezembro de 1948) e na Constituição da República Portuguesa (VII Revisão Constitucional, 2005. Artigo nº64).

Acreditamos que a realização deste estudo contribuirá para a compreensão do processo de transformação que vem ocorrendo ao nível macro, no interior do Capitalismo, e ao nível micro, permite analisar as alterações que vêm ocorrendo nas lógicas de justificação do sector da saúde.

É certo que a mudança nos parâmetros de concessão de produção de serviços públicos se não for devidamente estruturada poderá acarretar crises do tipo ontológicas bastante graves Giddens (2005:64).

A pertinência político – prática deste estudo refere-se com a produção de um documento que objectiva auxiliar os actores com funções estratégicas e operacionais na área da Saúde a serem mais assertivos no processo de tomada de decisão quanto às formas de mobilização de actores nos projectos de Responsabilidade Social.

Em suma, tencionamos produzir informações que contribuam por um lado para compreendermos em que medida as alterações que vêm ocorrendo no sistema capitalista influenciam as lógicas de justificação para a acção na área da Saúde. Por outro, esta investigação tem ainda o objectivo de propor um modelo de Sustentabilidade e de Responsabilidade Social passível de ser implementado em qualquer hospital de Portugal e do estrangeiro.

3. INTERROGAÇÕES INICIAISE CLARIFICAÇÃO DE CONCEITOS

Algumas questões iniciais despoletaram e estiveram na base da investigação que agora se propõe dentre as quais:

- ❖ Em que medida as lógicas de justificação para a prática da Responsabilidade Social na área da Saúde visam a legitimação da actividade e a obtenção da licença para operar?
- ❖ Até que ponto as referidas lógicas de justificação são influenciadas pelos valores éticos dos gestores, pelos estatutos das organizações, pela política de incentivos públicos e pelos valores morais das redes em que se encontram inseridos?

- ❖ Em que medida as redes de parcerias criadas em torno da Responsabilidade Social geram dinâmicas de clusters?
- ❖ Em que medida a Responsabilidade Social vem sendo utilizada como ferramenta de desenvolvimento territorial pelos Municípios?
- ❖ Qual o grau de maturidade da RS no sector da saúde, isto é, em que nível de evolução conceptual e estratégica esta se manifesta ?

Pode-se dizer que a Responsabilidade Social compreende um conjunto de iniciativas desenvolvidas pelas organizações, independentemente dos seus estatutos, com vista a criação de externalidades positivas e a obtenção da legitimidade e/ou licença para operar, através do desenvolvimento de projectos sociais, ambientais, culturais, económicos e científicos segundo os pressupostos da teoria dos *stakeholders* Almeida (2010), Blownfield & Murray (2008), Lee (2007), Krishner (2005), Hay & Gray (2003), Santos (2010).

Posto isto, podemos concluir que a Responsabilidade Social tem sido considerada como uma via para se alcançar a sustentabilidade, ou seja, o equilíbrio entre os recursos utilizados e os resultados obtidos na acção produtiva, com vista a melhorar as condições de vida da geração actual sem comprometer as condições de vida das gerações futuras.

O conceito de cluster que apoiará o nosso estudo refere-se a Zadeck (2003) visto queneste a Responsabilidade Social é apresentada como elemento – chave para a constituição de clusters e para o desenvolvimento dos territórios, uma vez que favorece a criação de redes de parcerias, fomenta o intercâmbio de conhecimento entre os actores, facilita o acesso a novos mercados e contribui para a actualização da doutrina empresarial. Ao contrário de Porter (1996), a existência de complementaridade de serviços e de vontade política nas regiões são os elementos essenciais à constituição dos clusters.

A proposta teórica de Zadeck (2003) ajusta-se melhor porque se parte do pressuposto que a Responsabilidade Social gera dinâmicas de criação de novas redes e/ou de reforço das redes existentes ao contrário de Porter (1996) que defende a concentração de serviços complementares numa determinada zona geográfica tal como de vontades políticas como elementos-base para a constituição dos clusters e de Ismael (2008) que aponta a existência de culturas cooperativas como factores-chave para a constituição das redes e/ou dos clusters.

4. ENQUADRAMENTO TEÓRICO

O nosso estudo será enquadrado na crise do modelo capitalista de estado – providência pelo facto de acreditarmos que factores como o envelhecimento populacional, a crise do modelo fordista, o aumento do desemprego, a intensificação do emprego das novas tecnologias de informação e de comunicação e a alteração nos parâmetros da gestão

Esping – Andersen; Veblen em Trigilia (2002) estarem a provocar mudanças estruturais bastante significativas no modelo capitalista neo-liberal dentre as quais se ressalta a intensificação da participação do sector privado na produção de bens públicos.

O sector privado inclusive o da saúde está cada vez mais envolvido na produção de bens públicos ora porque existem normativas políticas nacionais e estrangeiras que vão neste sentido (Livro Branco da Saúde da União Européia; Comissão Européia; Organização Mundial da Saúde OMS; Organização das Nações Unidas ONU; Plano Nacional de Saúde PNS; Agenda XXI; Plano de Desenvolvimento Social PDS) ora porque se acredita que este envolvimento poderá ser uma excelente via para acrescentar valor à actividade produtiva Zadeck (1996) ao mesmo tempo em que permite às organizações obterem a legitimidade e a licença para operarem. Blownfield & Murray (2008).

A partir de 2003, o serviço público português inclusive o da Saúde, passou por um processo de reestruturação bastante denso, que esteve relacionado essencialmente com a privatização de alguns serviços e/ou a implementação de modelos do sector privado no sector público Silvestre (2005).

Segundo Boltanski & Chiapello (2009) o sistema capitalista precisa constantemente de renovar as suas lógicas de justificação para a acção no espaço público, com vista por um lado, a responder às críticas estéticas e sociais trazidas pelo novo espírito do capitalismo e por outro, afirmar-se como um sistema económico viável e digno de confiança.

A introdução de preocupações sociais e ambientais nos parâmetros do sistema capitalista poderá ser uma excelente via para a resolução dos problemas das sociedades tal como para a legitimação do próprio sistema capitalista. Blownfield & Murray (2008).

O novo espírito do capitalismo está marcado essencialmente pela introdução de princípios relacionados ao bem comum Boltanski & Chiapello (2009); Wallerstein (2009) e ao trabalho em redes Boltanski & Chiapello (2009).

Contudo, a referida introdução não tem sido pacífica, pelo contrário, vem sendo alvo de grandes críticas principalmente por parte de economistas neo-liberais como Friedman (2003), Schumpetter em Trigilia (2002) os quais consideram a produção de bens públicos como obrigação exclusiva do Estado. Segundo estes autores a produção de bens públicos por parte das organizações privadas contraria os princípios que estão na base do sistema capitalista, além de não ser sustentado, visto que os gestores do sector privado continuam a terem formação em gestão pública.

Apesar de existirem controvérsias no meio académico e empresarial quanto ao desenvolvimento da Responsabilidade Social pelas organizações do sector privado, é certo que economistas e outros especialistas como Almeida (2010), Blownfield & Murray (2008), Hay & Gray (2003), Krishner (2005), Lee (2007), Santos (2010), acreditam que a produção de bens públicos pelo sector privado pode ser uma excelente via para o desenvolvimento de

novas parcerias, para manter os colaboradores motivados, para obter ganhos de imagem e reputação, para dotar o negócio de uma maior transparência tal como para acrescentar valor aos bens e serviços produzidos através da negociação constante com os stakeholders.

De facto, o investimento em áreas sociais é referenciado como sinal de sustentabilidade económico-financeira – logo, como um factor positivo de estatuto de mercado da empresa Podolny (2008).

5. METODOLOGIA

A metodologia que pretendemos utilizar é do tipo “compreensiva” visto que nos importa perceber o fenómeno da Responsabilidade Social na área da Saúde a partir da análise a informações densas em subjectividade, extraídas dos documentos normativos e estratégicos, tal como das entrevistas realizadas aos actores.

Pretendemos utilizar as técnicas de pesquisa documental e de entrevista semi – estruturada e de aprofundamento na fase do levantamento de dados e as técnicas de análise de conteúdo temática e estrutural na fase do tratamento de dados.

O emprego de técnicas distintas nas fases do levantamento e do tratamento de dados justifica-se pelo facto de desejarmos compreender as lógicas de justificação apresentadas a partir da constatação dos modos de produção de sentidos que estão por detrás destas. Quivy & Campenhout (1998).

Pretendemos tomar como amostra para análise os hospitais públicos, públicos – privados, público – empresariais e privados sem fins lucrativos dos Concelhos de Cascais, Oeiras e Lisboa (Ocidental).

Estes Concelhos foram seleccionados pelo facto de haver complementaridade de serviços entre os hospitais concelhios, pelos hospitais compartilharem os mesmos públicos – alvo, por estes possuírem estatutos organizacionais distintos e ainda por estarem inseridos em Concelhos, cujos níveis de desenvolvimento da Responsabilidade Social são bastante distintos.

Os hospitais a serem estudados serão o hospital de Cascais, o hospital de Sant’Ana e a Clínica CUF sedeados no Concelho de Cascais; o hospital Santa Cruz, o hospital Egas Moniz sedeados no Concelho de Oeiras e o hospital São Francisco Xavier sedeados no Concelho de Lisboa (Ocidental).

Salienta-se que outras organizações de Saúde inclusive outros hospitais poderão vir a serem abordados neste estudo numa fase posterior, visto que pretendemos também constatar se as redes de parcerias criadas entre as organizações de Saúde conformam-se ou não em clusters através da metodologia “Bola de Neve”.

6. OBJECTIVOS PROPOSTOS E RESULTADOS OBTIDOS

O estudo que pretendemos desenvolver pretende alcançar os quatro objectivos que se seguem:

❖ OBJECTIVO Nº1

Perceber quais são os princípios incorporados nas lógicas de justificação para a implementação da Responsabilidade Social na área da Saúde tal como em que medida a Grelha Taxonómica de Boltanski & Thèvenot (1991) atende as exigências de justificação da área da Saúde a partir da análise aos estatutos das organizações, aos projectos de Responsabilidade Social, aos relatórios de sustentabilidade, às informações disponibilizadas no site e aos discursos dos actores.

Os regimes justificativos que servem de referencial às acções foram tipificadas por Boltanski & Thèvenot (1991:17) em sete cités: a cité inspirada, a cité doméstica, a cité do renome, a cité cívica, a cité mercantil, a cité industrial e a cité por projectos.

Na cité inspirada, a grandeza é a do santo que atinge um estado de graça ou a do artista que recebe inspiração. Revela-se no corpo puro, preparado pelo ascetismo, cujas manifestações (santidade, criatividade, sentido artístico, autenticidade...) constituem a forma privilegiada de expressão.

Na cité doméstica, a grandeza das pessoas depende da sua posição hierárquica numa cadeia de dependências pessoais. Numa fórmula de subordinação estabelecida segundo um modelo doméstico, o laço político entre os seres é concebido como uma generalização do laço da geração conjugando a tradição e a proximidade.

Na cité do renome, a grandeza depende exclusivamente da opinião dos outros, isto é, do número de pessoas que concedem o seu valor e estima.

O "grande" da cité cívica, por exemplo, é o representante de um colectivo que exprime a vontade geral.

Na cité mercantil, o "grande" é aquele que enriquece apresentando mercadorias muito cobiçadas num mercado concorrencial, não desperdiçando ali as oportunidades.

Na cité industrial, a grandeza baseia-se na eficácia e determina uma escala de capacidades profissionais.

A Cité por Projecto caracteriza-se essencialmente por: a habituação de estar constantemente envolvido em projectos levando o sujeito e/ou as organizações a estarem comprometidos por longos períodos de tempo; a articulação dos actores e das organizações em redes é apontada como a via ideal para o garante para a sobrevivência visto que lhes possibilita o ganho de mobilidade/ ligeireza, a capacidade de liderar projectos é apresentada como uma ferramenta de obtenção de sucesso e a coerência entre os valores organizacionais e os valores éticos relacionados com o bem – comum como um caminho

indispensável a ser percorrido por aqueles que pretendem obter a legitimidade e a licença para operar. Blownfield & Murray (2008), Almeida (2010).

❖ RESULTADOS PRÉVIOS OBTIDOS

Na pesquisa documental realizada ao site do Grupo José de Mello Saúde (HYPERLINK "http://www.josedemellosaude.pt" www.josedemellosaude.pt , acessado em Março de 2010), grupo gestor da Clínica CUF Cascais, constatamos a existência de inferências à Cité Cívica Boltanski & Thèvénot (1991) a partir de discursos tais como “Procuramos sempre ter as pessoas em primeiro lugar nos processos de tomada de decisão porque elas são o motivo da existência do Grupo José de Mello Saúde” ou “Nosso objectivo é estreitarmos os laços com a comunidade...”.

Na consulta realizada ao site dos HPP – Hospitais Privados de Portugal (HYPERLINK "http://www.hppsau.de.pt" www.hppsau.de.pt , acessado em Março de 2010) verificamos a existência de indícios da Cité Industrial de Boltanski & Thèvénot (1991) em discursos tais como “...Temos como objectivo alcançar a eficiência na produção de serviços de Saúde”.

Embora tenhamos constatado inferências a algumas cites da Grelha Taxonómica de Boltanski & Thèvénot (1991), tencionamos analisar com uma maior profundidade estes discursos, com vista a tentarmos perceber se existem outras lógicas de justificação não contempladas na referida grelha.

❖ OBJECTIVO Nº2

Analisar quais são os tipos de Responsabilidade Social desenvolvidas pelas organizações de Saúde dos Concelhos de Cascais, Oeiras e Lisboa (Ocidental) e pelas organizações de Saúde do estrangeiro, com o suporte da grelha de análise à Responsabilidade Social para a área da Saúde que estamos a construir com base nos autores Almeida (2010), Blownfield & Murray (2008), Hay & Gray (2003), Krishner (2005), Lee (2007), Santos (2010) e da grelha de análise ao nível de maturação da Responsabilidade Social proposta por Elisabet Garriga & Dome`nec Mele´ (2004: 51–71).

As tipologias de Responsabilidade Social que estão a ser criadas resultam do confronto entre os princípios norteadores da Responsabilidade Social proposto por Almeida (2010), Blownfield & Murray (2008), Krishner (2005), Lee (2007), Santos (2010) com os princípios da Cité por Projectos de Boltanski & Thèvénot (1991) pelo facto desta compreender os novos parâmetros de funcionamento do capitalismo na actualidade. Boltanski & Chiapello (2009).

Começamos por salientar que existe uma predominância dos elementos da Cité por Projecto Boltanski & Thèvenot (1991) na Tipologia Responsabilidade de Responsabilidade Social nº1 que propomos, os quais são: a implementação da Responsabilidade Social por um período longo de tempo, a articulação em redes e a coerência entre os valores organizacionais e os valores éticos da Responsabilidade Social. Blownfield & Murray (2008). O elevado peso ético assente nesta categoria, levou-nos a identificar a Tipologia nº 1 como “cívica”.

Na Tipologia nº2 conseguimos validar dois dos princípios da Cité por Projecto Boltanski & Thèvenot (1991) excepto a articulação em redes por isso a identificamos como “Cívico – Industrial”.

Na Tipologia nº3 foi possível validar um dos princípios da Cité por Projecto Boltanski & Thèvenot (1991) citados no parágrafo anterior que consiste na articulação em redes por este motivo a identificamos como “Industrial”.

Na Tipologia nº 4 não encontramos nenhum dos princípios norteadores da Cité por Projecto Boltanski & Thèvenot (1991) por este motivo a identificamos como “Ultra-Industrial”.

Ressalta-se que na Cité Industrial Boltanski & Thèvenot (1991) a mobilização dos recursos e as iniciativas desenvolvidas objectivam fundamentalmente gerarem benefícios para o próprio indivíduo.

Escolhemos a grelha de análise proposta por Elisabet Garriga & Dome`nec Mele´ (2004: 51–71) pelo facto de haver uma clara evidência entre esta e grelha de análise às tipologias de Responsabilidade Social que estamos a construir. Constatamos que a ausência de sistematização no desenvolvimento de iniciativas de Sustentabilidade e/ou de Responsabilidade Social apresentada pelo Nível 1 da Grelha de Elisabet Garriga & Dome`nec Mele´ (2004: 51–71) está evidenciada de forma bastante clara na Tipologia nº4 da grelha que se encontra em construção (ex.: ausência de auditoria, ausência de marketing social, ausência de redes de parcerias de suporte).

No nível 2 da grelha de análise proposta por Elisabet Garriga & Dome`nec Mele´ (2004: 51–71) notamos que existe sistematização de processos e que esta vem no sentido de propiciar o desenvolvimento de algumas iniciativas a curto prazo tendo em vista a criação de mais – valias em áreas do negócio específicas. Este nível vai de encontro com a Tipologia nº3 visto que existe um conceito de Responsabilidade Social comungado pelos colaboradores da organização e sustentador das iniciativas de curto prazo levadas a cabo.

No nível 3 da grelha de análise apresentada por Elisabet Garriga & Dome`nec Mele´ (2004: 51–71) constatamos que a sistematização de processos já se traduz em iniciativas de intervenção concretas tais como a realização de auditorias e outras iniciativas que visam a criação de valor inclusive em área intangíveis (ex.: direitos humanos, ambiente, dentre outras). Constatamos que existe neste nível uma clara articulação entre os valores da

organização e os da Sustentabilidade, o que somado à capacidade da organização em produzir bens intangíveis, leva-nos a evidenciar uma relação entre este e a Tipologia nº2 da grelha que estamos a construir.

No nível 4 da grelha de análise formulada por Elisabet Garriga & Dome`nec Mele´ (2004: 51–71) verificamos que existe um conceito claro de Sustentabilidade e de Responsabilidade Social fortemente assente nas práticas de todos os colaboradores da organização as quais se encontram sustentadas por um modelo de gestão eficaz do ponto de vista da criação de valor tangível e intangível de acordo com as linhas estratégicas e de acção definidas para períodos específicos de tempo. Constatamos neste nível alguns dos elementos presentes na tipologia nº1 da grelha que estamos a construir tais como a existência de mecanismos de controlo e de medição de resultados (ex.: auditorias, certificação).

Mesmo tendo encontrado estas correlações, ressaltamos que os resultados da análise aos tipos de Responsabilidade Social tal como ao nível de maturação da Responsabilidade Social na área da Saúde serão apresentados em artigos posteriores por razões estritamente metodológicas.

❖ OBJECTIVO Nº3

Verificar se a Responsabilidade Social gera dinâmicas de formação de redes de parcerias e de constituição de clusters a partir da análise às linhas estratégicas e de acção presentes nos dossiês dos projectos de Responsabilidade Social, nos relatórios de sustentabilidade, nos sites das organizações e nos discursos dos actores com base na grelha de análise que estamos a construir de acordo com os pressupostos teóricos de Burt (2004), Granovetter (2003), Uzzi (1996), Zadeck (2003).

A grelha de análise aos clusters que apresentamos a seguir foi constituída com base nos pressupostos-base da constituição dos clusters Zadeck (2003) tal como da teoria das redes sociais Burt (2004), Granovetter (2003), Uzzi (1996).

As redes são normalmente constituídas por laços fortes os quais se caracterizam geralmente por contactos pessoais frequentes entre os actores e pela partilha de informação pertinente e íntima. Neste tipo de relações predomina os acordos informais em detrimento dos acordos estipulados em contratos formais. Já os laços fracos, caracterizam-se essencialmente pela descontinuidade de encontros pessoais entre os actores e pela realização de acordos via contratos formais. Segundo Granovetter (2003) enquanto os laços fortes oferecem a segurança e a protecção que os actores necessitam mediante situações de incerteza, são os laços fracos que provêm o mais volume de informação pertinente.

Por este motivo, as redes mais competitivas são aquelas que conseguem equilibrar o número de laços fortes com o número de laços fracos no interior das redes de parcerias. Uzzi (1996), Granovetter (2003), Burt (2004).

A partir da leitura dos autores acima referenciados, decidimos construir o nosso modelo de análise aos clusters, o qual apresentamos na tabela que se segue, embora esteja numa fase inicial de construção.

Matriz de Análise aos Clusters					
Estratégias	Tipos de Laços de Cooperação				
	Palavras – Chave	Formais	Palavras - Chave	Informais	Palavras - Chave
Formação de Redes de Parcerias	Parcerias; Novos Contactos	X	Contracto; Jurídico; Programação	x	Acordos Verbais; Encontros Pessoais; Amizade; Intimidade
Aumentar Fasquias de Mercado	Valor Acrescentado; Inovação; Concorrência; Competitividade; Ganhos de Escala	X	Aquisições Conjuntas; Redução de Custos de Transação; Valorização	x	Intercâmbio de Profissionais Talentosos, Tecnologias e Equipamentos
Intercâmbio de Conhecimento	Informação nova relevante	X	Rede de Partilha; Reuniões; Gestor de Conteúdo	x	Conversas; Encontros Informais
Formação de Doutrina	Nova Gestão; Novos Mecanismos; Novas Ferramentas; Metodologia	X	Mudança; Transformação; Renovação; Parâmetros; Linhas de Acção; Linhas Estratégicas	X	Mudança Comportamental

Tabela 2: Freitas, Mónica; Resende, José Manuel; Santos, M.João (2011). Grelha de Análise aos Clusters. 2º ano do Doutoramento em Sociologia. Faculdade de Ciências Sociais e Humanas. Universidade Nova de Lisboa. Lisboa. Portugal.

❖ OBJECTIVO Nº4

Realizar um estudo comparativo dos modelos de Responsabilidade Social implementados em hospitais de referência de Portugal e do estrangeiro com vista a

construirmos um novo modelo de Sustentabilidade e de Responsabilidade Social Hospitalar. Com vista a alcançarmos este objectivo analisaremos os projectos de Sustentabilidade e de Responsabilidade Social implementados na área da saúde a partir dos dossiês dos projectos tal como dos relatórios de Sustentabilidade.

A referida grelha de análise que pretendemos construir contemplará as seguintes variáveis: áreas dos projectos (ambiental, social, cultural, legal, económico, científico), tipos de profissionais, tecnologias e de equipamentos transaccionados, duração dos projectos, tipos de stakeholders envolvidos, tipos de públicos – alvo, custo total do projecto e resultados obtidos.

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NARRATIVAS AO PÉ DO FOGÃO: PENSANDO O DESENVOLVIMENTO LOCAL

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RESUMO:

As especialidades profissionais tornam o homem carente de outros conhecimentos. É no encontro com o outro que este se constrói e cria seu ambiente. A colaboratividade está presente quando se reconhece as limitações e a busca por algo comum, seja ele, neste caso, o desenvolvimento local de uma cidade do interior de São Paulo - Brasil. Propomos então o encontro de pessoas de diferentes áreas para, em uma cozinha, agregar: conhecimento, arte e saber fazer.

PALAVRAS CHAVE: Desenvolvimento Local, Inovação, Cultura, Narrativas, Culinária

INTRODUÇÃO:

“O que a vida requer acima de tudo é algo inesperado” – Bakhtin

A colaboratividade se apresenta desde as questões teóricas, nas interfaces das disciplinas acadêmicas, à prática em campo, onde nenhum profissional desenvolve seu trabalho sem o auxílio de outros. Neste sentido o encontro de profissionais de diferentes áreas permite um encontro de narrativas nas quais suas experiências em relação à culinária compõem metáforas que versam sobre a demanda do desenvolvimento local trazida à tona em conversas sobre a arte de se alimentar. A cozinha forja-se, então, como ambiente laboratorial propício para aqueles que buscam entender seu entorno e se posicionar como protagonistas de seu tempo e de seu espaço.

Quando falamos em Desenvolvimento Local baseado nos arranjos produtivos que certos elementos deste mesmo local oferecem – ainda que velhos, usados, e, aparentemente, deteriorados pela ação do tempo – quando dimensionados em arranjos, conferem uma nova ordem, uma instauração de componentes potenciais, cuja energia produzirá aquilo que movimentos pós-modernos buscam constantemente – seja ele: inovação.

Pensamos e relacionamos o termo Inovação à invenção, à tecnologia à criatividade de algo que engendra algo substancial no ambiente causando certo impacto. Mas e quando a novidade não chega, quando a acessibilidade aos recursos se torna um dos fatores que determinam o declínio de determinadas regiões? Assim, ampliamos aqui o conceito de tecnologia relacionando-o a produção do sujeito (tecnologia do eu), constituinte essencial da

tecnologia social permeabilizada pela tecnologia física. No entanto, intrínseco a todas estas tecnologias está a colaboratividade e, por esta metodologia de ações, a formação de redes que ao se desenvolverem desenvolvem o local.

METODOLOGIA COLABORATIVA

A metodologia colaborativa é tangenciada por métodos diferenciados, na verdade se caracteriza basicamente por uma “bricolagem” dos modos de se produzir conhecimento. Ora se os modos de conhecer diferem, se são permeados pelas relações humanas em suas negociações (simbólicas e materiais), então a construção do sujeito/objeto é um processo partilhado não só pelo grupo em questão como por outros grupos afins.

O Termo colaborativo indica um trabalho (ou a participação em obra científica) em comum com uma ou mais pessoas. Em seu cerne está a questão qualitativa relacionada aos estudos interpretativos e culturais abordados a partir de métodos tais como: estudo de caso entrevistas, observação participativa, dentre outros, enfim, como fora dito outrora, uma “bricolage” dos procedimentos. À questão de determinados objetos demandarem metodologias diferenciadas corresponderá a um “decifra-me”, a uma hermenêutica do objeto. Será necessário trazer à luz o que se assemelha e fazer falar signos, descobrir seus sentidos, o que só é possível por meio de uma metodologia adequada.

É próprio da colaboratividade o entrecruzamento de ciências, a transversalidade e a interdisciplinaridade e é nas fronteiras daquelas que os saberes dialogam e “acontecem” e se (re)inventam num processo imanente criativo. “(...) O único meio para a criatividade ser real é ser imanente, estar em processos contínuos. (...) a criatividade existe sempre e está por toda parte. (...)” (Morson, 2009, p. 58) Então a maneira de lançar mão desta criatividade que está em toda parte é “prender ensemble”, tomar em conjunto, partes aparentemente desconectadas e tecê-las em rede. É na dialogia que o eu e o outro se constituem sem anular suas diferenças e alimentam suas complexidades.

Tomada em conjunto, dentro de uma estrutura colaborativa, a criatividade torna-se inerente ao quesito Inovação é a colaboratividade é seu imperativo. Ou seja, quando pessoas de diferentes áreas se juntam e resolvem ter uma “Brainstorming” – os afazeres ganham potencialidades, porque cada detalhe é visto por pelo menos três prismas. Três, porque é necessário ao menos três para se constituir um plano. Neste sentido, ao aproximar pessoas que não se conheciam em uma cozinha e preparar um almoço em conjunto representou um desafio, desde o “Não coloque a mão na salada que estou preparando!” (frase evidentemente não dita, mas expressa em olhares, apesar de não obedecida), passando por verdadeiras aulas sobre tempo, culturas distantes e próximas, administração, saúde, enfim uma gama de informações inscritas nos alimentos e, principalmente, no agenciamento destes (recursos) de maneira inteligente com um objetivo comum, nutrir, reunir, combinar energias de partes em um todo, isto é inovar.

Substituição de ferramenta por tecnologia...

Entendendo por tecnologias como dispositivos, temos que estes modificam seu entorno enquanto são modificados pelos mesmos, assim sendo substituímos o termo ferramenta por tecnologia, justamente porque há uma grande evolução no uso dos recursos disponíveis. Melhor dizendo, todos os recursos, sejam eles quais forem, que nos chegam às mãos são exponencialmente multiplicados quando em contato/conexão com outros. Se ao preparar um pão, você percebe que lhe falta o rolo, pode usar uma garrafa; se sobrou arroz, há outras tantas maneiras de lhe oferecer uma “cara nova”. Em uma cozinha como na vida tudo depende do que queremos com determinado objeto e de como nos posicionamos diante dele. Melhor dizendo, quais efeitos queremos causar e quais patamares queremos alcançar com determinadas atitudes? Enfim, Quais ARRANJOS combinamos para “AFETAR” o ambiente?

Piracaia, cidade do interior paulista, lembrando que São Paulo, enquanto metrópole é o – “(...) lugar central de modernidade, definindo a forma geral da sociabilidade (...)” (Damiani, 2004, p. 23) São Paulo influencia seus arredores dentro de processos de urbanização, no entanto essa influência é parcial uma vez que a cultura e a tradição tende a incorporar apenas alguns fragmentos daquela modernidade. Segundo Martins citado por Damiani: “Não é o moderno que incorpora o tradicional e popular simplesmente. Antes, é a tradição que agrega fragmentos do moderno sem agregar um modo de ser consciência do todo. (...)” (Damiani, 2004, p. 23). Influência parcial e fragmentada dentro de uma urbanização que não é para todos. Os níveis de desenvolvimento diferenciados trazem em seus bojos a desigualdade desde seu processo ao seu produto. Então, por mais que se incorpore o novo ao tradicional (não necessariamente nesta ordem), a desigualdade no processo de desenvolvimento provoca algumas crises as quais, por sua vez, desencadeiam ações populares e políticas públicas reivindicadoras de direitos cidadãos. Essas ações caracterizadas por movimentos são acontecimentos e como tais devem ser entendidos como “virtualidades”, isto é, possibilidades que envolvem, segundo Lefbvre citado por Damiani, “certa consciência histórica.” (Damiani, 2004, p. 34) E mais uma vez, também esta consciência não é assimilada por todos, sendo necessário, portanto, instaurar um plano da consciência privada e social no âmbito cotidiano.

Um mundo que não se discerne claramente, em que é preciso buscar mais de uma forma de consciência; em certo sentido, a percepção funciona como a consciência provável, para uns; a lógica dos negócios, para outros, os que dominam. A economia para os últimos; a sobrevivência para outros. O espaço vivido e o concebido, mediados pelo espaço percebido. (...) (Damiani, 2004, p. 48)

Como localidade ou sede econômica, ou como trama de rede social, a cidade é antes de tudo um espaço e como tal se define historicamente. Suas indagações serão sempre no sentido da sua produção e da sua formação. “A cidade é ao mesmo tempo, uma região e um lugar, porque ela é uma totalidade, e suas partes dispõem de um movimento combinado, segundo uma lei própria, que é a lei do organismo urbano, com a qual se confunde. [...]” (Santos, 1994, p. 71) O organismo urbano é tecido no cotidiano permeado de “singularidades” que vão conferindo ao sistema material e aos comportamentos obrigatórios (formas, concretudes, padrões e códigos) outro modo de se relacionar ao tempo e ao espaço. Este modo está no campo das mediações que busca desvendar o mistério das formas (lugares, símbolos, significados).

(...) O homem se apropria do mundo como apropriação do espaço – com todos os sentidos, isto é com todo o seu corpo. Nesse sentido, o espaço contempla dupla dimensão: de um lado é localização; de outro, encerra, em sua natureza, um conteúdo social, dado pelas relações sócias que se realizam em um espaço-tempo determinado, aquele de sua reprodução na sociedade. (...) (Carlos, 2001, p. 13)

Piracaia se situa a 85 quilômetros da capital paulista e conta com uma população estimada em 22.335 habitantes em uma área de 385 km², segundo dados do IBGE, 2009. Neste município com uma economia basicamente agrária, a inexistência de dispositivos culturais somada à ineficiência quando estes existem desfavorecem o diálogo com seus entornos. Observa-se, em Piracaia, um crescente desinteresse de seus habitantes pelos seus bens culturais. Neste sentido a cidade vem perdendo potenciais, não se reconhecendo em sua territorialidade. Há também uma dificuldade em reunir documentos e fontes sobre qualquer informação, seja ela histórica, geográfica, econômica e, dentre outras, a cultural, cujos segmentos se encontram desarticulados por falta de política pública que os compreenda. Neste sentido as “Narrativas ao pé do fogão” têm se mostrado como uma poderosa tecnologia na apropriação, antes de alguns sentidos, para depois se instalarem no espaço físico e simbólico.

A descoberta da vocação de uma determinada cidade está diretamente relacionada à vivência comum de seus cidadãos em seus ideais e práticas. Anulando os valores simbólicos dessas, anula-se a busca significativa, comprometendo assim o desenvolvimento local e, em outras instâncias, o global. Neste aspecto vale ressaltar as demandas geradas pelas tecnologias e a exigência cada vez maior de competências múltiplas que geram novos desafios aos relacionamentos sociais. Por outro lado, as novas formas de ações coletivas, bem como os relacionamentos sociais requerem um potencial emancipatório numa inteligência social (agenciamento de recursos de maneira orgânica) que não diferencia gênero, faixa etária, raça, credo, etc. As estruturas sociais são alcançadas e permeadas por

engenharias, dentre elas as de softwares e de hardwares as quais somadas às demais perfazem as redes sociais alargando potenciais humanos, territoriais e culturais.

Contudo, ressaltamos que o público é visto como um constituinte “a priori”, cuja existência antecede qualquer ferramenta ou dispositivo, portanto estamos falando da essência de seres humanos portadores de visões e ideais múltiplos sobre si e sobre o mundo que ao apreenderem sua pertinência cultural constituem-se autônomos e singulares por meio do diálogo. Então o arranjo narrativo alimenta repertórios e estimula outros percursos a partir da surpreendência cotidiana. O resgate da memória em sons, imagens, paladares e cheiros representam o enlace do ser ao tempo e ao espaço fazendo emergir dimensões ocultas em “cidades intangíveis” (Latour, 1998).

O impulso de preservar o passado é parte do impulso de preservar o eu. Sem saber onde estivemos, é difícil saber para onde estamos indo. O passado é o fundamento da identidade individual e coletiva; (...) O impulso nostálgico é um importante agente de ajuste à crise, é o seu emoliente social, reforçando a identidade nacional quando a confiança se enfraquece ou é ameaçada. (Harvey, 1992, p. 85)

“Impulso nostálgico” são memórias, são produtos que compõem o conteúdo local, mas quando, e necessariamente deve estar, interligado ao contexto global, auxilia na apropriação da tecnologia social e, portanto, na participação em tomadas de decisões, elemento este de emancipação e de protagonismo, que estimula o desejo singular e modifica o que é estar presente. Daí a implicação diretamente relacionada entre o sentimento de pertencimento e o desenvolvimento do lugar onde se vive, o importar-se e envolver-se com seu entorno de maneira significativa. Neste resgate de memórias, o uso de dispositivos tecnológicos não representa por si só a salvação para problemas sociais, culturais ou educacionais, mas somado a outras ações permitem transparências de problemas e se insinuam com possibilidades de respostas. Histórias de vidas e as memórias locais, sejam de um grupo ou de outro, intercambiam-se aos saberes globais e ao encontrar ressonâncias na literatura sobre emancipação digital se oferecem como bases objetivas sobre as quais ganham luz a reconstrução da memória amparada por meios e processos audiovisuais.

Do Local e do Lugar no Global

Por meio de um processo de interação “eu-tu” o mundo se constitui e ganha sentido em algo comum – sendo esta uma relação dialógica em termos Buberianos completamos este conceito com o pensamento de Berger quando diz que o mundo constitui “o meio de nos unir, sem nos confundir.” Sendo assim, do particular ao mais universal, inferimos que o

local tem seu lugar no global, ou seja, à medida que vivemos “o local”, atribuímos-lhe significação quando nos apropriamos de seus espaços tornando-o “lugar”, onde cada lugar é ao seu modo um mundo e pode ser percebido em sua história cotidiana que redimensiona o local por meio de, dentre outros elementos, suas ações e narrativas.

As narrativas estão diretamente relacionadas ao campo da ação. A partir do momento que conto uma história alimento-a com a minha própria história, ou seja, o narrador é tanto testemunha (narra o acontecido de acordo com o percebido) quanto autor. Portanto acunha-se autoridade. Ora se sou autoridade para dizer o que digo, então sou também protagonista de determinadas ações seja no espaço, seja no tempo. Cada narrador, bem como suas narrativas, pertencem a lugares singulares.

(...) por um lado, as comunidades podem existir sem estar no mesmo lugar – de redes de amigos com interesses comuns. (...) Além disso, mesmo onde existem, isso não implica um único sentido do lugar, pois as pessoas ocupam diferentes posições no interior de qualquer comunidade. (...) Seus ‘sentidos do lugar’ são diferentes.” (Massey, 1994, p. 183)

As singularidades se encontram e constituem um tecido orgânico que se estende do local ao global, mas sempre caracterizando lugares, isto porque a singularidade está intrinsecamente relacionada aos processos de significação – da construção à apropriação, permeados de negociações simbólicas e materiais. Pensar e viver o e no espaço é dimensionar e articular estruturas governamentais, comunitárias, públicas e privadas inteligentemente agenciando-os para o desenvolvimento local e global. Portanto o Lugar é pensado para além fronteiras, ou melhor, o termo fronteira não lhe cabe:

(...) Assim, em vez de pensar lugares como áreas de fronteiras ao redor, pode-se imaginá-los como momentos articulados em redes de relações, experiências e entendimentos sociais se constroem numa escala muito maior do que costumávamos definir para esse momento como o lugar em si, seja uma rua, uma região ou um continente. Isso, por sua vez, permite um sentido do lugar que é extrovertido, que inclui uma consciência de suas ligações como mundo mais amplo, que integra de forma positiva o global e local. (Massey, 1994, p. 184)

O conceito de Lugar construído por Massey vai ao encontro da pesquisa-ação-colaborativa realizada em Piracaia tendo em vista as narrativas de seus moradores e o arranjo dessas como um dos elementos para desenvolvimento local daquela cidade. Assim, podemos pensar Piracaia em termos de lugares e estes, por sua vez, enquanto:

- a) “Processos”, posto que os lugares são conceituados “(...) em termos das interações em si mesmas não são coisas inertes, congeladas no tempo. (...)”. (Massey, 1994, p. 184);
- b) “Sem fronteiras”, porquanto suas relações “(...) econômicas, políticas e socioculturais, cada qual cheia de poder e com estruturas internas de dominação e subordinação, estendem-se pelo planeta em todos os níveis, da família à área local e até a internacional.” (Massey, 1994, p. 184);
- c) “Com especificidades continuamente produzidas” – “(...) A globalização (...) não acarreta simplesmente a homogeneização. Ao contrário, a globalização das relações sociais é outra fonte (da reprodução) do desenvolvimento geográfico desigual e, assim, da singularidade do lugar. (...)” (Massey, 1994, p. 185)

Nos termos acima especificados atribuímos, de acordo com Massey, que os lugares se constituem por meio da ligação desses com outros lugares, e que dentro de uma concepção progressista de lugar pensar “(...) um sentido global do local, de uma consciência global do local.” (Massey, 1994, p. 185)

As consolidações envolvidas nas relações onde os lugares se produzem avançam vizinhanças e buscam coalizões em escalas regionais a fim de enfrentar eventualidades decorridas da globalização. Segundo Scott

(...) Estados individuais não estão mais usufruindo do mesmo grau de autonomia política soberana que costumavam possuir e, sob condições de globalização intensificada, eles se encontram cada vez menos capazes ou desejos de proteger todos os interesses regionais e locais dentro de sua jurisdição. (...) (Scott, 2001, p.13)

OS ARRANJOS...

Diante da globalização algumas cidades brasileiras estão aplicando metodologias de desenvolvimento local baseadas em arranjos produtivos locais (APL). Estes arranjos implicam em Redes Sociais sejam por meio de comitês formados por agentes de associações de bairros ou, ainda, Redes Sociais veiculadas na Internet.

Conflitos e confrontos são inevitáveis e até mesmo necessário na busca por novas formas de integração e de representação política. Neste sentido as tecnologias de comunicação e informação (TICs) corroboram aos processos produtivos. A flexibilidade e a especialidade são imprescindíveis porque, enquanto lugares, as redes são incertas, instáveis e complexas.

(...) Essas redes propiciam uma atmosfera rica pela transparência constante de conjuntos de informações (em grande parte informal) a respeito das tecnologias, mercados e concepção de produtos. Assim, elas ajudam a incentivar a criatividade e a inovação econômica em muitos setores diferentes, incluindo em particular, alguns dos nichos líderes mais dinâmicos da economia contemporânea, como a indústria de alta tecnologia, serviços e indústrias de produtos culturais. (Scott, 2001, p.15)

O conhecimento e as práticas tecidas em redes sociais sobre temas históricos alimentam o capital social local ao colocar em cena o discurso extra-oficial ao mesmo tempo em que favorece o resgate da memória e projeções de cidadania *singular* e coletiva tanto no contexto local como no global. Assim, o espaço e o tempo se fazem por meio das práticas, da própria viabilização da existência humana a partir de produções desde a produção de relacionamentos à produção de materiais “(...) e da produção da vida e de suas possibilidades, em sentido mais amplo e profundo. Refere-se a modos de apropriação que constroem o ser humano e criam a identidade que se realiza pela mediação do outro. (sujeito da relação).” (Carlos, 2001, p. 13)

A produção do espaço e a atribuição de significados a localidade são constitutivos nas ações humanas e circunscritas em processos, que como dissemos acima, carregados de conflitos e, portanto, de negociações necessárias. É no embate e no debate que a sociedade se organiza e desenvolve seus ambientes. Assim, fluxos de ideias e conhecimento ocorrem ao longo dos vínculos transacionais das redes que, embora localizadas, são também “(...) telas estendidas em escala mundial de competição e troca inter-regional. (...)” (Scott, 2001, p.16)

Então, o processo da globalização é complexo de produções variadas, situadas em lugares específicos. Esses processos contêm a multiplicidade de atividades e de interesses, por vezes desligados de processos globais. Enfocar as cidades permite-nos especificar uma geografia dos lugares estratégicos em escala global. Focalizar cidades e especificar lugares estratégicos, mas quais são as estratégias de uma cidade que desconhece sua vocação?

VOLTANDO À COZINHA E ÀS NARRATIVAS

Como, muitas vezes ao confeccionar um prato, faltam-nos alguns instrumentos ou recursos e em outras atividades também é assim, surge então a necessidade de sermos criativos, e não apenas sermos como sabermos compartilhar e desenvolver trabalhos com outros universos, outras culturas e pessoas, neste sentido – “(...) a criatividade é sempre uma resposta a problemas que se apresentam em circunstâncias particulares num tempo particular (...)” (Morson, 2009, p. 431)

Diz-se que não há resgate ou recuperação da cultura, não se volta ao passado, mas há a possibilidade de, a partir do antigo, produzir o novo e, assim, fugimos do tradicionalismo ingênuo quando mantemos o diálogo de seus símbolos com contextos maiores. Porque não há mais o isolamento, nos apropriamos de outros elementos culturais para criar algo novo. “(...) A criatividade se enraíza nas ações reais de pessoas reais, que usam os recursos fornecidos pelo passado, vale dizer de uma criatividade anterior: ‘Esse passado criativamente eficaz (...) predetermina em certo grau o futuro’ Bakhtin (1979, como citado em Morson, 2009, p. 431).

A otimização dos recursos na cozinha, a contribuição de cada ingrediente em determinado prato, assim como o arranjo destes em seu conjunto nos alimenta, engendra em nossos corpos energias/potenciais que se convertem em realizações. Assim a metáfora não é apenas um jeito “novo” de dizer o óbvio, mas é a própria ação, um “prendre ensemble” – a manifestação de desejos que quando desenhados em conjuntos multiplica sabores e saberes.

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THE LITTLE MERMAID

LEARN+

Brigitte Zoerweg

The Learn+ project – Learning Plus for Adult Educators - is being conducted by AidLearn (coordinator, Portugal), MERIG (Austria), AHE (Poland), Gazi University (Turkey), Learning South West (United Kingdom) and, after project started, FDEP (Switzerland). Learn+ started in October 1st 2009 and finishes at 31st December 2011. Why create such a project?

In Europe we can see that mobility of people between countries is increasing, and the result is that we can have in the same place (work, classes, home), at same time, very diverse people: gender, age, race, social class, religion, culture, and so on. Sometimes this diversity can lead to misunderstandings between people, and even conflicts. It is necessary, therefore, to know how to deal and make the most of this diversity.

The trainers and teachers of adults are considered agents of policy and change, since they can reach and work new skills with many people, in effective way. The new role of adult educator as facilitator of learning includes the management of diversity, as well as ICT and research skills which needs to be developed in many European countries, according to Eurotrainer report (Jan 2008).

So, a course on diversity management is necessary, directed to adult educators. The adult educators will learn how to manage diversity in their learners groups; while doing that, they are also presenting a model / teaching their learners how to deal with diversity, how to know better the other, how can everybody reach the aims even using different ways to do it.

A previous EQUAL project concluded that the skills the trainers need to develop diversity management can be enhanced transversally through 7 pedagogical key activities: diagnosis, pedagogical resources, language, pedagogical relationship, leadership, self-questioning, and formative assessment. With this in mind, in Learn+ project we proceeded with research on this field: there was bibliographical research regarding the 7 pedagogical skills and diversity management; research on numbers / statistics concerning the existing diversity in partner countries; group interviews with experimented trainers and managers on diversity, to research about the reality in each partner country and practical strategies used in adult education to manage diversity.

Considering the research results and previous experience by partnership, the Diversity Management Course was planned in four modules:

Module 1 *Getting to know learners – choosing appropriate teaching methods and resources.* In this module are included two key competencies: Diagnosis and Pedagogical Resources, and it was prepared by Gazi University.

Module 2 *Leading a diverse group of learners and the communication process.* This module includes three key competencies, namely: Language, Relationship and Leadership, and it was prepared by Learning South West.

Module 3 *Ensuring individual learners' progress – tools and techniques.* This module is mostly based on one key competency, Formative Assessment, and it was prepared by AidLearn.

Module 4 *Managing myself – self-reflection.* The key competency developed in this module is Self Questioning, and the work was done by AHE.

Each of these modules is planned for 10 hours: 4 hours are to be performed in self-learning, based on material in digital format; 6 hours are performed in two face to face workshops (3 hours each workshop).

The Diversity Management training course includes also preparing a project on diversity management; this project is to be done in teamwork. The project preparation and presentation is planned for 20 hours. The guidelines to prepare the project are part of the training course, and were prepared by AidLearn.

In short: the Diversity Management training course includes 4 modules (10 hours each) and a project (20 hours, developing teamwork skills), in a total of 60 hours, built according to constructivist model, to ensure the appropriation of the educator new skills. The entire course is in a blended format: includes self-learning (so learners can develop ICT skills) and face to face workshops. Nevertheless, each module is prepared in a way that it is possible to deliver it independently, one module on its own.

All the learning material of the complete course is presented in digital format: on CD-Rom or USB pen, and in 5 languages: English, German, Polish, Portuguese and Turkish. This learning package includes four elements:

- **Self-assessment system.** This tool allows the learner to test his/hers knowledge on the subject of each module, whenever desires to. On every test there are 10 questions, multiple choice, on the subject of each module. The result directs the learner to the learning, or refers that the learner is at ease with the subject and don't need to work on that module anymore.
- **Project Guide.** In this guide is proposed a theme for the project, and also step by step how a project work is done, not only this particular one but a project work in general. It is possible for learners to engage in other theme, as long as it is negotiated with the tutor / trainer of Managing Diversity course.
- **Tutorial Program.** The tutorial program is only accessed by the tutors / trainers of the Diversity Management course, and it is protected by password. The program includes general instructions on how to deliver the course, and then is divided by module. In each module there are two workshops plans, 3 hours each. The workshop plan is organised by the aims, time consumption and description of several activities to be performed within the learners group. For each aim / objective, there are several activities that the tutor / trainer cab choose from; and it is also possible to use their own activities, as long as they are targeted for the same aim.
- **Course Manual.** Considering that the modules can be engaged independently, the course manual is also divided into four modules manuals. Each module presents a manual with the self learning material, and includes theoretical material on the module theme(s) and some activities on the subject.

The Diversity Management training course was piloted in four partner countries (Poland, Portugal, Turkey and United Kingdom), so the learning package was tested as well, between April and June 2011; FDEP also performed a thorough evaluation of the learning package during the same period. These actions allowed to collect useful information on how to improve the Diversity Management training course and learning package, and the improvements were introduced between June and September 2011.

The final Learn+ project is available to all interested parties since October 2011. Each partner presents the learning package and Diversity Management course on national specific workshops, in October, November and December 2011, and also in every possible events related to the subject. For more information, please refer to HYPERLINK

"<http://www.learnplus.eu/>" <http://www.learnplus.eu/> .

WELCOME CREATIVITY!
PIONEERING EXPERIMENTAL FINDINGS ON
HOW CREATIVE PERFORMANCE CAN BE ENHANCED.

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Abstract

From the world's first wheel to the latest microprocessor, our lives have been constantly inspired by creative ideas. Furthermore, quickly changing business transformations and global competition require innovation and creative thinking. Using Virtual Reality Technology, we demonstrated that encountering expectancy violations increases cognitive flexibility, a key aspect of creative thinking. Based on these unique findings, we developed an expectancy violation technique that can be easily applied to educational and organizational settings. Furthermore, we demonstrated that we can actively put our unconscious at work in order to enhance creative potential. Moreover, we developed a pioneering technique to actively boost the beneficial effect of sleep on creativity. These techniques designed to increase creative potential can be applied in various settings where innovation and a creative thinking style are needed.

Keywords: creativity, enhancement, unconscious processes, sleep, expectancy violation, cognitive flexibility, out of the box thinking, idea selection

From the world's first wheel to the latest microprocessor, our lives have been constantly improved and inspired by creative ideas. Furthermore, a recent survey among 1500 chief executives around the world ranked creativity as the most crucial leadership quality (IBM Corporation, 2010). Creativity has been of interest to researchers for centuries, and the modern age of creativity research has started in the 1950s with Guilford's address to the American Psychological Association to focus attention on a scientific approach to the study of creativity. "Historically, the study of creativity began with the concept of genius" (Sternberg, & Lubart, 1996, p. 680), and it was thought that creativity was a talent that only a few exceptional people possessed. Therefore, much of the early work focused on measurements to identify individuals who hold this inherent talent, and research based on outcome measures provided substantial progress in understanding personality and environmental influences on creativity. Inherent to this approach is that only successful ideas

are analyzed. However, if a creative ideas want to be successful, many factors have to come together (Sternberg, & Lubart, 1996), and various of these aspects are outside the control of the person that developed the creative idea. Therefore, measures that mainly focus on the product may limit our understanding of the creative process and how to encourage it. Having realized that creativity is possibly dependent on innate abilities, as well as on cognitive processes that can be stimulated, researchers have begun to look at processes that enhance individuals' creative potential.

The need to enhance individuals' creative potential becomes more and more important, given that quickly changing business transformations and global competition more than ever demand the need to innovate and be creative. Therefore, business leaders, politicians and academics around the world realize that creativity has to be fostered in educational institutions and organizations, and that more effort has to be invested in developing techniques and programs that are designed to enhance creative performance.

Conscious Efforts to Enhance Creative Potential

Many practitioners have started to look into and developed techniques to enhance the creative thinking process, and also within creativity research more and more attention is paid to the question how creative potential can be encouraged. A quantitative meta-analysis (Scott et al., 2004) evaluated training programs developed during the last half century that were intended to develop creativity capacities. Their analyses revealed that more structured techniques, such as problem identification, idea generation, conceptual combination and constraint identification, provide heuristics for solving novel, ill-defined problems and produce a stronger impact on training outcomes than more open and exploratory techniques, such as expressive activities, imagery and metaphors.

Furthermore, numerous well-known creators have suggested traveling as a means to facilitate creative performance. Traveling can facilitate a shift of perspective, and "such shifts can be useful for creative thinking because they suggest new ideas and options and allow an individual to avoid fixity and routine" (Runco, 2007, p. 333). For example, when Charles Darwin embarked on his voyage on the Beagle, a novel and surprising world opened up to him. Darwin left as a young man lacking direction, but came back as a highly creative scientist. Although Darwin's book describing his remarkable discoveries no doubt inspired and informed many fellow scientists, the scientist who benefited most from the Beagle voyage was the traveler himself. These findings raise two questions. First, why are these novel and unusual situations linked to creativity? Possibly they provide the set shifting experiences necessary for developing cognitive flexibility, one of the most important creative thinking styles. In other words, do unexpected events nurture one's ability to think flexible, and thus to overcome functional fixedness? Second, what is the effect of personally

experiencing expectancy violations versus being exposed to them second-hand? Is it necessary to experience surprising events oneself, or is it sufficient to read a book or watch a movie about unexpected situations to become more creative? We scientifically investigated these intriguing questions by using an innovative research tool, Immersive Virtual Environment Technology. Based on these findings, we further developed and tested an expectancy violation technique that can be easily applied in educational and organizational settings.

Previous research (e.g., Scott et al., 2004) has suggested that time on task and extensive work are generally needed to develop skills in creativity. In our studies an increase in creative performance was gained without a practice phase, and in a relatively short period of time. Interestingly, individuals seem to remain in a creative thinking style for a certain amount of time. Individuals' creative cognitive thinking style was not only increased immediately after the expectancy violation, but also during a subsequent creativity task.

Unconscious Efforts to Enhance Creative Performance

The current research findings, as well as the strategies mentioned earlier in this article, focus on the question whether creativity can be increased through conscious effort. However, many anecdotes about individuals hailed as geniuses suggest that unconscious processes may also play a crucial role in creative performance. For example, the mathematician Poincaré was convinced that his creative ideas emerged from the unconscious, and Einstein reported that he first 'saw' the solution to a problem without being able to express it (Ghiselin, 1952). In arts, experiences seem to be similar. According to Schopenhauer (1970, p.41) "everything primary, and consequently everything genuine works as the forces of nature do, unconsciously." Furthermore, anecdotal reports suggest that sleep, which can be considered an important unconscious process, improves creativity, ranging from musical compositions to insightful advances in scientific discovery. For example, a night of sleep inspired McCartney to write the tune for the evergreen 'Yesterday', and Mendeleyev reported that the rule underlying the periodic table of chemical elements emerged out of a dream following unsuccessful puzzling with the symbols of the elements (Mazzarello, 2000).

During the last decades a great deal of knowledge was gained about unconscious processes and their important role in various psychological processes. Therefore, we do not only focus on conscious efforts to increase creative potential, but also on the role of unconscious processes in the enhancement of creative performance. Previous research has shown that individuals may find creative ideas while doing something else, a process called incubation. It is suggested that incubation - which can also be called a "let it happen tactic" - can, for example, occur while taking a walk, exercising, playing or daydreaming and, thus,

operates when a person is not thinking at all. Important to notice is that the “let it happen tactics” ascribe the unconscious a merely passive role. However, the term incubation itself suggests that the unconscious can also actively contribute to creative problem solving (e.g., Claxton, 1997; Koestler, 1964). Furthermore, previous scientific research has supported the idea of an active unconscious (Bowers, Regehr, Balthazard, & Parker, 1990; Zhong, Dijksterhuis, and Galinsky, 2008). Therefore, the question rises if we have to passively wait until our “unconscious muse” finds us, or if we can actively put our unconscious at work in order to enhance creative performance. We investigated this interesting question by means of two studies. Given that being creative pertains to generating ideas, but also to selecting the most creative idea later on (e.g., Runco & Smith, 1992), in both studies we investigated the role of unconscious processes for the idea generation as well as the idea selection phase of the creative process.

In our first study on unconscious processes, we investigated whether a period of unconscious thought, defined as task-relevant thought process while conscious attention is directed elsewhere (Dijksterhuis, & Nordgreen, 2006), can enhance individuals’ creative performance. Our results show that unconscious thought facilitates individuals’ ability to select their most creative idea. Given that even after a successful idea generation phase suboptimal results can be gained when the wrong idea is chosen for further elaboration, the current findings could be relevant for practical implications.

Previous research has shown that a night of sleep, which can be considered a relatively long unconscious period, can increase creative potential (Wagner and colleagues, 2004; Cai et al., 2009). In our second study, we investigated whether one can actively control and boost this process. Our results suggest that the beneficial effect of sleep on creative performance can be actively boosted by covertly reactivating the creativity task during sleep.

The findings of the current two studies provide further evidence for the potential of unconscious processes in creativity. Moreover, the present two studies suggest that we do not have to passively wait until our “unconscious muse” finds us, by applying the right techniques we may even be able to actively put the unconscious at work in order to enhance our creative potential. Using unconscious processes as a means to enhance creative performance is promising, as unconscious processes can be applied without practice and can be performed while doing something else; for example, while sleeping or while working on another task.

General Conclusions

The present experimental findings demonstrate that conscious techniques, as well as unconscious processes are important means to enhance individuals’ creative performance. The techniques to increase creative potential presented in the current paper are unique and

promising for application in educational institutions and organizations. However, by applying these techniques designed to enhance creative potential not everyone will become a Nobel Prize Winner or world famous musician. Besides a creative cognition, there are also other factors that make someone a genius; think for example of the right combination of environmental and personality characteristics to be present. Yet, the current approaches to increase creative potential may help individuals to generate creative solutions to suit a particular situation or problem, a potential that is desired in a world faced with continuous change.

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MASTER CAT (OR PUSS IN BOOTS)

100 CAJAS

IMPACTO DE LA UNIVERSIDAD EN LA CREATIVIDAD COLECTIVA

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RESUMEN

Potenciar la creatividad colectiva es actualmente una urgencia, necesitamos aprender a trabajar de forma colaborativa y desprendernos de la competencia como única posibilidad. A raíz de esta preocupación hemos desarrollado un Proyecto de Investigación Docente en la Universidad de Sevilla (España), donde pretendemos encontrar las habilidades de creación colaborativa que los estudiantes adquieren o pierden durante sus estudios universitarios. Con esta finalidad se organizó un “taller de creatividad colectiva” como herramienta para averiguar qué ocurre con esta capacidad en los estudiantes de arquitectura, y como instrumento se proponen acciones colaborativas de transformación de 100 cajas de cartón.

La experiencia resultó muy interesante para los estudiantes y para los profesores, se utilizaron varias estrategias de activación creativa, y los participantes descubrieron el enorme potencial de creación de ideas del colectivo. La evaluación ha tenido dos partes, la presencial donde se han observado las interacciones entre los estudiantes, y la no presencial donde al término del taller se ha valorado el producto resultante. Y se puede concluir que los estudiantes de primer curso generan ideas más creativas aunque los estudiantes de último curso producen mejores interacciones en el proceso.

Palabras clave: Evaluación, Creatividad Colectiva, Competencias, Capacidades, Habilidades.

Introducción

Existen muchos problemas de adecuación entre la formación previa a la titulación y la que se exige al comienzo de los estudios universitarios, pero esta detección de inadaptación suele centrarse en carencias de conocimientos concretos. La sociedad actual está demandando innovación en todas las áreas, como solución a los graves problemas que han surgido en la contemporaneidad, así que existe una urgencia en la formación de los estudiantes y sobre todo en la adquisición de las competencias necesarias para ello.

La necesidad de cambiar ideas cada vez es más apremiante, y para ello la enseñanza debe orientarse hacia el desarrollo de alumnos con iniciativa, que sepan trabajar colectivamente y que adquieran estrategias, habilidades y automatismos, además de conocimientos teórico-conceptuales; de forma que la finalidad del aprendizaje sea ayudar a formar ciudadanos

competentes y útiles a la sociedad que puedan ofrecer soluciones creativas a los problemas que se planteen.

La demanda actual de competencias debe dedicar una parcela al desarrollo de la creatividad en sus estudiantes, para enfrentarse a los retos que la crisis ecológica, económica, social... nos plantea. Siendo capaces de inventar soluciones para problemas complejos y diferentes de los encontrados anteriormente.

Para descubrir las claves necesarias sobre el estado de las capacidades creativas de los estudiantes, se ha planteado en este proyecto de investigación la evaluación de los niveles de creatividad de los alumnos que empiezan el grado de arquitectura y de los que están a punto de terminar sus estudios universitarios, y así averiguar el efecto que producen estos estudios en la creatividad de los estudiantes y descubrir qué se puede renovar en las metodologías docentes para conseguir que los procesos creativos mejoren.

Un experimento en forma de taller

Este proyecto de investigación docente se plantea como un experimento, mediante el cual se puedan obtener resultados que desvelen nuevos recorridos para la docencia universitaria en el grado de Arquitectura.

Han participado en el estudio 100 estudiantes de las Escuela Técnica Superior de Arquitectura de la Universidad de Sevilla de las asignaturas Protectos 2 (50) y Proyecto Fin de Carrera (50). Y se han organizado 20 colectivos de 5 estudiantes para evaluar el proceso creativo colectivo. En cada uno de los dos grandes grupos de estudiantes hemos separado 5 equipos de control y 5 equipos de experimentación (con 10 integrantes cada uno), de forma que en los 10 grupos de P2 tendremos 5 equipos que funcionarán libremente y 5 mediante algún tipo de activación creativa, y en los 10 grupos de PFC igual, con la finalidad de no sólo averiguar los niveles de creatividad y capacidad colaborativa de los estudiantes, sino también comprobar qué efectos produce el trabajo con técnicas de estimulación creativa en los resultados de la producción colectiva.

La estrategia que se ha utilizado para evaluar la creatividad en los estudiantes, se ha basado en el test de los círculos del modelo de la batería de Guilford (Guilford, J.P. 1968), mediante esta prueba se evalúa la creatividad gráfica con los 3 indicadores conceptualizados por Guilford; Fluidez (capacidad para producir gran número de ideas); Flexibilidad del pensamiento (aptitud para cambiar de un planteamiento a otro); Originalidad (aptitud para aportar ideas nuevas); y un cuarto indicador incorporado en este estudio: Conectividad (capacidad de integrar en una unidad significativa superior estructuras gráficas autónomas). Para esta tarea se utiliza un folio con 24 formas circulares, de 3 cm de diámetro, con una separación de 3 cm entre sí, en base a las cuales se deben realizar todos los dibujos que se ocurran tomando como referencia estas formas.

Tomando esta prueba como referencia pero ajustándola para que tenga más sentido en la disciplina arquitectónica, proponemos una transformación del modelo de evaluación individual en una experiencia colectiva, donde 20 colectivos (con 5 estudiantes) parten también de un elemento único, en este caso tridimensional (una caja de cartón) para realizar sobre este transformaciones. De forma que los 20 grupos construirán en total 100 transformaciones diferentes, obteniendo una potencialidad de generación de ideas muy interesante.



Ilustración 1. Elemento básico utilizado en el proyecto para la evaluación de creatividad colectiva

El taller se ha organizado mediante una sesión conjunta (5 horas) con los 100 estudiantes en la Escuela Técnica Superior de Arquitectura de la Universidad de Sevilla, en la que cada colectivo ha recibido un protocolo específico con el que realizar el proceso en torno a un objetivo concreto: realizar transformaciones de una caja de cartón (de artista 30cm) para conseguir que la pieza primitiva pierda totalmente su identidad.

P2 A1 LIBRE	P2 A2 LIBRE	P2 A3 LIBRE	P2 A4 LIBRE	P2 A5 LIBRE	GRUPO DE CONTROL
P2 B1 MICRO- DIBUJOS	P2 B2 INSPIRA- VIDEO	P2 B3 MÉTODO 635	P2 B4 OJOS LIMPIOS	P2 B5 CHECK- LIST	GRUPO DE EXPERIMENTACIÓN
PFC C1 LIBRE	PFC C2 LIBRE	PFC C3 LIBRE	PFC C4 LIBRE	PFC C5 LIBRE	GRUPO DE CONTROL
PFC D1 MICRO- DIBUJOS	PFC D2 INSPIRA- VIDEO	PFC D3 MÉTODO 635	PFC D4 OJOS LIMPIOS	PFC D5 CHECK- LIST	GRUPO DE EXPERIMENTACIÓN

Tabla SEQ Tabla * ARABIC 1 . Organización de los colectivos de estudiantes, identificación de grupos y técnicas plicadas

Protocolos de activación de la creatividad

Para aprovechar al máximo los resultados del experimento, se ha trabajado con grupos de control (sin introducir ninguna técnica) y con grupos de experimentación (trabajando con una técnica de activación creativa). De forma que, además de evaluar los contrastes entre los estudiantes que están empezando el grado y los estudiantes de fin de carrera, se podrá valorar también la incidencia de la utilización de técnicas de estimulación en los procesos y los productos de los estudiantes.

Las técnicas, son mecanismos intelectuales que permiten lograr cierta eficiencia en la generación de ideas, incrementando su número (fluidez), promoviendo la relativización de los contenidos y potenciando nuevos enfoques (flexibilidad), y distanciando lo conocido para alcanzar la novedad (originalidad), el objetivo es liberar, acelerar y potenciar las capacidades creativas (Letelier, S., 2000).

La técnica es el instrumento vehiculizador de la ciencia aplicada sin el cual quedaría en una mera especulación teórica o en artilugio esotérico (Marín, R., Torre, S., Aranda, E., 1991).

Personas que aparentemente tienen la misma formación, pueden sin embargo mostrar distintos niveles de creatividad; la explicación de este fenómeno se encuentra en sus diferentes aptitudes, sus predisposiciones, su forma de interaccionar con el medio, su actitud e intereses frente a situaciones problemáticas, sus motivaciones, su inquietud transformadora, su modo de interiorizar los aprendizajes y experiencias. Es por esto que es interesante el aprendizaje creativo en su forma de potenciar las capacidades personales de

cada uno de forma diferente, no pretendiendo transmitir contenidos sino en desarrollar competencias.

Por otro lado, no hay que olvidar que las técnicas tienen un poder claramente desinhibidor y desbloqueador, facilitando el acceso a la reserva preconscious, cuando existan dificultades por la vía de racional y lógica.

Trabajo y evaluación en el taller de creatividad colectiva

El taller de experimentación se ha estructurado de manera que se pautan muy claramente las diferentes fases de acción:

01. Organización física de los colectivos en el aula
02. Inicio de interacción entre los estudiantes de cada grupo
03. Lectura de los protocolos específicos de cada equipo
04. Generación colaborativa de ideas
05. Evaluación de las ideas creadas
06. Elaboración de las ideas seleccionadas
07. Presentación de los resultados y debate

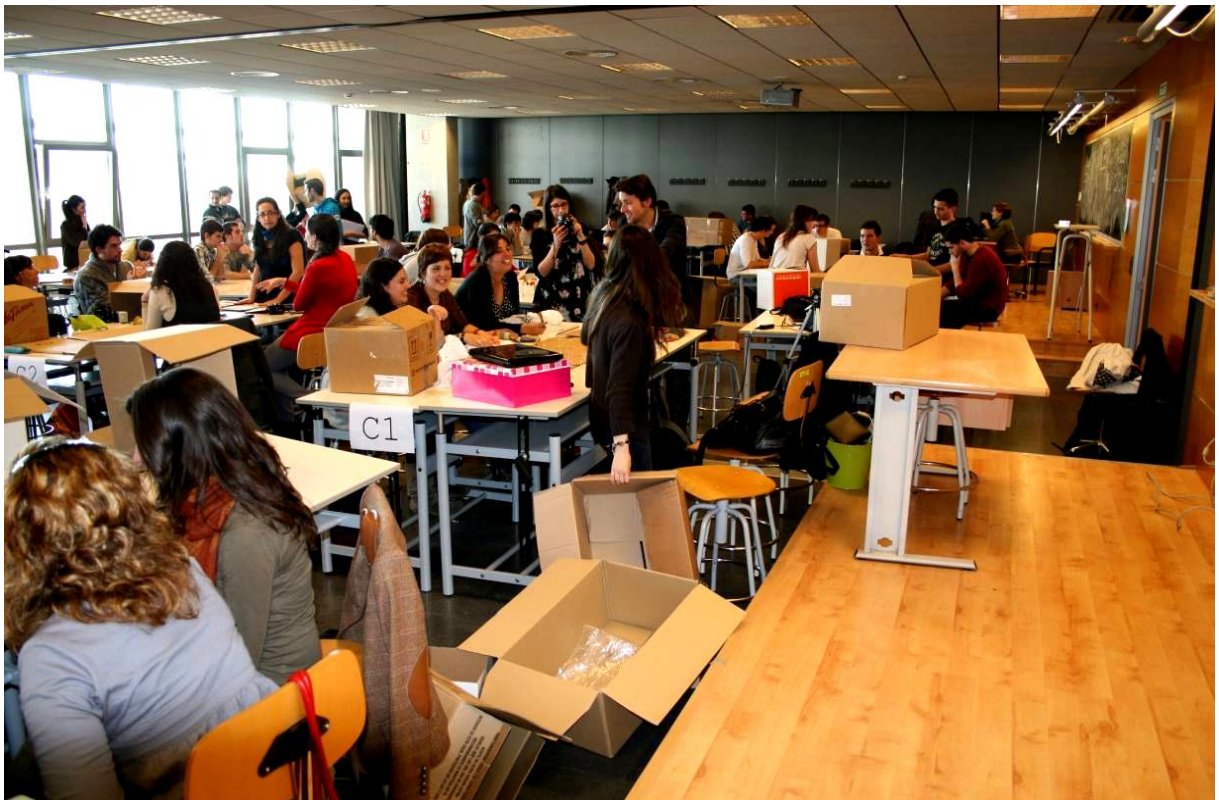


Ilustración SEQ Ilustración * ARABIC 2 . Los colectivos trabajando en la fase de generación de ideas



Ilustración SEQ Ilustración * ARABIC 3 . Estudiantes de un colectivo, trabajando en la fase de construcción de las transformaciones

En cuanto a la evaluación de la creatividad colectiva de los estudiantes se ha estudiado dos etapas de la creación: proceso (interacción social y atmósfera de creación) y producción (producto o resultado creativo). La primera etapa se ha analizado de forma presencial en el taller, mientras que la segunda se ha evaluado posteriormente con el material de producción generado.



Ilustración SEQ Ilustración * ARABIC 4 . Algunos resultados de la producción de las transformaciones de de los estudiantes

Como instrumento de evaluación se decide trabajar con indicadores, entendiendo a estos como pistas, evidencias que nos permiten reconocer los diferentes niveles en que la creatividad se manifiesta. En función del análisis de estos indicadores se establecen unos resultados y sus correspondientes conclusiones.

Tabla SEQ Tabla * ARABIC 2 . Indicadores seleccionados para la evaluación de creatividad colectiva de los estudiantes

EVALUACIÓN PRESENCIAL	
PROCESO	INTERACCIONES
	Liderazgo compartido
	Escucha activa
	Búsqueda de novedad
	Flexibilidad y fluidez
	Capacidad para manejar el cambio y el desorden creativo
	Sinergia y retroalimentación continua
	Interdependencia grupal positiva
	Comunicación horizontal y asertiva
	Sentido del humor
	Actitud frente al bloqueo
	ATMÓSFERA
	Apertura a la novedad
	Libertad
	Estimulante / de desafío
	Confianza
	Flexibilidad
	Desinhibición
	Desbloqueo
	Relajación
	Ausencia de conflicto
EVALUACIÓN NO-PRESENCIAL	
PRODUCTO	PRODUCTO
	Ideas resultado de integración y combinación de múltiples enfoques
	Flexibilidad
	Fluidez
	Originalidad
	Elaboración
	Relación idea-objeto
	Heterogeneidad de las ideas
	Toma de riesgos

Ya establecido el proceso de trabajo y obtenido el material necesario, a través del estudio de los indicadores seleccionados sobre el proceso y el producto creativos, se procede al análisis estadístico de los datos obtenidos mediante el programa informático SPSS 15 (diseñado para el análisis de datos específico para ciencias sociales). Se ha realizado un análisis univariado para la descripción, y bivariado para identificar las correlaciones entre las distintas variables. Para la comparación de los grupos se ha utilizado el estadístico T de Student y el Coeficiente de Correlación de Pearson y Spearman.

Estrategia para el análisis de datos

La estrategia seguida en la comparación de datos de los grupos de este proyecto ha sido:

Tabla SEQ Tabla * ARABIC 3 . Mapa estratégico de contrastes en el análisis estadístico

CONTRASTE 1	GRUPO CONTROL P2 +	GRUPO EXPERIMENTAL P2 +
	GRUPO CONTROL PFC	GRUPO EXPERIMENTAL PFC
CONTRASTE 2	GRUPO CONTROL P2 +	GRUPO CONTROL PFC +
	GRUPO EXPERIMENTAL P2	GRUPO EXPERIMENTAL PFC
CONTRASTE 3	GRUPO CONTROL P2	GRUPO EXPERIMENTAL P2
CONTRASTE 4	GRUPO CONTROL PFC	GRUPO EXPERIMENTAL PFC
CONTRASTE 5	GRUPO CONTROL P2	GRUPO CONTROL PFC
CONTRASTE 6	GRUPO EXPERIMENTAL P2	GRUPO EXPERIMENTAL PFC

Mediante la comparación de los diferentes grupos, se han analizado los datos y se han extraído resultados muy interesantes, los cuales se pueden observar globalmente en una gráfica, en la cual se ve claramente cómo los estudiantes de primer curso generan ideas más creativas pero que los estudiantes de último curso interaccionan mejor:

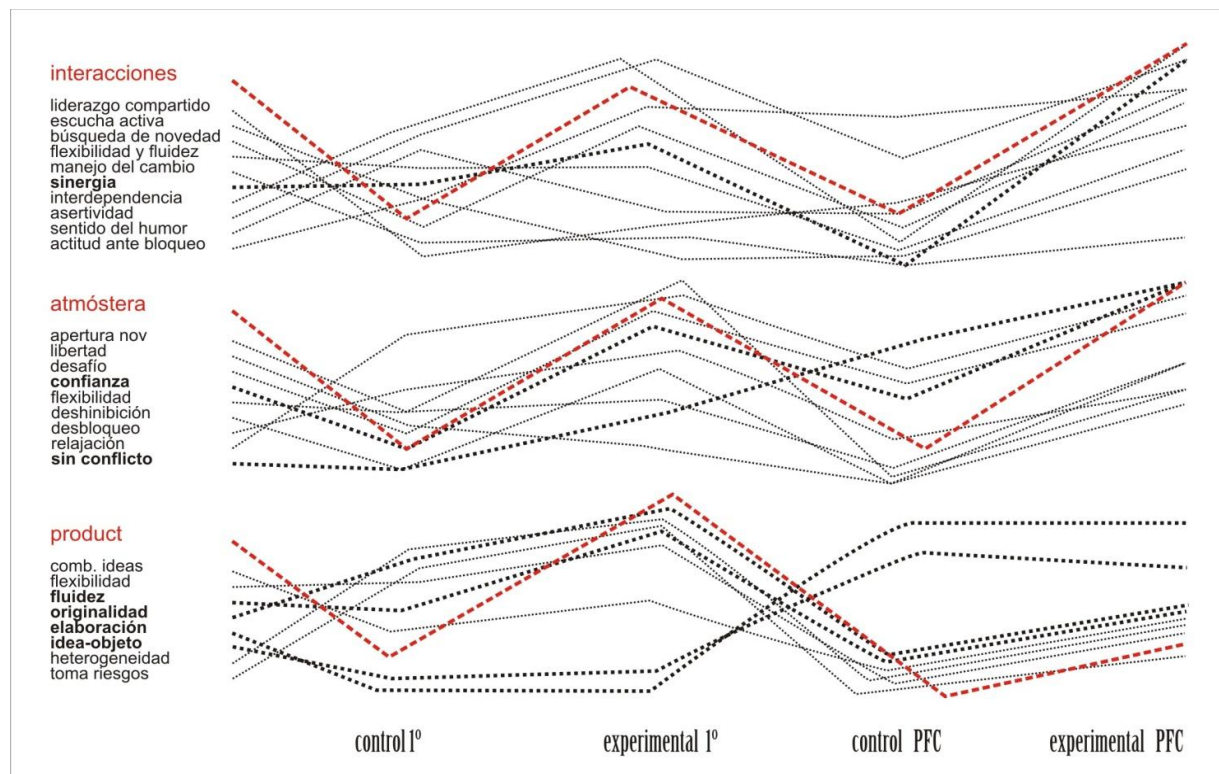


Ilustración SEQ Ilustración * ARABIC 5 . Gráfica global de resultados del taller de creatividad colectiva

Conclusiones

En general, los resultados indican que cuando se activa la creatividad de los estudiantes mediante protocolos específicos, tanto el proceso como el producto creativo se ven beneficiados, siendo el producto el que obtiene mejores efectos.

Se concluye también que aunque cualquier grupo estimulado mejora su creatividad colectiva, los estudiantes de P2 son más sensibles a esta activación y obtienen mejores resultados que los estudiantes de PFC. Sobre todo, esto ocurre en el producto final, sin embargo los estudiantes de PFC mejoran en indicadores que tienen que ver más con la interacción y la atmósfera del proceso creativo, podemos decir que el trabajo colectivo como relación social se desarrolla de forma más fluida, fomentándose la sinergia, la confianza y la ausencia de conflicto entre ellos.

Cuando comparamos estudiantes de P2 y estudiantes de PFC que han trabajado libremente, sin activación de la creatividad, los productos de los estudiantes de P2 son más originales, mientras que los estudiantes de PFC son mejores elaborando con más calidad el producto y tienen una mayor coherencia en la relación idea-objeto, cualidades que han adquirido durante sus estudios universitarios y que demuestra mayor experiencia. De lo cual se puede deducir que en la Escuela de Arquitectura, al no trabajarse directamente la activación de la creatividad, los trabajos de los estudiantes son menos innovadores que los de los estudiantes de primer curso que aun no están sumergidos en la formación universitaria.

Finalmente, se puede resumir que los estudiantes de P2 tienen más facilidad para generar mucha cantidad de ideas, más originales y más heterogéneas, que les resulta más fácil asumir riesgos en su proceso creativo, y que las técnicas de activación de la creatividad tienen positivos efectos en su creatividad. Sin embargo, los estudiantes de PFC han demostrado tener mejores capacidades para construir con calidad las transformaciones de las cajas y conseguir que las ideas se materialicen con mayor coherencia, y también se comprueba en las interacciones de los grupos hay menos conflictos y que construyen atmósferas de más confianza.

Después de llegar a estas conclusiones parece importante que el aprendizaje en la Escuela de Arquitectura de la Universidad de Sevilla dedique mayor esfuerzo a entrenar la creatividad colectiva de los estudiantes, pues es uno de los retos contemporáneos desarrollar procesos creativos más complejos y productivos.

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CREATIVITY TO INNOVATION IN THE APL OF INFORMATION TECHNOLOGY IN THE SOUTHWEST REGION OF PARANÁ-PR

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Abstract:

The Regional Development is intensified by actions and mechanisms which stimulate the generation of ideas. Creativity is a way of stimulating the innovative capacity. It boosts dynamic and innovative work, ideas and the products as well as process improvements. Thus, this paper had a goal to map creativity techniques used in the APL (Arranjo Produtivo Local) of Information Technology in the Southwest of Paraná - Brazil, to analyze the advantages of stimulating ideas that help the participating companies face changes and requirements in today's market environment. It also seeks to analyze the views of managers regarding the application of creativity techniques, and the relationship of companies, which use these techniques along with the successfully placement of innovative products in the market. Techniques of creativity, if utilized within an organization contribute to the creation of ideas and ultimately to the launch of innovative products in the market, which is paramount for Regional Development.

Introduction

Business knowledge can be stimulated and expanded by creativity. Learning new creative techniques is a continual process within an organization and will result in new and improved processes, product and methods.

A large number of professionals and managers from several areas have gradually showed interest in this field. It leads to organizational and professional success as it stimulates the ideas and solutions from within a company, increasing its productivity and innovation.

Team development and involvement through creative and innovative work joins the procedural cycle to the creative cycle, creating a propitious environment to stimulate creativity and consequently abilities are developed and improvement in the problems solving process.

Everyone involved will develop and improve their creative capacity which will be highly beneficial in the long run of a company.

Searching for new and innovative mechanisms developed in the work environment stimulates the emergence of creativity and intensifies regional development, this article aims to map creativity techniques which are used by the companies in the APL (Arranjo Produtivo Local) in Information Technology in the Southwest Region of Paraná – Brazil, as well as analyzing what the relationship between companies that use creativity techniques have with the release of innovative products in the market.

The objective was also to analyze the pros of idea generation that support or boost the company's growth and the necessary changes to cope the deep transformations and challenges in the competitive environment that surrounds them. This requires flexibility and innovation. Focusing the following questions: Can creativity be used as a tool to face these new market challenges? Do managers see creativity as a competitive advantage?

This research becomes important as the creativity techniques and the managers' vision of this tool are laid out. This allows them to create effective policies that stimulate the creation of ideas and knowledge, and therefore the Innovation, essential to local development.

Creativity Management

Creativity according to Loures and Schlemm(2006, p.41), was seen "as the solution search to a problem, answer to a conflict in the unconscious or in the preconscious and the individual's ability to remain open to the world." However, it's been realized that it's much more the result of groups and communities than from individuality.

That is, the concept that creativity was few people characteristic is already a myth, because it can be build, depending on factors of social and cultural nature. TORRE(2008, p.21) notes that:

If in past centuries it was believed that the creator potential was a gift given to a small group of people, nowadays there is a widespread perception that we all have a creator potential, similar to intelligence, capable of being developed. It is noteworthy then, that creativity can and must be resolved (NOVAES, 1973).

Modern society has given value to creative potential stimulus, because it's the key to holistically develop and fully train an individual. The educational environment is one of the mainly creativity stimulants, so the teacher must be creative to introduce this way a propitious environment to creativity, promoting the discovery, stimulating the creative intellectual processes, diversifying opinions, promoting the intellectual capacity, introducing the self-evaluation. Helping the student to be more sensitive, to overcome failures and to have a more democratic than authoritarian attitude (TORRE, 2008).

Thus, Melo(2002) points out: It is therefore fundamental that the school, far more than accumulating knowledge, teaches the student to reason, to develop creativity, imagination and the initiative spirit, exciting him to knowledge acquisition and enabling him to understand what the new world, that is taking shape to the professional life, will be. Because, the globalization fast changes required and the technological advances revealed an incredible capacity to creativity. The industrial park modernized itself, the relationships capital-labor are thinning and crystallizing in a much more professional relationship.

This context allows us to evaluate that creativity will only be valued from the moment when the most part of teachers, students, politicians, businessmen and managers create an environment to teach learning methods in a creative way, with larger independence and self-organization to increase the creativity stimulus (TORRE, 2008). This educational characteristic requires the current education to contribute to the creativity stimulus, focusing its work beyond the traditional knowledge field, emphasizing what is stated by TORRE (2008, p.27):

In education, it's not allowed a lesson being given by someone who isn't qualified or without adequate knowledge about the subjects, neither we can walk blindly in a so undefined field as the creative.

However, that is also observed that, although there are already a large number of projects in the creativity field in the organizations, many questions must still be explored, mainly with reference to the influencing factors of the employee creative potential and the companies innovation process (FARIA; ALENCAR, 1996).

Among the highlight mental factors attributed to creativity, Torre (2008) cites the fluency and productivity, focusing the active education, in which the students not only listen, they also answer, participate and practice. Other factor is the flexibility, trying to require from the student besides ideas, different answers and solutions, proposing originality, with the production of unusual and ingenious answers. Cites as a creativity factor the details elaboration that contribute to the ideas development and the invention education, or the attitudinal factors and the sensitivity to problems, as characteristic factor to a creative person. Other factor is the formation in the independence and freedom, and the creativity stimulus.

These factors that lead to creativity, can be stimulated or blocked. According to Torre (2008) the creativity stimulus factors, can be influenced by the creative climate in the classroom, and different approaches, because the question is the hook to creativity. Another stimulus factor is the use of creative techniques, besides several resources, abolish judging, and the use of praising.

In relation to the creativity blockade, Torre (2008) cites perspective and mental blockade, as the difficulty to isolate the problem, the limitation to the problem, and the difficulty to realize remote relationships. Another kind of blockade is the emotional or psychological including the insecurity, the terror of making mistakes and being embarrassed, the desire to succeed quickly. Other blockade is the social-cultural, with conduct practices, the intelligence and cooperation overvaluation, excessive importance to gender role. Still, the blockade generated at schools, with pressures, authoritarianism, bullying, overvaluation of rewards or punishment and insecurity with playful activities.

These factors are also addressed by Faria and Alencar (1996) in which they state that mainly creativity stimulus, in different companies, are the organizational, managers, and coworkers support; organizational structure; freedom and autonomy; salary and benefits; participation; physical environment; and communication. And the obstacles: organizational structure, manager characteristics, interpersonal relationships, organizational culture, communication, lack of technological and material resources, physical environment, chores characteristics, political and administrative influences, the service amount, lack of training, salary and benefits.

Based on this context encompassing factors that affect the creativity, Torre (2008) describes the creative cube, which includes: methods, techniques and the application field, to influence creativity. This method consists in a general way to proceed, the technique with a series of steps to follow and the application field, the strategies.

With respect to the techniques and mental operations of the creative cube Torre (2008) characterizes the invention as a way to act of our minds, the analytic techniques, as an element analysis, the structural, the association, to establish links between the ideas, the metamorphic, to address redefinition skills, and mixed that joins three or more operations.

Among the creativity methods to stimulate the mind, Torre (2008) highlights the analogical method, basing on similarities to solve a new problem, the antithetical method, relying on the critical and revisionist attitude and the random method, including the concepts and relationship combinations.

Thus, Torre (2008) classifies the practice fields as figurative, that are individual, symbolic, meaningful for themselves, semantic, by its design, behavioral considering the personal planes and mixed for developing three or more fields.

Creativity Techniques

The creativity techniques contribute to the ideas generation and therefore to the creation of innovation. Among these techniques Brainstorming is highlighted, it helps and motivates the creation of ideas, being applied in team. This technique makes the verbalization of ideas free (RODRIGUES, 2004).

That way the Brainstorming consists in a gather of a team of 4 to 12 members under the coordination of a leader, with a specific period of time, indicating ideas that arise about a defined subject. The general rule is not to criticize any idea (RODRIGUES, 2004).

Another important technique in this research is the 5W1H, being used from a checklist, which has English words applied: What, Why, When, Where, Who and How. Which means those are questions applied front a significant change.

The PNI, meaning positive, neutral and interesting technique, explores an idea by its positive, neutral or interesting points, getting beyond simple answers as yes or no (SIQUEIRA, 2009).

The Nominal Group Technique has as objective to reduce the large number of ideas generated by the Brainstorming, in which every participant will individually give a score to each idea. The selection of idea will be prioritized by the score sum.

Each technique is used or chosen as the organization deems interesting or necessary, that's why the manager knowing the importance of these techniques to generate ideas creates competitive advantage in the market.

APL of Information Technology in the Southwest Region of Paraná

The **NTI or Information Technology Center** which compose the APL, is a nonprofit association that aims to help the economic and technological development of its members and the local community involved, with a proposal of disclosure of all technical and marketing information of the region, promoting the experience exchange between professionals and associated companies and business actions that will create jobs and income.

The Arranjo produtivo Local or APL, according to Lemos (1997) can be considered as a group of companies geographically near that act around a predominant productive capacity, and share ways of cooperation.

The APL Project in the Parana Southwest Region started through a political proposition in one of the city member of the APL, but after some time it started to have autonomy, acting independently from local political support.

The NTI summarize itself in a Arranjo Produtivo Local – APL in the technological IT area. This center, is the result of business leaders efforts, and includes companies, public organs, entities and IT professionals, that is, the local community interested in develop the IT field. Nowadays there is already the State and National recognition of this entity as one of the mainly actors in the technological development process in the software field.

It's mission is "Provide organization and improvement in the IT field, looking for new opportunities, partnerships and policies to achieve international reference".

Methodology

This research is classified as exploratory and descriptive. Exploratory because it explores a reality and descriptive by description of involved factors. It's also classified as quantitative and qualitative. Quantitative by seeking to measure in numeric data the creativity techniques used and qualitative by phenomenon interpretation.

A questionnaire was answered by managers from the 45 companies that are members in the APL in Information Technology in the Southwest Region in Paraná – Brazil, it

had 67 creativity techniques, each one with a short explanation about its concepts. The manager made a mark on the side of every technique used by its company, helping in the analysis of positive points to stimulate the creation of ideas that improve the innovations, favoring companies to changes and competitiveness in the market environment. That is, a 100% of the companies where surveyed.

These 67 creativity techniques come from a study performed by Fonseca (2009) that a survey containing more than 200 creativity techniques, concluded that the most well known are these 67 used in this research.

The companies were also questioned about the amount of innovation presented in the last 3 years, in order to relate the amount of creativity techniques used with the quantity of presented innovations.

The 67 techniques researched were the following: Advantage, Limitations and Unique Qualities, Analogies Technique, Brainstorming Technique, Individual Brainstorming Technique, Imaginary Brainstorming Technique, Brainwriting Technique, Navigation Technique, Defect Listing Technique, Random Stimulus Technique, Bullet Proof Technique, Bunches of Bananas Technique, Causal Mapping Technique, Tables Comparison Technique, Concept Fan Technique, Contradiction Analysis Technique, CPS - Creative Problem Solving Technique, Critical Path Diagram Technique, Do it Technique, Do Nothing Technique, Design Techniques, Essay Writing Technique, Evaluation – Discussion – Evaluation Technique, Fish bone Diagram Technique, 5W1H Technique, Focus Group Technique, New Look Technique, Heuristic Ideation Technique, Mark – Highlight Technique, Ideas Defender Technique, Ideal Final Result Technique, Imagination to Answer Questions Technique, Lateral Thinking Technique, Mind Maps Technique, Morphological Analysis Technique, Negative Brainstorming Technique, NOTEBOOK Technique, Other People Definition Techniques, PDCA Technique, Preliminary Questions Technique, Productive Thinking Model Technique, Progressive Revelation Technique, Provocation Technique, Quality Circles Technique, Random Stimulation Technique, Ideas Responsiveness Technique, Relaxation Technique, Systematized Direct Induction Technique, Slice and Dice Technique, Nominal Group Technique, Technology Surveillance Technique, Reflection Group Technique, Trigger Method Technique, Using Experts Technique, Value Brainstorming Technique, Value Engineering Technique, Visual Brainstorming Technique, Goal Visualization Technique, Why? Why? Why? Technique, Creativity 7x7 Technique, Discontinuity Technique, External Opinions Technique, Comparisons and Metaphors Technique, Reverse Assumption Technique, Conscious Intuition Technique, Attribute Listing Technique, PNI – Positive, Neutral, Interesting Technique, Assumption Questioning Technique.

Data Discussion and Analysis

Based on the questionnaire applied containing the 67 creativity techniques, it has been noticed that from 45 company members of APL of Information Technology (NTI), only 25 use some creativity technique. At table 1, it is possible to see what are the used techniques.

Table 1 – Relation of quantity of companies by used technique

Used Techniques	Company Amount
Brainstorming	25
5W1H	2
PNI	2
Nominal Group Technique	1

Source: own author

It is noticeable the lack of knowledge about the creativity potential to increase the organization innovative capacity. Only 55.5% of the organizations in the Information Technology Center use some of the creativity practice surveyed.

The companies that introduce the management creativity techniques are the larger ones, with greater market share and with the greater number of employees with specific training to the field, as curses or graduation.

Brainstorming technique was the most indicated within the organizations, being used in every company that is open to these techniques. The other creativity techniques were cited in only 5 companies.

Among the companies that use creativity techniques, occurred a greater incidence of successful innovation product placement in the market. The other 20 companies that don't use any of the creativity techniques, the average was the placement of 2 innovation products per company - being that Information Technology is a field with extreme need of innovation to be competitive in the market. Bono (2000) confirms the result in table 2, determining that the creativity stimulus is a key differentiator to companies, because it stimulates the creation of ideas to solve problems, to new methods and processes, that is, to innovation, which is the achievement of a good idea.

Table 2 – Average of innovation products among NTI companies that use and don't use creativity techniques

Companies	Average of innovation products placements in the last three years
Companies that don't use creativity techniques	2
Companies that use the creativity techniques	5

Source: Own author

In relation to companies that use creativity techniques it is also possible to observe, as table 3, that the greater number of creativity techniques used the greater is the amount of innovation products being placed in the market. In this sense Gurgel (2006) states that to have more opportunities, it is necessary to stimulate creativity.

Table 3 – Innovation products relation among companies that use Creativity Techniques

Company	Creativity Technique used	Innovation Products placed in the market
Company 1	Brainstorming, 5w1h, PNI	7
Company 2	Brainstorming, Nominal Group Technique	6
Company 3	Brainstorming, 5w1h	6
Company 4	Brainstorming, PNI	6
Company 5	Brainstorming	5
Company 6	Brainstorming	5
Company 7	Brainstorming	5
Company 8	Brainstorming	5
Company 9	Brainstorming	4
Company 10	Brainstorming	5
Company 11	Brainstorming	4
Company 12	Brainstorming	4
Company 13	Brainstorming	4
Company 14	Brainstorming	4
Company 15	Brainstorming	4
Company 16	Brainstorming	5
Company 17	Brainstorming	5
Company 18	Brainstorming	5
Company 19	Brainstorming	4
Company 20	Brainstorming	4
Company 21	Brainstorming	4
Company 22	Brainstorming	4
Company 23	Brainstorming	5
Company 24	Brainstorming	5
Company 25	Brainstorming	4

Source: Own author

Companies that showed greater creativity techniques quantity being used were the ones that had the greater number of employees with specific courses or graduation in the field.

With this survey the creativity techniques showed its importance to the creation of ideas and innovation products, that is, the relation of used techniques quantity and the quantity of innovation products being placed in the market were listed as directly proportional. According to Stoner & Freeman (1999) creativity and innovation are directly linked, since while one creates the ideas the other puts it in practice.

Company 1 proved to be the unique to use 3 different creativity techniques: Brainstorming, 5W2H and PNI, and consequently was the company that placed more innovative products in the market. It then includes Reis (2004) ideas which states that innovation is the placement of ideas into practice, successfully.

Then focuses the creativity importance to managers, in a way to create an environment that stimulates the creation, generating innovation, and contributing to the organization competitiveness this way, with increasingly need to differentiate from its competitors for its own survival.

Conclusion

Creativity as shown through this study has shown the influence it has within organizations that utilize it. New and innovative techniques may be the edge that many companies are looking for in today's competitive market. Openness to new ideas and innovative product placement is one of the most important factors in business today.

Mapping these creativity techniques demonstrates the managers' vision in relation to this theory. Competitive advantage is not being utilized by today's companies. Creativity management is not being used by managers of the associated companies of APL of Information Technology in the Southwest of Paraná. It is suggested then, to the NTI coordinators, spreading this positive relationship between the creativity techniques and innovative product placement will be important in regional development.

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NUTEIXOS NA EDUCAÇÃO

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Abstract

Apresenta-se um caso de trabalho em rede para desenvolvimento de soluções originais visando a educação ambiental no Algarve: o projecto “Contos do Mago”. Contos do Mago constituiu uma iniciativa institucional que se propôs melhorar a capacidade de reflexão das escolas sobre a forma como se habita. Para o efeito explorou o imaginário usando contos de autor desenvolvidos em redor de uma mitologia de criação geológica da região com correspondência em espaços concretos de proximidade. Com base nos contos e percursos que os inspiraram, implementaram-se oficinas de formação de professores com vasta participação de instituições da comunidade regional. A formação integrou, além das sessões de conto e respectivos percursos, oficinas de criatividade. Nelas explorou-se o uso do imaginário para potenciar o envolvimento afectivo com o território e a curiosidade em conhecê-lo. E elaboraram-se métodos alternativos para construir novas pontes para conhecimento e compreensão das várias dimensões inscritas nos espaços do quotidiano.

Palavras – chave: Educação, Ambiente, Território, Criatividade, Conto

O Imaginário como porta de entrada para o estudo do território

É comumente aceite que o real é o que percebemos através dos sentidos e opõe-se ao imaginário. Mas será mesmo assim? Poderá um conto ajudar-nos a perceber os paradigmas que influenciam a nossa percepção da realidade? Poderá o imaginário ser uma chave para criar laços com o território, para compreender a forma como se habita?

Vejamos “O Caso do Oceano Remendado”, um dos Contos do Mago, Tapadinhas (2009):

Há muito tempo atrás, o local onde estamos agora, era o centro do Pangea, o continente único. Estava um calor insuportável.

Os animais reuniram-se e pediram ao Mago Zóico para fazer qualquer coisa, senão morreriam de calor. O Mago aproveitou a ocasião para experimentar fazer a maior magia que um mago geológico podia fazer: criar um oceano. Apesar de ter o Nuteixo, a sua âncora mágica, o risco era elevado e precisaria da ajuda de todos – mas quando o disse, já os animais se tinham ido embora, as tartarugas a pensar no biquíni, os iguanodontes a comprar protector solar.

Para fazer o oceano, o Mago teria de fracturar o Pangea, mas só ao centro, para criar um vale de rift que se encheria de água.

Sozinho, reviu as palavras mágicas e proferiu-as, ao mesmo tempo que desenhava oitos no ar. Mas, fosse porque o Nuteixo estava amuado ou porque o Grande Magma o quisesse impedir, num instante começou a fracturar-se todo o Pangea. Grandes blocos de continente afundavam-se rapidamente no mar. A continuar assim, o planeta ficaria a ser apenas água. O Mago tentou tudo, dizer a magia de trás para a frente, oitos ao contrário... até que teve uma ideia: pediu ao Ornitogea de Olhos Quartzo que emitisse o chamamento geral, iria solicitar a ajuda de todos os animais do Reino Meso.

Aos corais pediu que remendassem o Pangea, multiplicando-se nas falhas indesejáveis; às amonites que retirassem a água acumulada dentro do Pangea; aos dinossáurios que fincassem os pés e aproximassem blocos fracturados, e assim por diante. Todos colaboraram, até as criaturas *bizaráticas* que viviam nos mais recônditos buracos da Montanha Hercínica. Trabalharam sem cessar, até que ao cabo de uns dias, o Pangea estava concertado. Não era exactamente o resultado que o Mago tinha idealizado, mas a verdade é que ali estava o Atlântico a estrebuchar, embalado pelos dinossáurios, que lhe cantavam a canção “A lua nasceu e cresceu no Além, mas também para ti desceu, meu bebé vai dormir, vai dormir e sonhar, que amanhã voltarás a brincar”.

“O Caso do Oceano Remendado” não aconteceu num sítio qualquer, aconteceu neste lugar, em Loulé. Há milhões de anos, aqui era um deserto, terra de xistos e grauvaques. Foi sobre eles que se formaram os calcários que se pisam agora, pela precipitação nas águas do “oceano remendado”. O que estamos então a fazer quando criamos um conto sobre estes acontecimentos? Estamos a efabular sobre o aparecimento de uma geografia concreta apoiados em teorias científicas reconhecidas. Poderá o imaginário ser uma chave para criar laços com o território, para compreender a forma como se habita? O sentido de pertença pode começar assim. Conta-se, percorre-se, pensa-se as rochas que pisamos agora, ouve-se dizer que foram criadas no fundo de um oceano que nasceu neste local. Quando? Como? Percorrem-se caminhos em redor de Loulé, observam-se as pedras calcárias dos muros, os solos e a que deram origem e os usos que eles permitiram, encontram-se fósseis de coral e amonites. Discute-se que não se encontraram até ao momento pegadas de dinossáurio, mas, diz alguém, há jazidas em rochas da mesma idade no concelho de Vila do Bispo, a ilustrar a dimensão regional dos acontecimentos. E se se verificar a transgressão marinha prevista, ficará tudo de novo sob as águas no futuro? Bem, o Mago já naquele tempo tinha grandes dificuldades para conseguir o resultado que pretendia com as suas magias. Nem tudo funcionava como ele queria e não sabe porquê. Na verdade ninguém sabe tudo, nem um Mago. A ignorância é uma dimensão essencial para compreender o que somos. O Mago especula e avança com várias hipóteses explicativas. Pode ser o Grande Magma, o feiticeiro do manto terrestre, que, com ele, trava

uma disputa pelo amor da Princesa do Gesso. Ou pode ser avaria do Nuteixo, que o deixou incapaz de dominar o tempo. O tempo é outra coisa que importa perceber para bem ler o mundo. O território é tempo? Poderá um conto ajudar-nos a desmontar o poder dos paradigmas instituídos na nossa percepção da realidade? E se as rochas ganhassem uma dimensão afectiva, se fossem guardiãs da memória? Elas até têm uma história mais longa e mais lenta do que a nossa. Metamorfoseiam-se, transforma-se, transformam a paisagem. E nós, também transformamos a paisagem? Que canções entoaram os canteiros dos muros calcários de Loulé? Basta encostar nelas o ouvido e.... Poderá o imaginário ser uma chave para criar laços com o território, para compreender a forma como se habita?

Pesem embora todas as matizes que têm vindo a ser introduzidas nos discursos produzidos em redor da criatividade, não parece que o seu eixo conceptual tenha sofrido alterações significativas. A ser assim, continuaria a poder definir-se a criatividade como a produção intencional de novidade com valor, Romo (1998). Nesta acepção pode-se afirmar que os apelos à criatividade têm sido uma constante na Educação Ambiental (EA) na escola. Com indução interna ou externa, proliferam os concursos de ideias e projectos ambientais. Com eles têm-se procurado novas vias para promover valores ambientais: redução, reutilização, reciclagem, conservação, preservação. Os resultados são evidentes. Proliferam slogans, personagens, textos, esculturas, campanhas. A criatividade ambiental tem andado “à solta” nas escolas. Podemos comparar a qualidade criativa dos resultados. Podemos criticar a preferência pelo slogan “a água é vida” em detrimento do outro que dizia “gastar água é uma seca”. A nosso ver, porém, a questão central é outra, e podemos formulá-la assim: por muito criativos que sejam, segundo todos os cânones da criatividade disponíveis, que há de ambientalmente educativo no slogan sobre a água ou na árvore de Natal feita com resíduos reutilizados que ganhou o concurso de ambiente?

A nosso ver a questão merece uma resposta profundamente ambígua: tudo e nada. Com efeito há muitos olhares possíveis sobre o mesmo objecto. Não basta a intenção do autor para que o publico seja capaz de extrair da obra a mensagem desejada. Poderíamos então aventar a hipótese de que boa parte do potencial da criatividade aplicada à prática da EA na escola possa estar nos processos. E que seja aí que a exploração das premissas, hipóteses e teorias associadas ao campo do ambiente tenha espaço para ser efectivamente compreendida. Mas como?

Na escola a criatividade procura-se para potenciar uma complementaridade clássica: ensino - aprendizagem. As pedagogias inovadoras é esse objectivo que servem: potenciar a capacidade do professor no ensino e a do aluno na aprendizagem de conteúdos. Mas o ambiente é um conteúdo?

O ambiente pode ser definido nesta proposta lapidar: o modo como se habita. Não um “meio”, um “contexto” ou sequer um “somatório de partes”, mas um todo em processo. Faz tão pouco sentido dissociar na ideia de ambiente meio e seres vivos, como dissociar na pessoa mente do corpo. Faz mais sentido pensar ambiente como conceito complexo que incorpora dimensões tão diversas como a clássica dialéctica entre o idealismo e o materialismo. Compreender estas dimensões corresponde a um investimento em educação. Claro que isso não é impossível de conseguir no processo que conduz á produção de uma árvore de natal com lixo reutilizado. Contudo, esse género de iniciativas como que aprisionou a prática da EA num conjunto de estereótipos instrumentais em prol de uma determinada ideia de higiene publica e de civismo. Uma deriva onde a criatividade que sobra nos soluções tem faltado na reflexão que lhes dá origem.

Ao contrário do que aconteceu na América do Sul, onde a EA incorporou uma forte componente de contra-cultura na oposição ao capitalismo, na Europa e na América ela assumiu uma linha de contra-conduta claramente reformista, Pepper (1996), Quer isto dizer que se considera ser possível resolver os desfasamentos detectados entre o ambiente existente e o ambiente idealizado com mudanças ao nível das atitudes e dos comportamentos. Ou seja, de algum modo a EA submete-se ao paradigma vigente. Daí o pragmatismo das práticas de EA implementadas.

No fundo esse pragmatismo parece resultar da conjugação de várias crenças de cariz ideológico, Pepper (1996), nomeadamente na capacidade instalada na ciência para produzir diagnósticos infalíveis e soluções à prova de erro. Essa dupla crença, na onisciência da ciência e na bondade dos fins, como que tem funcionado como um salvo-conduto que dispensa quem dinamiza EA do domínio dos conteúdo das temáticas sobre as quais trabalha. Dessas lacunas de domínio, resulta também uma óbvia falha de capacidade crítica sobre as políticas, os métodos, as práticas de EA que têm sido empreendidas, e o seu consequente manejo criativo, Sternberg e Lubart (1997). Esse contexto gerou e tem perpetuado nas escolas um argumentário ambiental de grande inconsistência ecológica, mas que, invocado para justificar as propostas de mudança apresentadas aos alunos, quase ganhou contornos de doutrina. Quando é que se irá assumir que os “equilíbrios naturais” cujo “respeito” se promove na escola como justificação científica para boa parte das propostas ambientais são um mito ecológico, Pickett & all (1994)?

O refúgio em soluções criativas mas muito pouco educativas, como a metáfora do “equilíbrio da natureza” ou o slogan da “salvação do planeta”, é uma das estratégias que tem vindo a ser usada *ad-nausea* para colmatar as insuficiências argumentativas de quem faz EA. Mas quantos dos alunos do 1º ciclo que aderem à reciclagem de papel para “salvar o planeta” é que irão desenvolver a capacidade crítica necessária para entender que o que efectivamente tentam salvaguardar é o paradigma civilizacional da modernidade ocidental?

Essa compreensão é irrelevante em face do imperativo dos objectivos de política ambiental instituídos? Se é, porque se insiste na referência à educação e não se assume claramente que o que se pretende é instruir os alunos num conjunto de regras práticas tidas como socialmente importantes?

O “clima ambiental” instalado na esfera pública e banalizado pelos média, não permite criar espaço para desenvolver estas questões, pois como que aprisionou o discurso ambiental nos estereótipos da sua prática. O professor na sala não está imune ao efeito deste caldo cultural. Mesmo quando teve oportunidade de desenvolver um arsenal crítico razoável, ele tem dificuldade em bater-se com uma citação do último episódio do “Climat Tracker” do programa televisivo “Biosfera”, sobre as ameaças ao urso polar, visionado por algum aluno na tarde da véspera. A abordagem nas escolas das questões de base fundadoras da compreensão das dinâmicas ambientais, como que parece bloqueada pelo pragmatismo reformista instalado no *main stream*. Como escapar deste constrangimento?

Criado em 1998 para promover a EA através das expressões artísticas, cedo o Programa Regional de Educação Ambiental pela Arte (PREAA) tomou consciência dos condicionalismos que temos vindo a referir, DREAlg (2009). Os Contos do Mago, o seu 5º ciclo temático, foram pensados como tentativa de resposta a essas limitações, como um projecto para abordar a educação ambiental “fora da caixa” ideológica instalada (Tapadinhas, 2009). De algum modo, os “Contos do Mago” têm pretendido falar de Ambiente sem dar a entender que é de ambiente que se fala. É o caso da abordagem da “mudança” no “Caso do Oceano Remendado”.

A mudança constitui a grande constante do mundo e da vida (Shugart, 1998). Uma espécie de permanência em redor da qual se desenrolam todos os acontecimentos. Rápida ou lenta, aleatória ou intencional, a mudança está sempre a acontecer. Pode ser desencadeada por coisas tão prosaicas como a vontade dos animais do reino Meso se refrescarem e não terem onde. Algo semelhante aconteceu quando as pessoas de Loulé quiseram refrescar-se sem ter de ir à praia: fizeram-se piscinas municipais. Mas a mudança é emergente. Emergente é a propriedade de um sistema que gera padrões de alta complexidade a partir de interacções simples. Activado o Nuteixo, desencadearam-se acontecimentos imprevistos. A imprevisibilidade é um corolário da mudança. O Mago Zóico não esperava que o Pangea se fracturasse tão rapidamente. O Presidente da Câmara de Loulé também não esperava que o nível dos freáticos que abastecia piscinas e outras banheiras baixasse tão rapidamente. De repente apareceram oceanos em crescimento onde antes havia continentes e barragens onde tínhamos vales agrícolas. O Mago tentou remendar as coisas convocando os dinossáurios para segurar os continentes à deriva. O Presidente da Câmara também convoca os munícipes para travar o esvaziamento dos freáticos e a proliferação de

barragens, pedindo-lhes que segurem a água. E cantamos canções enquanto esperamos refrescados por esses futuros. A mudança continua porque o tempo não pára.

O tempo poderia ser a outra dimensão de base para compreensão das dinâmicas ambientais, Fabar e Proops (1994), a enfatizar a partir do conto. Nas formações de professores dos Contos do Mago, o binómio tempo vs mudança é uma referência contínua nos percursos pedestres em redor dos locais onde decorre o quotidiano. Procuram-se e encontram-se sinais de ambos nas rochas, nos solos, nas plantas, nas casas. Sobre eles podemos reinventar o conto. Criar Magos Imobiliários, oceanos de laranjeiras, máquinas jurássicas escavando túneis do tempo nas pedreiras do Alto Parragil por onde nos podemos aventurar para descobrir que o futuro não está decidido. Nunca esteve. Do futuro pode-se dizer o que Agustina disse do amor: uma “espécie de inpenitência sagrada”. Não há como nos arrependermos dele. Nem precisamos de o antecipar como se fosse mera projecção do passado, determinado por uma bitola maniqueísta qualquer. No fundo, trata-se da crítica à ideia de que se fizermos as coisas certas, amanhã teremos os resultados que esperamos, porque no processo tudo é controlável. Não é bem assim. Por isso aprender a lidar imprevistos talvez seja mais educativo que aprender a funcionar com certezas.

Não falamos exactamente do imprevisto com que os professores Pedro e Ana se depararam quando saíram com os alunos das vedações da escola básica de Vale Judeu para procurar nos arredores sinais da passagem do Mago Zóico, e perceberam que nem eles nem elas sabiam como aliviar as bexigas por detrás das moitas, embora o episódio ilustre na perfeição como a realidade que habitamos influi na nossa interacção com o mundo. A verdade é que mesmo soltos no campo, os miúdos da nossa urbanidade estão tão aculturados à sanita que não concebem o chichi fora dessa infra-estrutura. Algo de semelhante se passa com ver o mundo, actividade natural, mas que parece ter deixado de ser possível de realizar fora dos centros de interpretação construídos para esse efeito. Inspirados no Caso do Oceano Remendado, os professores de Vale Judeu tentam contrariar essa deriva. Saem com os alunos a calcorrear os arrabaldes. Vão todos à caça de sinais dessas vicissitudes jurássicas. Todos sonham em dar de caras com um fóssil do iguanodonte inadvertidamente soterrado pelas derrocadas malucas que o amadorismo do Mago Zóico desencadeou. Não o vão encontrar, porém. Tudo em redor são calcários que resultaram da consolidação de sedimentos depositados durante milhões de anos no fundo do tal oceano que já aqui existiu. Reflectem nessa explicação para o insucesso da caçada sentados no poial exterior da nora mourisca entretanto desactivada. Sabiam que foram os árabes quem inventou estas noras? Para que servem? Já não servem, serviam para regar as hortas. E agora como se regam? Responde-se com uma visita à casinha do furo feita ao lado de onde o motor eléctrico acciona a bomba que retira ao freático a água que vai regar

as laranjas que se estão a apanhar e que depois serão enviadas para Lisboa. Ou seja, semeia-se mundo. Há outras formas de fazer chichi.

Concluindo, recapitulamos que pretendemos reflectir a dimensão ética na criatividade quando aplicada à educação ambiental.

Para o fazermos assumimos como premissa que a educação transcende o ensino. Isto é, que não se limita a transmitir informação e conhecimento, que promove a sua compreensão, Chaves (1999). A importância de promover a compreensão das coisas tem a ver com a necessidade de ir mais longe do que aquilo que nos permite a transitoriedade dos consensos que periodicamente vão sendo redefinidos em redor da verdade e do valor. Comte – Sponville (2008) formula esta questão nos seguintes termos "A verdade não tem em si mesma um valor objectivo nem o valor contém em si uma verdade absoluta". Ou seja, do ponto de vista que temos defendido no PREAA e que tentamos expor nesta reflexão, a educação não se esgota na instrução e seguramente não se traduz na defesa de causas, mesmo quando estas correspondem às crenças dominantes, mesmo quando tudo nos leva a crer que são causas de bem. Como dizia Nietchze, todos os grandes acontecimentos têm pelo menos duas leituras. Essa capacidade de olhar o mundo através das várias leituras dele que são possíveis é o que melhor ilustra que o compreendemos. A construção dessas mundividências plurais requer o domínio de conteúdos objectivos de conhecimento, sem dúvida; mas não se autonomiza se não for possível desenvolver filtros críticos para se proceder à sua leitura. Quer dizer, o conhecimento científico é uma mais-valia para a compreensão do mundo. Mas o mundo não se esgota nas explicações da ciência, Torre (2006). Por conseguinte, do ponto de vista da educação, não parece honesto trabalhar conteúdos científicos como quem promove doutrinalmente sistemas de crenças. Nem parece ético usar a criatividade para melhor o conseguir. Contudo isso acontece. Inclusive na escola. Na EA não é raro encontrar programas e professores que usam as salas de aula para advogar causas ambientalistas como quem divulga ciência. Para o efeito servem-se do crédito da ciência na esfera pública e usam a criatividade como recurso metodológico ou como instrumento didáctico para potenciar a mensagem. A criatividade aplicada tem a capacidade reconhecida de transformar humildes moleiros em abastados marqueses, e não faltam gatos das botas disponíveis para mostrar como se conseguem esses milagres. Mais raros são os criativos que entendem que a crença na bondade dos fins não justifica todos os meios. Dizendo o mesmo de outro modo, marketing e educação são coisas distintas. A primeira realiza-se na adesão que suscita; a segunda na autonomia que produz. Uma distinção que nem sempre é clara nas práticas criativas que têm vindo a ser adjudicadas à EA.

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The Innovation Pantheon.

How the orchestration of the Gods of Innovation can lead the way to innovation.

Herman Hoving

Abstract

On the occasion of the 12th European Conference on Creativity and Innovation the Innovation Pantheon was designed starting with a journey through the innovation landscape. On this journey the gods of management came on handy to transform them into gods of innovation. Also empowerment as intermediary between inspirational leadership and innovation came to the foreground. Influence and Meaning as basic cognitions of empowerment are used as design factors of the Innovation Pantheon. However they are not sufficient to realize collaboration between Athena, Zeus, Apollo and Dionysus as innovation gods because they have the nasty habit of fighting each other. With the help of Janus as their leader the innovation gods are orchestrated to contribute to innovation and to bring ideas into good currency within an organizational context. The role of Janus as a leader of innovation is described by Inspirational Influence tactics. The most important implications for the management and organization of innovation are the accentuation of the role of the Politician and a multi-level approach to innovation. Theoretical implications are summarized in a model to research new relationships between inspirational leadership and innovative behaviour. Finally the innovation paradoxes of Time, Control and Knowledge are solved by the Innovation Pantheon.

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1. Introduction

The 12th European Conference on Creativity & Innovation (ECCI) was organized from 14-17 September 2011 in Faro (Portugal) *to 'bring together methods and tools from collaborative arts, science, business, education, technology and social development, which can be adapted to innovation in organizations'* (convocation of the conference). Speakers and participants were requested to keep following question in mind: *"How is it possible to devise ways of directing people with entirely different occupations, backgrounds and experiences to agree on a common purpose to achieve unique solutions?"*

This inspired me as an invited speaker to reflect on the forces in the management of innovation. During the preparation of my presentation these reflections evolved into the full model that I will present here and that will answer the question put forward. It will also provide solutions to the basic innovation paradoxes of Knowledge, Time and Control. Let me introduce them first .

Often, especially in The Netherlands and this may be generalized to other European countries, it is maintained that business doesn't profit enough from academic knowledge. It is believed that vast amounts of knowledge are available at universities. However there is supposedly not enough *transfer* of knowledge from academia to business. This is the paradox of Knowledge that not only is a concern to academia but also inflicts innovation management.

The paradox of Control is related to dominance of old control mechanisms in management . When the management of innovation is confronted by a 'control and command' style approach little success may be expected. Should we then totally absolve from control in the management of innovation? The answer has to be a clear 'no!' Management of innovation can be characterized as 'controlled chaos' which implies a form of control will always be needed to bring ideas into good currency, but this is not control as we generally know it. This constitutes the innovation paradox of Control. We might be inclined to say farewell to control but (some form of) control will always be necessary.

Finally the paradox of Time refers to an important bottleneck in innovation management that is known as the lack of time for innovation. There never seems to be time available for innovation. When everything is all right with the business and profits are high all time of managers is consumed by 'business as usual'. Production and sales have priority and time should not be 'wasted' on innovation. However, when the business is not doing well there neither is time for innovation because all efforts are put on cost cutting and downsizing.

In this article solutions to these paradoxes will be presented. Innovation management is defined as *'to bring ideas into good practice within an institutional context'* (Van de Ven, 1986). This puts the human side of innovation on the foreground. Mythology can be inspiring in the study of human affairs. Therefore Greek gods come on handy in explaining how people can agree on a common purpose to achieve unique solutions.

I was inspired by the gods of management presented by Charles Handy (1985) for a better understanding of an organization's character or culture. He distinguished four role orientations in organizations that correspond to four Greek gods.

Athena, the goddess of wisdom but also a warrior goddess, stands for the task orientation that can be recognized in project structures. As a real problem solver Athena is focussed on results. The power orientation in organizations is symbolized by Zeus who is the spider in the web who controls everything and everybody by his omnipotent power. Organizations can also be characterized as role oriented and then Apollo is their god who stands for functional roles organized in 'silos' such as research, planning, production, marketing and sales. The

bureaucracy is an example of a formal Apollo culture. The organization that focusses on personal interests is symbolized by Dionysus. While the task oriented organization is exclusively organized around tasks the person oriented organization is structured around persons and the values they espouse as for example in a partnership of lawyers. In this article I will demonstrate how these gods of management can become gods of innovation and describe the type of leadership that can make them agree upon a common purpose to achieve unique solutions as required in the management of innovation. Unlike humans organizations can be characterized as polytheistic. Therefore all gods can be found in one organization but they don't go so well together and their collaboration is problematic. The Innovation Pantheon will solve this problem.

In the next paragraph major theoretical and practical insights from more than two decades of practical and academic experience with innovation will be presented by a bird's eye view on the innovation landscape. This also allows me to couple the gods of management to success factors in the management of innovation and to introduce them as gods of innovation. Furthermore intermediary mechanisms between leadership behaviour of innovation managers and their followers that can account for innovative results will be introduced throughout this journey. In paragraph three I will work out these mechanisms as design factors of the Innovation Pantheon that will be introduced in paragraph four. The final paragraph is devoted to theoretical and practical implications. Innovation paradoxes will be resolved.

2. Backgrounds. A bird's eye view over the innovation landscape.

By a bird's eye view on the innovation landscape I will use mainly but not exclusively a social psychological approach to innovation management. Basic question then is what kind of influence will be required to bring ideas into good currency within an institutional context. This approach stands closer to the work of Van de Ven et al. (2008) than to the approach of Trott (2008). Both authors however, agree upon the conceptualization of innovation as a process that can be managed or influenced.

Taking a bird's eye view we now will make a journey through the innovation landscape that starts in 1987. In that year the first ECCI was organized in The Netherlands and two more deliveries of the ECCI, the conference in 1999 and the one held in 2011, will be milestones throughout this journey.

1987	ECCI I. Vision and innovation. <i>Enter Athena.</i>
1997	The knowledge creating company.
1999	ECCI VI . Metaphors and powerful innovation tools. <i>Enter Zeus.</i>
2000	Coherence and cognitions of empowerment
2006	The 7 laws of innovation. Innovation values. <i>Enter Dionysus</i>
2008	Strategy safari and Strategic Roles. <i>Enter Apollo</i>
2011	ECCI XII. Innovation Pantheon.

Table 1: A journey through the innovation landscape

In 1987 I served as an innovation consultant at the Innovation Consultancy Group (ICG) of the Dutch organization of Applied Scientific Research (TNO). At the first ECCI I presented a paper on vision building applied to personal development. The founder of the ICG of TNO and one of the major organizers of the first ECCI then recently was assigned as professor in the Policy and Organization of Product Development ('innovation management') at the Faculty of Design at Delft University. His inaugural address was titled *Vision and Innovation* (Buijs, 1987) and stressed the role of vision in the innovation process that was preferably

managed in a step wise innovation *project*. The innovation project intended to be a learning process that also had to result in new products and services and - not to forget- in additional turnover for the innovating company. In this focus on results we now recognize Athena who can serve as an innovation god by organizing the innovation process in a project. Therefore the first milestone of the journey is the presentation of Athena as a god of innovation who organizes the innovation process to deliver an innovation need, a vision and finally concrete results such as new products and services.

Before we reach the 6th ECCI, our next milestone, we arrive in the year in which the book *The Knowledge Creating Company* was published by Nonaka and Takeuchi (1995). An important publication for at least two reasons. First, an entirely new concept of knowledge was clearly distinguished in the context of innovation. Tacit knowledge was distinguished from explicit knowledge and this was crucial for the creation, sharing and valuation of knowledge that was conceptualized as a justified belief that is created in social interaction. Knowledge as a justified belief will later help us to understand especially the role of Zeus in the Innovation Pantheon. Second, Nonaka and Takeuchi made a distinction between *temporary* innovation and *continuous* innovation. An innovation project is a form of temporary innovation while the development of an innovative climate refers to continuous innovation. This distinction will be of significance when the orchestration of the Innovation Pantheon will be discussed in paragraph four.

The 6th ECCI was held in 1999 and also in The Netherlands. My contribution was the presentation of an experiment with metaphors. This experiment also served to test a theory about the effectiveness of inspirational leadership (Hoving, 2001). Metaphors are powerful innovation tools that can give way to new business models. For example the Beertender for delivery of beer opens new markets for breweries. An *airport* is quite another way to organize air traffic and related economic activity than an *airstrip*. Metaphors can also serve to direct new business activities. Flow for example is a metaphor of Aalberts Industries, a company that produces equipment to control various flow processes. All acquisitions and innovations of Aalberts industries have to contribute to flow to create synergy between the various industries.

This milestone in our journey brings us to the role of idea generation techniques such metaphors as powerful innovation tools. De Bono (1982) qualified these techniques as belonging to the *operative* method of lateral thinking in contrast to the inductive and the deductive method. In the operative method the solution is contained in the tools. It is by this operative method that Zeus organizes idea generation in the innovation process in an omnipotent way. Mnemonics such as PMI (Plusses, Minuses and Intriguing points) help to analyse a business situation in the fuzzy front end of the innovation process. CAF (Considering All Factors) is helpful in testing the potential value of a vision. By using these tools or operations in an interactive way Zeus also contributes to the proper use of knowledge in the innovation process. Enter Zeus as an innovation god!

The next stop on our journey we make in the year 2000 when I published a dissertation on leadership and innovation (Hoving, 2000). It was demonstrated that feelings of coherence and self-regulation played key role as intermediary mechanisms in the explanation of the effects of inspirational leadership on followers in an innovation process. In this way Inspirational leaders obtained more innovation and a higher innovation pace, i.e. more turnover from new products or services. Lissack and Roos (2001) exclaimed a year later in the journal Long Range Planning to "*Be coherent, not visionary*" thereby accentuating the role of coherence, which is not to say that vision is unimportant. According to Hoving (2000) coherence and vision can be theoretically related to the cognitions of empowerment as they have been distinguished by Thomas and Velthouse (1990). Cognitions of empowerment play a key role in recent research on leadership and innovation. Therefore they will also be used to build the Innovation Pantheon.

So far Athena was introduced as god of innovation who organizes the innovation process and Zeus as the innovation god who provides powerful innovation tools. Innovation management as the 'bringing of ideas into good currency' could be related to inspirational leadership and this on its turn is expected to exercise its influence through cognitions of empowerment.

To elaborate the concept of inspirational leadership further I published together with historian and journalist Rik Plantinga *The 7 laws of innovation* (Hoving & Plantinga, 2006). The 7 laws of innovation stress the human side of innovation and correspond to seven basic steps in the innovation process. In this way they provide Athena with a road map to organize innovation as a project. They also express innovation *values* that can inspire those involved in the innovation process: *intuition, creativity, force, phantasy, emotion, empathy* and *courage*. In this use of values we now may recognize Dionysus who can inspire participants in the innovation process. Enter Dionysus as a god of innovation.

By the way, the treatise of the laws of innovation also provided additional operations as KEK, CREATIVITY and OTMF that complete PMI and CAF as operative methods in Zeus' toolkit. They will later reappear in the Pantheon but I will not elaborate them here because of space limitations. For a full description I refer to Hoving & Plantinga (2006).

Let us now take the opportunity to make a short strategy safari (Mintzberg et al., 2008) on our journey through the innovation landscape. Mintzberg et al. used the metaphor of a safari to describe ten schools in the study of strategy development. To be able to develop an *active* approach to innovation management as a form of strategy development I derived eight strategic *roles* from these schools. In these roles we now recognize the hand of Apollo as a god of management who stands for the role orientation in organizations. Apollo becomes a god of innovation when we locate these roles in the innovation *process* in a similar way Mintzberg et al. have suggested to organize the strategic schools in the *strategy process* (Mintzberg et al., 2008, final chapter). The result of this exercise is presented in paragraph 4 where the full Innovation Pantheon will be introduced.

Finally we come to the end of our journey. So far the gods of management have been introduced as innovation gods but they are not yet organized. At the 12th edition of the ECCI in Faro I have presented their organization in a preliminary version. The term Pantheon refers to the ways the gods of innovation can be organized. This preliminary version of the Innovation Pantheon now will be further elaborated using basic concepts that were distinguished in the journey through the innovation landscape. These concepts also figure in recent research as intermediary mechanisms between leadership behaviour and innovative by followers. In the next paragraph they will be used to constitute basic organizing principles for the gods of innovation.

3. Intermediary mechanisms in leadership and innovation as organizing principles for the gods of innovation.

On our journey we have met the concept of coherence that emerged as an intermediary mechanism in the relation between inspirational leadership and innovation. Coherence was related to cognitions of empowerment. In recent research the relation between transformational leadership and intermediary mechanisms is emphasized (Nederveen

Pieterse et al., 2010; Gumusleoglu & Ilsev, 2007). Intermediary mechanisms as coherence and cognitions of empowerment that play a key role in the explanation of the effects of leadership on innovation now will be compared and integrated into two new factors.

3.1. Coherence and cognitions of empowerment.

In an empirical study the role of inspiring behaviour of managers was investigated (Hoving, 2000). Inspirational leadership can be described as the presentation of a vision, which in turn can lead to enhancement of coherence in the form of manageability of the innovation process by followers and reinforcement of their self-regulation. These effects were moderated by self-esteem and could eventually lead to stronger innovative behaviour. Effects of meaningfulness and comprehensibility, the other theoretical components of coherence, could not be demonstrated in this study. Factor analysis of results demonstrated that coherence consisted of one factor that could best be described as *manageability*.

Recent studies found empirical evidence for cognitions of empowerment as intermediary mechanisms in the relation between transformational leadership and innovation (Nederveen Pieterse, 2010; Gumusluogu and Ilsev, 2009). Psychological empowerment was composed of following elements or cognitions: competence, self-determination, impact and meaning, usually measured by one scale.

Now we may expect coherence and cognitions of empowerment to play an important role as intermediary mechanisms in relation between inspirational/ transformational leadership and innovation. They are compared in table 1 to suggest new cognitions of empowerment.

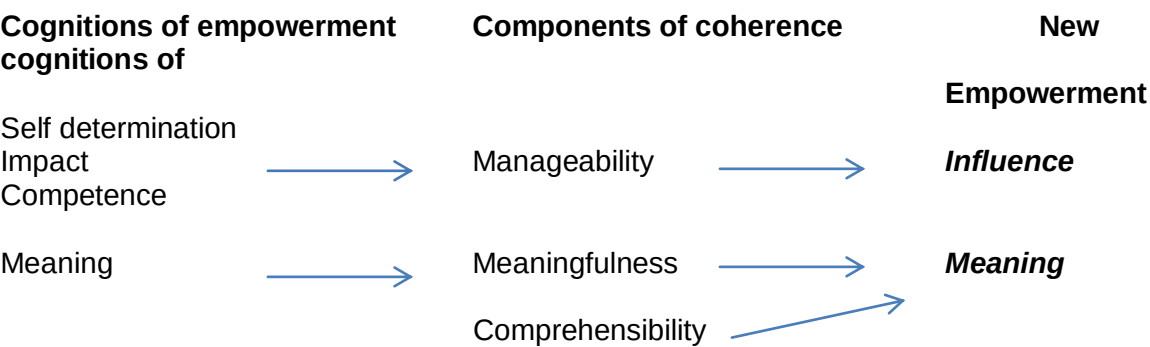


Table 2: New cognitions of empowerment

Here I suggest to distil two basic cognitions of empowerment from table 2. First it seems plausible that *Meaningfulness* as a coherence factor and *Meaning* as a cognition of empowerment correspond to each other. Earlier we noticed that meaningfulness and comprehensibility could not empirically be validated as coherence factors while meaning figured in recent research as a cognition of empowerment. Therefore I suggest here to nominate ***Meaning*** as a basic cognition of empowerment. Meaning as a cognition of empowerment then also is supposed to have a connotation with comprehensibility. *Making meaning* also has been stressed as key success factor of entrepreneurship (innovation) by Guy Kawasaki in his inspiring pitch about this topic. According to Kawasaki this can be done by improving the quality of life. With a background at the Macintosh Division of Apple he declares that Apple employees were not motivated by making money, but “*we were motivated changing the world to make people more creative*”. Other ways to make meaning are the prevention of something good to disappear and ‘to right a wrong’.

Second, *Manageability* as a coherence factor is equalled in table 1 to *impact, autonomy and influence* as cognitions of empowerment. Research demonstrated that empowerment, measured one-dimensionally, and Manageability - as component of coherence- play significant roles as intermediary mechanisms between leadership and innovation. Now I suggest to summarize them all under the common denominator of ***Influence*** as cognition of empowerment keeping in mind that this cognition has connotations with manageability, impact , competence and self-determination.

3.2. Influence and Meaning.

The innovation process (Athena) and the innovation tools (Zeus) now can be classified under *Influence* as cognition of empowerment. Empowering Influence is exercised by Athena and Zeus by making the innovation process manageable through competence of those who are involved, through the impact of operations and through the self- determination that results from the alternation of divergent and convergent thinking that will be explained in the next paragraph.

Strategic roles in the innovation process (Apollo) and Inspirational values (Dionysus) will be classified under the cognition of *Meaning*. It is evident that Dionysus makes Meaning by his inspiring values but for Apollo this doesn't seem as obvious at first sight.

Meaning however, is also provided by Apollo through the expectations that are related to the roles. In the Pantheon the Analyst for example is expected not only to rationally analyse the situation of the organization but also to do this in an *intuitive* way. Intuition then is an innovation value. This dualistic character is inherent in all gods of innovation and will be explained in the next paragraph when we introduce the leader of the Innovation Pantheon.

Foregoing results in the introduction of an Innovation Pantheon that is designed by Influence and Meaning as cognitions of empowerment (figure1).



Fig. 1: Innovation gods organized around empowerment

A nice company one would like to think, but how can collaboration between these gods be achieved besides their organization for the sake of empowerment? Enter Janus!

4. The orchestration of the Innovation Pantheon.

The innovation gods have been presented in the Innovation Pantheon designed by Influence and Meaning as cognitions of empowerment. Now we have to remember that these Greek gods have the nasty habit of fighting each other! Therefore the initial question that was raised for the 12th ECCI (see introduction) now can be reformulated. How can we realize the collaboration of Athena, Zeus, Apollo and Dionysus as gods of innovation? Meaning and Influence have been suggested as organizing principles but how can these be activated? Janus comes to the rescue.

4.1. Janus revisited.

Janus figured already in the work of Arthur Koestler (1985) in which he was introduced in a holographic approach of life sciences in general and creativity in particular. Koestler titled his book '*Janus. A summing up*' and in the Innovation Pantheon Janus is revisited. Janus stands basically for the human division that can be compared to the distinction that has been made between planning on the left side and management (or leadership) on the right hemisphere of the brain (Mintzberg, 1976). More recently this aspect of dualistic functioning also is demonstrated in *The innovation Journey* of Van de Ven et al. (2008) as the alternated use of divergent and convergent thinking that forms an essential part of each innovation process.

This alternation of thinking modes also is a key element of the innovation process outlined in the 7 laws of innovation (Hoving & Plantinga, 2006). Each of the 7 steps is characterized by a divergent (first!) and subsequent a convergent phase to achieve original and unique results that finally materialize in new business activities. It is the role of Zeus to provide tools that organize this kind of alternation that can best be achieved by operative methods as PMI, KEK, CAF, CREATIVITY and OTMF.

Actually the whole Pantheon, not only Athena and Zeus but also Apollo and Dionysus, is affected by this dualism. For Apollo this means that every strategic role reflects both planning by the left and managing by the right hemisphere, which corresponds to the alternation of divergent and convergent thinking in the innovation process.

Let's consider for example the role of the Analyst who helps to define the need for innovation in the first step of the process by composing a Profile of Demands and Desires (PDD) for a new business activity (Hoving & Plantinga, 2006). This PDD is based on a PMI of the business situation and identification of first ideas of the participants in the innovation process. It therefore contains elements of *divergent* – in the form of intuitive ideas- and *convergent* - in the form of the rational analysis of the situation- thinking. Intuition can also be interpreted as 'forgotten rationality' (Hoving & Plantinga, 2006, pp. 9-11). Therefore the Analyst is both analytic and intuitive.

The same holds for Dionysus. His dualistic character is determined by the essential nature of values. A value provides general direction to behaviour as well as a focus on a specific outcome by deriving a norm from it. This may be contaminated when values are presented as norms as often seems the case. In this context it is exemplary that the Dutch tend to say '*norms and values*' while the Belgians speak about '*values and norms*'. The Belgians are right (this time ...) because values do precede norms. So intuition as 'forgotten reality' is a *value* that welcomes immediate insight. Intuition as a *norm* is expressed by the requirement to express first insights in the form of first and often not yet so concrete ideas at the start of the innovation process.

Janus is the god with the two faces. These faces represent his dualistic character. This is expressed by his empowerment of the innovation gods through his omnipresent Influence and by providing Meaning in the Innovation Pantheon. Janus is also known as a gate keeper and I would like to introduce him here in the role of a gate keeper to *time*.

Following the distinction between continuous and temporary innovation that has been made earlier Janus is able to organize innovation management in time. To this purpose he may wear either the face of Kronos or of Kairos. Both are gods of time but represent different modalities of time. Kronos stands for *chronological* or *linear* time while Kairos stands for the *right* time or the right *moment*. In mythology he is described as a young man that can run by. You get lucky when you succeed to grasp him by his hair. If you fail you might have to wait a long time before Kairos comes by and luck might be yours! Kairos stands for a kind of *preparedness* to innovation while Kronos deals more directly with the innovation process.

Now it will be obvious that activities of Athena and Zeus fall in the category of linear time. They are led by Janus when he shows his face of Kronos.

On the other side Apollo and Dionysus represent a kind of preparedness to innovation by creating an innovative climate or culture. In the next table these roles are summarized referring to their original strategic schools (Mintzberg et al., 2008).

Strategic school	Apollo's role
Positioning school	<i>Analyst</i>
Cognitive school	<i>Knowledge Manager</i>
Design school	<i>Designer</i>
Planning school	<i>Planner</i>
Entrepreneurial School	<i>Entrepreneur</i>
Cultural school	<i>Culture manager</i>
Learning school	<i>Teacher</i>
Political school	<i>Politician</i>

Table 3 : Strategic schools and Apollo's roles

The first five roles figure in the primary innovation process supporting Athena in specific steps on the innovation path. The last three roles are of a supportive character. These supportive roles can be effectuated anywhere and anytime in the innovation process and especially serve to make meaning.

Having assigned the role of leader of the Innovation Pantheon to Janus and by identifying the strategic roles of Apollo the full Innovation Pantheon can now be presented (figure 2). Various elements as expressed by Athena, Zeus and Dionysus during the innovation journey reappear in this Pantheon. To sum up Athena stands basically for the definition of an innovation need, the development of a vision and the transformation of vision into concrete results such as new business activities. Zeus stands for powerful innovation tools (or operations). Last but not least Dionysus' values of intuition, force, emotion, chance, empathy, phantasy and courage inspire the Analyst, Knowledge Manager, Designer, Planner, Entrepreneur, Teacher, Culture Manager and Politician to fulfil their respective roles to the best of their abilities.

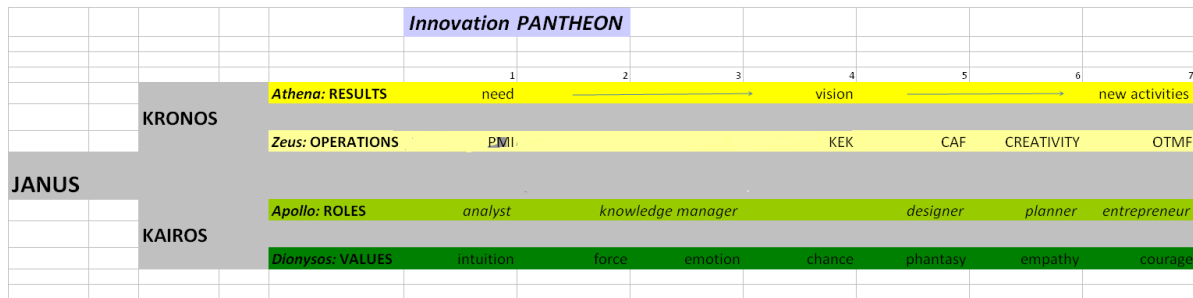


Fig. 2: The full Innovation Pantheon*

* Supportive roles of Apollo have been deleted for the sake of simplicity but this does not mean they are unimportant. **On the contrary!**

With Janus as their leader Athena, Zeus, Apollo and Dionysus now can make orchestrated efforts to bring ideas into good currency within an institutional context. This orchestration goes by the organization of pairs of gods. Janus organizes as Kronos the efforts of Athena and Zeus in chronological time. As Kairos he organizes Apollo and Dionysus to seize the right moment for innovation.

So far the metaphor of the Innovation Pantheon which brings us to the following questions. Which tactics does the leader - Janus- have to his availability to get things done through the innovation gods? Inspirational influence is the key to the answer of this question. The other question – when will Janus show a specific face ? - will be addressed when implications for management will be discussed.

Finally a comment has to be made about the metaphorical character of the Pantheon. The innovation gods may serve for a better understanding of the organization of innovation. They give us grip on innovation and help to measure variables that are in play. Referring to the Sanskrit origin of measurement 'maya' which literally means 'not that' we can say this is an illusion. Nevertheless this illusion of control is helpful to make innovation management comprehensible, manageable and meaningful.

4.2. Inspirational influence of Janus.

Theoretically it can be expected that the use of pro-active influence tactics by a leader will be a better predictor of innovation than more general leadership styles. For that purpose the Personal Influence Tactics (PIT) questionnaire was developed and used in research on leadership and innovation (Hoving, 2000). The PIT measures two tactics: 'Inspirational Influence' and 'Exchange'. Another device to measure this type of leadership is the Multifactor Leadership Questionnaire (MLQ, Bass, 1985). The Transformational Leadership scale of the MLQ originally was designed to measure vision, individual consideration, building of trust, charisma, inspiration and intellectual stimulation as elements transformational behaviour of a leader. However most studies do not distinguish between these aspects and only use one scale to measure transformational leadership. The Inspirational Influence Tactic is also measured by one scale consisting of eight items that throw more light on specific inspirational influence behaviour by a leader (table 4).

The inspirational leader*:*Provides examples (metaphors and analogies) in service of problem-solving**Presents an important plan enthusiastically**Has the other do he/she is good at**Has the other reformulate a problem**Takes care the other can choose a new angle on a problem**Has the other transform a problem into a challenge**Encourages the other to set goals to excel him/herself**Takes care the other has a clear understanding of a problem***Table 4: Influence behaviour of the inspirational leader (agent version, Hoving, 2000).**

* The alpha as measurement of internal consistency of this scale was .77. The alpha of the target version was .88. The agent is the person who exercises influence *upon* another person as shown in table 3. The target is the person who is influenced *by* another person (usually a superior).

Results obtained by the use of the Inspiration Influence Tactic scale and the Transformational Leadership Style scale are shown in table 5. These results demonstrate relationships between leader behaviour, intermediary mechanisms such as Empowerment and Manageability and outcomes such as innovation and creativity.

Variables	Transformational Leadership Style (MLQ)	Inspirational Influence Tactics (PIT)
Empowerment	.33 *	
Innovation	.04 * (not significant)	.28 ***
Creativity	.17 **	.29 ***
Empowerment	.27 **	
Manageability		.65 ***

* Nederveense Pieterse et al. (2010) ** Gumusluoglu and Ylsev (2009)
Hoving (2000)

Table 5: Comparison of Transformational Leadership Style with Inspirational Influence Tactics.

The right column contains correlations from the study by Hoving (2000) while the left column contains correlations from studies by Nederveense Pieterse et al. (2010) and Gumusluoglu and Ylsev (2009). All are significant except the correlation of .04 between Transformational Leadership and innovation and they are not very high which usually is found in social scientific research. Inspirational Influence Tactics correlate .28 with Innovation, .29 with Creativity and .65 with Manageability. The Transformational Leadership Style correlates .33 and .27 with Empowerment, .04 with Innovation (n.s.) and .17 with Creativity.

Inspirational Influence Tactics show stronger relationships with creativity and innovation compared to leadership styles. They also demonstrate stronger relationships with an intermediary factor as Manageability (a component of coherence) whereas correlations between the Transformational Leadership Style and empowerment were substantially lower. These results seem to confirm that a preference for influence tactics to measure inspirational leadership in relation to innovation is reasonable. Further research on convergent and predictive validity of instruments measuring leadership as styles and as influence tactics is required.

Foregoing gives insight into the inspirational influence exercised by Janus. In summary the inspirational leader has to pay simultaneously attention to the primary innovation process, operations, strategic roles and innovation values in a holistic approach of innovation management. As a leader he/she exercises inspirational influence as described in table 4. Using the metaphor of the Pantheon this is the way Janus leads the way to innovation by his orchestration of the gods of innovation.

5. Theoretical and practical implications.

This Innovation Pantheon invites to reflect on theoretical and practical implications. Last but not least it can also provide solutions to the innovation paradoxes.

5.1 Theoretical implications of the Innovation Pantheon.

Alternatives for cognitive factors.

Influence and Meaning are defined as cognitions of empowerment thereby stressing a cognitive approach to the management of innovation. This predominantly cognitive approach needs to be completed with social factors as for example innovative climate (Nederveen Pieterse et al. , 2010).

In the Innovation Pantheon this role is fulfilled by Apollo through the exercise of five strategic roles in the primary innovation process that are completed by three supportive roles. These roles can establish an innovative climate in organizations. In this way they complete the cognitive approach to produce a richer and more complex model of innovation management.

Management of diversity

This immediately raises the problem of management of diversity that is even intensified by the introduction of relatively new roles of the Culture Manager, the Teacher and the Politician. This certainly causes greater diversity which makes effective management of diversity more urgent. The solution to this problem of management of diversity lies also in the hands of Janus being a transformational or inspirational leader. Recent research demonstrated that transformational leaders are better capable of dealing with diversity (Kearny and Gebert, 2009). Future research into the relationships between transformational leadership and the configuration of strategic roles can provide more insight into the management of this type of diversity.

Dominant roles

This research into diversity can also be focussed on presumed dominance of certain roles. It can be expected that the roles of the Planner, Designer and Analyst will be dominant just as their corresponding schools of Planning, Design and Positioning are the dominant Strategic Schools of the past decades according to Mintzberg et al. (2009). Further research might explain how and to what extent transformational leadership can improve especially the saliency of the supportive strategic roles in the management of innovation and their specific effects on innovation.

The Politician.

Ideas have to be brought into good currency within an institutional context. Therefore special attention has to be paid to innovation as a political process. This role is fulfilled by Apollo as a Politician. Then special political and negotiation skills are required that are immanent in the dualistic role of Apollo as explained when Janus was revisited (paragraph 4.2) This dualism can also be found in theories on negotiation. Generally two styles of negotiation can be distinguished: the distributive -zero sum game- style and the integrative – nonzero sum game- style. The latter is also known as the win/ win style. It can be expected that Politicians as integrative negotiators are better able to align interests underlying the meanings that are involved in the innovation process. This is what Peter Block (1989), had in mind with positive *'political skills at work'*, which was also the subtitle of his book about the empowered manager. As we have already noticed this empowerment can best be achieved by transformational leadership. Therefore we might expect that transformational leaders are especially effective inducing positive political skills in Politicians thereby empowering them in the innovation process. In contrary the transactional leader - by exercising only Exchange tactics – is expected to focus only on the distributive or exchange style of the Politician thereby decreasing his empowerment. This can be a subject of future research.

Role breadth self-efficacy.

Another implication for theory of the Innovation Pantheon is concerned with theoretical backgrounds of transformational leadership theory. Most researchers make use of the MLQ to conceptualize and measure this type of leadership and to distinguish it from transactional leadership. However, relations between the factors of transformational leadership and cognitions of empowerment are not explicitly specified in these approaches. Relations

between inspirational leadership, coherence, self-regulation and innovation have been specified and empirically investigated using social cognitive theory (Hoving, 2000).

In this study it could not be demonstrated that self-efficacy plays a role as an intermediary mechanism between inspirational leadership and innovative behaviour of followers. However self-efficacy is the cornerstone of social cognitive theory (Bandura, 1997). It has also been demonstrated that self-efficacy can explain why people show more perseverance in obtaining goals even when circumstances are difficult (Bandura and Wood, 1989), which certainly is not unimportant for difficult tasks such as the management of innovation. Therefore this concept should not be neglected. The fact that self-efficacy could not be empirically validated in the study of Hoving (2000) might be attributed to the general definition of self-efficacy in this study. Recent research demonstrated that *role breadth* self-efficacy may be a better concept (Nauta, 2009; Den Hartog and Belschak, 2011, in press). The concept of role breadth self-efficacy therefore should be used in further research.

Inspirational leadership, intermediary mechanisms and innovation.

So far inspirational leadership, role breadth self-efficacy, cognitions of empowerment and diversity of strategic roles emerged as key elements that can entail a new model for leadership and innovation and the management of innovation.

Role breadth self-efficacy in the innovation process is a promising concept for further research. This type of research might also benefit from the operationalization of leadership in the form of inspirational influence tactics. Then these *tactics* can also be compared to transformational and transactional leadership *styles* as concurrent predictors of innovation. The Innovation Pantheon demonstrates that better prediction of innovation may result from taking also strategic roles into account. In this way social factors complete cognitions of empowerment in the explanation of innovation. This can be summarized in figure 3.

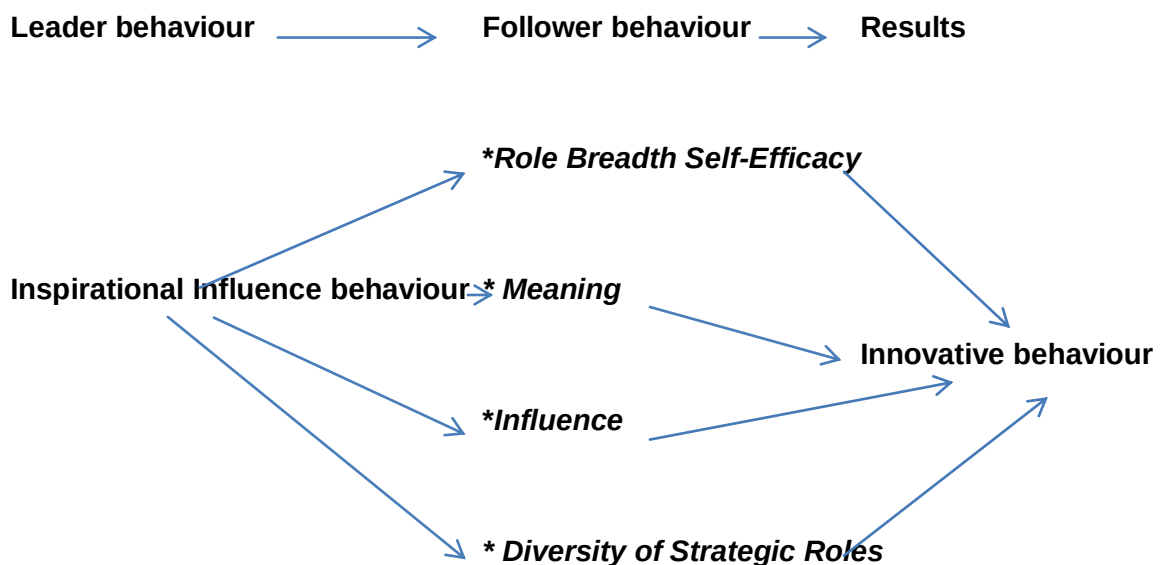


Fig 3: Relations between leader behaviour, intermediary mechanisms in followers and innovative behaviour .

Figure 3 summarizes basic concepts and relations between leaders and followers that have been introduced so far. They are expected to play a key role in the management of innovation and provide directions for future research .

Diversity of Strategic Roles and Role Breadth Self-Efficacy are new concepts in this model that may account for better prediction and explanation of innovative behaviour. It is remarkable that most, if not all, research in this field is *correlational* and cannot demonstrate causal relationships while most models, also that depicted in fig. 3 do suppose causal relationships. Therefore future research should not only investigate correlations between variables but also focus on *causal* relationships as has also been noticed by Nederveen Pieterse et al. (2010).

5.2. Implications for practice

As the most important implications for management I will focus here on the special role of Apollo as Politician and the multilevel approach of innovation management. By a multilevel or holistic approach the innovation paradoxes can also be solved.

Apollo's role as Politician

By distinguishing Apollo's role as Politician we come close to the concept of empowerment as described by Peter Block (1989). This implies that positive political skills will be at work when the Politician is involved in the innovation process. He/ she brings different parties together to find win/win solutions. However, they will not succeed if they all work under a bureaucratic contract. Basically then is that all parties realize the necessity to adhere to the *entrepreneurial* contract. This requires that they all work according to the principles of *autonomous partnership*, *enlightened self-interest* and *authenticity* (Block, 1989).

Multilevel approach to innovation management

With the help of the Innovation Pantheon a multilevel approach to the management of innovation is within reach of managers who have to lead the way to innovation. Being as Janus they can profit from the different contributions of Athena and Zeus. With the face of Kronos they can manage innovation in (chronological) time as Athena by the organisation of innovation projects that are supported by Zeus who provides the powerful innovation tools. On the other hand they can evoke Kairos with the help of Apollo and Dionysus to create a readiness to innovation. This implies the organization of Apollo's strategic roles and the establishment of an innovative culture that espouse the innovation values of Dionysus.

Basically managers of innovation have to deal with the dualism that is inherent in the Innovation Pantheon. This confronts them with a new problem. When to show the face of Kairos and when will Kronos be preferred? It will certainly not be easy to be like Janus!

In order to present an attractive management perspective I finally bring back to mind the paradoxes of Time, Control and Knowledge. To resolve these paradoxes the Innovation Pantheon also comes on handy (). This will eventually also be conducive to act like Janus as a leader of innovation.

5.3. Innovation Paradoxes resolved.

In paragraph 2 (p. 5) a sneak preview was given of the way Zeus resolves the Innovation Paradox of Knowledge by using De Bono's operative method. This operative method can be used individually and in interaction. It is especially the *interactive* use of the operative method that creates knowledge of participants as a justified belief. By performing a PMI of the business situation participants in the innovation process who each might often hold different and at first sight incompatible views will come to a clear and collective understanding of the innovation need. As such Zeus helps to generate a justified belief of the innovation need and by little dispute. So far the solution of the Knowledge Paradox on a micro level in the primary innovation process.

The same may hold for the solution of this paradox on the macro level of scientific/academic institutions and companies. Remember the complaints about the lack of *transfer* of knowledge that is supposed to be abundant available in academia to business. This presupposes knowledge as an objective entity that is stored and available in some place, a concept in which object and subject are separated. This is the dominant concept of knowledge in Western societies. The innovation paradox of Knowledge is resolved when knowledge is conceived of as a justified belief that emerges from social interaction. By bringing participants from institutions and companies together skilled interventionists as Zeus are helpful by the introduction of operative methods to create (new) knowledge as justified beliefs.

The Innovation Pantheon also makes clear how the Paradox of Control can be resolved. This paradox is caused by the dominant exercise of external control that is contra-productive in the management of innovation. External control is in the Pantheon replaced by self-control of the innovation gods. By providing them Influence and Meaning they are empowered to innovate. It is the new leadership of exercising Inspirational Influence that empowers participants in the innovation process. Self-control in the form of empowerment of followers replaces external 'control and command' exercised by the leader. Inspirational leadership makes us all gods of innovation!

Finally the Paradox of Time can be resolved by the Pantheon. When Janus shows his face as Kronos innovation is organized along chronological time by Athena and Zeus. Innovation can then be accomplished by the organization of innovation projects but these are time consuming, complex and risky. The failure rate can be high. Moreover Athena and Zeus make war of innovation. This cannot be a permanent state in an organization!

Therefore a readiness to innovation that can be organized by Apollo and Dionysus has to be preferred and can be the epitome of innovation management. Unfortunately this organizational readiness to innovation might be as difficult to obtain as an organizational culture. Here Athena and Zeus may come to the rescue by the organization of innovation projects as *learning* projects. Then the failure rate of these projects merely is 'collateral damage' in a continuous learning process to create a readiness to innovation. This is in line

with Nonaka and Takeuchi (1995) who consider new product development as the most important process of organizational knowledge creation. To them organizational knowledge creation is a derivative of new product development and they suggest an hypertext structure as a structural base for knowledge creation. The Innovation Pantheon shows characteristics of such a hypertext organization. In this context it is symbolical that supportive roles are hidden in in the Pantheon. They are not visible in fig. 2. The *Teacher*, the *Culture Manager* and the *Politician* are the invisible hand of Janus. Then the *Teacher* will ensure that an innovation project is a learning experience. Innovation values will be supported and expressed by the *Culture Manager*. The *Politician* will build the plots that unite the parties that are necessary to seize the right moment to bring an idea into good currency. For example the *Knowledge Manager* , the *Designer* and the *Planner* can be urged by a *Politician* to come together to transform a vision into a design for a new activity that is accompanied by a proper business plan for its realization.

This does not deny that new product development or innovation projects should deliver concrete results. However, the most important contribution of an innovation project as a learning experience will be that it invites Apollo and Dionysus to manifest themselves. Therefore the training of a critical mass of the work force in innovation project management in the perspective of the Innovation Pantheon can be a good policy to organize innovation.

Considered this way Kairos beats Kronos but this is not a problem because both are the faces of Janus, two sides of the same medal. We don't have to bother about time and considered this way concrete results of innovation projects are side catch. Not unimportant, but side catch in a process that brings the organization in a state of readiness to innovation.

Van de Ven et al. (2008) to some extend come to the same conclusion as a result of their study of innovation projects over a period of nearly two decades in the Minnesota Innovation Management Program. In their advice for innovation managers and entrepreneurs the authors conclude "to learn to go with the flow" keeping in mind that while they can learn to manoeuvre through the innovation journey, they cannot control its flow.

In terms of the Innovation Pantheon this comes down to learn not only to be as Athena and Zeus and manage innovation in chronological time but also -and more important - to be like Apollo and Dionysus to create an organizational readiness to innovation. This makes the innovation paradox of time obsolete. Eventually the organization will always seize the right moment for innovation.

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A LINHA E A AGULHA TECENDO A REDE COLABORATIVA PARA O DESENVOLVIMENTO LOCAL

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Abstract

O presente trabalho pretendeu demonstrar como uma comunidade de agricultores de uma zona rural encontra alternativas para sua manutenção e desenvolvimento através da colaboração e envolvimento com a criatividade e inovação de uma cadeia produtiva da confecção de roupas. O foco do estudo foi sobre o grupo de costureiras da comunidade de Lajes, situada no município de Caruaru-PE no Nordeste do Brasil, a qual faz parte de um relevante pólo industrial de confecções, cujo PIB se equipara ao do crescimento da China. E de toda a confecção aí comercializada, 57% dos produtos são criados na região na qual Lajes está situada, fazendo parte de uma cadeia de empresas subcontratadas. Problemas locais como a baixa escolaridade e falta de assistência governamental são superados através da transferência de conhecimentos consolidada numa rede informal de ensino, gerando riquezas e desenvolvimento local. Também foi identificada a importância do capital humano associado ao empreendedorismo..

WHEN BUSINESS MEETS ARTS

Lucie Huiskens and Han van der Meer

Summary

As is commonly known the bond between the wealthy powerful elite and artists is having long lasting roots. Although it seems to be a very old phenomenon it is still rather actual. Once aware of it an unavoidable observation seems to be: entrepreneurs love art.

But why?

Based on several real time experiments we can also observe the process working from the other end. Organisations successfully employ arts and artist in their innovation processes. But how? In this paper the issue of cooperation between artists and organisations will first be covered. This will raise some fundamental questions on the function of art for business. To broaden the topic some results of a study of motives for art appreciation of innovative entrepreneurs will be presented. This study led to a new reason why entrepreneurs appreciate art and how they use it: art gives them energy.

So the authors end with some fundamental questions on the relation between art and business:

- What if Beauty is (provoking) a form of energy ? - What if Art is a way to step on the "line" between Knowing and Not Knowing ? - In what ways can we organize Business meeting Art?

Introduction

Organisations are facing complex change issues that require authenticity, creativity, sustainability and (social) innovation. Artists can contribute as they are very sensitive of and major commentators on what's happening in the world. Creative as they are, they can visualise their vision of the future, show different perspectives and new directions.

Managers realize that in the knowledge economy we live in, creativity, originality and authenticity are important elements in all of their business processes, and are crucial for sustained competitiveness. Arthur Simonetti, Marketing Director DSM:

"These days a company has to work in a satiated world. We have hundreds of solutions for every problem in the Western world. Of course, as a company, you want your product to be the one selected but that requires more and more inventiveness. We have to be conspicuous, seek out new frontiers, and do things differently than we did in the past. That is where artists can help. Not because they are necessarily more creative than we are. There are a lot of creative and talented people working in a large company like DSM; you do not need to recruit them from outside. However, it can be difficult to tap into this creativity. The special quality possessed by artists is that they have a different outlook than we do. After all business only has one intrinsic motive: making money.

Artists do not think this is so important. Passion and beauty move them. It is their very nature to be curious and inquisitive. So are we, but we have been trained to think analytically, they work using an association of ideas

and emotions. Precisely because they are different from us our interaction with them awakens our interest in all kinds of things. Their very presence is disarming and charming providing the new impulses we need.” (Huisjes 2009)

Business in the 20th century has focused on analytical skills, on increasing necessary knowledge and skills for technological, functional improvements. To find the right answers.

Business in the 21st century needs to focus on continuous innovation, on the capability of each and every employee to put oneself in another position, to influence and to inspire others. To pose the right questions. In this situation it seems logical that organisations seek cooperation with artists and creative professionals. They might be able to help organisations to break out of fixed patterns, to explore new directions, and tap new sources of creativity. Bringing together artists and business people produces disturbing and surprising encounters leading to new perspectives for both parties. Linda Naiman, CEO CreativityAtWork:

The worlds of the arts and business are formulating a new relationship, distinct from the traditional models of entertainment or sponsorship. As Miha Pogacnik, a concert violinist and cultural ambassador to Slovenia, argues: “The world of arts must be rescued out of the prison of entertainment and the world of business must be led out of the desert of dullness of meaning!” In this new relationship, art is a role model for business, since all great art pushes boundaries beyond the established norms. Thus, it can teach us about aesthetics, ambiguity, diversity, chaos, change, courage, and complexity.” (VanGundy and Naiman 2003) Over the past, a wide range of arts-based interventions have been developed. We will give some cases of arts-based interventions in a wide range of industries such as engineering, chemical and banking as well as a case in a law firm.

Case Engineers: Re-energizing Tauw, a Dutch engineering consultancy brought together six site exploration engineers with six artists from different disciplines, painting, sculpture, soundscaping, mixed media. The six engineers also came from different fields of expertise: waste matter, water, soil, civil works, environmental planning and legal affairs, and were coupled with artists who felt an affinity with their partner’s working field. The six duos were sent out into the industrial area under development, to gain inspiration from this harbor area, and to develop a work of art proper to the area in three months’ time. The objective was not so much the work of art itself, as getting the creative juices flowing among the employees. This would make it easier for them to deviate from the beaten track, and to come up with truly new ideas for the re-development of the area. A few years ago, a choice would definitely have been made to follow a course, however, the consultancy now recognized the added value of a direct confrontation and collaboration with artists. (Blok 2008, Kunstenaarinbedrijf 2006)

Case Chemical Industry: Product launch room The multinational DSM wanted to improve their product launch process. Four artists, dancer Erik van Duijvenbode, graphic artist Nienke

Jansen, multimedia artist Michiel Koelink, and writer Moniek Spaans helped DSM develop a product launch room: a room where temporary teams with production managers, technologists, marketing people, controllers and people involved in logistics and communications could withdraw for a couple of weeks to draw up a plan for the launch of a new product. The former library was turned into a creative space, comprising of various 'spheres', all with their own atmosphere and duties. Thus, there is a brainstorming room, a games area, a cutting and pasting area, a presentation area, a silence room and a real small garden. There is an electrifying atmosphere because the rooms and areas contain not only modern design furniture but also old leather armchairs that belonged to the management, reliquaries from the company's history and an antique twisting stairway leading up to a virtual sky. The space is frequently used. Whether or not the team leaders can make better decisions is difficult to say, but it is done more quickly than when they met in various little conference rooms. DSM liked the result that much that they asked the artists to develop a similar room at a different location, the Open Launch Platform. A multi-functional, dynamic room with optimal facilities for brainstorm sessions and presentations, with ample space for reflection and finding new inspiration. (Kunstenaars&CO 2008)

Case Law Firm: Disrupting encounters of the art kind Kennedy van der Laan, a Dutch law firm thought its considerable art collection so inspiring and such an autonomous part of its office culture, that they wanted to take it further. Therefore, they now often commission work from artists, who are given complete freedom in their artistic decisions. Disruption in order to stay alert, that is the idea involved. Thus sound artist Nathalie Bruys has carried out two projects for the company. The first was Silence At Work, a number of performances, campaigns and installations specifically devised for this location. Part of the project involved a campaign, in which Bruys set up all the plants contained in the building in the entrance hall to form a gigantic forest, entitled For(A)rest. She also set up an installation with a number of large birds of prey (Not guilty, Nature never goes wrong), in which the lawyers had their canteen lunch disrupted by the birds flying through the canteen. On the occasion of the law firm's 15th anniversary, she created Saved by the Voices, a festive entity in which the lawyers' voices – their 'instrument' – can be heard in all kinds of manners. The final performance included a 'singing wreath': a long line of people, hand in hand in front of the entrance to the building, producing a tone together. In contrast to Silence at Work, in which the hard side of the law profession was addressed, this project was about joint efforts and saving people. (Vinken & Van Kampen 2007)

Case Bank: Artists challenging bankers 'Trust depicted' was a project, organised by Art-Partner and Cultuur-Ondernemen, that started with artists interviewing bank managers, 12 artists speaking with 50 opinion leaders in the financial sector, such as executive and non-executive managers, consultants and clients. Topic: 'trust' and the possible role of artists in

the restoration of trust lost and the bad image that was the result of the financial crisis. It was interesting to learn that the artists were met with great openness, and they noticed that everyone they spoke with were really looking for

answers on how things could have got so out of hand. The interviews show that there seemed to be 'winner-takes-all', and also an anxiety culture. It was very difficult to put long term client's interests above short term profit. This created a culture where critical remarks were not appreciated, and that destroyed mutual trust. In the interviews, insecurity and vulnerability were important topics, and it was interesting to see that these are precisely aspects that artists are used to deal with. In their work, they are deliberately searching for it, as this helps them to reach deeper levels and make better work. While, instead, bankers are going overboard to ban insecurity and vulnerability. According to the interviewees, to change the macho, winner- takes-all mentality, top managers have to stand up and start the change, which is difficult and rather scary, and so they thought that maybe artists could help out. And so this project, where two totally different worlds met and talked with each other did shed a new light on the notion 'trust', and resulted in several art&business projects.

To give two examples: Andreas Vonder, playwright, wrote 'First the bonus, then the moral principles', a play about greed, fear, ambition and the human mechanisms behind the financial crisis. The interesting thing was: he developed the storyline and the scenes in workshops with financial managers, so that in the end, 60 bankers had contributed to the play.

Most of them were present at the opening performance, and took part in the discussion afterwards. And Heidi Linck, fine artist, made INSIGHT, a light installation for which she collected, through the bankers that she worked with, more than 80 photos of windows of employees and their clients, and the views that they have out of these windows. She wanted to challenge the bankers: how does your client view the world out of his home, his personal world, so totally different from the business world, from the bank which is mostly looked at from a computer screen and described in numbers. In these projects, no clear cut answers were given by the artists of course, but it did give the bankers powerful leads to search for new answers themselves. As one of them stated: 'I can now really feel and appreciate the insecurity and vulnerability of my clients when they come to me to invest their money'. (KPP Magazine 2010, Bakker 2011)

Entrepreneurs and motives Looking at the four cases presented we can see several motives for using arts in business but there seems to be more. Looking at the connection of art appreciation and innovative entrepreneurs the authors have been fascinated by this phenomenon for years. As is commonly known the bond between the wealthy powerful elite and artists is having long lasting roots. For example the word meceanas (in Dutch a well known word for the benefactor of arts) stems from the Roman knight Gaius Cilnius

Maecenas (65 till 8 bC). So it is a very old phenomenon but still rather actual. Once aware of it, it seems an unavoidable observation: innovative entrepreneurs love art. But why? One day we tried to falsify the obvious relation by asking one of the entrepreneurs we were working for as consultant. At first glance this entrepreneur could be considered as a fairly tough and hardboiled type with a rather direct style of management, to put it mildly. Certainly not the type who one would expect to have a connection with art or appreciation for the arts.

Much to our surprise he answered he had to make an all decisive choice after college: to go to Arts School to follow his passion for painting or to become the successor in the company his father had founded. Since his father was seriously ill he decided for the last and made the company very successful in both innovative and financial respect. But his love for art was still there "I only can not find enough time to paint myself" he confessed.

Quite flabbergasted by this we decided to continue our research on the how and what of the relation between business and arts in a somewhat more systematic way. In the rather scarce literature on the subject (Antal 2009; Buswick, Craemer and Pinard 2004; Taylor, Hansen and Hansen 2005; Styre & Eriksson 2007) several possible motives for the appreciation of art are given. We will not follow Richard Greene (Greene 2004) in his claim there are "64 Purposes of All Arts" but cluster the motives we found in 5 major motives : 1. Investment 2. Borrowed plumage 3. Nice forms (in Dutch I use formies) 4. Resemblance of the process 5. Pivot (lookout?) to the future With the use of these motives as sensitizing concepts a rather open interview protocol was developed. In long interviews with 10 CEO/owners of innovative Dutch companies these concepts were explored. The interviews lasted from 1,5 hour till 4 hours and were held in the period August 1995 till April 1996. The transcriptions of the interviews are the basis of further detailed analyses leading to the following preliminary results.

The motive Investment means the possession of works of art as a good way of investing one's money and with the purpose of making profit on the longer term. Two CEO's gave this motive as their main reason of their interest in art "Aah, in old days I used to sell knickers now I sell Art".

To strut in Borrowed Plumage is a Dutch expression for the fact to be near someone with success others will find you successful as well. In our case will the beauty and prestige of a piece of art reflect on the perceived beauty, good taste and prestige of the owner of that piece. We can see this motive partly in the case Chemical Industry and with 3 of the CEO's in the research this seemed a very prominent reason behind their buying of art.

Nice forms is the motive of a CEO for hiring an artist in to better shape his product and make it thus more profitable. We can see this motive partly in the Bank case. In two of the companies in the research this motive was a dominant factor why the arts were used. "Each year we ask an artist to make a piece of work with the theme Sleep (the company is a pillow

producer). It is attractive on the walls of our offices and it makes a nice new year's gift for our resellers. They really appreciate this and ask every year for it".

Resemblance of the process reflects the resemblance of the innovation process of an entrepreneur with the creative process of an artist. This motive is reflected in the practice at the Engineering case. For 3 of the interviewed CEO's it too was an important motive to enlarge their thinking with the world of artists. The before mentioned hardboiled CEO did put it like this "Whether you paint or model your company it is almost the same. It is never finished, it is never what you really meant it to be. Sometimes it goes well and sometimes you are drawn back for years, things simply did not work and you have to try again and again and again ."

Finally the last motive "Pivot (lookout) to the future". In this motive the artist is someone who is working on the border of what is and what will be. The artist gives form to "Zeitgeist" (spirit of the age) and is supposed to be years ahead of other more average people. Observing (contemporary) art can be helpful to understand "Zeitgeist" and by doing so providing inspiration for the companies' translation of vision into form. We can observe this motive in the Law Firm case and only one of our CEO's pointed out this was a major result of his love for art. "Every time I visit a museum my notebook is filled with ideas. Last time in Groningen I wrote 12 down". So we can conclude the motives we know from literature indeed can be observed in the cases and the interviews but none of them in a very convincing or prominent way. However in the interviews a sixth motive came forward that was important for almost all the interviewed CEO's (9 out of 10) namely "Arts give me energy". For many the arts are a form or a source of energy and this seems the major motive why entrepreneurship and arts join forces and lead to new developments. In a conversation we had with a Pakistan cricket coach on the subject of this state of energy he put it in this way "We have the same phenomenon in sports. We call it "being in the zone".

Discussion Does this type of research bring us in the domain that Plato describes as "He (the tyrant of Sicily) forces me to speak about matters that should not be spoken about" (Plato, 7th letter)?

We don't think so. Our subject has nothing to do with an unnatural or supernatural phenomenon (by the way this is not what Plato meant either) but with consciously looking for inspiration in a consciously created state of astonishment. The state of astonishment that occurs when we are actively aware of what we know and what we do not know. In the words of Laozi "To know you don't know is best" (Henricks 1989). It is this state of astonishment that will provide both the employee as well as the entrepreneur the ability to give form to what not yet is there (completely). Art can bring us in this state of astonishment. Or as our CEO's put it "an almost limitless state of energy". But what does this bring us? Is this useful? We do think so. Consciously nurturing the relation between entrepreneurship, companies

and art means looking for times and places where we can exploit the combination of arts with entrepreneurship. The cases discussed here, provide examples in which artists attack issues faced by companies and public organizations. In which they employ their artistic talents to come up with other solutions. Tauw wished to reinforce the innovative capacity of its employees. DSM wanted to improve conditions for developing innovative and effective marketing campaigns. Kennedy van der Laan regards the project with artists as part of its brand strategy. 'Trust depicted' addressed a major issue that shocked our society and economy, but which was difficult to talk about. These examples prove that the input of artists in, for example, product development, human resource management, and marketing & communication provides an added value, and leads to an innovative approach to issues and change processes. So we think the examples show it is possible that art operates between the Knowing and Not Knowing; and provokes energy for change and innovation. However, the contact between artists and companies is not always obvious. People with different backgrounds, cultures, expertise and experience must learn how to work together. Learn to understand each other's language, recognize each other's qualities, learn to see each other's interests and to take each other seriously. It is precisely that interaction which gives birth to innovative ideas. But it means hard work. Because everything looks different once off the beaten track. It is very inspiring to let yourself be surprised. But it is also suspenseful, because creative processes are unpredictable and involve risks. Organizations that collaborate with artists accelerate their powers of innovation, but it still is not business as usual for them to work together. So: in what ways can we organize Business meeting Art? Initiatives like Artists in Residence (Taylor, Hansen 2005) and the cases we described proof to us that there is more to it than the occasional visit to the museum, cinema or concert hall. For our main question the following sub questions might help us to find directions towards answers:

- What if Beauty is (provoking) a form of energy ? - What if Art is a way to step on the "line" between Knowing and Not Knowing ? Or as Glenn Gould, the pianist, puts it: "The purpose of arts is not the release of a momentary ejection of adrenalin but rather the gradual, lifelong construction of a state of wonder (and serenity)."

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Images

page 2: photo Peter Boer

page 3: snapshot website KennedyvanderLaan: HYPERLINK

"<http://www.kennedyvanderlaan.nl/KVdL/nl>" http://www.kennedyvanderlaan.nl/KVdL/nl/NL/_main/over+ons/Kunstprojecten/Silence+at+Work

page 4: photo Heidi Linck



GOLDILOCK AND THE THREE BEARS

DEVELOPING TEAM CREATIVITY AND INNOVATIVENESS WITH IMPROVISATION THEATER BASED APPROACH

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Abstract

This paper aims to extend understanding on the practical development of creativity and innovativeness in organizations through improvisational theatre based approach. We examine how enabling factors of creativity could be facilitated in organizational context and how it influences on the teams and thereby innovativeness of an organization. We illustrate the improvisational theatre based approach and its application through examples from one action research project. The research method is a case study. Data is collected from a one large municipal organization. Improvisational theatre based approach is carried out in three workshops and in two groups of participants. Besides, the survey and written diaries were used as research material. We propose that improvisation based approach can be a promising and viable means for improving enabling factors of creativity also in less creative businesses. This paper extends understanding of the facilitation on individual and group level actions (microfoundations of an organization) organizational capabilities i.e. the collective and community kind of capabilities of people working..

EXPERIENCES OF MANAGEMENT OF ACADEMIC WORK GROUPS AND COMPANY-UNIVERSITY AGREEMENTS FOR PRODUCT DESIGN

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Abstract

This article presents some insights drawn from the experience of tutoring the working groups, and on how to encourage cooperation among members of a group of people who have different personalities and interests. This experience has been mostly with engineering students.

It is needed to combine the different characteristics of people, to work in one direction. For this it is important to have an organization that has objectives, tasks, rules, monitoring, control, etc., clearly defined, but something more it is needed. The reward-punishment is a typical form of motivation, but is not sufficient to enhance the creativity that makes an engineered product will be innovative. It is necessary, for example, to promote some enthusiasm for the work and a reconnaissance of ideas. A list of motivations is given in the conclusions, although, similar motivations may be applied to other cases.

Keywords: motivation; working groups; courses; agreements; creativity

1. INTRODUCTION

The word motivation is taken here as the incentive, the inducement, or the stimulation to persons or group of persons, for their animation and their interest to do product-engineering design.

The motivations that the lecturer can bring to the persons that they supervise are among many other motivations that persons have. This article comments the experiences of some motivations specifically geared to promoting teamwork. One of the author's experiences as a lecturer and academic researcher has been the mentoring working groups of conceptual engineering design, for the development of new products (technical objects), since 1992. Below are related the learned from this experience especially some motivational aspects given to members of the working groups to produce their best performance.

Teaching the courses: *Project* (mandatory); *Product Engineering and Technical Systems 1* (optional); or *Creativity, Eco-Design and Patents* (free elective), at the Dpt. of Projects, of Industrial Engineering School of Barcelona, of Technical University of Catalonia of (UPC), is made through the work of groups, each one of four to six students. The features of these courses are published on the university website (Guia Docent, 2011), where are specified: the objectives, the content, the methodology, the evaluation system and some

references. In this way, students can know the characteristics of each course before their registration.

In these courses is offered the possibility of passing the course without a final examination. For this it is necessary to have successful completion the group work, some exercises in class, and have a regular attendance. Most students can approve without examination and only a small percentage must go to the final exam.

The experience in company-university agreements concern the coordination and participation in the work of conceptual engineering design of product, which is also done through working groups and, in this case, are of variable composition depending on the needs until reach the construction of a prototype.

1.1 Example of students work

Usually, the lecturer begins the class with theoretical explanations and then the students apply it in their group, until complete two hours. Classes are two days per week, in one semester.

For example, in the optional course: *Product Engineering and Technical Systems 1*, the students have to work the following sections:

- Objectives, Purpose, and Scope of the product design.
- State of the Art (especially patent search).
- Alternative solutions analysed and justification of the chosen solution.
- Definition and Description of the designed object and its features.

Also they detail the design tools that have been used for product development, which has led to the final design:

- Functional analysis, FAST Diagram (Functional Analysis System Technique) (Bytheway, 2007) Functional specifications.
- Improvements in the design (Pyzdek & Keller, 2009):
 - QFD (Quality Function Deployment), Functions-Elements.
 - TRIZ (Theory of Inventive Problem Solving), (Altshuller, 1990).
 - Risk analysis: Ishikawa diagram or cause-effect diagram, ETA (Evaluation Tree Analysis), FTA (Failure Tree Analysis). Hazop Diagram (Hazard and Operability).
 - Safe Design. FMEA (Failure Modes and Effects Analysis).
 - Environmental impacts, Ecodesign strategies, MET (Materials, Energy, and Toxicity) matrix, (Berkel, et al 1997), Eco-profile; Recycling.
 - Simplification of the design and DFA (Design for Assembly) (Boothroyd 1980), for some detailed part of their product.

Finally expose the following sections with which they close the project:

- Analysis of advantages and disadvantages of the final product.
- General scheme, drawings and product details.
- Planning task on a Gantt chart (Wallace & Gantt, 1922) until the construction of a hypothetical prototype.
- Cost estimation of engineering and of product. Equilibrium diagram of costs and of production, for a hypothetical manufacturing.
- Conclusions.
- References.

This program may seem excessive, but the desire to learn and the improvements to the design that may arise, are motivations for students to gradually improve the design of their product. Some of these aspects are treated only superficially because of time constraints, but this way student has had a basic understanding of these design tools that will allow its later deepening. The own working group subdivides into subgroups and their work is supervised and assisted by the rest of colleagues. But sometimes it raises the doubt if all group members they know the use of each design technique.

Towards the end of course it is noted a certain fatigue of the students in the application of design techniques, and the latest classes there are no theoretical content, and the groups completes the work. Each group of students delivers a document of their work and then is orally presented and defended.

2. MOTIVATIONS OF STUDENTS

This section considers some motivations for students, from basic motivations until those that allow a better creative work. These motivations are induced by some proper actions that are explained below.

2.1 Basic Motivations

Usually the studies choice is influenced by multiple factors, but is normal to have some vocation for them. The motivation of the majority of students is the desire to learn and obtain the corresponding degree, with which can practice their profession with a certain social level.

As in many other activities the award-punishment is one of the main motivations by which persons move, and this mechanism also exists in the university, where the award is the approval. The student qualification, reflect their work and give a partial idea of what the student has learned. In some cases, the fear of fail it is only the motivation that moves the worst students. To enhance this basic motivation of students towards high motivation levels, several actions are performed.

2.2 Motivations that drive the students to work in group

Following lecturer recommendations, the formation of working groups is done by the students themselves. In the *Projects* course, is requested a mix of students from different knowledge to form a group. This freedom, within limits, in the formation of working group is a positive motivation, which is best than imposed group formation.

In the courses mentioned in the introduction, it has sought to value more the final work of the student group that to do only an individual examination. The possibility of not having an individual final exam is a motivation that drives them to work in-group. The student surveys prove it. But in return, it is required the assistance and class work. Is valued those who attend and working assiduously in class and so can opt for approved without final exam. However, a small percentage of students must go to the final exam.

In the optional course of *Product Engineering and Technical Systems 1*, belonging to the intensification of Product Design, has been detected in recent years an increasing number of students, but some of them are incorporated into working groups to profit the efforts of others to pass the course. These students distort the original intention that was functioning for years. For this reason, in future editions of this course, it is scheduled to put some individual written examinations. These partial examinations will also be required for approval without final exam, which is more exigent. In this way, is expected to reduce registration of some students only motivated for approval without exam. The just pay for the sinners, and trust placed in the students' work must be demonstrated also by an individual written proof. In fact, only a minority of students are conflictive.

2.3 Motivation by the choice of theme of work

The choice of theme of work is a process that takes place during the first classes of the course, and has several phases. The lecturer starts the process showing some work of previous years, and read some enunciates of other works. It also sets out to solve general problems, such as saving energy, or water scarcity, to be the central themes of course for to develop some solution of these general problems.

Next, the students discuss in group the main lines of different partial solutions to the general problem proposed, and shows to the lecturer a list of possible solutions, and these are discussed in their feasibility. The product to be designed must be simple, that permits to students to work the essential and not get lost in details.

Each group of students presents to the lecturer a final triad of their possible work themes and discusses their pros and cons. The lecturer recommended one or several of such themes and lets to the students the choice of this theme. Thus, motivates them more than if the theme was imposed.

2.4 Motivations for creative design

Above all motivations are those that promote the creative design of the product. For that, it is given special importance to the novelty of the product and this encourages students to its resolution.

Once the working group has chosen their theme of product design, begins up the work and the firsts outlines produced are compared with existing products, or patents in databases accessible online. At the same time they apply some creative techniques such as Brainstorming, Mind Maps (Buzan, 2000), etc., to produce new ideas of solutions. This way of working involves group creativity in the early stages of product design, which is when setting the bases that will define the new product. Students usually follow this with enough interest.

In this initial phase, is needed a good quality of lecturer work, which discusses with each group the functional or constructive problems of the product. This is an incentive for students that can overcome the problems they face, or to include solutions that are suggested. Also the lecturer accepts and values the best solutions that are proposed. Applying design techniques, students refine their product.

It is important for the growth of self-esteem of students that the lecturer recognises their work, their contributions, or their merits and that are a strong motivation.

3. MOTIVATIONS IN THE COMPANY-UNIVERSITY AGREEMENTS

For the recruitment of personnel in charge of an agreement between company and university, it is need to choose the adequate persons, which also show a special interest in the work that is presented to them. In this case they receive a salary for their services and this is usually one of their main motivations.

Some regular meetings of the university team, of the company team and of both teams, are especially important in the conceptual designs to control the evolution of design, and direct the activities to the proposed objectives.

The motivation for creative work has to go beyond monetary interest, and must focus on the recognition of persons whose ideas drive the design. In this case it is recommended to have written ideas, which can permit to deduce the authorship. It must also to have group work to discuss individual ideas and propose new ones. In the event that have a patent, must ensure the presence of the inventor's names in the patent. Knowing that ideas are rewarded and especially those that win, it is a stimulus for persons or groups of persons and that fosters the creative work.

4. RESULTS

In the above referenced courses, the students worked in-group to make innovative products, and also is worked in-groups in company-university agreements. Below are commented some results

During this time have been presented 17 patents with the students of working groups of the courses: *Projects*, *Product Engineering and Technical Systems 1*, *Ecodesign*, and *Innovation Patents*. As an example, the patent: "Lifeguard suit waterproof and thermally insulated" (Patent 2001). Although the proportion of students registered as patent inventors with respect to all students is only 8.35% (Lloveras, 2011), this percentage could have been greater if there had been adequate infrastructure and a better chance of dedication, which means that only some works are patented, and other works worthy of patent have not been patented.

In company-university agreements have been made 3 patents. One of the agreements made, was between the administration-university-company (Lloveras, 2010), or triple helix (Etzkowitz, 2003).

Three groups of students who presented their work to different contests were awarded (1998, 2002, 2011). For example, the rescue system for fire-fighters (see Figure 1). This rescue of people in damaged buildings is by a zip-line system (Award, 1998).

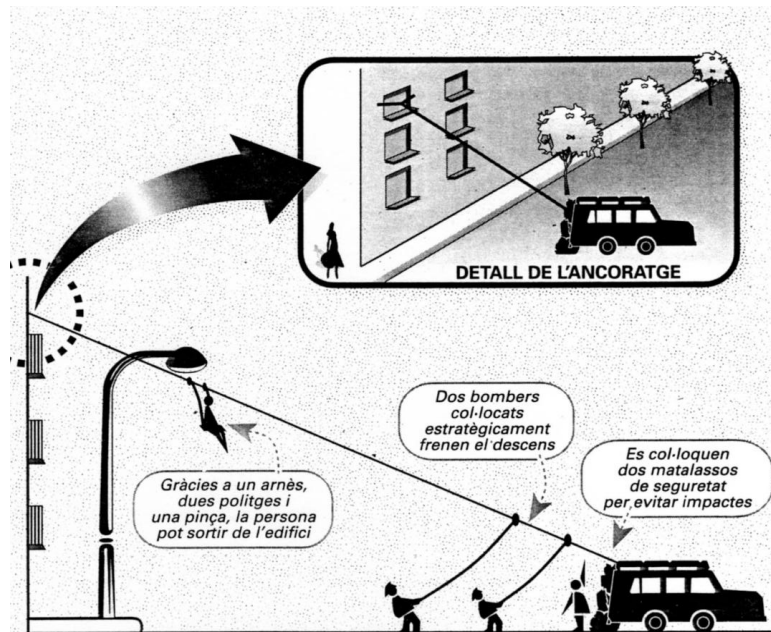


Figure 1. Zip-line to rescue of persons in fire building. Newspaper: The "Berguedà setmanal", October 17, 1998 - Región 7. Catalonia (Spain). Drawing Helena Rovira.

Several informative articles related to group works have been published in the internal magazine of the UPC (*Informacions*, 1994 to 2009), and some few of them have transcended to the mass media.

5. DISCUSSION AND CONCLUSIONS

Usually the product designing in-group appears richer than the individual design, and this applies both in industry as in academia. But in the industry, the salary is individual, and one difficulty arises on how to reward the one who has the technical idea, because who has the technical idea want to be recognized. Some other difficulties about that, are: what value is given to the ideas in front of his accomplishment? what is the just remuneration to the person who has the initial idea?, or, how to evaluate justly the group who have contributed to the success of a product on the market?, etc. And all these questions, without easy solution, are directly related to the motivation that can be given to the individual and to the group.

For students, it is assumed that the basic motivations to obtain a degree are: the desire to learn, to approve the courses, and to obtain the title in order to have a way to earn a living. But there is someone that searches the minimum effort in their studies and a course with work of group, without individual examination is perfect for their intentions. Due to this, shall be established an individual examination previous to the final exam.

The lecturer must know the technical problem and their solutions, but also must know some characteristics of persons and of groups of persons in order to manage their motivations.

Finally some results of this experience are listed below. They are some actions that seem to motivate better the group work and especially the work with creative flair:

- Clear rules of the course. Exigency of work. At the end of the course each designed product is presented to all the class.
- Formation of the students group by themselves, but with some recommendations or limitations. Many groups have a core of friends, and so they prefer.
- In the case of company-university agreements it is necessary to choose skilled persons, but they must be especially enthusiastic for the topic, and naturally, good workers.
- Election of the theme of teamwork by students, but guided by the lecturer.
- Challenge to make an innovative product.
- Give freedom choice in the development of students theme, but the lecturer assesses the solutions that they propose, analysing their advantages and disadvantages, or can to suggest other solutions. In this way, students are aware that their solution can be improved and they do so.
- At the beginning of work, must be questioned the firsts proposed solutions, in order to create an environment of search for alternative and innovative solutions. This encourages the appearance of creative solutions.

- Search of state of the art, especially patents. Sometimes the solution proposed is already patented, and that causes a student disappointment, but also motivates the group to overcome this.
- Give tools to solve technical problems, or encourage the group to find some technical solutions in other departments.
- For the qualification, it is most valued the final work of the group, which implies to work jointly. Normally the group controls the individual worked parts, and that multiplies the quality of the final result.
- An individual written exam is necessary to avoid the students that profit the effort of other members of group.
- Encourage the work in class, with computer connected to Internet (Wi-Fi).
- Try to create a relaxing atmosphere and do not cut and even participate in some playful moments. Creative moments are also generally playful moments.
- Show appreciation and reconnaissance to those groups of students who are excellent in their work and in their individual contributions. This increases self-esteem individual and group. Try to motivate groups of students who need it more.
- Recognition of the ideas held by individuals and by the group, and in some cases to register a patent with all members of the group.

The essences of these motivating factors can surely be valid for other situations, where a group of people have some activity.

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UNEARTHING IDEAS

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Abstract

This paper outlines the results of 'Unbreathing Ideas' a face book page concept that brings together the fields of social media and creativity in a way that allows the creative capacities inherent in all human beings to be expressed and understood as a process by people from diverse backgrounds so as to bring about positive change to the many issues facing communities across the globe. In a rapidly changing world with unprecedented means of communication and knowledge acquisition...ideas and the creative application of knowledge will in our opinion be the 'new knowledge'. This site through the use and application of social media creates a new means of communication for ideas to be expressed shared and acted upon in communities outside traditional specialist fields where creativity and decision making once rested. It is a work in progress with new and exciting ideas being unearthed and for the author's new insights into the collaborative creative process.

This paper outlines the results of 'Unbreathing Ideas' a face book page concept that brings together the fields of social media and creativity in a way that allows the creative capacities inherent in all human beings to be expressed and understood as a process by people from diverse backgrounds so as to bring about positive change to the many issues facing communities across the globe. In a rapidly changing world with unprecedented means of communication and knowledge acquisition...ideas and the creative application of knowledge will in our opinion be the 'new knowledge'. This site through the use and application of social media creates a new means of communication for ideas to be expressed shared and acted upon in communities outside traditional specialist fields where creativity and decision making once rested. It is a work in progress with new and exciting ideas being unearthed and for the author's new insights into the collaborative creative process.

Background.

The stage we are at with the site is still very much work in progress and our initial intention to promote the importance of creativity have focused on how the site can be used primarily as a teaching medium exploring new methodologies utilising a social media platform. Creativity and creative ability is increasingly being recognised in society as a desirable attribute and skill across a wide range of disciplines beyond the traditional Arts/Design specialisations. Its importance in the school curriculum is also gaining prominence across disciplines beyond the Arts Music and Drama specializations where it has traditionally sat as a specialised talent activity only relevant to a small percentage of

students. There is a growing body of research in media, cultural and business studies that is beginning to challenge many of these preconceptions, instead demonstrating that a creative capacity is a vital component of sociological, economic and educational enterprise (Haring-Smith 2006; Cunningham 2005; 2006; Hartley 2004).

‘Thus creativity has become core business for those who seek to develop employability capacity through formal education. According to a recent policy report in the UK, employers are now seeking “multi-competent graduates” (Yorke [HYPERLINK "http://www.springerlink.com/content/g518p92082x3l221/fulltext.html"](http://www.springerlink.com/content/g518p92082x3l221/fulltext.html) \l "CR48" [2006](#)), who have, “high level expertise ... emphasising discovery ... and ... exploiting the discoveries of others through market related intelligence and the application of personal skill’ (E. McWilliam and S. Dawson 2008).

However in spite of these recent developments and evidence of the importance of creativity there is still much scepticism and resistance that needs to be addressed. McWilliam states that “Notwithstanding academic longing for a theory or model for everything, creativity continues to be regarded by many both within and outside academic circles as so mysterious and serendipitous that it defies definition, and thus also defies any attempt to foster it systematically”. (McWilliam 2008). It was with this in mind that Unearthing Ideas attempts to demystify the discipline and provide a platform for wide engagement, participation and understanding of not only the principals involved in its practice but the wide community benefits that creativity and creative thinking can bring. More and more work is being defined in ways that is ‘less focused on routine problem-solving and more focused on new social relationships, novel challenges and the synthesising of ‘big picture’ scenarios. It is unsurprising therefore that we find a broad consensus among employers about the qualities they are seeking in graduates, with “imagination/creativity” being top of the list.’ (McWilliam 2008)

A factor in establishing Unearthing Ideas as a facebook site has been the growing evidence that, “Web 2.0 applications are seen to form an important element of the digital landscape of many learners which is decidedly outside the control of the education institution. As such they constitute what (Kirkpatrick) terms “other, more flippant[educational] concerns” than officially implemented and sanctioned e-learning applications. Yet flippant or not, many commentators are now arguing that these Web 2.0 applications are of equal if not more importance than formal educational ICT applications in the ‘real-life’ educational conduct of contemporary learners and, as such, are worthy of acknowledgement by the education community” (Neil Selwyn.2009) It is common knowledge that many people

including students, teachers, and parents are beginning to widely use sites such as Facebook and in some cases for educational purposes.

Facebook has become one of the most popular social media sites in the world and more and more teachers are beginning to incorporate it into their teaching practices (Lawrence, 2008) to enhance positive interactions between students and teachers. There are the many purely social aspects for its popularity but applications such as posting ideas for discussion and providing links to educational resource are beginning to gain a place. Facebook can enhance communication in an educational context because it allows for a faster and easier approach for teachers and students to connect with each another. Teachers can post material on line and students are able to respond to tasks, communicate to their teachers about issues relating to their work and extend this communication to their peers. Facebook in this way provides a very effective link between education and technology in an environment where we are relying more and more on electronic mediums. Overall though social media sites 'mirror much of what we know to be good models of learning, in that they are collaborative and encourage participatory role for users' (Maloney 2007). Its impact on education in a significant way cannot be underestimated and many educationalists are heralding a Web 2.0 transformation of teaching and learning with "potentially ground breaking implications for the field of education" (Thomas 2008). Much of this is due to the fact "that Facebook shares many of the qualities of a good 'official' education technology in its reflective element to use, mechanisms for peer feedback and goodness-of-fit with the social context of learning" (Mason 2006).

Having taught in a university environment for the best part of thirty years I am in a position to reflect on a number of significant changes especially in my field of design and design education. Technology for example has completely revolutionised the Graphic design industry with computers now able to assist in performing tasks that were once laborious and time consuming. In our teaching we now use things like power point to add a richness and diversity to our presentations. At an instant one can bring up links and references that were not possible in the old 'slide' days. We are developing on line delivery models so we can reach students in a distance mode thus maximising our delivery and income from our teaching. Within the university we can converse with students through a range of electronic mediums and post aspects of our curriculum, course outlines, assessment requirements, course and teaching evaluation instruments, have chat room discussions, provide feedback assessment and so on all aimed at increasing participation and engagement and hopefully assisting in improving the overall teaching and learning environment.

In spite of all these technological advances it is true to say that our teaching methods ironically have not really changed that much at all. For example in my field we still organise

'classes' in a studio with one teacher responsible for a cohort of students. Each teacher sets a course of work within a program and delivers it at a set time essentially by transference of 'information' and 'experience' still very much teacher driven. The teacher is the centre of the stage and the students the recipients. What might be termed 'traditional teaching' even in a school of Art and Design is still very evident with a focus on teaching and not always consciously on learning. We still plan our curriculum and experiences for students very much on what is to be taught with a tight correlation between what is taught and what is to be learnt. In all of this the teacher is still the controlling factor and students perform to meet the expectations implied in order to achieve success. Even with the advent on line modes of learning we are still fundamentally working with models from the past 'Despite the beacons of first class work that exist the bulk of e-learning across higher education has been concerned with reproducing old models of teaching leading to largely passive on line learning opportunities'(F Orandini, G Saunders. 2007) It was with this observation in mind that a discussion with some of my students and a colleague Helen Robinson who had delivered lectures on social media that the penny dropped. What about using social media in our teaching and what will it have to offer that is not possible in current models of practice?. Helen worked very much on the following conclusion by Ebersole & Woods (2003) in conveying her message to the students on the value of social media in an educational context. 'What researchers like Sarason (1974), McMillan and Chavis 1986) and Richmond, Gorham McCoskey (1987) have discovered is that optimal learning outcomes are directly tied to the establishment of social networks among participants engaged in a collaborative learning enterprise. Put another way, dialogue is the lifeblood of effective learning.' Lawrence (2008) And for us the dialogue was missing in many aspects of our teaching; dialogue which is also an essential component in the process of creativity and generating ideas. We speculated that introducing a social media dimension might be of benefit in opening up our teaching to new ways of working but we also felt that a model might be useful for opening up lines of communication between staff and students, students and students and between staff. Our results to date focus on the first two with a staff social media communication model still at the planning stage.

One big hurdle to overcome was the negative perception that social media had when connected to an educational context, 'The phrase "social networking" can conjure up images of students doing what students do when they *socialise* – party, share music, gossip and sometimes get involved in risky behaviour. Teachers and parents frown on this type of activity anywhere, but especially in school' (Tim Childers. 2011) It was noted that there was very much a mixed reaction to the use of social media sites for educational purposes and I was the first in our school to venture into this domain. Concerns related to privacy and appropriateness of getting too close with students in their interactions with lecturers was

expressed. Many academics I work with were opposed to the concept and had no desire to even be on sites such as facebook as they could see absolutely no benefit in their teaching. To try and change this perception it was important to move from terminology focussing on 'social' to one focussing on 'academic' within this on line presence. Thus changing the focus from something the community might frown upon to something that would be embraced and accepted in fostering knowledge, learning, research and enquiry. 'academic networking' as (Tim Childers) refers to it. As well as the incredible high usage of sites such as facebook by the student body these sites have ready-made features that facilitate their use in an educational context. The ability to post images, clips, links, email, bulletin boards and encourage a process of collaboration and sharing of ideas. Now while most universities have similar features within their Virtual Learning Environments structures such as Moodle for staff and students; utilising the 'social' and broader audience sites like facebook have made them far more attractive to students. Westminster University staff have observed 'a growing feeling that its use Virtual Learning Environment (VLE) is merely re-enforcing a model where the teacher controls and is at the centre of the process.' (F Orandini, G Saunders.2007) We noted and it is a worrying trend for our university that our attempts to engage the students to use in house forums especially those promoting communication and discussion of course work are failing miserably. For some reason in spite of intensive encouragement students have not embraced this aspect except to access staff notices and content. However on sites such as facebook it's a different matter because of the social factor which our internal management systems do not offer. (Van Horn and Parker) in surveys they conducted on facebook showed that 56% of students stated that facebook was a good tool for classroom related activities and that students contacted each other about things happening in class, set up meetings and study groups and crits of each other's work. (Van Horn and Parker 2007) Demski states that 'web 2.0 is not just a passing fad ;it is an activity that has embedded itself into the way work gets done' and the implications for education attempting to model in some way the student experience to reflect the work place must take notice. (Demski 2009) Claire Couillard states 'The central role of social networking tools, how employees do business, needs to be in student education' (Claire Couillard 2010)

Aharon summarises that much current research acknowledges the many positive relationships created between academics and students as a result of social media in an educational context.

- '1. Self- disclosing offers opportunities for students to connect with their instructor, building immediacy between instructor and student.
2. This 'personalisation' helps to increase student desire to participate – feeling more connected to the instructor.

3. In turn, this positively influences motivation, engagement and effective student learning' (Aharon Adi (2008)

In building a case for establishing and using the site in our teaching we have attempted to define a number of areas where this approach might foster and improve student learning in the discipline of creativity.

Student interest

Any experienced teacher will acknowledge that students learn and engage best when they are interested in what they are doing. High levels of student interest also have the flow on effect of minimising negative behaviour and increasing participation rates as well as retention in our programs. Many teachers would agree with Dewey's theories on the importance of the role played by student interest or, as we say today, student purpose. Dewey thought of interest as a basic psychological drive which, if mobilised in the learning process, would evoke greater effort and therefore progress. (Beck Robert H 2009) The use of social media in education though gives the interpretation of 'interest' a new slant when it is perceived as presenting something that students are already interested in rather than evoking an interest in the work set in the curriculum. Our model we hoped would address both areas even though as stated there was scepticism on the part of staff in my department that the idea of aligning in some way the educational experience with student 'social' interest could be seen as diminishing the authority of the teacher. Dewey, 'never equated interest with mere whim. Unfortunately, it has often in the years since been so construed, sometimes even by the advocates and practitioners of progressive education themselves'. (Beck Robert H 2009)

In my teaching experience one thing that does stand out is the effective and powerful student engagement that occurs when students have a genuine interest in what they are learning. My teaching in design and creativity has fortunately given me many opportunities to apply this where traditional subjects have not had the flexibility to do so. In applying and practicing creative thinking students often had the opportunity to work on topics that were of relevance to them and not merely dictated by the teacher. Often in my classes work focussed on a team approach with my role as facilitator helping students plan ways of working, developing and testing ideas in a variety of ways, making decisions and presenting results...not just following the teachers instructions to some predetermined outcome. Sometimes things didn't work out but reflecting on this was just as valuable a learning outcome by what the process had taught the students and not just the end product.

A blunt way of looking at the issue of student interest was an off the cuff statement made by a colleague early in the piece. 'If you can't beat them join them' in an attempt to try and be a

part of a social media movement we could see was happening and greatly influencing the lives of young learners whether we as adults, parents and teachers liked it or not. As stated students were not embracing our university on line sites but readily participated on facebook. reflecting what (Stutzman 2005) stated 'Facebook owns your campus'

Impact and scale

One of the aims of the project has been to increase the impact of creativity and to aid in dissemination to a wider educational and general community. Social Media has the ability to scale things in ways never imagined in the past. Conversations and exchanges once only possible on a local level now become macro and available to a potential world audience. Richard Elmore states that 'a significant body of circumstantial evidence points to a deep, systematic incapacity of US schools, and the practitioners who work in them, to develop, incorporate, and extend new ideas about teaching and learning in anything but a small fraction of schools and classrooms.' (R Elmore date) This I would argue holds true in Australian education and the situation is getting worse as the body of advisors once charged with the responsibility of disseminating good practice and offering advice has virtually disappeared in a range of cost cutting measures over the past 15 yrs.

Much work is not disseminated and good practice not shared. Students as well tend to work in isolation and do not share their work apart from formal critiques and many of these at the conclusion of courses are between a student and an assessment panel of lecturers. Social Media has the ability to change dramatically the scale of things. Conversations that in many situations exist between small groups or in a classroom or studio now have the potential to reach the whole university, local, national and international communities.

Feedback from our students revealed that they were posting ideas on the site not just to meet the needs of the assignment or for the teacher but to their friends and colleagues and 'other' people who might see it and in a way that traditional teaching didn't allow. Needing to tell people about what you are doing and to get positive feedback sometimes from complete strangers was a very positive drive for my students and a big plus to building self-esteem which social media can do. I got to the point of not having to remind my students to post work they did it as a matter of course in their own time selecting things that not only related to the task at hand but also related sites and topics that demonstrated a willingness and motivation to add to the body of work. The motivation seemed to stem from the fact that someone was going to see and share in their efforts, their images words comments, links etc. Students were motivated to add to the body of material about creativity so that now the lecturer wasn't the sole provider of learning resources. Students were now assuming some ownership and this had never happened on this scale in my teaching before...social media made the process easy and it was what students constantly do in sharing information on

sites like facebook except that now it had an educational and learning focus. In turn I would argue that in this on line environment creativity is enhanced and encouraged through investigative approaches that are student centred, exploratory methodologies, testing propositions, discussing and sharing possibilities that have the space to be shaped over a flexible time frame that is not an artificial imposition. The site provided the flexible environment for creative thought to occur and for many students they had rarely experienced this autonomy before.

The on line concept can move beyond the individual teacher in the classroom with responsibility for one group of students. The site encourages groups of teachers and groups of learners to come together so collaboration is possible in ways previously impossible in the confines of the traditional classroom architecture. Discussions can occur with the whole community of teacher, learners and interested parties in a sharing collaborative environment greatly enhanced through technology and the internet. Our next teaching semester will allow for the expansion of these collaborations to occur with a number of courses sharing their creative experiences and outcomes on the site. What is proving to be exciting is the powerful nexus that is then growing between the teaching and the promotion of creativity as a concept to the wider community.

Engagement

Much of my work in teaching creativity focuses and challenges the observation that much education is still focussing on the past and what has been known not on the future and what we need to know to speculate on future scenarios. It could be argued that this approach helps to maintain the status quo producing members of society not prone to challenging conventions and the way things are. A teaching model based on this approach is relatively easy to manage with many predetermined outcomes, directions that are mapped out and students having the security of knowing that they can successfully strive and achieve the right answer to most things.

'Traditional education focuses on teaching, not learning. It incorrectly assumes that for every ounce of teaching, there is an ounce of learning by those who are taught. Being taught is, to a very large extent, boring and much of its content is seen as irrelevant. It is the teacher, not the student, who learns most in a traditional classroom' (Ackoff R, Greenberg D. 2008). Wanting my students to continuously challenge what they saw around them in fact encouraging the community to do the same in a process of speculating about our future through ideas needed something beyond traditional education to be successful and it needed a vehicle like facebook to help disseminate the message. One of the challenges I face when beginning each of my courses in creativity is changing the mindset of students who expect me to have all the answers and for the program to be mapped out in a logical step by step

manner. This is what they have experienced in the many years of formal education before they arrive at university. It takes a few lessons to undo some of these preconceptions and create a culture building the confidence of exploring, trying, speculating, working off mistakes, making hunches and generally 'playing' with possibilities as a legitimate way of working and a process absolutely crucial in fostering creative thinking. The interactive nature of social media sites and the ability to evolve and create a variety of possibilities in the way information was gathered, processed, reconfigured and reflected upon was to me a powerful medium to explore in supporting my style of teaching to enhance creative outcomes. Also working with a medium that students themselves were expert in helped to build confidence in the students applying their creativity and this was continuously born out in formal student feedback. Comments along the lines that they were working in 'their territory' and not having the anxiety of fitting a university or lecturer driven model made them very comfortable in exploring their creativity in the course. The site gave them an opportunity to display their expertise and knowledge of the medium as a way of demonstrating a skill they possessed. An interest was generated because they were familiar and enjoyed the medium. This they commented was in contrast with other courses in their program that they found stressful, demanding and sometimes difficult to connect with. Feedback often reflected on the more relaxed nature of my course through its social media presence. They didn't feel pressured, they actually enjoyed the experience and they connected so that the work was not a chore to be gotten over and done with but ongoing and interesting...supporting Woods' observation that 'Embracing social media in education actually extends the class content into students' personal world. Students pay attention to content delivered in "their territory" because it is less formal and less intimidating -- it's also two-way and interactive; they're not just lumps sitting in desks being lectured to.' (Woods R 2008) Ziegler states that sites like facebook have the potential ...'to better motivate students as engaged learners rather than learners who are primarily passive observers of the educational process'.(Ziegler 2007)

Danah Boyd discusses particular features of social networking sites that I have considered when setting up this site. Boyd D (2009) Firstly the site establishes a profile and as Boyd describes a means of 'showing off' and just as young people on social media sites need to express who they are so does Unearthing Ideas but in a way that is not the formal presence that official university communication might convey. The fact that we wanted the audience and my students especially to own and interact with the site was facilitated by having a social media profile with all the things that that implies.

Secondly the notion of friends is an interesting one from the point of view of education. We are not talking about friends as in your nearest and closest friends but friends who share something about the concept of creativity. Normally these would be colleagues, students or formal connections within the University environment. My notion of friends

created a less formal relationship and invited participation from the wider community and I saw facebook as having a less formal aspect that would attract involvement and participation and feedback from students constantly bore this out. Part of the reason why the internal university on line sites were abandoned universally by students and even staff was that their formality was not inviting.

The 'friends' connection means that opportunities can be provided for students to build engagement in their courses within a community much of which has been established by themselves. In a sense the lecturer is now going into their classroom as much as they were coming into the lectures'. I was able to observe how they interacted in their space because my site was part of their space. Postings could range from serious to fun with some frivolity and humour just as one does on personal facebook sites. Students commented that it was in part the informality that made the site attractive more so than the official university one.

Thirdly Comments are encouraged through the nature of the site in a way that is not always possible in the formal classroom. My observations were that in class the more vocal and confident students command the airwaves and the majority sit back unless I prompt them. Comments in class tend to be teacher directed or managed and they happen in a tight time frame often with little time to think through responses. Students would often comment that they thought of something after they left class but had no means of adding these new ideas to the conversation. Through this medium we take away the shyness or intimidation aspect. Students are expected to contribute through postings and comments but these can be 'stage managed' by them. Feedback indicated they felt much more comfortable contributing when they could think about their response before posting and the ability to do it in their own time or when it came to them .By taking their time when commenting or posting students were able to reflect on what they wanted to say and the consequences of this. They also had to time to peruse each other's work and acknowledge with everything from a 'like' to a more detailed description that articulated deeper understandings of the creative processes being employed which was what I expected. Taking risks in turn was facilitated, but in a 'safe' environment where they could 'try' out ideas, explore, even retract if they wished in a less judgemental environment; a vital component in the creative process and certainly not encouraged in traditional education based on rightness at every step.

Another interesting aspect of student engagement that emerged on the site was that students were posting and commenting not always for grades or marks (their words) but because the site offered them the opportunity to express their interest and involvement on the notion of creativity and the ability to think differently. This genuinely interested them beyond the requirements of the course I was teaching them, something like students doing extra maths because they enjoyed it, or reading novels or researching topics because they

developed a love of learning. Students commented that this actually occurred and that they interacted on the site not only to meet formal course requirement but also out of genuine interest in the concept of creativity and how its understandings were beginning to change their attitudes and thinking as never before. Students continue to post on the site now that the course has concluded and many take an interest in the general conversation and in forthcoming events planned to promote creativity in the community.’ Students commented that they could continue to go back to the facebook page for new ideas and to contribute on how they have applied their creativity’.

The site also encouraged variety and flexibility of expression in the learning process an important component in encouraging creative thought and something not always possible in the structured traditional approaches where a body of information and processes are delivered to all students in the same way at the same time. ‘Many of the critics seem to assume that all students learn or progress in the same way, but they don’t. Using technology can help with that, by prompting comments from people who might not be able to get into a live discussion. If a teacher is smart, they could promote a good idea that was submitted through these back channels and encourage a student to expand on it. This could encourage more participation and also help some become more confident with their suggestions.’ (Kim R 2011)

Students also commented that the site gave them the opportunity to collaborate with each other beyond what I may have expected in the studio work I had set them. They were also able to detail how this had assisted their learning by seeing the value of community in developing creative skills. Csikszentmihalyi, for example, insists that it is *the community, not the individual* that is the unit that matters when seeking to foster creativity. This proposition is aligned with the view that ‘flying higher’ results from ‘flocking’ capacity, not the exceptional abilities of any one entity. It moves the focus to the sorts of environments in which collaborative efforts are fostered and rewarded, and to consider the social conditions and forms of conduct that might pertain in such enabling environments. (Csikszentmihalyi 1999). Lave and Wegner conclude that ‘the future of learning lies in a carefully planned and integrated network designed to give autonomy to learners, whilst involving tutors in a facilitating role, stressing the importance of guidance rather than management in forming “communities of practice” groups of people who share a concern or a passion for something they do and learn how to do it better as they interact regularly’, exactly the environment of social participation we were attempting to establish through the site to foster creative thought.(Lave J and Wegner E. 1998)

Learning issues.

Paramount in the decision to utilise social media in my teaching was the question of learning and more importantly the enhancement of learning beyond my existing practice. As mentioned my colleagues were very sceptical as they could not envisage any advantage and lots of disadvantages. Boyd's words were echoed in my colleagues scepticism 'Just because youth are using social media doesn't mean that it can fit well into the classroom. It needs to be thought through pedagogically and y'all need to understand how it's being used in everyday life before bringing it into the classroom' (Boyd 2009) My critics thought I was jumping on the bandwagon of trying to connect with the latest trend popular with young students. In part this was true but essentially because I believed it was a means of establishing a new connect and that it could enhance my teaching in effective ways not possible with my current practice .Boyd's comments about the importance 'to note the ways in which we need to learn to learn. Social media is connecting educators and learners in new ways and this too is extremely important'. (Boyd.2009) and it was these new ways that are beginning to emerge as a result of the site.

Firstly it was evident that the students and I were getting to know each other better through this interaction. Compared to past classes where we only physically met once a week punctuated with the occasional email the continuing conversation with students on the site generated a new and more relaxed familiarity. In a course where one of my aims was to get students to be adventurous and exploratory in their approach, the need to be more fluent and flexible in their thinking and a willingness to express thoughts more openly was a feature students commented as being facilitated by interacting through the site and through the flow of ongoing feedback.

Another important aspect of learning that the site is facilitating is the notion of sharing. A defining feature of social media is of course just this and how through it we are accessing posting and in turn exchanging information. Now it can be argued that most of this information on sites like facebook are superficial and based on gossip but the potential is there to also share ideas, original thought, post references and links that not only progress ideas but build up a body of knowledge that relates to them and the mechanisms and processes to enact them. What was obvious in our past approaches was that little sharing was taking place except in formal presentations and even then unless the teacher made the information accessible little transferred between students occurred. Everyone was responsible for accumulating their own research and to present their own ideas often not really knowing how others in the group were interpreting the same scenarios. What emerged from our approach was that students were conversing and sharing ideas more. Some even approached me on certain topics asking if they could do a collaborative effort and my

approach was open enough to allow this so long as each student could reflect on the processes that lead to new ideas.

Fluency and Flexibility of Ideas a critical component of creative thinking was enhanced by posting and interaction on the site due to the self-reinforcing function that commenting and the subsequent conversations that arose created. One idea led to another as the class and others interacted, building, evolving, questioning, modifying, refining etc, and this could occur over an extended period of time a function impossible to replicate in the traditional classroom. Many ideas could emerge (fluency) and the subsequent discussion led to ideas being interrogated and developed (flexibility) as students both individually and collectively presented proposals and ideas to a range of situations. The site also greatly facilitated the (elaboration) of ideas another important factor in the creative process. Comments and postings reflected deeper understandings of creativity processes in the work undertaken. The discussion often moved well beyond the specific task at hand to what I call 'thinking about the thinking' and an understanding of principles that facilitated the application of these into other situations beyond the present task. This was a crucial aspect of my work as I wanted the processes to be understood in a way that gave the students the confidence to apply them in other and more diverse future situations.

Boyd in her commentary on Broadcast to Network states that 'For the last few centuries, we have been living in an era of broadcast media, but we have been switching to an era of network media. This fundamentally alters the structure by which information flows' (Boyd 2012). Reflecting on this in terms of education one can see that our teaching has been situated in a model where the information was by delivery to everyone at the same time and that control of this centred in the power of the lecturing staff and in so doing we commanded all the attention. The Internet now provides opportunities for people to make their own content available and in so doing gain attention and gaining access to this information is now easy. Searchability a new term that changes the information landscape dramatically making information instantly available .We have utilised this ability to empower our students to contribute not only to the information content but to comment, reflect and shape aspects of what is being experienced in my courses and what is being learnt. For many lecturing staff this might be seen as somewhat of a threat and dangerous in that the question arises as to who vets this stuff if in fact it needs vetting. The teacher as the information expert and holder of the knowledge is eroding and changing. How well this transformation can work very much depends on the nature of the course but in mine the aim was to encourage multiple view points and as mentioned an experimental approach. My main stipulation was that students had to reflect and articulate aspects of a creative thinking methodology in their postings and

their work. Within this approach the many ideas and references that they contributed were almost all appropriate in describing aspects of the creative process...many reflecting acknowledged practice but every now and then students were able to communicate their own twist on where an idea came from. Again this the students found enlightening as for the first time for many the teacher was not the sole driver of content and how things had to be done.

Informal learning

The use of social media in education which Unearthing Ideas represents also raises the question of informal learning and its place in educational programs. In trying to bridge the gap between social media and academic content we were attempting to tap into the positives of the informal learning processes that might characterise the connect between the two. Informal learning is seen as happening in a personalised manner very much driven by interests and needs. It is voluntary, self-directed and embedded in a social context which promotes ongoing activity and continual learning. One could observe that this is an ideal to strive for as teachers plan and execute experiences for students in more formal educational contexts. Bull, Thompson, Searson, Garofalo, Park, Young and Lee state that 'The informal learning that occurs in the context of participatory media offers significant opportunities for increased student engagement in formal learning settings. The experience with communication technologies that teenagers today possess must be tapped by educators and connected to pedagogy and content'. (Bull, Thompson, Searson, Garofalo, Park, Young and Lee 2008). Sterling suggests that 'young people's engagement and creative endeavour being practiced outside of the classroom should be harnessed and directed to the academic enterprise within schools'. (Sterling 2008) My experience with my students has led me to observe that the formality of content in the traditional model of classroom teaching can be enhanced expanded and made more relevant when a more student centred approach is employed that taps into the experiences that a more informal environment provides. Formal student feedback conveyed that developing skills and confidence to apply creativity principles was enhanced in this social media environment that encouraged an element of students making decisions beyond the 'confines' of the classroom and the perceived curriculum. The very nature of what we might term the creative approach certainly encouraged students to explore, experiment speculate and take risks in their endeavours and the informal learning environment gave them the licence to do this. 'When the curriculum allows for self-directed online learning, students can learn more than what is taught in class because they are able to create meaning for themselves beyond the intent of the teacher'. (U.S. National Technology Education Plan 2010)

'The concept of sociality itself has learning implications. Young people engage with others in a range of ways that provides life experiences to work out what Boyd describes as .'boundaries, to understand norms. This is how they learn power and authority, how they learn the networked architecture of everyday life. It's easy to eschew this, to argue that this is irrelevant, but most people spend a decent amount of their time working through' (Boyd 2009) For me the site facilitated this learning process by opening up a dialogue. I was encouraging my students through their postings to discuss what they are doing and why they were doing it. My feedback focused always on aspects of the process so they could position their ideas in some creative methodology context and the application of the created knowledge which was a major aim of the course. In turn students were able to teach me aspects of the technology and I was able to provide an overview from my experience so we learnt from each other in a co-operative, engaging flexible way reflecting the interactions that occur in everyday life and in a social context. Consistently I made reference to the notion of how the experience was teaching them to learn about the learning not just what to learn. Some students commented on how this gave them a sense of being able to look at things from a 'big picture' scenario and empowered them with a 'wisdom' about the work that they universally agreed they could take and apply in future scenarios. All my students provided feedback and examples of how what they had learnt could be applied beyond the immediate experience of my class and an important function of the site as we move forward is to provide a forum for expressing how this is occurring. In a sense the notion of how society passes on experiences and its culture and traditions is being facilitated by the site as students share and pass on their experiences and these are then recorded and available for all to interact with

Practicality

From a purely practical and efficiency point of view the site has created a number of advantages for me in delivering my courses. The system is cost effective because students are already using and are very connected to social media and are not having to adjust and fit into something that the lecturer or the institution has created. As well for the uninitiated there are ready made and easily accessible resources to get help on how to use social media sites like facebook. Posting and distributing information is far more effective than through traditional lectures email and internal university sites and students readily acknowledged this. Students and staff are able to post images links video clips to disseminate information on the site in ways that the traditional lecture and classroom environment cannot and does not because it becomes time consuming and cumbersome to organise and in an environment where everyone has to see it at the same time. Access to information and responding on

the site now have a wider time frame for interaction and as such students and staff can manage their time in new and flexible ways without the rush or urgency of having to interact within the specific class lecture time as specified on the timetable. I found that my time in formal class now involved much more a reflection of the week's activity on the site rather than providing information and setting and doing tasks which were now being posted on the site. Student comments indicated that they felt their performance was enhanced along with their confidence as a result of this greater feedback and discussion supporting in part Tower VanHorn and Parker's research that have shown that students who participated in on line web enhanced class environments outperformed students in traditional lecture studio classes.

For me another practicality was the ability of this type of student engagement and interaction to facilitate different learning styles which were very evident in this new environment. I have already mentioned the greater collaboration that students naturally built up within the group to work on issues just by having the means to see, share and comment on each other's work. Students would approach me and ask if they could work together on an idea because their on line discussions revealed common interests or connections that they thought were useful...and I could see that some of these connections came about through the social aspect of the site as students interacted and got to know each other. Groups would collaborate with other groups so a presentation of ideas which in the past was characterised by the individual was now becoming a communal one. This in turn began to alter my views on how this work was to be assessed and inevitably I have moved away in part from individual to group assessment and also to peer assessment where the groups are able to objectively assess their creative processes, applications and outcomes. Students were grasping the underlying principles relating to creativity and building confidence in knowing when and how it was taking place and as such evidence of this deeper learning and understandings mentioned earlier was happening through this group decision making and an enthusiastic taking control of their learning. The site in turn demonstrated this as this new initiative was revealing itself in the things that students were posting and commenting on, that were going far beyond specific task orientated course requirements and even beyond the bounds of the course. 'For example, it has been suggested that social networking offers the opportunity to re-engage individuals with learning and education, promoting a 'critical thinking in learners' about their learning which is one of the traditional objectives of education' (Selwyn, 2009)

Some students continued the conversation regarding class issues after the class and assessment had finished. What was exciting was to see how some of these ideas and

discussions were now filtering into other courses and aspects even beyond the university experience. Some students even started setting up their own sites relating to design and creative application of ideas. This was achieving in measurable ways one of the main aims of my course and that was to encourage students to use and apply the principles I was teaching to their specialist areas of study and other. In the past I obtained anecdotal feedback, calls from students comments from other lecturers providing evidence on the positive impact of what I was teaching and how it was been applied in other situations. Now through the site the evidence was appearing as a continual and ongoing conversation.

The site allowed us to build the teaching and learning community by connecting with other institutions individuals organisations doing similar work on creativity and creativity education. Sometimes we sought them out and sometimes they found us but certainly facilitated by the on line environment. As a result even in the short time that we have been operating we now have a number of ongoing conversations and sharings and are beginning to establish some collaborative projects with people all over the world. Some of these are The Monterey Institute,USA. Power Drawing Program UK, Intellectual Entrepreneurship Consortium Texas University. Fontys Creative Academy, Netherlands.

I have always had a small cohort of students that from time to time have difficulty attending lectures and studio classes. The reality of work commitments, family needs for mature aged students with young children means that the traditional delivery modes do not have the flexibility to cater for these last minute changing situations. The site has allowed students to stay in touch make up work and continue to participate even though they have missed sessions.

Conclusion

The creation of this site to promote creativity and its use in my teaching has provided a benefit to both me and my students in allowing a broad range of teaching styles that are an alternative to the traditional lecture studio format. 'The benefits of Facebook's networking and social communication capabilities can greatly enhance the learning experience of both the teacher and the student by tapping into a greater number of learning styles, providing recommended relief from the traditional lecture format and by building a top the community already established by the students themselves. (Kim R 2011). The community of the classroom was enhance and for me changed dramatically by this on line mode that students have already embraced, are using and feel comfortable with. Student teacher interaction and community involvement and participation takes on a whole new dimension through this 'social' approach and in turn it has grown connections and engagement with what I am teaching in creativity.

Whilst still very new and still in a state of development I can already see the benefits and importantly so can the students. What was once a series of experiences recorded exclusively in a journal and exchanged with the lecturer was now becoming a conversation open to many and with the ability to be openly shown with pride. I noticed a greater 'connect' with students reinforcing Mazer's findings that 'Students who viewed an instructor- with high levels of mediated immediacy, including forms of self-disclosure, reported high levels of motivation and effective learning, indicating positive attitudes towards the course and teacher' (Mazer 2007).

The work as mentioned is ongoing and the nature of this approach is that it will always be. In the past I have tended to repeat my formal teaching approaches and specific methods but now I can envisage that as technologies develop so will the interactive abilities and so might the conversation and inevitably so will my teaching and in turn the learning on the part of my students. The most exciting thing for me is that students are taking a more active role in the process of knowing about and practicing creativity and I see myself as part of a team with my students sharing a learning experience where I am no longer the gatekeeper of the knowledge and the processes to be undertaken.

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ALADDIN AND THE WONDERFUL LAMP

UPDATING THE CASE METHOD WITH INNOVATION*

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INTRODUCTION

After using the standard case method for over 35 years to teach marketing courses I felt that something was missing. The missing parts were in creativity, innovation, and mindmapping. I found that by combining these concepts with the standard case method, students could become innovators, not just problem solvers. To present this new approach I will use a mindmap because it enables materials to be displayed efficiently in a nonlinear fashion, which is the way creative people think.

FORMING AN INNOVATING TEAM

Gone are the days of a pyramid organization where the few people at the top hold all the information and make all the decisions. The personal computer has made information widely available. A variety of skills are needed to innovate successfully. No one person can process all of the information or has all of the required skills. Effective teaming is needed to combine information and skills. And an effective team requires members to acknowledge the strengths of all persons involved. Exhibit 1 is a mindmap that shows the learning steps to create an effective team. This is a cooperative approach that is quite different from the earlier case environments where students viewed the class discussion as a zero-sum game to get the best individual grade. Today companies that are recruiting MBA students evaluate them on teaming skills.

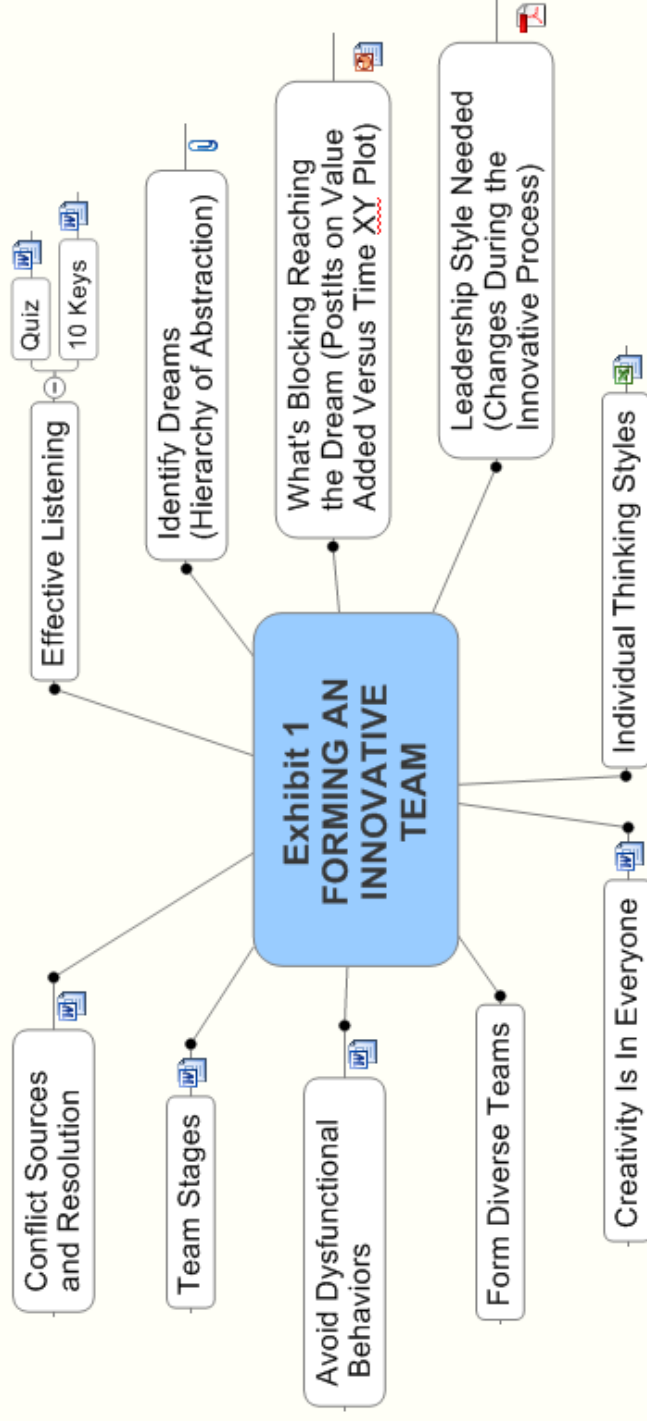
Teaming begins with effective listening. Students complete a self evaluation of how well they listen. They are also asked to have colleagues and perhaps a spouse or friend make the same evaluation. This exercise generally reveals that their best friends think they are good listeners, but it is downhill from there.

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Move to Innovation Model



Moving clockwise around the map brings us to Identifying Dreams. The case method generally focuses on defining the problem and then sets a narrow goal for solving it. But a dream is more motivating than a problem or a goal. When the problem is solved or a goal is reached, motivation is gone. An organization with a dream stays motivated. Working with a client in New Zealand I asked two founders of the company to independently complete a hierarchy of dreams (Exhibit 2). When they finished they were surprised to learn that they shared the same dream—an educational fund for grandchildren. No, they were not related.

In the next step, the students individually write on a PostIt[®] reasons that are blocking reaching the dream. After each participant has written as many PostIt[®] as possible, the reasons must be prioritized for the creative solutions step. After investing in computer programs to rank these reasons, I found a better and cheaper method—a flip chart and PostIt[®]. To prioritize the reasons, each participant affixes the PostIt[®] on a flip chart that has an XY diagram (Exhibit 3). I have found that “Value Added” and “Time to Complete” are good defining dimensions. This method has two additional advantages: participants read each others’ statements to decide where to post theirs, and it gets them out of their chairs and walking around, which enhances creativity.

Participants and the client group the reasons in clusters and name them. There are generally only 3 or 4 clusters. The “parking lot” is where irrelevant statements go but we don’t want to turn off a participant by ignoring them. The client decides which cluster will be the focus for creative problem solving.

Leadership should rotate according to the stage in the process. Early in the innovation process the leader should be someone who is visionary. Later, to draw on all of the participants’ knowledge and skills, leadership should shift to someone who has a democratic leadership style. The action plan stage needs a leader who is detail oriented. Thus, an innovative team needs all thinking styles.

It is difficult for participants to realize that not everyone shares his or her thinking style so it is common to have them complete a form that helps them to understand if they are left- or right-hemisphere thinkers. After finding that available forms did not fit the demands of this exercise, I developed one (abstracted in Exhibit 4). The results are used by the coach and assistants to form heterogeneous teams. Having only right-hemisphere thinkers would generate many creative ideas but there would be no closure and no movement to an action plan. Conversely, a team of left-hemisphere thinkers could get stuck in details and not break out of traditional approaches.

At the bottom of Exhibit 1 there is a title “Creativity is in Everyone.” One of the features of this mindmap (See Mindjet.com for a trial sample.) is that links will lead to documents. In this case the document is a summary of research showing that creativity is not limited to a few people.

I project mindmaps on a screen so participants can follow the process and we keep them on schedule. By clicking on the link we can discuss findings from relevant research.

Exhibit 2

HIERARCHY OF DREAMS

Dreams are above a goal and much higher than a problem. Motivation is stopped when a goal is reached or a problem is solved. A dream is the difference between highly motivated organizations or persons and unmotivated ones.

What are your dreams for this organization? Start at the bottom of the page and work upward by asking the question

WHY.

9. Highest Dream

Why

8. Higher Dream

WHY

7. Higher Dream

WHY

6. Higher Dream

WHY

5. Higher Dream

WHY

4. Higher Dream

WHY

3. Higher Dream

WHY

2. Higher Dream

WHY

1. Dream

Exhibit 3 Prioritize

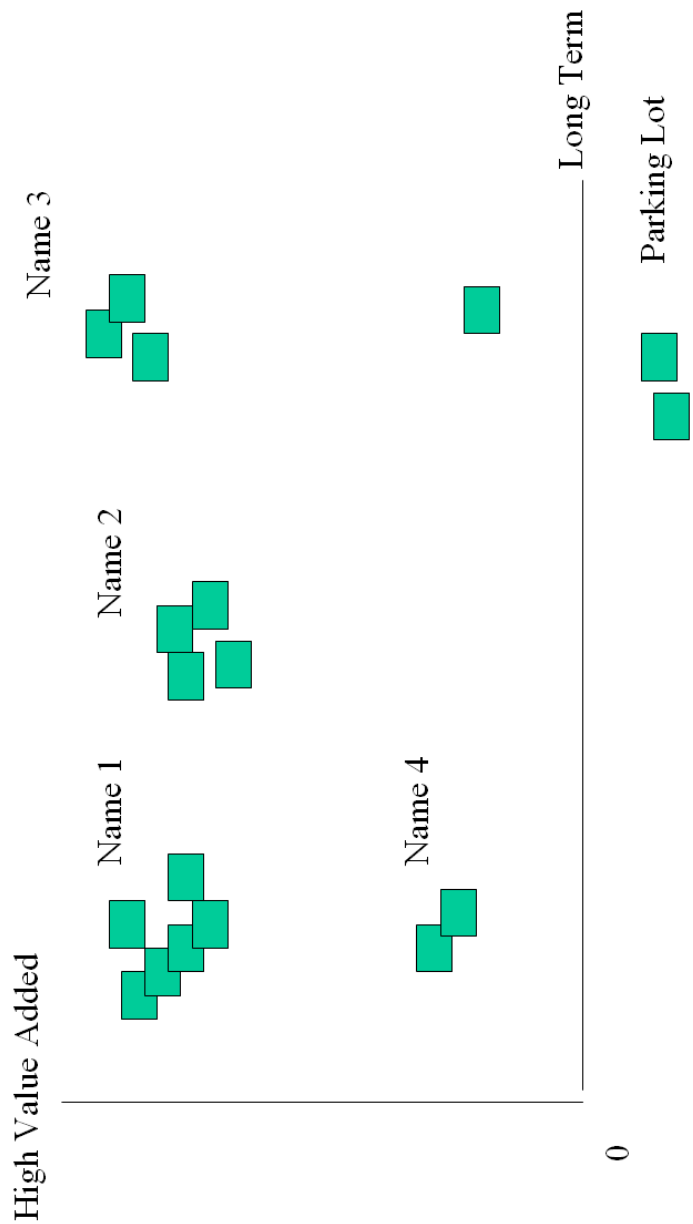


Exhibit 4. INNOVATION TEAM 8 ARE THE MOST FUNCTIONAL WHEN MEMBER 8 ACCEPT OTHER THINKING STYLE 8
(This concept is based on the brain research of Robert W. Sperry, who received the 1981 Nobel prize.)

WHAT IS YOUR THINKING STYLE AND THAT OF OTHER TEAM MEMBER 8?

Indicate your preferred thinking style by circling one of the numbers between the two opposing statements.

A 3 indicates that style fits you strongly, a 2 if fits mildly, a 1 means it fits you slightly, and a 0 means neither fits you.
Only one circle per line please

For example:

If you strongly preferred hot tea over ice tea you answer would look like this...

Hot tea 3 2 1 0 1 2 3 Ice tea

If you mildly preferred ice tea to hot tea you answer would look like this...

Hot tea 3 2 1 0 1 2 3 Ice tea

Thinking styles can change as the decision context changes. For example, hot tea on a cold day and ice tea on a hot day.
For this case assume that you are working on a project team, what is your thinking style?

	Column A	Column B
Uses objective, rational, unemotional processes	3 2 1 0 1 2 3	Thinks outside of reality
Focuses on a single issue	3 2 1 0 1 2 3	Processes varied information simultaneously
Combines known elements	3 2 1 0 1 2 3	Likes to discover the unknown
Uses science for knowledge	3 2 1 0 1 2 3	Knows without consciously thinking about it

Additional items have been omitted

Total the numbers in Column A that you circled

Total the numbers in Column B that you circled

Connect your numbers to create your thinking style profile.

Compare your profile with those of other participants.

Complete it for yourself and then have a colleague at work complete it to describe your thinking style.

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After teams are formed, it is time to identify dysfunctional behaviors. We have all seen these in meetings. For example, there is the saboteur ("this won't work"), the dominator who takes up too much time, and the attention seeker who clowns around. By alerting participants to these behaviors they are on notice that these behaviors will not be appropriate on this team.

So that teams do not get discouraged, it is important to share with members the stages that teams must go through to be effective. These stages include Forming, Storming, Norming, Performing, Concluding, and Celebrating success or failure. If members or facts change, it will be necessary to go through the sequence again.

Before moving to the innovation process, the final step is to brief students and participants on the types of conflicts that can occur and how to resolve them. Conflicts can be positive or negative. Positive ones are cognitive in that they deal with issues, ideas, principles or processes. Resolving these can help the group to grow. Negative conflicts are destructive because they aim at people and values, so no resolution is possible. The team needs to be

aware of these conflicts not only to perform effectively as a team but also to help them implement the action plan with persons who have not experienced team-building.

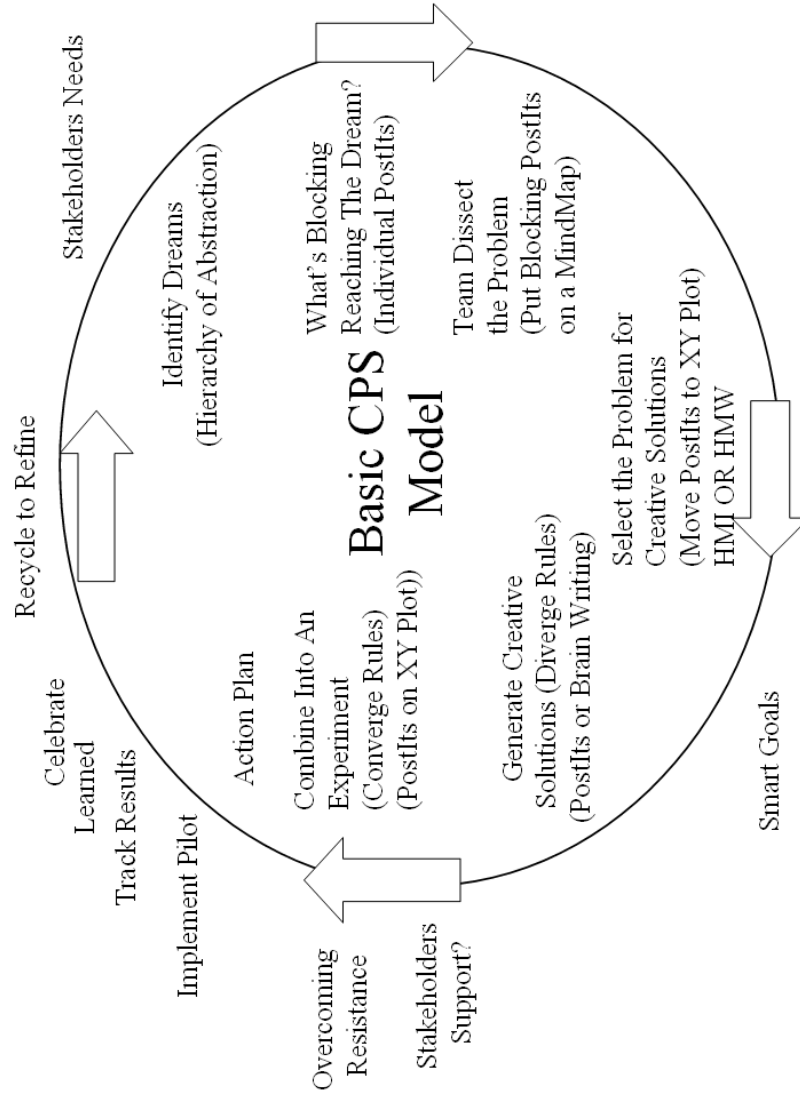
THE INNOVATION PROCESS

With some unpleasant tasks behind us we turn to the fun creativity process. Exhibit 5 shows an inner circle that includes the creative problem solving process, with many changes from the process taught by the Creative Problem Solving Institute. These changes are based on my experience in coaching innovation sessions. There is no need to explain the changes here, but it is necessary to introduce two definitions.

These are simple definitions, but they work. *Creativity* is doing something different that has not been done before. *Innovation* is doing something different that adds value. Value is not limited to monetary value. It can be social value, such as educating children in remote villages. It can be environmental value, which would include saving trees by reducing pollution. Creative problem solving can be fun but it is not always implemented. Missing are the business steps used to create a business strategy. These steps are shown in Exhibit 5 outside the circle.

Before beginning the innovation process it is necessary to identify the stakeholders who will be affected by innovation. What are their individual and organizational criteria? What do they want out of the changes that will occur? How can we anticipate resistance and build into the action plan means for overcoming their resistance? Exhibit 6 shows three groups—customers, the parent company, and employees—with quite different importance weightings for three different criteria: final product cost, variety of products offered, and the final sales price. This is an actual company in Turkey. (As an experiment I conducted a doctoral student innovation seminar remotely from Chapel Hill, North Carolina, using software for remote computer sharing.) This table and chart illustrates the sources of resistance that may be anticipated. Selling the final plan to these three groups may require some marketing skills.

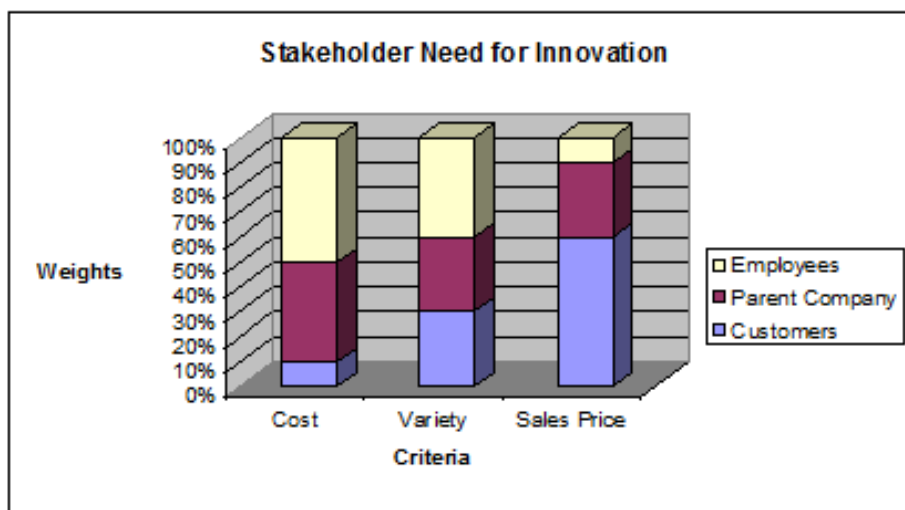
Exhibit 5. THE INNOVATION MODEL INCLUDES BUSINESS STEPS



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Exhibit 6. THREE STAKEHOLDER GROUPS CRITERIA FOR INNOVATION

Criteria	Stakeholder		
	Customers	Parent Company	Employees
Cost	10	40	50
Variety	30	30	40
Sales Price	60	30	10
	100	100	100



The first four steps of creative problem solving—Identify the Dreams, What’s Blocking Reaching the Dreams, and Dissecting these Blocks to Identify the Main Problem, were completed during team formation so that students could apply their new team-building skills. Before moving to creating solutions, the problem must be defined more precisely.

Stating the problem in negative terms is a creative turnoff. So it should be stated as “How Might I” which is abbreviated as HMI, or “How Might We.” For example, “We don’t have the money” ends the innovation process. “How can we solve the problem without asking for additional funds” becomes a creative challenge. (I coached a session for a major hospital that startled the board of directors by presenting a major plan with no request for funds.)

The solution to the problem requires a goal that will drive innovation through to the action and follow-up stages. This goal must meet the well-known SMART criteria—Specific, Measurable, Agreed upon, Realistic, and Time for completion.

There are hundreds of methods for stimulating the generation of creative solutions. Every coach has favorites that work in different situations. I have observed that participants whose jobs require that they be structured by rules or models are delighted to be moved outside the

box. One participant who worked for a high-tech company in New Zealand responded to smelling vanilla, which always brings back happy memories. He had hit a creative block. The vanilla triggered dozens of new ideas. Other stimulating ideas include taking participants out of a comfortable environment, such as taking off one shoe and walking around the room, shouting “ahaa” as they write a new idea.

Participants should be encouraged to develop wild, out-of-the-box ideas and ignore critics. Here is what some computer experts said about computer prospects:

“I think there is a world market for maybe five computers.” Thomas Watson, IBM Chairman, 1943

“But what is it good for?” Engineer in IBM Advanced Computing Systems Division commenting on the microchip, 1968.

“There is no reason anyone would want a computer in their home.” Ken Olson, President and Founder of Digital Equipment Corp., 1977.

“640K (of RAM) ought to be enough for anybody.” Bill Gates, 1981

Collecting all of these creative solutions can be a problem. One common method is to have people shout them out while two assistants write them on two flip charts. This method is sometimes called “Brain Storming.” It has two problems. One is that shy people tend not to participate so their ideas are not recorded. The second problem is how to converge these ideas.

“Brain Writing” overcomes shyness and encourages participants to read and build upon the ideas of other team members. The process is simply a large sheet of paper on the table with about six members of a team surrounding it. The SMART goal is written in the center of the paper. Each person draws a branch from the goal, writes an idea and rotates the paper. Other participants can add new branches or build on existing ideas by creating twigs on an existing branch. The paper continues to rotate until all ideas and build-ons are recorded. To converge the ideas of all teams, each team must then write their best ideas on PostIts© and put them on the now familiar XY plot. The client and the group cluster the ideas, name the clusters, and select the idea for which they will build an action plan.

Another approach is to have *each* participant write PostIts© and put them on an XY plot. Each of these methods has advantages and disadvantages. The innovation coach will need to make decisions during the process as to which, among others, will be most successful.

The final selected creative solution should be stated as an *experiment* rather than a *project*. Everyone remembers science experiments: they frequently fail and require redoing. But projects are supposed to work the first time. In this regard the process in Exhibit 5 is a circle, not a straight line, which indicates that another cycle may be necessary. This experiment is ready to be converted into an action plan; the plan should be introduced as a small pilot study so adjustments can be made without disrupting the whole organization.

Each organization probably has its own steps for an action plan. The sample action plan in Exhibit 7 requires some elaboration. After the Action Steps the skills required for each must be identified. The Resources column includes equipment, capital, and human resources. There are two columns for Person. The first column is the person who is responsible for the step being completed and the Check person follows up to see that it is on schedule. The start and completion dates track the progress of the step. The evaluation metric tracks the progress of the step. Since all projects should begin as an experiment, it is necessary to

record what was learned. This record assures that mistakes will not be repeated and that the process can be improved. Finally, when the project or experiment is completed, celebration should be planned, even if it was a failure. Celebrating failure creates closure so the team members can move on with no regrets. Since the innovation model is a circle, at this point it must be decided whether to go through the cycle again.

Now it is easy to see the difference between creativity sessions, sometimes called *brain storming*, and innovation sessions. Brain storming sessions create lots of ideas, which is good, but they are not guided by SMART goals. In short, they produce unique differences but they are not innovating because they do not reach an action plan that adds value for the organization. One company provides an example of how focusing on creativity can get out of control. One person's job was to conduct creative sessions. He had a room with lots of creative stimuli. Then the company discovered that they had 1,200 ideas and did not know what to do with them. They then had a weekend session to converge them.

CONCLUSION

The case method of teaching has been used successfully for over 100 years. People have learned to analyze data, identify alternatives, make decisions and in the process become good executives. But when instructors depend on the analysis, alternatives, and decisions written in the instructors' manual, there is a danger of not moving outside the case writers' thinking at that point. Times have changed. Methods for generating creative ideas have existed for 70 years. The cry now is for innovation, which requires introducing creative processes into the case method. This shift requires creating cooperative teams composed of right- and left-hemisphere thinkers who respect each others' thinking styles. It is time to combine the two processes to move students into the fast moving changes that include global competition, shorter product life cycles, and the impact of information systems.

*This paper is the outcome of a study titled "Finding New Ways for Business Schools," which outlines how teaching at Business Schools has not kept up with new developments in the sciences. See <http://www.unc.edu/~gdhughes/>, click on articles, and then on the title "Working Paper: Finding new ways for business schools."

Exhibit 7. ACTION PLAN

This plan will identify resources and actions that will support implementation of the selected solution.

Solution _____

Action	Re-	<u>Person</u>	Start	Complete	Evaluation	Learned from	Cele-		
<u>Steps</u>	<u>Skills</u>	<u>source</u>	<u>Respn</u>	<u>Check</u>	<u>Date</u>	<u>Date</u>	<u>Metric</u>	<u>the Experiment</u>	<u>brate</u>

1.

2.

.

n.

ASSESSING THE CLIMATE FOR CREATIVITY: THE EXAMPLE OF A FRENCH HIGH-TECH ORGANIZATION

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Abstract

This paper addresses the issue of climate for creativity in organizations. The two objectives of the present research are to measure a creative climate in a high tech organization and to investigate the relationship between the organizational context and the level of creativity. A mixed research method has been used in this research, a quantitative study with an online survey and a qualitative analysis with a one-hour open interview. An abbreviated version of the instrument KEYS (Amabile et al., 1996), measuring the extent to which the work environment impacts creativity and innovation, was used in this study. Sixty employees working in a French high-tech company have participated in the study, over a period of one year. The relationship between the organizational context and the level of creativity was confirmed. Implications for future theory and managerial practice are discussed.

Keywords: organizational climate, creativity, product innovation.

Organizational creativity represents a research area within the field of organizational behavior and is considered as a relatively new and emerging research area (Shalley & Zhou, 2009). Previous research has provided a rich foundation from which to draw upon for a conceptual and empirical framework focusing exclusively on factors that can either enhance or constrain creativity in organizations or in the context of work (Amabile et al., 1996; Ekvall, 1996; Anderson & West, 1998; Mathisen & Einarsen, 2004; Hunter et al., 2007). The study of creativity is two-fold, on one hand studies of organizational creativity's exclusive focus on variables that have direct implication for the workplace, and on the other hand studies of creativity in a work or organizational context (turbulent, high-pressure, competitive environments). This paper addresses the issue of climate for creativity in organizational context. More specifically, the two objectives of the present research are to measure a creative climate in a high tech organization and to investigate the relationship between the organizational context and the level of creativity. Researchers (Amabile, 1983; Rokeach,

1965; Simon, 1985; Steiner, 1965) have theorized that ability, intrinsic motivation, and engagement in certain cognitive stages are necessary for creative performance. Creativity can be described as both an outcome and a process. Each individual can have creative ideas, however they are often restrains them by the person itself. Creativity can be defined as a psychological process by which an individual or a group of individuals shows originality in the manner of associating things, ideas, situations and, by the publication of the concrete result of this process. The componential theory of creativity (Amabile, 1983, 1988, 1996) describes the creative process, as well as factors that can influence this process and its outcomes. According to this theory, the influences on creativity can be internal or external. Domain-relevant skills, creativity-relevant process, and intrinsic task motivation represent internal drivers of creativity, whereas the work environment typifies an external influence. The motivation for a task can make the difference between what an engineer can carry out and what he will actually carry out, as the pleasure found in doing the task is a greater contributing factor than social or financial rewards. A high intrinsic level of motivation can even make up a deficit of expertise or creative thought. Creativity can be affected by any work environment. However, certain elements of the model are likely to be particularly distinctive in organizations, such as team dynamics and top management behaviors. Personality and managerial practices also have an impact on creativity. In order to understand the phenomenon of creativity, it is important to adequately assess each creativity component, the creativity process and the creative outcomes. Our research rather focuses on the work environment and its assessment, than on the individual components of creativity. Different instruments measuring the extent to which the work environment impacts creativity and innovation have been developed. In their review, Mathisen & Einarsen, (2004) found that the most useful instruments are Team Climate Inventory (TCI) and KEYS. A single-time correlational study in a large high-technology organization was performed in this study, by using an abbreviated version of KEYS, according to the componential parameters defined in Amabile's theory (Amabile et al., 1996). This present study investigates the relationship between the level of a work environment perceived and external influences in a context of an organization, especially in the context of high tech industry.

Background

According to Amabile's componential theory (Amabile, 1983, 1988, 1996), the influences on creativity include three components within the individual – domain-relevant skills, creativity-relevant process, and intrinsic task motivation – and one component outside the individual, that is the work environment. Domain-relevant skills include knowledge, expertise, technical skills, intelligence, and talent in the particular domain in which the individual is working. Creativity-relevant processes include a cognitive style and personality

characteristics that are conducive to independence, risk-taking, and taking new perspectives on problems, as well as a disciplined work style and skills in generating ideas. Intrinsic task motivation is the motivation to undertake a task or solve a problem because it is interesting, involving, personally challenging, or satisfying – rather than undertaking it out of the extrinsic motivation arising from contracted-for rewards, surveillance, competition, evaluation, or requirements to do something in a certain way. The outside component is the work environment or the social environment. In this study, we used an abbreviated version of KEYS, according to componential parameters (Amabile et al., 1996), (1) the encouragement of the organization, (2) the encouragement of the hierarchy, (3) the support of the group, (4) sufficient resources, (5) the challenge, (6) autonomy with work, (7) pressure, (8) organizational obstacles. The abbreviated version is composed of only 24 items, compared to 78 items (see table 1). The number of items has been reduced compared to original KEYS questionnaire (Amabile et al., 1996). Each item was selected compared to a particular aspect, which we wanted to observe within the organization. The criteria of creativity and the productivity have been considered (see table 2).

Table 1: items of the work environment

Name scale		Number of items	Description	Impact on creativity
Stimulant scale	(1) Organizational encouragement	3	An organizational culture that encourage the risk to test new ideas, reward and recognition for creative work	+
	(2) Supervisor encouragement	3	A supervisor who sets goals appropriate, have open interactions between supervisor and subordinates, supports the work group	+
	(3) Work group support	2	Work group in which people help and trust each other	+
	(4) Sufficient ressources	2	Access to appropriate resources, including funds, materials.	+
	(5) Challenging work	2	A sense of having to work hard on challenging tasks and important projects	+
	(6) Freedom	2	Freedom in deciding what work to do or how to do it ; a sense of control over one's work	+
Obstacles scale	(7) Organizational impediment	4	An organizational culture that impedes creativity through internal political problems, harsh criticism of new ideas, destruction internal competition, an avoidance of risk	-

	(8) Workload pressure	2	Extreme time pressures, unrealistic expectations for productivity	-

The scales predicted to be positively related to creativity are referred to as “stimulant scales” and those predicted to be negatively related are referred to as “obstacle scales.”

Table 2: criteria of creativity and productivity

Criterion scales	Number of items	Description
Creativity	2	A creative organization or unit, where a great deal of creativity is called for and where people believe they actually produce creative work
Productivity	2	An efficient, effective, and productive organization, or unit

Description of the items chosen:

(1) Organizational encouragement

The organizational encouragement concerns the orientation of the organization towards the innovation and the supports for the creativity and the innovation. The organizational encouragement refers to several aspects within the organization. (1) The first is encouragement of risk taking. The risk taking include the aspect of “failure” and the chance of a new idea, in order to give a value to the creativity. Cabrales, Medina, Lavado & Cabrera (2008) show that the development of risk-taking attitudes within the organization is associated with radical innovation. (2) The second main aspect is reward. Amabile (1993) showed that reward perceived as a bonus can stimulate creativity, whereas the mere engagement in an activity to obtain a reward can be detrimental toward it. In a recent study, Farmer, Tierney & Kung-McIntyre (2003) revealed that employee’s perceptions of the organization’s valuing of creativity were strongly related to supervisors’ ratings of employee creativity. (3) The third aspect is recognition. A study showed that different dimensions of work motivation and satisfaction are significantly correlated and reward and recognition have great impact on motivation of the employees (Danish & Usman, 2010). Godkin, Parayitam & Natarajan, (2010) found that the source of recognition and attitude towards recognition is positively related to preference for rewards.

(2) Supervisor encouragement

Several studies have pointed to the role of project managers or direct supervisors. (1) The main aspect is goal clarity. Arvey, Dewhirst, & Boling (1976) showed that goal clarity were factors linearly and positively related to individual satisfaction. Goal clarity is very important to create a vision perspective. (2) The second aspect is the open interactions between supervisor and subordinates. Some studies have been focused on the relationship between exchange quality and supervisor and subordinate attitudes and behaviors (Wayne et al., 1990). Because exchange quality can significantly affect the job-related behaviors, it is important to understand what determines or influences this dimension of the supervisor–

subordinate working relationship. The procedural relations have a negative effect whereas the support, the encouragement, autonomy, the confidence and the valorization of the creativity have a positive effect. Indeed, the styles of supervision are harmful when they define a hierarchical environment intimidating and not leaving to the creative individuals opportunity of being expressed personally. (3) The third aspect is supervisory support of a team's work and ideas. Some studies suggested that a quality exchange relationship is related to supervisor support and guidance ([HYPERLINK](http://web.ebscohost.com/revproxy.escpeurope.eu/ehost/detail?vid=9&hid=10&sid=e61a6895-e033-4496-9d48-12ae2633c060%40sessionmgr12&bdata=JnNpdGU9ZWZWhvc3QtbGl2ZQ%3d%3d)

"[http://web.ebscohost.com/revproxy.escpeurope.eu/ehost/detail?vid=9&hid=10&sid=e61a6895-e033-4496-9d48-](http://web.ebscohost.com/revproxy.escpeurope.eu/ehost/detail?vid=9&hid=10&sid=e61a6895-e033-4496-9d48-12ae2633c060%40sessionmgr12&bdata=JnNpdGU9ZWZWhvc3QtbGl2ZQ%3d%3d)

[12ae2633c060%40sessionmgr12&bdata=JnNpdGU9ZWZWhvc3QtbGl2ZQ%3d%3d](http://web.ebscohost.com/revproxy.escpeurope.eu/ehost/detail?vid=9&hid=10&sid=e61a6895-e033-4496-9d48-12ae2633c060%40sessionmgr12&bdata=JnNpdGU9ZWZWhvc3QtbGl2ZQ%3d%3d)" \l

"c35#c35" Liden & Graen, 1980 ; [HYPERLINK](http://web.ebscohost.com/revproxy.escpeurope.eu/ehost/detail?vid=9&hid=10&sid=e61a6895-e033-4496-9d48-12ae2633c060%40sessionmgr12&bdata=JnNpdGU9ZWZWhvc3QtbGl2ZQ%3d%3d)

"[http://web.ebscohost.com/revproxy.escpeurope.eu/ehost/detail?vid=9&hid=10&sid=e61a6895-e033-4496-9d48-](http://web.ebscohost.com/revproxy.escpeurope.eu/ehost/detail?vid=9&hid=10&sid=e61a6895-e033-4496-9d48-12ae2633c060%40sessionmgr12&bdata=JnNpdGU9ZWZWhvc3QtbGl2ZQ%3d%3d)

[12ae2633c060%40sessionmgr12&bdata=JnNpdGU9ZWZWhvc3QtbGl2ZQ%3d%3d](http://web.ebscohost.com/revproxy.escpeurope.eu/ehost/detail?vid=9&hid=10&sid=e61a6895-e033-4496-9d48-12ae2633c060%40sessionmgr12&bdata=JnNpdGU9ZWZWhvc3QtbGl2ZQ%3d%3d)" \l

"c42#c42" Rosse & Kraut, 1983 ; [HYPERLINK](http://web.ebscohost.com/revproxy.escpeurope.eu/ehost/detail?vid=9&hid=10&sid=e61a6895-e033-4496-9d48-12ae2633c060%40sessionmgr12&bdata=JnNpdGU9ZWZWhvc3QtbGl2ZQ%3d%3d)

"[http://web.ebscohost.com/revproxy.escpeurope.eu/ehost/detail?vid=9&hid=10&sid=e61a6895-e033-4496-9d48-](http://web.ebscohost.com/revproxy.escpeurope.eu/ehost/detail?vid=9&hid=10&sid=e61a6895-e033-4496-9d48-12ae2633c060%40sessionmgr12&bdata=JnNpdGU9ZWZWhvc3QtbGl2ZQ%3d%3d)

[12ae2633c060%40sessionmgr12&bdata=JnNpdGU9ZWZWhvc3QtbGl2ZQ%3d%3d](http://web.ebscohost.com/revproxy.escpeurope.eu/ehost/detail?vid=9&hid=10&sid=e61a6895-e033-4496-9d48-12ae2633c060%40sessionmgr12&bdata=JnNpdGU9ZWZWhvc3QtbGl2ZQ%3d%3d)" \l

"c43#c43" Scandura, Graen, & Novak, 1986 ; [HYPERLINK](http://web.ebscohost.com/revproxy.escpeurope.eu/ehost/detail?vid=9&hid=10&sid=e61a6895-e033-4496-9d48-12ae2633c060%40sessionmgr12&bdata=JnNpdGU9ZWZWhvc3QtbGl2ZQ%3d%3d)

"[http://web.ebscohost.com/revproxy.escpeurope.eu/ehost/detail?vid=9&hid=10&sid=e61a6895-e033-4496-9d48-](http://web.ebscohost.com/revproxy.escpeurope.eu/ehost/detail?vid=9&hid=10&sid=e61a6895-e033-4496-9d48-12ae2633c060%40sessionmgr12&bdata=JnNpdGU9ZWZWhvc3QtbGl2ZQ%3d%3d)

[12ae2633c060%40sessionmgr12&bdata=JnNpdGU9ZWZWhvc3QtbGl2ZQ%3d%3d](http://web.ebscohost.com/revproxy.escpeurope.eu/ehost/detail?vid=9&hid=10&sid=e61a6895-e033-4496-9d48-12ae2633c060%40sessionmgr12&bdata=JnNpdGU9ZWZWhvc3QtbGl2ZQ%3d%3d)" \l

"c49#c49" Vecchio & Gobdel, 1984).

(3) Work group support

Research on work teams is focused on factors that affect team effectiveness. The group literature suggests a variety of factors that can inhibit or facilitate teamwork and creativity. A "work group" is a social entity embedded in one or more larger social systems. The work group support refers to several aspects within the organization. The first relevant aspect is trust. A number of studies have shown employee trust to be a critical variable affecting the effectiveness and efficiency of organizations (Mayer & Davis, 1999; Searle et al., 2009). In the context of inter-organizational relationships, trust has been identified as essential to foster innovation (Bachmann, 2001). Dirks & Ferrin, (2001) and Mayer & Davis (2007) show that trust has positive effects on attitudes, perceptions, behaviors, and performance outcomes within organizational settings. Empirical work of Dirks and Ferrin (2001) confirmed that trust supports cooperation. Schoorman, Mayer & Davis (2007) propose an integrated model of organizational trust. This model argued that trust lead to risk taking in relationship.

The second relevant aspect is mutual help. Madjar, Oldham, & Pratt (2002) found that work support, as help, from both colleagues and supervisors positively predicted employee creativity.

(4) Sufficient resources

Some researches have suggested that resource allocation to projects is directly related to the project's creativity levels (Damanpour, 1991). An important problem for decision-makers in work environment deals with the efficient and equitable allocation of scarce resources to individuals and groups (Eek & Selart, 2009).

(5) Challenging work

Some research has found that the intellectual challenging nature of a problem could have a positive influence on creativity. Performance team has been investigated in challenging work environments (Haas, 2006). It is necessary to distinguish two distinct forms of pressure, excessive workload pressure and challenge, the first should have a negative influence on creativity and the second should have a positive influence.

(6) Freedom/autonomy

Intrinsic motivation is a fundamental basis for creativity and innovation. Intrinsic motivation emerges when team members are provided with the autonomy to carry their task and to be responsible for its completion (Amabile, 1993). Several authors have proposed general measures of autonomy such as 'freedom to make operating decisions' (Abbey & Dickson, 1983) or 'degree of empowerment' (Tipping & Zeffren, 1995).

(7) Organizational impediment

Several studies have pointed to the role of impediment within organization (Kimberley, 1981; Kimberley & Evanisko, 1981). For example, Yang & Pandey (2008) show in a statistical study that the political environmental context affects employee attitudes and have a negative impact on his behavior. (1) The first aspect is the internal political problems. (2) The second aspect is the harsh criticism of new ideas. (3) The third aspect is the internal competition to destruction. (4) The fourth aspect is the avoidance of risk. Research on impediments to creativity is, in comparison to research on stimulant of creativity, still comparatively restrained.

(8) Workload pressure

Some researches have found that extreme workload pressure could undermine creativity (Amabile et al. 1996). It's necessary to distinguish two distinct forms of pressure, excessive workload pressure and challenge, the first should have a negative influence on creativity and the second should have a positive influence.

Method

KEYS was designed to provide reliable and valid assessments of aspects of organizational work environment perceptions that are likely to influence the generation and development of creative ideas (Amabile et al., 1995). Each item addresses all positive and negative aspects of the work environment described above. KEYS was intended to serve as a tool for research and theory development, particularly for scholars interested in understanding contextual influences on creative behavior in work organizations. The Center for Creative Leadership has been contacted to get the questionnaire KEYS. This instrument includes measure's norms, factor structure, reliability of the scales, as well as their test-retest reliability, their convergent validity, and their discriminate validity. This instrument is an acceptable scientific quality and is well documented in peer-reviewed literature (Mathisen & Einarsen, 2004). The current version of KEYS includes 78 items, 66 describe the work environment, the remaining 12 items are included to gauge the respondent's assessments of two work performance criteria: the creativity (6 items) and productivity (6 items). In our study, we have chosen to give only 24 principles items, in order to reduce the number of question, 20 describes the work environment, justified in the literature review; the remaining 4 items are the same (creativity and productivity). In our study, we have used a 4-point Likert scales, the same scale as KEYS.

This research consisted of analysis of data and allowed examination (1) the degree to which the results fit with KEYS scale structure; (2) the reliability or internal consistency of the scale – the degree to which each item on the questionnaire statistically fits with the other items on its particular scale; (3) the short-term test-retest reliability, to determine that respondents' answers are not random; (4) convergence validity, to determine by correlating it with established work environment measures (Amabile et al., 1996). The questionnaire (see Table 3) has been translated to French and administered within a high tech organization where the validation of the quality of translation has been carried out. The study has been conducted in 2 phases, the 1st phase consisted in a quantitative approach, by analyzing the results of the electronic questionnaire comprising 24 questions and the 2nd phase consisted in collecting information ground within this same organization, in order to explain the statistical results, over a period of 6 month.

Table 3: survey

Name scale		Number of question	Question
Stimulant scale	(1) Organizational encouragement	1 □	Are new ideas encouraged in this organization?
		2 □	Are people recognized for creative work in this organization?
		3 □	Are people rewarded for creative work in this organization?
	(2) Supervisor encouragement	4 □	Does my boss clearly set overall goals for me?
		5 □	Does my boss have good interpersonal skills?
		6 □	Does my boss support my work group within the organization?
	(3) Work group support	7 □	Are people willing to help each other, in my work group?
		8 □	Is there is feeling of trust among the people i work with most closely?
	(4) Sufficient ressources	9 □	Is the budget of my project(s) generally adequate?
		10 □	Am I able to easily get materials i need to do my work?
	(5) Challenging work	11 □	Are the task in my work challenging?
		12 □	I feel challenged by the work i am currently doing.
	(6) Freedom	13 □	Do i have freedom to decide how I am going to carry out my projects ?
		14 □	I have the freedom to decide what project I am going to do
Obstacles scale	(7) Organizational impediment	15 □	Are there political problems in this organization?
		16 □	Are people critical of new ideas in this organization?
		17 □	Are there destructive competitions within this organization?
		18 □	Is the top management not willing to take risks in this organization
	(8) Workload pressure	19 □	Do I feel a sense of time pressure in my work
		20 □	Are there realistic expectations for what people can achieve in this organization?
Criterion scales	(9) Creativity	21 □	My area of this organization is creative.
		22 □	I believe that I am currently creative in my work
	(10) Productivity	23 □	My area of the organization id productive
		24 □	Overall this organization is productive

Samples

The abbreviated questionnaire KEYS was tested in a high technology organization. This firm designs high technology products. The sample is composed of 60 individuals, 40 engineers (manager) and 20 technicians. The sample is enough to assess a good statistic. Measures (1st phase) / Interpretation (2nd phase)

(1st phase) Our research used the original questionnaire item (Amabile et al., 1995). Of the 24 main items chosen, 20 describe the work environment; the remaining 4 items are included to gauge the respondents' assessments of two work performance criteria: the creativity (2 items) and productivity (2 items). The work environment scale is composed of eight conceptual grouping items, six assessing proposed stimulant to creativity and two assessing proposed obstacles (Amabile et al., 1996). A four-point response scale is presented in this research. The questionnaire defines "current work environment" as "the day-to-day social and physical environment in which you currently do most or all of your work" (Amabile et al., 1996). Table 1 presents the scale's names and their description.

(2nd phase) In phase 2, 20 middle-level managers were individually asked to give the number of project with high- creativity and the low creativity with which they had been involved during the previous three years in the company. The 20 middle-level managers were selected across the same organization, which received the electronic survey. 10 projects have been selected by the managers in order to identify high- creativity and the low creativity project. They also provided some background information on themselves. Respondents were told to answer the abbreviated KEYS questions by reference to the work environment surrounding the 10 particular projects. These respondents did not know that the study concerned creativity. 2 independent experts have been called to assess of the level of creativity in the projects nominated. These experts were kept blind to the initial nomination status of the projects. This research has been completed by open interviews and in deep-interviews of each middle-level manager, that is to say, a total of 20 in-deep interviews. Convergent validity The measure used to establish convergent validity was KEYS's results (Amabile, 1996).

Results

1st phase : Measuring the creativity climate

The overall fit measures show a good fit to original KEYS's measures (Amabile, 1996). Table 4 shows descriptive statistics for each variable. Internal scale reliabilities (Cronbach's alpha) range from .61 to .80. The median Cronbach's alpha in our study was .70, whereas in the original KEYS the median was .84. The following Cronbach's alpha were obtained for each item of the stimulant scale: (1) Organizational encouragement ($\alpha=0.61$), (2) Supervisor encouragement ($\alpha=0.60$), (3) Work group support ($\alpha=0.80$), (4) Sufficient resources ($\alpha=0.75$), (5) Challenging work ($\alpha=0.70$), (6) Freedom ($\alpha=0.74$); and the following Cronbach's alphas for the obstacles scale: (7) Organizational impediment ($\alpha=0.63$), (8) Workload pressure ($\alpha=0.79$). The test-retest reliabilities of the scales, over a period of two months, yielded a median of .80, thus confirming a fair stability of our results. The KEYS instrument has demonstrated that it discriminates between different work environments. The

stimulant scales are rated lower and the obstacle scales higher, for work environments surrounding projects with low creative outcomes, compared to environments of projects with high creative outcomes (Amabile et al., 1996). Figure 1 and Table 5 show that the level of the High Tech unit's creative climate approaches the "Low creativity" climate identified by Amabile and colleagues (1996), with freedom appearing at even a lower level than the one found with the original KEYS. The average is calculated on the sample of 60 answers and t-tests have been carried out. Impediment factors seem to have a stronger weight in the unit we observed. We can note that "Encouragement of new ideas" is significantly and positively correlated with "Workload" ($r=0.62$, $p< 0.01$) and "Appropriate goals" ($r=0.67$, $p< 0.01$). Moreover, we can note that "Appropriate goals" are positively and significantly correlated with "Challenging" ($r=0.64$, $p< 0.01$) and "Competition" ($r=0.73$, $p< 0.01$). A surprising result is that "Freedom" is positively correlated with "Workload pressure" ($r= 0.74$, $p < 0.01$). These results will be interpreted in the discussion.

Table 4: Correlation table

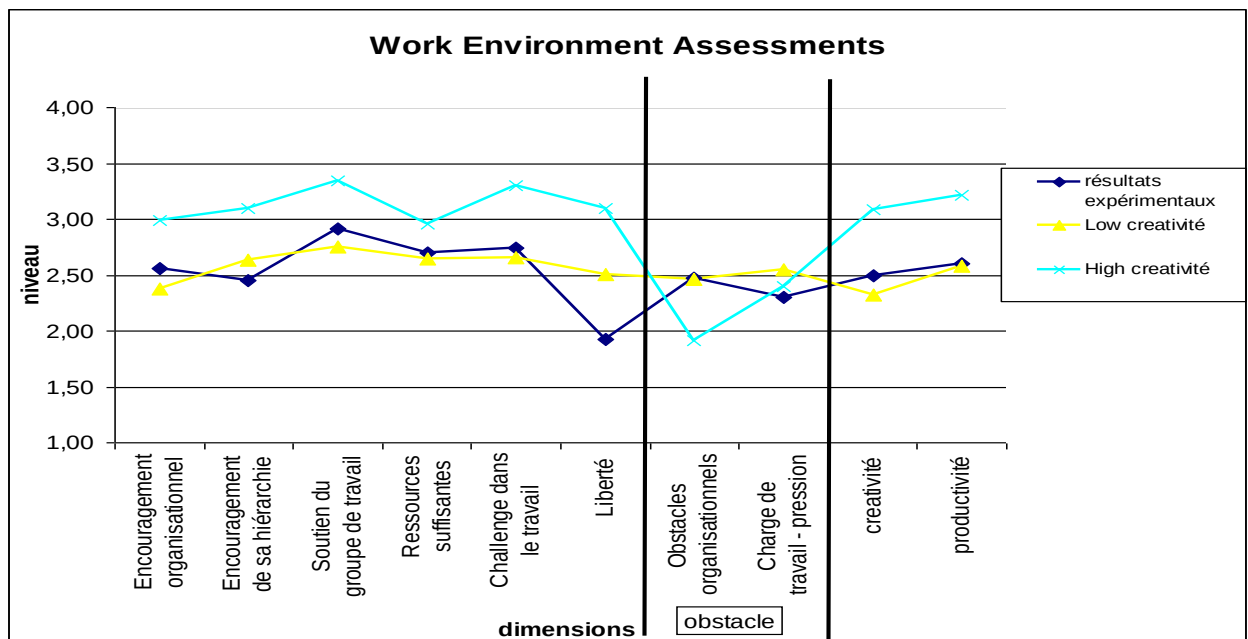
Name scale	Variables	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
Organizational encouragement	risk to test new ideas	1																
	reward	0,218	1															
Supervisor encouragement	recognition	-0,150	0,181	1														
	open interactions	0,323	0,450	0,206	1													
	appropriate goals	0,672*	0,381	0,087	0,506	1												
Work group support	supports the work group	0,281	-0,040	0,113	0,046	0,152	1											
	support	0,231	0,087	-0,001	0,495	0,321	0,121	1										
	trust	0,564	-0,140	0,252	0,086	0,409	0,009	0,151	1									
Sufficient resources	material resources	0,037	-0,239	-0,123	-0,264	0,156	0,157	0,000	0,205	1								
	financial resources	-0,177	-0,211	0,106	0,054	-0,006	0,006	0,078	0,116	-0,189	1							
	challenging	0,221	0,434	0,039	0,287	0,638*	0,064	0,161	-0,024	0,135	0,052	1						
Organizational impediment	Freedom	0,393	0,186	0,133	0,580	0,406	-0,034	0,483	0,521	-0,346	0,148	-0,127	1					
	political problems	-0,353	0,110	0,038	0,068	-0,002	0,012	0,503	-0,152	-0,139	0,145	0,296	0,217	1				
	harsh criticism	-0,234	0,123	0,538	0,043	0,100	0,160	-0,094	-0,125	0,355	0,219	0,398	-0,373	0,031	1			
	competition	0,439	0,483	0,241	0,536	0,733*	0,178	0,370	0,435	0,072	-0,199	0,358	0,612	0,187	-0,051	1		
time pressures	avoidance of risk	-0,130	-0,191	0,008	0,018	-0,012	0,001	0,070	0,035	0,272	-0,129	0,388	0,001	0,002	-0,151	0,052	1	
	Pression en charge travail	0,626*	-0,019	0,027	0,454	0,529	-0,158	0,230	0,597	-0,244	0,063	0,022	0,737*	-0,001	-0,277	0,445	0,012	1

** p < 0.01

Table 5: Work Environment Assessments For The High Tech Organization

KEYS scales		Experimental results		Results (Amabile et Al., 1996)			
				High creativity		Low creativity	
		Mean	s.d.	Mean	s.d.	Mean	s.d
Stimulant scale	(1) Organizational encouragement	2,56	0,90	2.99	0.58	2.38	0.60
	(2) Supervisor encouragement	2,45	0,87	3.10	0.59	2.63	0.69
	(3) Work group support	2,92	0,73	3.34	0.52	2.75	0.62
	(4) Sufficient resources	2,70	0,74	2.96	0.57	2.65	0.51
	(5) Challenging work	2,74	0,70	3.30	0.52	2.66	0.63
	(6) Freedom	1,93	0,81	3.10	0.51	2.51	0.66
Obstacles scale	(7) Organizational impediment	2,48	0,88	1.91	0.54	2.46	0.62
	(8) Workload pressure	1,92	0,83	2.40	0.56	2.55	0.65
Criterion scales							
Creativity		2,50	0,85	3.09	0.56	2.32	0.62
Productivity		2,60	0,80	3.22	0.56	2.58	0.65

Figure 1 : Work Environment Assessments For The High Tech Organization



2nd phase: Interpretations

The 10 nominated projects were rated at a low-creativity level by the person who named the projects and answered the questionnaire. The high and the low-creativity projects are substantially different perceived work environments (Amabile et al., 1996). Five in-depth interviews have been conducted among the 40 managers, in order to investigate the relationship between the organizational context and the level of creativity. Five main factors emerged: (1) a strong conservative culture in the R&D unit responsible for product design, (2) a lack of clear strategy on product development, (3) few resources affected to test new technologies, (4) a directive management style, and (5) a low level of idea exchange between employees. (1) The culture in the R&D unit responsible for product design has a strong conservative aspect: *"We take the existing work, what is already known, we never start from zero to revolutionize"*. (2) The R&D unit perceived a lack of clear strategy on product strategy from the top management: *"We cannot define clearly our product development orientation, because the strategy of our top management is not clear"*. (3) Few resources are affected to test new technologies: *"R&D unit have to convince top management to engage new resources to test new technologies"*. (4) The top management is characterized by a directive management style: *'the top management is very directive, few liberty is given'*. (5) The organizational climate is characterized by a low level of idea exchange between employees: *"there's a lack of idea exchange, of information circulation about project inside the R&D unit, we have the risk to reinvent the same think as his colleague"*. Consequently, the low creative climate assessed can be interpreted by a low innovative culture and a strong conservatism culture. Thus, the relationship between the organizational context and the level of creativity was empirically confirmed in this research. The conservative culture induces impediment to new ideas diffusion in the organization (Amabile et al., 1996). The lack of clear strategy and scarce resource allocation can induce a low level of sense making within the organization. The directive management style reduces the individual autonomy, which is one of the main factors of individual creativity.

Discussion

The creative climate assessed within the High Tech company is significantly low, according with the KEYS's results (Amabile et al., 1996). This study is useful to understand the level of creativity within an organization. In Amabile's study, causal interpretation has not been drawn from the observation study (Amabile et al., 1996). Our study further strengthens this observation as well as our understanding of the inhibitors and facilitators of a creative climate. Even though there might have been a memory bias could have misled the

respondents in their appraisal of high and the low-creativity projects, the results of our investigation regarding the relationship between the level of creative climate and the characteristics of the context are still interesting. Encouragement of new ideas was related positively to workload pressure. The results could be interpreted as “new ideas” being perceived as a risk factor within the organization. This statistical result is in line with the qualitative interviews, which shows that the organization has a conservative culture. Consequently, in a such culture – i.e., a “low innovative culture”- new ideas can be perceived as a pressure and can have a negative impact on creativity. Consequently, a stimulant can be perceived as an impediment. This observation is completed by the significant correlation between the variables “freedom” and “workload pressure”. This study also showed the rigidity of the organization studied, and the fact that the management style is perceived as a directive management from the top. The characteristics of supervision are harmful when they impose an intimidating hierarchical environment and not leaving the creative individuals the opportunity to express themselves. We think that this organization may never take the chance to test new ideas and innovate by relying on what already exists. Additionally, the lack of idea exchange among employees can be one of the causes of a low level of creative climate, because when employee are not able to exchange ideas, they are not able to co-create together and to develop new knowledge (Argyris, Schön, 1978). Moreover, the appropriateness of goals appears to be an important factor in this study. They were correlated with challenge and competition, which confirms Arvey et al.’s study (1976) and showing that goal clarity is positively related to individual motivation. Goal clarity is very important to provide an overall perspective and a long-term vision..

Conclusion

KEYS is a useful tool in theory development in organizational creativity for quantitatively assessing the perceived work environment for creativity. This tool has been used in conjunction with in-depth interviews. The present approach highlights the psychological context of innovation. In this research, the work environment perceived and the context have been investigated. This study shows a strong link between work environment perceived and characteristics on context. It is necessary to consider characteristics of the organizational context that can impede or support the generation of those ideas. The research reported here suggests severals directions for future research, for example concerning the duality between “freedom” within the organization and the “pressure” felt by employees. The topic for future research will be to determine the specific managerial behaviors and other events within organization that lead people to perceive such felling.

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“FF BRAINSTORMEN”

A set of tools that supports Dutch small enterprises
in setting-up and executing an effective creative session

by Katrina Heijne

“FF Brainstormen” is a set of tools that supports Dutch Small and Medium Enterprises (SMEs) in setting-up and executing an effective creative session with satisfying results.

This thesis has been carried out in favor of SKIO, a research center of Saxion University of Applied Sciences that focuses on innovation and entrepreneurship in SMEs. Currently, SKIO is managing a project, called Crenovation, which aims at enhancing the innovating power of Dutch SMEs through creativity. This thesis is part of the Crenovation project.

Creativity and innovation are closely linked. Innovation is often seen as the engine of economic growth. In that case creativity can be seen as the fuel. Since innovation enhances business performance, it is beneficial for SMEs to consider the use of creativity seriously.

Creativity can be applied deliberately for solving open-ended problems or opportunities. This can be done with a group of people in a workshop, called a creative session. Purposes of a creative session on which this thesis focuses are generating ideas for new products, services, applications, commercial activities or improving existing processes.

Managing a creative session is complex. Preferably this is done by an expert, however hiring these are often too expensive for SMEs. Occasionally, SMEs organize creative sessions themselves, but these are often performed weakly. Although a lot of techniques and guidelines exist to enhance the creative process, these are not applied by SMEs optimally. In order to make it easier to apply creativity techniques, they are shaped into creativity tools. Numerous of such tools are available, but these are neither fully exploited by SMEs for several reasons, among which: the difficulty of picking the right technique from the plentiful techniques; the complexity of these; and the unawareness of the promising results. Moreover, most techniques cover only a part of a creative session, while all phases need equal attention.

The goal of this thesis is to improve the quality of current amateur creative sessions, organized and guided by inexperienced employees of SMEs.

The target group is micro and small enterprises (consisting of 1-50 employees) who decided to organize a creative session, but want to perform these more effectively. These SMEs can be active in all kinds of industries.

The main phases of a creative session are: problem inventory, idea generation, idea selection and planning for action. These phases are supported by *FF Brainstormen*. Additionally, *FF Brainstormen* supports the preparation phase (including the intake and designing and preparing the session).

An overview of the process from the moment a problem occurs until the planning for action can be described as follows: when a problem occurs, the problem owner (often the director/owner of a SME) might want to set-up a creative session. The first thing he/she should do is checking whether the question is suitable for a creative session. If so, the problem owner should find someone who can guide the creative session: a facilitator. Preferably, this is not the same person as the problem owner. Next, the facilitator has to find out, together with the problem owner, what the exact problem is in order to formulate a accurate question statement. Besides, the required information is indicated and collected. Then, a resource group is composed and invited. This a diverse group of participants of the creative session. Now, the facilitator has to design the creative session and select techniques that fit the problem statement, the goal, the available time, the participants and also him/herself. Prior to the session, the facilitator has to collect all the required materials and make sure the session room is appropriate for use. During the creative session the session plan is executed and adjusted if necessary. At the end of the session special attention is given to planning the next steps. There should be thought about acceptance of the ideas generated and an action plan will be composed containing a clear task division. It is suggested that the facilitator evaluates the creative session, to learn and grow as a facilitator.

The process described above are the steps supported by *FF Brainstormen*. *FF Brainstormen* is a set of tools, which can be divided into two categories:

1. Instructions on how to set-up and execute a creative session;
2. tools supporting the instructions through sounds (preset and recordable).

The instructions are communicated by means of cartoons and consist of the following tools:

- **Manual:** a booklet consisting of procedures, tips & tricks and checklists that will help the problem owner and facilitator to set-up a creative session;
- **Procedure cards:** 19 cards each consisting of a procedure for a creative or critical thinking technique, which support the facilitator in executing the creative session and planning for action.
- **Mindset booklet:** explicates the most important guidelines for creative and critical thinking to the resource group

The tools with supportive sounds consist of:

- **Sound ball:** ball with a ten seconds rec-and-play device that plays when squeezing, which can be used for energizing the resource group, random input, fun, spreading an idea among groups, etc.
- **Target box:** an object with the colors of an archery target, with a rec&play device in the bulls eye. The goal of the session is recorded which requires a clear formulation and can be used along the session to stay focused.
-

FF Brainstormen also includes a digital storage device containing formats for worksheets, which can be printed and used during the session to support certain procedures (like, making an agenda).

Values of *FF Brainstormen* are: clarity in role division, accurate problem formulation, deliberate preparation, a balance in creative and critical thinking and attention to planning for action.

Meanwhile the first edition of *FF Brainstormen* is introduced to several SME's, who are cooperating with a qualified facilitator and a group of students. *FF Brainstormen* will keep on evolving, since an open source system is used, which means that everyone can use the tool under one condition: if any changes are made to *FF Brainstormen* by the user, it should be reported to [HYPERLINK "http://www.crenovatie.nl" www.crenovatie.nl](http://www.crenovatie.nl) . This way SMEs can share their experience to built on a great dynamic tool, which will benefit all.

Tools for INSTRUCTIONS

Manual:

Purpose: Support in setting-up and preparing a creative session properly
Usage: When you want to solve a problem with a creative approach, get this manual and start (active) reading and take action.

Procedure cards:

Purpose: Supporting the facilitator in executing the creative session and planning for action.
Usage: Prior to the session the cards can be used for designing the session and understanding what will happen. During the session it can be used as checklist.

Mindset booklet:

Purpose: Communicating guidelines for idea generation and idea selection and supporting the switch in mindset between creative thinking and critical thinking
Usage: Handing out to the resource group in the beginning of the session. When a switch of mind is needed, the facilitator should use the book to communicate this.

Supportive SOUND tools

Ball:

Purpose: Energizing the resource group or communicating principles.
Usage: Record something (an idea, a random word or a yell of the resource group), then squeeze the ball to hear the sound.

Target box:

Purpose: Stay on course, remembering actual target
Usage: The problem owner records the target statement. Push the button to get the resource group (re)focused on the task (e.g. before selecting ideas)

For more info go to www.crenovatie.nl

SCIENCE SAYS: WHAT DOES 30 YEARS OF PSYCHOLOGICAL CREATIVITY RESEARCH TELL US

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Abstract

What do you believe is the best way to generate new ideas? Is it a good strategy to collect some colleagues, sit together and start brainstorming? Or is it more effective to sit alone in a room and think of new possible ideas on your own? Although it feels counterintuitive, thirty years of research in psychology shows that the second option is the most effective way. When you generate ideas on your own, you think of more and better ideas than when you generate ideas in groups. In practice this means that when you organize a brainstorm, it would be valuable to let all the participants generate ideas on their own first, before discussing them in group. This specific example is widely known in academic environments since the 80's and is only one of the many findings that years of evidence-based research revealed. However, almost none of this knowledge has reached the real world or organizations that seek to be creative and innovative. How to stimulate an innovative climate in your organization, how to stimulate creativity in teams and employees, when is diversity an advantage in creative processes? All these questions are being examined in organizational psychology research for years. This presentation will give wide and clear overview of the scientific findings in the last 30 years concerning creativity and innovation. The presentation focuses on the interpretations of these findings and their practical implications for organizations, teams and employees. Science does not have answers to all questions concerning creativity, but it already has a wide variety of answers that haven't got any attention in the practical world. The presentation aims to give new insights and practical tips based on this scientific knowledge. This presentation is not about selling a self-invented theory about creativity, but about sharing valuable public scientific knowledge with the people who have to lead creative processes on a daily basis.

I WOULD LIKE TO BE A LEADER

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Abstract

“I would like to be a leader” is a training tool that aims to provide an overview of competences and skills that people in a leadership position should have, paying special attention to creativity and including a female perspective.

It is organized like a game: a journey through 13 islands of an archipelago, each island being devoted to a different subject: Being a leader, Creativity, Problem Solving, Decision Making, Mission Vision Goals, Emotional Intelligence, Communication, Team, Delegation, Time Management, Project Management, Mentoring, Networking.

“I would like to be a leader” is a way to give students and people who are not familiar with leadership and creativity a flavour of what they are and stimulate them to go deeper into the topics, providing useful links and a bibliography; all in an amusing way.

Keywords: leadership, e-learning, creativity

The “I would like to be a leader” e-training tool is the result of the collaboration among universities, companies and students, involved in the project FEPIC - Female Engineers Pushing Innovation in Companies (HYPERLINK "http://www.fepic.eu" www.fepic.eu). This project was funded by the European Commission within the framework of the Lifelong Learning Programme.

University students and new recruited young employee are the main target of this training; in order to catch and keep their attention, it is organised like a game: a journey to the islands of an archipelago.

Each island hosts animals and objects that are linked to different contents that could be a text, a video or a quiz.

After reading or listening to each piece of content you are awarded the object related to it.

At any moment of your journey, you can check how many awards you have already collected by clicking the treasure chest on the upper bar: only the objects you have already collected are coloured.

You also have a bar with the total number of awards you have gained.

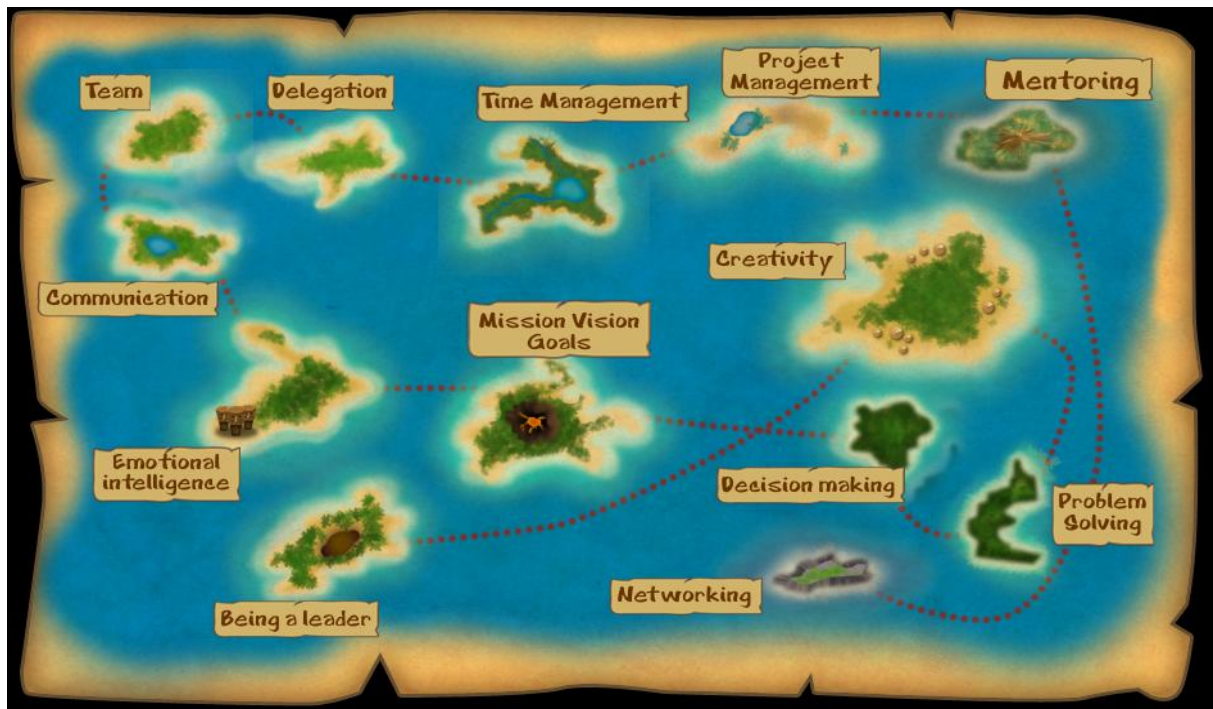
For each content of the 13 islands, a bibliography with links to websites is provided.

A Forum area is also available in order to update the training tool continuously with information about text, video, conference provided by the visitors.

Through your "identity card" you can stop your travels at any time and continue later on, keeping the awards you have already gained; you can also record all the islands you have already visited and where you were when you logged out. At the end of your journey, you will have a record of attendance with your name.

The e-training tool is free available in 6 languages: English, Italian, Estonian, Hungarian, Polish, and Swedish.

Aim of this e-training tool is disseminating a culture of creativity and proper leadership among the new generation, integrating the technical training that usually is the only subject of training in scientific university curricula.



DEVELOPING A PRODUCT: FROM NEEDS TO RESULTS

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ABSTRACT

Eletrobrás is the Brazilian government state company responsible for electrical energy efficiency and they offer several energy efficiency programs. One of these programs helps small municipalities reduce consumption of electricity and improve the energy efficiency of operations that use electricity. Until 2004, this program followed an approach that failed to meet the company's targets for improvement, and thus a new approach was proposed. This paper reports on the successful implementation by Eletrobrás of a creative process in 43 small municipalities. The results show that both the municipalities and their inhabitants managed to reduce consumption as a result of the new approach. The municipal employees—people with varying but often low schooling—felt their self-esteem increase as they solved problems and taught their clients to save energy.

Keywords: creativity, innovation, energy efficiency, municipalities, self-esteem, save energy, sustainability.

Introduction

Eletrobrás is the governmental agent that runs the Brazilian National Electricity Conservation Program (Procel). The energy efficiency subprograms implemented by the company affect both public and private activities, including efficient street lighting; reduced consumption of power by water and sanitation utilities, government buildings, industries, commercial establishments and residences. Wherever there is a need for electric power consumption, Eletrobrás will devise ways to promote its adequate use.

Energy efficiency programs have become popular in many countries as a tool to improve the use of electricity and, more importantly, to reduce consumption. As a result of such programs, the otherwise high investments required in such activities as power generation and transmission are also reduced.

In the past two years, these programs have been gaining momentum since they were recognized as a solution to prevent further deterioration of environmental conditions, which may accelerate global warming.

Using energy wisely, i.e. in an efficient and economic way, is a prerequisite to help preserve the environment and to avoid depletion of natural resources which will be needed in the future – this is called sustainability. Nowadays, this attitude is called Lifestyle of Health

and Sustainability (LOHAS). Using electricity and other kinds of fuels wisely is therefore has become an imperative for mankind survival.

Having this scenario as a backdrop, Eletrobrás adopted an innovative methodology to implement energy efficiency programs in municipalities of up to 30,000 inhabitants.

I was fully responsible for leading the development of implementation of the new, innovating methodology. I began working with my Eletrobrás clients in 2004: collecting data with them, uncovering the problems that needed to be dealt with, developing ideas for new options to be exploited, designing a project down to its operational level, supervising the preparation of a distance education manual, managing the consulting team and the facilitators, and working as a facilitator.

Implementing innovation is both challenging and gratifying. For every step taken a new problem is found and new solutions are sought in a process like a creative cascade. I took part in all the stages of the project whose implementation is reported here.

This text contains no internal bibliographical references, because it is not meant to be read as a straightforward academic paper, but as a description of an actual project whose implementation depended on the collaboration of different minds. The references provided at the end of the paper are meant as basic reading for anyone who needs to learn how to foster a creative and innovative environment.

Objective

This paper presents reports the whole experience, from the identification of a client's needs, to the generation and selection of an idea, and finally through the development and evaluation of a prototype.

Process

The report is organized around the several stages in the project development, namely:

- The Client's needs
- The Client's goal
- The Problem
- The Idea
- Feasibility of the idea
- Prototype design
- Prototype implementation
- Results

These stages can be directly traced to the Osborn/Parnes Model, also known as Creative Problem Solving – CPS (Isaksen, Dorval, Treffinger, 1993), which was used in the project design. CPS consists of six stages, namely:

1. Wish or goal identification;
2. Data gathering;
3. Problem or challenge definition;
4. Idea generation;
5. Idea selection and refinement;
6. Acceptance and plan for action.

CPS stages can be matched to this project's stages as follows: 1 - Client Needs; 2 and 3 - Problem; 4 - Idea; 5 - Feasibility of the Idea; and 6 - Prototype Design, Prototype implementation and Results.

Another methodology – the Product Platform –, developed by this author, was also employed. This new methodology has been shown to play a significant role in the development of projects, products, services and strategies.

Like CPS, Product Platform gets its creativity-fostering potential from the use of divergent and convergent thinking and works with the following stages:

1. Wish or dream;
2. List of stakeholders who are in tune with this wish or dream;
3. Definition of stakeholders' needs, expectations and requirements in relation to this wish or dream;
4. Solution development; and
5. Implementation.

CPS was employed throughout the whole project while Product Platform was employed in specific situations.

The Client's Needs

In 2004, during the evaluation stage of the annual plan for the Municipal Energy Management (GEM in Portuguese) subproject of the Brazilian National Electricity Conservation Program (Procel), it was found that the subproject was not reaching the small municipalities in the country.

The GEM plans present a cost to Eletrobrás – the governmental agent for the promotion of electrical energy efficiency in Brazil – and the financing is non-returnable. Energy efficiency initiatives are designed by consultants from qualified entities and delivered for implementation by the municipalities.

The results yielded by these plans were not positive enough to stimulate the company to maintain them. A solution was needed to justify the maintenance of an energy efficiency

program with such a scope. And it had to be one that could yield positive results. . The small municipalities mentioned are those with less than 30,000 inhabitants, corresponding to roughly over 80% of the country's municipalities.

The Client's Goal

After some meetings we decided about the following goal:

“Eletrobrás needed to develop an alternative to help these municipalities achieve positive results with the efficient use of electricity”.

The Problem

During the divergent stage of the project, these were the main factors affecting the client's expectations:

- The energy efficiency program was not reaching the small municipalities adequately;
- The initiatives designed by the consultants did not stimulate the municipalities to rationalize energy consumption;
- Initiatives which were not implemented represented a high loss for Eletrobrás, since the company had to pay the consultants' fee;
- Distress with the local authorities on account of the lack of quality in the existing option;
- Slow job done by the consultants since each plan was developed for a specific municipality and not replicable in others;
- The knowledge required to implement an initiative was not retained by the municipality, which caused a lot of frustration;
- The number of municipalities that could benefit from these initiatives was extremely high (over 4,000);
- The inhabitants received no practical orientation, therefore they wasted energy.

The analysis of these factors yielded the statement of the problem to be solved:
“How can we get the municipalities to commitment to the efficient use of electricity?”

The Idea

During the days when the planning was under evaluation, new ideas were produced. Basically, the techniques of brainstorming and visual synectics were employed by the person in charge of leading the planning.

What contributed the most to the creation of high quality ideas was incubation – one of the strongest mechanisms in the creative process. Providing people with plenty of time for

their minds to make new combinations of information available yields better quality in the generation of ideas.

After a few days, a new idea gained momentum:

“Using city-hall employees to teach public and private organizations about the rational use of electricity.”

Although this idea seemed simple enough, in Brazil it had never been used before, and the most usual ways to promote the fight against energy waste had been promoting campaigns and giving lectures at schools to raise children’s awareness regarding the issue.

The new idea proved strong enough in comparison with the alternative option after being analyzed for its costs, maturation time, replication potential, dissemination and for the autonomy it could provide the local agents.

Its basic premise was the preparation of employees in small municipalities to run the project in their own towns.

To evaluate the solution we use the PPCO (Pluses, Potentials, Concerns, Overcomes) technique:

Overall advantages of the new idea:

1. It provided a new approach on the issue;
2. Its cost was lower than the cost of alternative approaches;
3. The knowledge created in the project would remain in the municipalities and no longer just recorded in a document;
4. It provided for immediate application of knowledge;
5. It would help the inhabitants change their attitude towards energy conservation;
6. The city halls would have their own qualified agents to fight wasted energy and water;
7. The city halls would reduce their direct expenses with electricity without compromising street or public building lighting;
8. There would be a higher degree of commitment of local public agents with reduced deployment of energy for the improvement of global environmental conditions;
9. The knowledge that was produced in the process would be disseminated among the inhabitants in each municipality.

Advantages of the new idea after its implementation:

1. Reduced expenses in the municipalities;
2. Existence of local agents prepared to promote improved use of electricity;
3. Improved use of electricity by the general population;
4. Reduced domestic expenses with electricity for the inhabitants in the municipalities;
5. Application of financial resources saved through efficient use of energy in basic activities such as healthcare, education and public buildings;

6. Domestic savings carried to the local commerce, fuelling economic growth in the municipalities;
7. Reduced investments in power generation;
8. Reduced water consumption;
9. Improvement of environmental conditions;
10. Propagation of a culture of efficiency, against the waste of natural resources.

Concerns identified:

1. How would the municipalities be chosen to take part in the project?
2. How would the municipalities be attracted to the project?
3. How many participants would make the ideal team for project development?
4. How would they be selected for participation?
5. What topics should be taught?
6. How should the developmental program be designed?
7. What approach should be used with the topics?
8. How would the results be measured?
9. What to do to make it a long-lasting program?

The following solutions were proposed for each of the concerns identified:

1. A ranking of economic and social indexes was developed to select the municipalities. With this ranking, an algorithm was created.
2. The mayors were informed that all expenses related to the participation (i.e. travel, lodging and meals) would be paid by the project, therefore by Eletrobrás. This meant that their municipalities would not have any expenses.
3. Although it was believed that the ideal team would comprise 25 participants, an attempt was made to gather up to 40 participants. However, as the program developed, the initial assumption was confirmed.
4. At first a set of desired characteristics was created for selecting participants, but this proved fruitless. Most of the target municipalities were poor and lacked personnel with adequate schooling and knowledge of electricity to meet the requirements. The solution was to rely on their indication of participants for the project. As a result, professionals with differing educational backgrounds were accepted in the team.
5. The culture of efficiency, public lighting, public (and private) buildings, sewage treatment and the relevant legislation were the topics selected to be covered in the program.
6. The program was designed to provide plenty of time for learning to take place and with a presentation of results towards the end of the process.

7. It was decided that the participants' own experiences would be the starting point for the learning process.
8. The results were measured with reference to the kilowatt hour savings obtained and how much they would amount to.
9. A tri-monthly newsletter was created to be distributed to the municipalities providing them with news on the results of the program and relevant orientation given by Eletrobrás. Besides, a toll-free number was made available to solve the participants' doubts and address their needs. This solution was devised after the project had begun.

Feasibility of the Idea

After the preparation of a flowchart containing all the stages for project development, the schedule and budget were prepared for the following activities:

- Design of a distance education manual to be distributed in print;
- Graphic design and print for this manual;
- Preparation of strategies for attracting participants;
- Preparation of workshops;
- Organization of three workshops for three sets of municipalities;
- Manual evaluation;
- Workshop evaluation;
- Video recording of the events and conversion to DVD format for easier deployment in the future;
- Purchase of materials for the workshops;
- Provision of lodging expenses for members of three sets of municipalities for three workshops;
- Provision of meals expenses for members of three sets of municipalities for three workshops;
- Provision of travel and transportation expenses for members of three sets of municipalities for three workshops;
- Provision of space and facilities expenses for the events;
- Provision of transportation, lodging and meals expenses for the facilitators.

The total budget for these activities amounted to US\$ 488,000. Provided the project reached 50 municipalities, the average cost would amount to US\$ 10,000 per municipality – half the cost of the previous and less efficient project. However, after its approval, as the project developed into the implementation stage, the costs would be significantly reduced as

the expenses related to its development would no longer be considered. The new project would be both faster and cheaper, therefore Eletrobrás decided to invest in a pilot test (a prototype) to turn the idea into an actual project that could later become a program.

Prototype Design

Development of a prototype was contracted to the COGE Foundation (FUNCOGE), an organization made up of representatives of most Brazilian electric power companies. FUNCOGE hired other experts to develop and run the project with me.

Eletrobrás started by identifying the municipalities that would be eligible to participate in the project. At this stage it was decided that the states of Bahia, Maranhão and Minas Gerais would significantly contribute to the project, since they could offer a set of participants with varying schooling levels, therefore allowing for a sound testing of the project's principles.

After the selection of the municipalities, a series of meetings was held to develop strategies designed to fight municipal authorities' skepticism and indifference towards the project. Then local associations and electric power distribution utilities were contacted in the municipalities to collaborate by convincing authorities to take part in the project.

After the topics – culture of efficiency, public lighting, public buildings, sewage treatment and legislation – were defined, experts were chosen to develop content suited to the participant's schooling level. Later, during project implementation, it was found that two topics – sewage treatment and legislation – were not relevant since the municipalities have no control over sewage treatment, which is run by the state. On the other hand, a correlation was found between water and power consumption and this topic was given proper emphasis not only with a focus on consumption itself and environmental protection as well.

Legislation was found to be too broad a topic for the results expected and in relation to the participants' profile. Therefore, it was focused on some very specific issues. After data selection by the subject matter experts, the resulting content was given to experts on distance education methodology who would rewrite it to suit the participant's low schooling level. They produced a Manual that would be delivered to the participants before they joined the project. The manual was written in easy language for people with low pattern of formal education.

This manual was later revised and significantly improved with contributions received from the participants and the facilitators during project implementation.

When the manual was ready, a team of experts on energy efficiency, behavioral methods and facilitation was selected to design the developmental program. This program was divided in two parts: the first focused on the learning process and the second focused on the presentation of results through the explanation of basic concepts and plenty of practice in each meeting. The concept of learning community – a context in which participants'

experiences and knowledge are mobilized to overcome difficulties and solve problems – was adopted. Later it was found that this was decisive for the project's success and Learning Community became the project's name.

The participants' developmental process followed this sequence of events:

1. They received the Manual a month before joining the project;
2. A 3-day workshop (21 hours) was designed to solve their doubts and teach about the culture of efficiency and energy efficiency. As the participants were about to join the project, however, it was found that few of them had actually read the Manual. The first workshop had to be adapted to focus on the concepts they had to learn, mostly with the analysis of practical cases. At the end of this workshop, they had to prepare a simple action plan to be implemented on their return to their municipalities;
3. The second workshop (another 21 hours) took place nearly two months after the first. It was designed for the participants to discuss the problems they faced in the implementation of their action plans and the solutions they came up with. At this meeting they had to work in communities so as to learn from one another. As the project developed, a new character emerged: the "Power Buddy" – a member from a participant's community who was willing to help convince the population in their municipality about the benefits of using energy wisely. A flip book was designed to help the Buddies convince their neighbors and friends. At the end of the second workshop the participants had to design a new action plan with a definition of results to be obtained;
4. A new meeting was held after six months. This time the participants had to present the results obtained, i.e. the reduction in energy consumption in their municipalities.

By taking part in the project, a participant received the status of Municipal Agent for Energy Efficiency (AMEE in Portuguese) and, after each workshop, he received a specific badge, namely:

- Beginner AMEE – after the first workshop
- Junior AMEE – after the second workshop
- Senior AMEE – after the last workshop

By accomplishing the three stages, the agent was awarded a certificate of achievement and the municipality received a certificate acknowledging its participation in the program.

The agents' participation was voluntary and they received no compensation for it.

A team from FUNCOGE was responsible for organizing the events in terms of logistics and support, i.e. they rented the meeting rooms and equipment; handled lodging, travel and transportation arrangements for participants and facilitators.

Implementing the prototype

The project was implemented by means of an approach called PPEE (plan, prepare, execute, evaluate), which is quite similar to the PDCA (plan, do, check, act) used in total quality management projects.

All the workshops were organized and revised. The revisions took place while they were being held and after they had finished. Since the participants' profiles were unknown prior to the meetings, this procedure yielded very good results, because it enabled the team to adapt the program to the participants' needs and skills.

Another aspect worth mentioning is the fact that most of the facilitators who were familiar with energy efficiency concepts had had no prior experience in facilitating processes. This means that they had to overcome their limitations and learn facilitation techniques.

The adoption of the learning community format caused some insecurity at first, since most participants were more familiar with a teacher-centered approach to learning. As the project developed, however, they adapted to the new approach and did a very good work together. The PPEE approach allowed for changes and improvements to be made in and between gatherings. It may be said that the prototype yielded world-class-level results.

Support materials were produced for the workshops such as:

- PowerPoint presentations, posters, folders and stickers with messages stimulating energy-saving behavior;
- a DVD with short spots to show examples of energy-wasting and energy-saving behavior;
- self-guided tasks.

As the workshops were held, the use PowerPoint presentations was reduced, since this application was not a tool that the participants used and they were not likely to use them at the replication stage of the project in their municipalities. Knowledge transmission would have to rely on simple tools to foster replication.

During the workshops, the participants reported on their experiences and this proved invaluable for the revision of the content and the Manual. There was a collective effort for the creation of the material – a flip-book – they would later use to work with their Power Buddies.

As a result of these processes, the participants felt empowered and took full responsibility for their own learning. Their self-esteem was also boosted by the realization that their opinion mattered. The facilitators reported the environment energy of the room when they see how excited the participants felt, in the second workshop, as they realized

they could perform complex tasks and build up their knowledge from experience when asked to create solutions to the problems they had brought for discussion.

It soon became evident that the decision to have civil servants in the project had been a wise one, because this brought significance to the project of Learning Communities in the municipalities.

It was also noticed that the participants did not read the Manual or study it before the meetings, even though it had been delivered to them before the first meeting was held. It is suggested that in future implementations of the project some time be scheduled for the participants and the facilitators to work with the Manual before the actual discussions begin.

Results

Sixty-eight participants from forty-three municipalities took part in the pilot test. Forty-four of these participants, representing thirty-three municipalities, presented results in the third workshop.

Dropout rates were around 19% from the first to the second workshop and around 13% from the second to the third. The reasons are varied and suggest there is room for improvement in the program.

Energy savings in street lighting amounted to 2,343,902 kWh/year, which corresponds to 1,350 residences or 5,400 consumers; the savings in public buildings and residences amounted to 266,882 kWh/year, which corresponds to 150 residences or 600 consumers. The total amount saved was around US\$ 261,500/year.

It is relevant to stress that energy saving figures in energy efficiency studies consider data collected in the first year only. Therefore, data collected in subsequent years will not be taken into account.

The initial budget contained provisions for total expenses of US\$ 488,000. They reached US\$ 344,000 after the prototype was run, which corresponds to expenses of around US\$ 10,422.5 per municipality – nearly half of what Eletrobrás would have invested in the old methodology with no guarantee of success. If one takes into account the forty-three municipalities that were actually successful, however, the expenses drop to US\$ 8,000. But if we discount the savings obtained with electricity consumption in the experimental stage (prototyping) the expenses drop again to US\$2,500.

These results proved the project to be a complete success, and the GEM team at Eletrobrás was convinced that the Learning Communities should become a long-lasting program.

Final Comments

A new edition of the Manual will be printed with improvements resulting from the discussions held during the prototype study.

During the prototype study, Eletrobrás had the opportunity to present other subprograms within the PROCEL program, so as to stimulate the municipalities to adhere to them as well.

As the pilot test was being implemented, there were attempts to integrate the local electric power facilities so as to make them aware of the participants' needs.

At the end of the prototype study, a Facilitator's Manual was produced with all the directions and content for the workshops. Other experts will benefit from this material and will be able to replicate the experience.

An evaluation did a year after the last event checked the AMEEs (agents) were working in energy efficiency, getting new saves for their municipalities. Some of them, four decided to be consultants in energy efficiency and were working for small cities (less than 30,000 inhabitants). This fact shown that the program could train experts for energy efficiency for small cities.

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BACK TO LIFE | USING CULTURAL ASSETS TO STIMULATE INNOVATION

Paul Corney

Prepared for the 12th European conference on creativity and innovation to accompany the presentation entitled “Flexing the Imaginative Muscle: how London’s businesses are using the capital’s cultural assets to stimulate innovation.”¹² August 2011
www.sparknow.net

Writing this concluding blog (the third of a series) reporting on the More than Money workshop on the road this warm Sunday afternoon in August, I am aware of how this reflection process which has not only allowed me to revisit the archives of research for the workshop and book Imaginative Muscle and have new conversations with people along the way, it has enabled a blog to be curated - longer than anticipated and one I hope you enjoy reading – that highlights how innovation and creative knowledge exchange in organisations and businesses can be explored through; objects, storytelling, human interaction and creative spaces and this is something to shout about.

Blog one we are not alone | illustrated the critical role of space and objects in knowledge exchange:

If there isn’t fluidity, comfortableness, adaptability the experience will not be an open and enjoyable one for the participants or the facilitators; we are not alone and we can listen and learn from our surroundings, colleagues, objects and buildings and takeaway an enjoyable experience, whilst learning along the way.

Blog two objects surface stories | stories provoke a response demonstrates:

Objects surface interesting stories, subjects, and avenues to explore; they overcome barriers in a group and are valuable icebreakers. We also found objects are catalysts for knowledge transfer and a powerful qualitative research tool.

The final blog back to life | using cultural assets to stimulate innovation tells the story of the workshop’s last exercise and how it opened up dialogues about businesses utilising heritage and cultural objects for business strategy and how objects play a key role as emotional indicators for innovative products to be developed. I use the term back to life, as the case studies used for the workshop, and Leeds Museums Galleries own stories, highlight tangible ways in which cultural objects and spaces and people can bring about relevant and innovation strategies in

* effective two way relationships expanding on a sponsorship partnership between a museum and a business

* a business; redesigning its headquarters, developing a cultural strategy:

internal communications and branding through external communications

The case studies introduced attempted to discuss how a business uses an archive and objects as part of cultural strategy and to ask Leeds Museums and Galleries staff:

- * can you think of good examples of business and archives working together in a two way relationship, how and why?
- * how could a museum present to businesses advising them on how to develop cultural strategies through objects or if this is happening how and why?

One group told the story of how they had chosen the case study: Pringle of Scotland because they could relate to the processes and possible outcomes of the two-way relationship.

Case Study: The Pringle Archive 1815 - 2010

- * Partnering with Central St. Martin's College of Art and Design
- * Promoting and supporting talent through education project
- * Completion of a comprehensive archive
- * Development of future re-issues of iconic vintage styles and original Scottish manufacturing techniques
- * BA History and Theory course researching and cataloguing the existing archive and hosting 'Pringle Day of Record' [see poster]
- * Members of community bring along generations Pringle of Scotland and memorabilia to be recorded
- * MA Fashion and Design Students design and create modern interpretations and exhibit at London Fashion Week (source: Pringle of Scotland press release) unique memories of the factory

We found this case study [Pringle of Scotland] was unique to the company. It was creating an archive from scratch. We felt that this was creating a historic archive where there wasn't one, it was very much high knowledge transfer. It was all about gathering that knowledge. We felt that some of it was unique as Pringle of Scotland are trying to create something that would otherwise be lost and disappear; unique memories and artefacts related to the actual factory. Other companies who found themselves in similar situations [could use this] model.

The fact that it involved the training of students in research, oral history, collection management, interpretation, design skills and intergenerational interaction was important. It potentially sounds like successful project, but it depends on the outcome and quality of the students' work.

As part of this exercise the curator at Leeds City Art Gallery shared his story of how the paper collection was used in a two-way relationship project; a developed mentor project exploding the hierarchy in a law firm. It started as an audience development project,

asking people to come in and work with the collection. We invited a local firm of solicitors to select and curate an exhibition using artworks from the paper collection on the theme of landscapes. The firm did take a bit of persuading, as initially they couldn't see what was in it for them.

We weren't thinking about business case scenarios at all, we wanted the employees to come and work with our collection. It ended up being a good case for the company as the participants were from all aspects of the company, not just senior management there were; senior management, partners and clerical staff. The project was about exploding the hierarchy within the business.

These kind of Community Choice exhibitions had happened before but people were simply asked to come and look at what's in the store and an exhibition would be created from 'Oh I like that, I'll put that up'. We wanted to take it to another level, be a bit more of developed mentor in our approach. We employed a facilitator to be a neutral voice, we didn't want the 'expert curator' to dictate to the participants, and we didn't want the curator's knowledge and expertise to be relied upon.

Participants looked at catalogues, and chose paintings they liked from a visit to the store. The facilitator asked people to start thinking about why they had selected that work and they ended up reconsidering their choices thinking about how their choices could work together in terms of an exhibition. This was revelatory, they saw that paintings weren't just nice pictures on a wall, that they actually meant something and had a story behind them.

The project allowed people to mix with other people in the business they didn't get to meet. It was a good example of developing people skills and confidence. The business used the exhibition as a communication tool to talk to their clients through a private preview event.

It is evident that the museum's staff are working with objects in many knowledge exchange ways with business and other stakeholders. They are of course natural storytellers and More than Money enabled people to share new stories and experiences around objects that they work with everyday. One feeling that weighed heavy in this workshop was that new conversations, projects should be two-way and that outcomes of a project with a business are an important factor to be considered and implemented, conversations and relationships should be sustainable and not just be a fleeting experience. A couple of snapshots of the businesses case studies used in More than Money follow. They identify the importance of objects; in archives, cultural artefacts, or human objects, for various business strategies: corporate communications

In 2010, we started a series of history brochures - the first one was 'Barings in the Middle East' - designed to show clients that we have long tenure in the markets where we are operating. It has been pretty memorable putting these history brochures together because they actually involved me going to the archive and looking through the documents

myself, with obviously Moira and Claire there helping me and obviously finding the right material and steering me in the right direction. There's something special about looking through the old documents and seeing the letters that the partners themselves must have written at that time, it's a real historical experience.

Alasdair Anderson [pictured below] Barings' Investment Communications Manager. To read more on Barings see the blog the function of a business archive Cultural strategy | building design 'Standard Chartered is known for its strong values driven culture. Our values: courageous, responsive, international, trustworthy and creative, were here before this building. When our buildings are designed and planned our values are always at the back of everyone's mind. The reception [picture below] reflects our business focus in Asia, Africa and the Middle East. The different artefacts were picked to reflect out interesting history and culture. Art and artefacts are moved around the building from time to time to create freshness and surprise.'

Andrew Hunter, Group Head of Corporate Real Estate Services, Standard Chartered Bank, to read more see blog source the 'heritage' object internal communications

Recently, I met John Entwisle, Group Archivist, Thomson Reuters for a coffee and catch up at the Museum of Docklands; his insight into the important business use of an archive is poignant in these austere times: 'you 'flog' your heritage, it has a higher priority as it makes the business unique and interesting'

The picture below is John at his desk writing his 'exciting' story blog that he sources from the archive and distributes in a newsletter every few weeks to 56,000 staff. The blog has a huge response and the comments section is very active, often identifying related stories for John to investigate. It is seen as an important knowledge tool that staff can read in their lunch hour.

For more information please see the blog: what is an archive

I would now like to share with you some quotes from the book Onward; How Starbucks Fought for Its Life without Losing its Soul by Howard Shultz CEO of Starbucks - a bit of light reading in-between PhD research books. The quotes sum up

- * how a business in a time of trouble reflected on its practices and direction and went back to its founding aims to develop strategies that were relevant to changing times and sustainability
- * how human experience is a key area of development internally to enhance to the customers experience
- * how curation of its stores are crucial to the customers physical Starbucks experience amongst a stores objects are integral to its success
- * how success changes and has to be re-assessed but always be tied to founding aims and ethics

We can look at these and ask how could More than Money enhance innovation through objects?

A New Way to See

Feeling somewhat skeptical, I entered the large event space of Seattle's Palace Ballroom for a three-day brainstorming retreat. Historically, I was not a fan of business consultants. Rarely had I looked to outsiders to tell Starbucks what Starbucks needed

Starbucks' leaders debated, disagreed, and occasionally laughed as we envisioned a future that involved much more than opening new stores.

We had a delicate balance to strike.

A balance between heritage and innovation.

Between meaningful tradition and modern-day relevance...

I told them [participants] the meeting was about much more than making money or putting bandages on old wounds. We needed to rediscover who we were and imagine who we could be

Our ongoing challenge is to creatively nurture coffee's essence, keeping it personal despite our size. I do not want Starbucks to be defined solely by its thousands of stores or millions of customers.

More than our scale, the brand can and should be defined by the quality of its coffee as well as its values. Community. Connection.

Respect. Dignity. Humor. Humanity. Accountability.

It is our mission to make sure the world sees us through these lenses.

Benevolence

Our partners' attitude and actions have such great potential to make our customers feel something. Delighted, maybe. Or tickled. Special. Grateful. Connected. Yet the only reason our partners can make our customers feel good is because of how our partners feel about the company. Proud. Inspired. Appreciated. Cared for. Respected. Connected.

..we do have high expectations of ourselves as we try to manage the company through the lens of humanity. Starbucks' coffee is exceptional, yes, but emotional connection is our true value proposition.

..our founding mission [was] to achieve the fragile balance of profit with a social conscience. Magic I love to experience different stores...I am a sponge, always soaking up store design, layout, and salespeople's behaviors... ..one of my favorite places to visit is Colette...The owners are curators, and shopping Colette is an adventure in discovery. The merchant's success depends on his or her ability to tell a story. What people see or hear or smell or do when they enter a space guides their feelings...I have always understood this. So when, in 2006 and 2007, I walked into more and more Starbucks

stores and senses that we were no longer celebrating coffee, my heart sank. Our customers deserved better.

Paul and I hope you've enjoyed this story of More than Money out on the road and the extra little noticings that have been found on this journey.

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Text from Onward: How Starbucks Fought for Its Life without Losing Its Soul, by Howard Schultz with Joanne Gordon, 2011, A John Wiley and Sons, Ltd Publication is reproduced with kind permission of the publishers.

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MAPEAMENTO COGNITIVO COMO UMA TÉCNICA PARA APOIO À ENGENHARIA DE REQUISITOS.

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• **RESUMO**

Este artigo aborda conceitos de engenharia de requisitos e propõe aplicação de mapas cognitivos como ferramenta colaborativa e de suporte à identificação dos problemas dos *stakeholders*, durante o processo de levantamento de requisitos de sistemas, apresentando estudo de caso do *cluster* aeronáutico de São José dos Campos, São Paulo.

A técnica de mapeamento cognitivo foi criada, a partir de pesquisas em psicologia, para representar pontos de vista dos indivíduos gerando mapas cognitivos, que agregados expressam graficamente o ponto de vista coletivo para tomada de decisão, demonstrando eficiência colaborativa.

Aplicada à engenharia de requisitos revelou potencial para promover a convergência dos diferentes pontos de vista sobre as necessidades reais dos *stakeholders*, de forma inovativa. Demonstrou eficiência ao aproximar os requisitos declarados no início do processo de desenvolvimento com os implementados ao longo do ciclo de vida do sistema/produto.

Palavras-chave: mapa cognitivo, engenharia de requisitos, tomada de decisão, representação do conhecimento, ferramenta colaborativa.~

1Introdução

O ciclo de desenvolvimento de produtos tem como fase principal o levantamento das necessidades dos *stakeholders*. É neste momento que são identificados os problemas que desenvolvedores e os *stakeholders* precisam resolver, e para isso buscam ferramentas de apoio para a elicitación do conhecimento. A maioria das dificuldades em todo o processo de desenvolvimento de produtos está associada ao perfeito entendimento entre os *stakeholders* e os desenvolvedores, estes, responsáveis pelo levantamento dos requisitos do futuro

produto. É comum a existência de retrabalhos, atrasos de cronograma, custos alterados e insatisfação, de ambos os lados, ocasionada pela deficiência na fase de levantamento dos requisitos.

Durante a fase de validação, os desenvolvedores confirmam se os requisitos especificados correspondem às solicitações dos *stakeholders*, bem como suas reais necessidades.

Em geral utilizam-se revisões e *checklists* como técnicas de apoio ao processo de validação, junto às partes interessadas, tais como clientes, usuários e engenheiros, analistas. Os requisitos serão revisados, os problemas identificados e sanados.

Alguns problemas mais comuns são: Kotonya (1998).

- falta de conformidade com padrões de qualidade;
- requisitos mal formulados, ambíguos, confusos;
- erros no modelo de sistema;
- conflitos entre requisitos, os quais não foram detectados e tratados na fase de análise.

Na fase de análise o detalhamento permite completo conhecimento dos problemas e dos requisitos mais importantes, embora haja a possibilidade de mudanças ao longo do processo de desenvolvimento, exigindo intensa iteração no processo, de forma a impactar o mínimo possível as atividades das fases posteriores.

Estruturar o ambiente decisório de forma a identificar os problemas que os desenvolvedores de produtos aeronáuticos enfrentam, durante a fase de levantamento de requisitos junto aos *stakeholders*, foi altamente motivador pois vislumbramos a possibilidade de criar um cenário que permitisse extrair um modelo para minimizar as deficiências que, em geral, ocorrem nessa fase.

O objetivo deste estudo foi demonstrar a eficiência do uso de mapas cognitivos como ferramenta de suporte à engenharia de requisitos para a identificação e estruturação dos problemas associados à fase de levantamentos de requisitos no setor aeronáutico.

2 Engenharia de requisitos.

O objetivo da Engenharia de requisitos é capturar, analisar, validar e refinar requisitos para o desenvolvimento de um sistema através do uso de ferramentas que auxiliam no processo de identificação, detalhamento e gestão dos requisitos.

Existem diretrizes para a engenharia de requisitos ditadas, dentre outras, por normas como a Electronic Industries Alliance (EIA) stander - 632 (America National Standards Institute ANSI (1998) e Institute Electrical and Electronics Engineers (IEEE) stander STD (1220-1998), IEEE (2005).

Requisitos podem ser conceituados como atributos de um sistema que permitem identificar a capacidade e fator de qualidade que revele a utilidade do produto para o cliente ou usuário, Young (2003). Os requisitos podem ser classificados como:

- requisitos de negócios: definem o alinhamento do produto/sistema às metas de negócios do *stakeholder*;
- requisitos de alto-nível: revelam a visão do *stakeholder*, e são descritos na sua linguagem. Permitem a definição do escopo de um sistema, bem como a estimativa de custos e prazos necessários para o seu desenvolvimento;
- requisitos funcionais: definem as funções que o sistema/produto deve atender;
- requisitos desempenho: definem o padrão de desempenho exigido pelo cliente;
- requisitos de interface: definem o padrão de operacionalidade, e
- requisitos de verificação e validação: definem o grau de atendimento às solicitações dos *stakeholders*.

A especificação de requisitos é composta pela relação das características que os *stakeholders* desejam ver implementadas através do sistema de forma a atender plenamente suas necessidades para resolução de seus problemas. A especificação é elaborada usando-se a linguagem dos *stakeholders*.

É necessário que os requisitos sejam submetidos à análise técnica para que possam ser traduzidos para linguagem técnica (de baixo-nível) expressando o papel de cada componente do sistema de forma a atender as necessidades especificadas pelos *stakeholders*.

O processo de engenharia de requisitos é composto por quatro etapas principais: levantamento e elicitação dos requisitos, análise e negociação, modelagem, e validação dos requisitos. Estas etapas se processam de forma iterativa e recursiva devido às mudanças que, normalmente, ocorrem durante o processo de desenvolvimento do sistema, conforme pode ser visto no modelo espiral apresentado pela figura 1, a seguir.

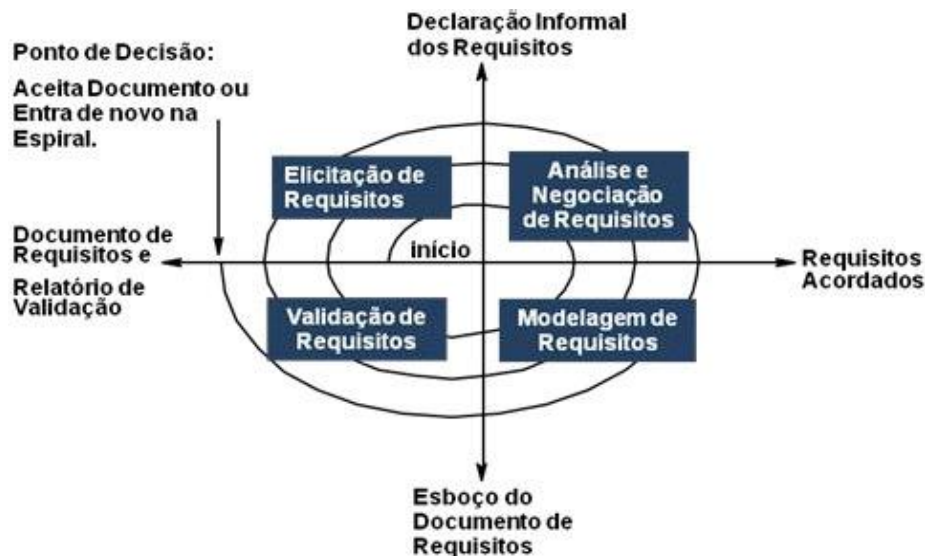


Fig. 1 - Processo em espiral de Engenharia de Requisitos, Alves (2007)

Os requisitos podem, simplesmente, migrarem da forma que estão para a linguagem técnica e neste caso recebem a denominação de requisitos transferidos, no caso de requisitos novos, serão denominados por requisitos derivados.

Os requisitos tratados pela engenharia de requisitos possuem as seguintes características:

- Rastreabilidade: os requisitos de alto e baixo níveis devem estar estreitamente relacionados, já que são apenas conversões de linguagem. A rastreabilidade permite que ao se verificar e validar os requisitos de baixo nível seja possível identificar o atendimento das solicitações do cliente.
- Evolução: os requisitos sofrem modificações ao longo do processo de detalhamento, e por isso muda de *status* à cada nova modificação tornando-se requisito definido, aprovado, alocado, projetado, implementado, testado e verificado.
- Alocação: os requisitos têm que ser alocados onde são necessários no sistema, como se fossem componentes físicos.

As diferentes atividades para o cumprimento da fase inicial do ciclo de vida de um sistema são conhecidas como análises de requisitos. As atividades a serem desenvolvidas nessa fase, são as seguintes: Kotonya (1998).

I - Identificação e Levantamento de requisitos

Atividade em que são identificados os *stakeholders*, e os requisitos são extraídos através de consultas a esses envolvidos, aos documentos, ao domínio do conhecimento, e aos estudos de mercado; as atividades envolvidas nesta fase incluem:

- Compreensão do domínio: busca estabelecer processo eficaz de comunicação entre o desenvolvedor e os *stakeholders*.
- Captura: corresponde à extração dos requisitos pretendidos, através de iteração com os *stakeholders*.
- Identificação e análise de problemas: descrição conjunta dos problemas e das soluções propostas.

II - Análise e negociação dos requisitos

Atividade em que os requisitos são detalhados e analisados, podendo ser recusados ou aceitos. Algumas das atividades envolvidas na análise de requisitos incluem:

- Classificação: agrupamento de requisitos em “módulos” para facilitar a visão global do funcionamento pretendido para o sistema.
- Resolução de conflitos: é comum a existência de conflitos nos requisitos identificados ao longo do processo de identificação dos mesmos; tais conflitos devem ser resolvidos o mais breve possível.
- Priorização: consiste na atribuição de “prioridade” a cada requisito.
- Confirmação: é confirmada com os *stakeholders* a completude dos requisitos, sua consistência e validade.

III - Modelagem dos requisitos

A Especificação e Documentação formalizam os requisitos aceitos em um nível de detalhamento adequado. Em todos os tipos de especificação há dois tipos de requisitos a considerar:

- Requisitos funcionais: descrevem as funcionalidades que se espera que o sistema opere, de forma completa e consistente para atender aos propósitos para os quais foram desenvolvidos.
- Requisitos não-funcionais: descrevem os aspectos não-funcionais do sistema, como restrições nas quais o sistema deve operar, ou propriedades emergentes do sistema. Costumam ser divididos em Requisitos não-funcionais de utilidade, de confiança, de desempenho, de suporte e de escalabilidade.

A especificação resulta no Documento de Especificação de Requisitos incluindo uma combinação dos requisitos dos diversos *stakeholders*. A utilidade desse documento é diferenciada, conforme cada envolvido no processo Kotonya (1998), Sommerville (2007).

- Clientes: utilizado para confirmar a completude dos requisitos e solicitar modificações de forma a atender suas necessidades.

- Gestores: utilizado para orçamentar o sistema e planejar o desenvolvimento.
- Engenheiros: utilizado para compreender o sistema que será desenvolvido.
- Engenheiros (testes): utilizado para elaborar e aplicar os testes para validação do atendimento dos requisitos.
- Engenheiros (manutenção): utilizado para compreensão do sistema e o interdependência de suas partes.

IV - Validação dos requisitos

Nesta fase de validação, os requisitos especificados são verificados e confirmados pelos decisores, de forma a refletirem perfeitamente as solicitações dos *stakeholders*.

Em geral são feitas várias revisões e checklists que auxiliam a execução do processo de validação, que envolve todos os *stakeholders* de forma a identificar os problemas e as possíveis ambiguidades na descrição dos requisitos.

Finalizada esta fase, é possível admitir-se que há um nivelamento do conhecimento relacionado aos requisitos de sistema, embora modificações possam ser exigidas ao longo do processo de desenvolvimento. Alves (2007).

Estas fases não são independentes entre si, pois uma informação obtida numa delas pode ser utilizada nas demais. A identificação e análise de requisitos é um processo iterativo que se inicia com a familiarização do domínio do futuro sistema, e culmina na confirmação dos requisitos, aumentando o grau de compreensão do sistema, a cada fase do ciclo de desenvolvimento deste.

Uma das atividades mais importantes e complexas que ocorrem no ciclo de desenvolvimento de sistemas é a gestão dos requisitos. Trata-se de atividade em que os requisitos são controlados em função das mudanças ambientais. A gestão dos requisitos tem início na sua especificação formal.

Esse documento precede a definição do escopo e as estimativas de custo e prazos, por isso qualquer mudança na base dos requisitos causam impactos, e muitas vezes propiciam situações críticas em todo o projeto.

Os requisitos de um sistema estão em evolução constante, por diversas razões, como por exemplo, o problema abordado não ter sido completamente definido antes da produção do documento de requisitos, ou pela alteração dos próprios requisitos no decorrer do projeto devido às evoluções tecnológicas ou alterações na organização na qual será utilizado.

A resolução de conflitos entre requisitos busca o equilíbrio no atendimento das necessidades das diferentes partes interessadas.

O planejamento é uma parte importante da gestão de requisitos. Devem estar definidas desde o início políticas para:

5. gestão de mudanças: o conjunto de procedimentos que permitam avaliar o custo e impacto das alterações;
6. tratamento dos requisitos: procedimentos para tratamento dos requisitos. Como mencionado, o processo é iterativo ao longo de todo o ciclo de desenvolvimento do sistema.

A atividade de validação dos requisitos culmina na elaboração de documento dos requisitos que adquire valor contratual na forma de “acordo de nível de serviço” entre cliente e fornecedores. Este documento norteará todos os esforços das fases seguintes do ciclo de vida do produto. A especificação dos requisitos deve ser objetiva e clara de forma a evitar retrabalho, minimizando custo e esforço de implementação.

Em praticamente todos os domínios do conhecimento, a extração das características ou dos requisitos do sistema tem como principal dificuldade o fator comunicação.

Roger Pressman ilustra o problema com uma declaração de um cliente a um analista:

“ sei que você acredita que entendeu o que acha que eu disse, mas não estou certo de que percebe que aquilo que ouviu não é o que eu pretendia dizer...” Pressman (1995).

3 Mapas cognitivos.

Os mapas cognitivos são expressões gráficas de discursos realizadas por um indivíduo ou grupos de indivíduos (atores) com o objetivo de demonstrar objetos (o problema) em contextos de interações particular, segundo Cosset & Audet (1992).

A representação gráfica é o resultado da interpretação mental do(s) ponto(s) de vista de indivíduo(s) capturada pelo facilitador relativa aos discursos dos atores sobre determinado problema.

O facilitador deve permanecer o mais neutro possível ao longo de todo o processo discursivo-reflexivo-recursivo, de forma a não interferir com informações pessoais na elaboração do mapa cognitivo; porém é, praticamente, impossível a neutralidade total. Isto porque o facilitador precisa interpretar e construir os eventos baseado nos seus conceitos de valores e de visão subjetiva.

Na abordagem cognitiva, o problema é identificado, detalhado e analisado através de um processo de interação entre o facilitador e os *stakeholders*, em busca de uma definição precisa, admitindo-se a intersubjetividade do grupo ou do indivíduo. Desta forma os mapas

cognitivos podem ser utilizados para resolução de conflitos de pontos de vista na definição dos requisitos no processo de desenvolvimento de sistemas.

Os mapas cognitivos demonstram ser bastante úteis tanto como produto quanto como ferramenta, possuindo caráter dinâmico, admitindo-se alterações e ajustes durante sua utilização, face as modificações por parte dos decisores diante de problemas complexos.

Os componentes dos mapas cognitivos podem ser de:

- Identidade - determinam as chaves do problema (eventos, processos e atores);
- categorização – definem escalas e perfis revelando os relacionamentos das entidades envolvidas no problema;
- causais ou de argumentação - apresentam alternativas para mudança de estado ou posição no mapa (linhas de argumentação).

Os mapas cognitivos podem ser:

- organizacionais – busca-se um mapa coletivo que represente uma ferramenta de suporte para ações organizacionais;
- individuais – apresentam pontos de vista individuais, isolados, e são utilizados para a construção dos mapas coletivos. Cosset & Audet (1992).

3.1 Construção do mapa cognitivo individual

A construção de um mapa cognitivo depende de dois fatores:

- abordagem inicial por parte do facilitador demonstrando empatia e
- estabelecimento de um processo de negociação.

As entrevistas devem ser espontâneas permitindo ao entrevistado tranquilidade para expor seu ponto de vista e suas informações sobre o problema. Isto porque a expressão corporal e reações constituem-se informações relevantes para o entendimento do facilitador sobre o problema.

O mapa cognitivo é uma hierarquia de conceitos relacionados por ligações entre os objetivos meios e fins, que representam o sistema de valores do(s) decisor(es) na forma de objetivos estratégicos (os conceitos superiores na hierarquia).

O processo de extração do conhecimento é cansativo, por esta razão não deve ultrapassar mais que 90 minutos, por reunião.

O processo de elaboração de mapas é composto por quatro passos conforme descritos a seguir: adaptação de Eden (1998), Ensslin (1998), Montibeller (1996) , Bana (1992).

1º Passo: Definição de um rótulo para o problema.

Reuniões entre facilitador e decisor(es) para definição de rótulo para o problema baseado em questões relevantes levantadas pelo(s) decisor(es).

2º Passo: Definição dos elementos primários de avaliação.

Os Elementos Primários de Avaliação (EPAs) representam os objetivos, metas, valores, ações, alternativas, apreensões dos decisores e são definidos a partir de entrevistas entre facilitador e decisor(es).

3º Passo: Construção dos conceitos a partir do EPAs.

Os conceitos são transformados em ações e organizados conforme existência de similaridades, e hierarquizados por constructos subordinados e superiores, Eden (1998).

A estrutura é representada pelos constructos individuais organizados hierarquicamente. Para garantir a corretude da percepção do facilitador face às informações do(s) entrevistado(s), utiliza-se a observação do contraste, ou seja, o pólo oposto psicológico, de forma explícita ou não, para a construção dos mapas.

Em geral, o facilitador adota a primeira descrição anunciada pelo(s) decisor(es), obtida na primeira percepção que lhe vem à mente, seja esta positiva ou não.

Algumas diretrizes podem servir de orientação ao longo do processo de construção dos conceitos, constituindo-se em boa estratégia Eden (1998).

- Cada conceito deve ser orientado por uma ação, e ser claro e conciso, expresso por apenas uma frase.
- Deve-se utilizar a linguagem do(s) decisor(es), aproveitando-se as palavras e expressões usadas, de forma a preservar o perfil do(s) decisor(es).
- Deve-se identificar os valores, opções, meios e fins.
- O decisor deve ser interrompido sempre que o facilitador não conseguir registrar as percepções, porém deve-se preservar a linha de raciocínio.
- Identificar, registrando na parte superior do mapa os conceitos que representam objetivos estratégicos e/ou as metas mais importantes para o(s) decisor(es), que possam representar ações estratégicas.
- Identificar os conceitos muito explicados e justificados através das ligações com outros conceitos e aqueles expressos emocionalmente pelo(s) decisor(es).
- Evitar palavras como pode, precisa, deve.
- A validação das informações contidas no mapa, devem ser realizados em um curto período de tempo.

4º Passo: Hierarquização dos conceitos e análise do Mapa

A estrutura dos mapas cognitivos é composta por conceitos-fins identificados através da pergunta “por que esse conceito é importante?”, e conceitos-meios

identificados através da pergunta: “Quais as razões que explicam esse conceito? Como ele pode ser alcançado? “.

O processo prossegue até que o(s) decisor(es) responda(m) que o conceito é importante por que é importante, caracterizando que se chegou ao nível hierárquico mais alto do mapa.

Os conceitos relacionados por ligações de casualidade, par-a-par são representados por setas.

Pode ocorrer situação em que um objetivo fim possa ser explicado por mais de um objetivo meio, conflitantes. Neste caso Ensslin recomenda a adoção da análise Multicritério. Ensslin (1998), Jardim (1999).

A análise dos mapas

Identificação dos *clusters*.

Pode-se definir um cluster como um grafo composto por um conjunto de nós inter-relacionados. A sua identificação possibilita uma visão macro do mapa, e proporciona redução da sua complexidade já que ressalta as ligações mais fortes que são as intracomponentes, pois agrupam os conceitos que apresentam áreas de interesse específicas baseadas nos conteúdos dos conceitos, e permitem uma análise separada de cada cluster.

A detecção dos Pontos de Vista Fundamentais é feita através da observação da topografia do mapa. Observa-se o conjunto de linhas do grafo. Essas linhas formam os eixos de avaliação do problema Ensslin (1998), Ensslin (1996).

A análise dos ramos do grafo busca estruturar os caminhos que levam ao conceito-fim do problema.

Esses caminhos, denominados por linha de argumentação, são compostos por conceitos que sofrem influência e estão em posição hierárquica superior a um conceito-meio. As linhas de argumentação dos clusters são consideradas linhas de argumentação internas.

Os ramos do mapa são compostos por linhas de argumentação que representam similaridade de conteúdo em relação ao ambiente de decisão.

Identificação dos Pontos de Vista Fundamentais.(PVFs)

Os pontos de vista fundamentais (PVFs) são base para ações que culminam na tomada de decisão já que são oportunidades de escolhas entre alternativas. Os PVFs

carregam no seu bojo os valores considerados mais importantes pelo decisor(es) no ambiente, permitindo antecipar as consequências advindas de tais ações.

A definição dos PVFs é feita a partir do enquadramento do mapa, quando se determinam para cada ramo:

- localização dos conceitos relacionados com o pensamento estratégico do(s) decisor(es).
- localização dos conceitos que revelam ações potenciais.
- localização dos conceitos que revelam ideias relacionadas com o candidato a PVF do(s) decisor(es).

À medida que aumenta o grau de controle sobre o ponto de vista do(s) decisor(es) é importante levar em conta as ações que influenciam tal PVF naquele ramo.

A propriedade essencialidade do ponto de vista no ramo configura-se característica importante, a ser observada, ao longo da análise meios-fins, pois se trata da necessidade de que o PVF corresponda à consequência dos objetivos estratégicos.

As propriedades controlabilidade e exaustividade dos conceitos devem ser verificadas na análise dos objetivos fins-meios.

Realizadas as verificações das propriedades mencionadas, é possível estabelecer critérios para avaliação de desempenho das ações conforme o PVF avaliado.

3.2 Construção do Mapa Cognitivo de Grupo ou Mapa Congregado

Quando o contexto exige mais de um decisor, configura-se a necessidade da construção de mapa cognitivo coletivo.

O poder de decisão neste caso é compartilhado, porém os interesses podem ser conflitantes, devido à representatividade de diferentes áreas, bem como diferenças de perfis, personalidades, valores e etc... Ensslin (1998).

O mapa cognitivo que representa o modelo decisório de um grupo é denominado por mapa cognitivo congregado, e pode ser abordado de duas maneiras:

- Iniciar diretamente com o grupo;
- Iniciar com os mapas cognitivos individuais.

Quando o levantamento é incompleto ocorre grande perda de qualidade prejudicando a análise posterior.

O mapa congregado pode ser elaborado observando-se as seguintes etapas:

- agregação dos mapas individuais através da união dos conceitos similares devendo ser unificados pelos conceitos de sentido mais amplo; Eden (1998).
- conexão entre conceitos: conectar os conceitos por ligações de influência.

O mapa cognitivo do grupo é obtido através da negociação entre o facilitador e os decisores.

Uma vez elaborado o mapa agregado, com a evidência da contribuição de cada decisor individual, este deve ser apresentado ao grupo que passará, então, a negociar inclusão ou exclusão de conceitos, bem como suas respectivas ligações de influências para a “nova” configuração, até que se obtenha um mapa representativo dos valores dos decisores, gerando uma estrutura cognitiva coletiva denominada por mapa cognitivo congregado.

A análise desses elementos pode levar ao estabelecimento de ações que convirjam para a resolução dos problemas melhorando o desempenho dos processos de desenvolvimento dos produtos/sistemas.

4 Aplicação prática

A engenharia de requisitos depende muito da interação entre os *stakeholders* para minimizar qualquer problema na definição de requisitos, que é a base para execução de todo o ciclo de vida do sistema. O maior desafio dos profissionais envolvidos com o desenvolvimento de produtos é eliciar o conhecimento de forma a entender, plenamente, as necessidades e desejos dos *stakeholders*, traduzindo-as sob a forma de requisitos.

Aos requisitos estão vinculados os principais problemas que ocorrem durante o ciclo de desenvolvimento de produtos como por exemplo, requisitos que não correspondem às reais necessidades dos clientes, requisitos incompletos e mudanças nos requisitos já definidos são problemas que propiciam retrabalhos, insatisfações e oneram os projetos.

Em geral, os requisitos se alteram durante o desenvolvimento de um sistema, e por esta razão há que se estabelecer processos de engenharia de requisitos bem definidos, definindo padrões, e dominando, conceitualmente, o problema a ser analisado e solucionado.

Foi com a intenção de melhorar o processo de levantamento de requisitos que realizamos a experiência de aplicar mapas cognitivos para identificar os pontos de gargalos e as principais dificuldades enfrentadas pelos *stakeholders* durante a fase de elicitação dos requisitos.

4.1 O método utilizado

Para a elaboração e análise dos mapas seguimos as teorias e recomendações descritas na literatura publicada pelos autores Ensslin e Montibeller.

Foi utilizada a abordagem individual, com a construção do mapa cognitivo através de entrevistas com cada decisor.

As entrevistas foram realizadas em ambiente neutro, tanto aos decisores, como ao facilitador, com duração entre 60 e 90 minutos. Além das entrevistas, como informações complementares, foi solicitado a um fornecedor a elaboração de um texto com descrição das principais dificuldades enfrentadas por ele na qualidade de fornecedor de produtos aeroespaciais, em ambiente clusterizado como se configura a cidade de São José dos Campos.

À todos decisores foi solicitado que estabelecessem rótulo(s) para o(s) problema (s) relevantes, com liberdade total de expressão.

As entrevistas aconteceram em clima de espontaneidade, colaboração e confiança de todos os envolvidos.

A hipótese defendida de que os mapas cognitivos se prestam à melhoria do processo de levantamento de requisitos, na identificação dos problemas impactantes, bem como a compreensão da sistemática de elaboração do mapa, foi confirmada à medida em que foi possível identificar e estruturar as dificuldades detectadas ao longo do processo de engenharia de requisitos.

Os facilitadores, levando em conta os aspectos e o ambiente em que o processo cognitivo ocorreu, concluíram que:

- a liberdade de expressão e a informalidade contribuíram, sobremaneira, para o desenvolvimento do trabalho de forma acelerada;
- durante as entrevistas iniciais foi preciso redirecionar o foco para manter a linha de raciocínio voltada para as questões levantadas pelos decisores.

4.2 Ferramenta utilizada para elaboração dos mapas. Marinho (2008)

Foi utilizado o software O IHMC CmapTools, um organizador gráfico, como ferramenta, de apoio, para criar, editar, compartilhar, navegar e comentar mapas conceituais.

Trata-se de um software para autoria de Mapas Conceituais desenvolvido pelo *Institute for Human Machine Cognition da University of West Florida*. É uma ferramenta colaborativa que permite interação em rede facilitando o processo de feitura dos mapas, principalmente quando há mais de um facilitador envolvido, como foi o caso deste estudo.

Apresenta flexibilidade permitindo que módulos sejam instalados à medida em que suas funcionalidades sejam requeridas, ao longo da feitura dos mapas.

Permite exportação dos mapas criados em formato XML/XTM, permitindo o uso dos mapas em outros ambientes.

Disponibiliza recursos para formatação dos Mapas, permitindo que estes sejam utilizados como imagens, vídeos, textos e até mesmo outros Mapas para detalhamento do conhecimento.

4.3 Construção do modelo

Apresentamos, a seguir, como foi elaborado o modelo para estruturar e apoiar a identificação das principais dificuldades no processo de levantamento de requisitos para desenvolvimento de sistemas no setor aeroespacial de São José dos Campos. Os dois clientes escolhidos demonstraram experiência e conhecimento no desenvolvimento de foguetes e de aeronaves.

Um dos clientes, por possuir experiência como fornecedor, foi entrevistado também na condição de fornecedor. O outro fornecedor atua no seguimento de desenvolvimento de computador aeronáutico.

As influências externas são representadas pelo mercado profissional e concorrência com outras empresas do ramo.

Os decisores revelaram heterogeneidade em termos de visão, métodos de atuação e valores.

Foram construídos quatro mapas cognitivos individuais (Anexo I) como ferramentas básicas de apoio à estruturação e identificação dos principais problemas que impactam o processo de levantamento de requisitos.

4.3.1 Contexto decisório

Trata-se do ambiente de desenvolvimento de produtos aeroespaciais no cluster aeronáutico em São José dos Campos, SP, durante a fase de levantamento de requisitos junto aos *stakeholders*.

4.3.2 Estruturação do modelo

Para elaborar o modelo foram realizadas reuniões individuais com os dois clientes e dois fornecedores.

Cada decisor expôs os problemas que vivencia no seu dia-a-dia com a engenharia de requisitos.

A vantagem das entrevistas terem sido individuais, foi que o processo de levantamento foi puro, ou seja, os decisores não foram influenciados uns pelas ideias dos outros.

Os quatro decisores entrevistados falaram sobre seus valores, experiências e embora a visão de cada um sobre aspectos relevantes da engenharia de requisitos foram diferenciadas, todos convergiram a um objetivo principal que é desenvolver o produto para satisfazer as necessidades dos *stakeholders*.

Apesar dos quatro decisores terem expressado o mesmo objetivo, o mapa foi enriquecido devido aos conceitos diferentes já que foram abordados vários problemas críticos na engenharia de requisitos o que se observa na heterogeneidade dos *clusters*.

O resultado foi a obtenção de uma visão mais abrangente dos problemas na área. Isto pode ser constatado quando observamos a quantidade de conceitos que foram unidos com outros similares, e que em um total de 81 conceitos, apenas 3 foram congregados (identificados com caixas em gris no mapa congregado), além dos principais objetivos de produzir o sistema e satisfazer as necessidades dos *stakeholders*. A grande maioria dos conceitos foi relacionada por ligações de influências.

Para realizar os *clusters*, optou-se pela inclusão do objetivo final em cada *cluster*, visando proceder a análise de cada *cluster* como um mapa individual.

1º Passo: Definição de um rótulo para o problema.

Na primeira reunião foi ainda solicitado aos decisores que informassem um rótulo para definir os objetivos principais. Cabe observar que um dos fornecedores disponibilizou as informações através de um texto, já que não dispunha de horário para participação nas reuniões.

Os rótulos escolhidos pelos clientes foram:

- Gerenciar o desdobramento dos requisitos desde o início do problema.
- Satisfazer as necessidades do cliente.

Com relação aos desenvolvedores o rótulo escolhido foi:

- Garantir a qualidade dos requisitos

2º Passo: Definição dos elementos primários de avaliação.

Ao final da primeira reunião foi solicitado a cada decisor que refletisse sobre os aspectos que consideravam importantes quando pensavam nos problemas enfrentados com engenharia de requisitos, permitindo a elaboração da lista de elementos primários de avaliação (EPAs), resultando nas EPAs, mostrados na Tabela 1:

Tabela 1 – Lista de Elementos Primários de Avaliação (EPAs).

Decisor	Elemento Primário de Avaliação (EPA)
Cliente 1: foguete	1) Diferentes processos de engenharia de requisitos podem ser um problema se não for bem gerenciado. 2) Questões de Comunicação. 3) Mudanças – gestão/impacto das mudanças. 4) Sistema para gerenciamento dos requisitos.
Cliente 2: Aeronaves	5) Nem sempre a empresa captura a vontade do cliente. 6) Dinâmica do processo: cliente quer algo hoje e amanhã quer outra coisa (mudanças no pedido). 7) Fator cultural. 8) Requisitos deficientes, com erros.
Fornecedor 1: Aeronaves	9) Má qualidade dos requisitos. 10) Não levantamento dos requisitos. 11) Erros na comunicação.
Fornecedor 2: Computador aeronáutico	12) Treinamento. 13) Aprimoramento dos processos de engenharia de requisitos e a integração com outros processos da empresa. 14) Escolha da ferramenta certa para o gerenciamento e gestão de requisitos. 15) Base de requisitos estáveis.

3º Passo: Construção dos conceitos a partir do EPAs.

Ainda nesta primeira reunião foram elaborados um conceito inicial para cada EPA indicando ação sobre cada aspecto que os decisores julgavam importantes para analisar no contexto decisório considerado.

4º Passo: Hierarquização dos conceitos e análise dos mapas

Os facilitadores realizaram a primeira versão dos mapas cognitivos individuais, com base nas informações colhidas na reunião. Foram, então, construídos quatro mapas, sendo dois dos clientes e dois dos fornecedores.

Durante a reunião cada decisor foi questionado sobre o porquê da importância e como se alcançar as ações expressadas pelos conceitos informados possibilitando a obtenção de sequenciamento das ações meios-fins e as relações de influência formalizando a topografia dos mapas, e corrigindo possíveis ambiguidades.

É importante notar que se dois ou mais conceitos estiverem posicionados em mesma linha horizontal não significa que estarão no mesmo nível hierárquico.

Desta forma, a partir dos conceitos iniciais foram elaborados os conceitos meios e fins resultando em 87 conceitos conforme mostrado na Tabela 2.

Tabela 2 – Conceitos elaborados a partir dos conceitos iniciais.

Decisor	Conceitos elaborados
Cliente 1: Foguete	23 conceitos
Cliente 2: Aeronaves	21 conceitos
Fornecedor 1: Aeronaves	18 conceitos
Fornecedor2 : Computador aeronáutico	25 conceitos
TOTAL	87 conceitos.

Os mapas foram enviados a cada decisor pra confirmarem se a orientação das ações estava de acordo com seus pontos de vista.

Os mapas foram novamente encaminhados aos decisores para validação e rearranjo possibilitando identificação dos clusters.

Mapas Cognitivos do Grupo ou Mapa Agregado.

Uma vez elaborados e validados os mapas individuais, procederam-se ao processo de agregação dos conceitos na tentativa de representar o que o grupo de decisores considerou importante observar durante o processo de análise das dificuldades enfrentadas pela engenharia de requisitos para o desenvolvimento de sistemas complexos. Os facilitadores, então, agregaram os conceitos individuais em “clusters”, ou seja, grupos de conceitos que tratam do mesmo aspecto e apresentam forte relação de influência.

Os mapas individuais foram agregados formando o mapa agregado do grupo, e novamente enviados aos decisores Montibeller (1996).

Os decisores tiveram a liberdade de realizar qualquer modificação nos conceitos e nas suas relações de influência. Os facilitadores analisaram as modificações inseridas pelo grupo e realizaram as alterações enviando novamente o mapa agregado para validação final do grupo.

A análise dos mapas - Identificação dos *clusters*

Com o mapa agregado validado, procederam-se à sua análise, inicialmente, identificando-se os clusters, ou áreas estratégicas de interesse dos decisores para obter o mapa congregado. Assim os conceitos cujo conteúdo apresentaram similaridade foram agrupados formando os clusters.

Observa-se, na tabela 3, que ocorreram casos de conceitos pertencerem a mais de um cluster, Cunha (1999).

Tabela 3 – Identificação de clusters existentes no mapas individuais.

MAPA	Clusters
Cliente 1	Necessidades Mudanças
Cliente 2	Qualidade Comunicação
Fornecedor 1	Mudanças Conhecimento Processos Ferramentas
Fornecedor 2	Necessidades Ferramentas Gestão

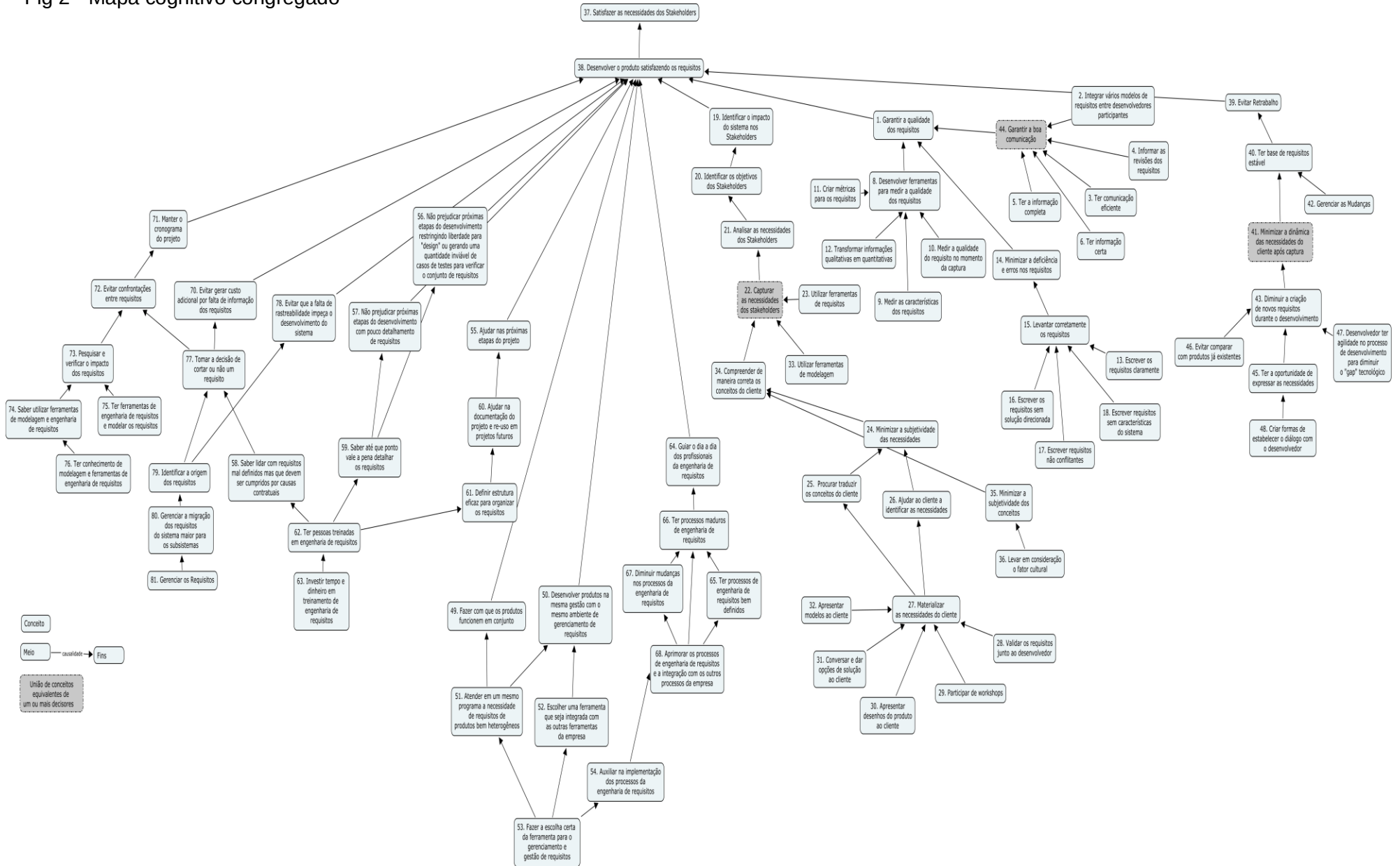
A tabela 4 auxiliou no processo de identificação dos clusters em comuns de cada mapa, resultando na detecção de oito clusters.

Tabela 4 – Identificação o de clusters comuns existentes nos mapas.

Cluster	Cliente 1	Cliente 2	Fornecedor 1	Fornecedor 2
Necessidades	X			X
Mudanças	X		X	
Qualidade		X		
Comunicação		X		
Conhecimento			X	
Processos			X	
Ferramentas			X	X
Gestão				X

O resultado dessa análise é mostrado, através dos mapas cognitivos mostrados pelas figuras 2 e 3 , apresentadas , a seguir.

Fig 2 - Mapa cognitivo congregado



O diagrama apresenta um mapa de conhecimento sobre Engenharia de Requisitos, estruturado em sete áreas principais, cada uma representada por uma cor e um tipo de linha tracejada:

- Comunicação** (Linha tracejada magenta): Foca na interação com stakeholders e na comunicação de requisitos. Inclui práticas como "Garantir a qualidade dos requisitos", "Desenvolver ferramentas para medir a qualidade dos requisitos", e "Ter comunicação eficaz".
- Qualidade** (Linha tracejada verde): Relacionada à validação e verificação dos requisitos. Inclui práticas como "Validar os requisitos antes do desenvolvimento", "Testar os requisitos", e "Garantir a qualidade dos requisitos".
- Mudanças** (Linha tracejada amarela): Trata da gestão de mudanças nos requisitos. Inclui práticas como "Gerenciar as mudanças", "Analisar o impacto das mudanças", e "Compreender o impacto das mudanças".
- Necessidades** (Linha tracejada azul): Foca na identificação e análise das necessidades do cliente. Inclui práticas como "Identificar as necessidades do cliente", "Analisar as necessidades do cliente", e "Compreender as necessidades do cliente".
- Processos** (Linha tracejada laranja): Relacionado aos processos de engenharia de requisitos. Inclui práticas como "Definir o processo de engenharia de requisitos", "Implementar o processo de engenharia de requisitos", e "Monitorar o processo de engenharia de requisitos".
- Ferramentas** (Linha tracejada verde): Foca no uso de ferramentas para apoiar a engenharia de requisitos. Inclui práticas como "Selecionar ferramentas", "Implementar ferramentas", e "Manter as ferramentas atualizadas".
- Conhecimento** (Linha tracejada vermelha): Relacionado ao conhecimento sobre requisitos e engenharia de requisitos. Inclui práticas como "Manter o conhecimento atualizado", "Compartilhar o conhecimento", e "Aprender com o conhecimento".

As práticas são representadas por caixas de texto, e as linhas tracejadas indicam as conexões e fluxos entre elas, mostrando a interdisciplinaridade da Engenharia de Requisitos.

Linhas de Argumentação do Mapa Cognitivo Congregado

As linhas foram identificadas através da composição dos conceitos respeitando-se a organização do mapa devido às influências e hierarquias, e tomando como ponto de partida os conceitos terminais, denominados conceitos “Caudas”, e direcionando-os até os conceitos que representam os objetivos principais, denominados conceitos “cabeças”.

A tabela 5 mostra as linhas de argumentação detectadas na topologia do mapa congregado.

Tabela 5 – Linhas de Argumentação.

Cluster	Linhas de argumentação	Sequência de conceitos
Gestão	A1	C81 - C80 - C79 - C78 - C38 - C37
Gestão	A2	C81 - C80 - C79 - C77 - C70 - C69 - C38 - C37
Gestão	A3	C81 - C80 - C79 - C77 - C72 - C71 - C38 - C37
Gestão	A4	C76 - C74 - C73 - C72 - C71 - C38 - C37
Gestão	A5	C75 - C73 - C72 - C71 - C38 - C37
Treinamento	A6	C63 - C62 - C58 - C77 - C70 - C69 - C38 - C37
Treinamento	A7	C63 - C62 - C59 - C57 - C38 - C37
Treinamento	A8	C63 - C62 - C59 - C56 - C38 - C37
Treinamento	A9	C63 - C62 - C61 - C60 - C55 - C38 - C37
Treinamento	A10	C63 - C62 - [C58] - C77 - C70 - C69 - C38 - C37
Treinamento	A11	C63 - C62 - [C58] - C77 - C72 - C71 - C38 - C37
Ferramentas	A12	C53 - C51 - C49 - C38 - C37
Ferramentas	A13	C53 - C51 - C50 - C38 - C37
Ferramentas	A14	C53 - C52 - C50 - C38 - C37
Ferramentas	A15	C53 - [C54] - C68 - C65 - C64 - C38 - C37
Ferramentas	A16	C53 - [C54] - C68 - C66 - C64 - C38 - C37
Ferramentas	A17	C53 - [C54] - C68 - C67 - C64 - C38 - C37
Processos	A18	C68 - C65 - C64 - C38 - C37
Processos	A19	C68 - C66 - C64 - C38 - C37
Processos	A20	C68 - C67 - C64 - C38 - C37
Necessidades	A21	C32 - C27 - C25 - C26 - C24 - C22 - C21 - C20 - C19 - C38 - C37
Necessidades	A22	C31 - C27 - C25 - C26 - C24 - C22 - C21 - C20 - C19 - C38 - C37
Necessidades	A23	C30 - C27 - C25 - C26 - C24 - C22 - C21 - C20 - C19 - C38 - C37
Necessidades	A24	C29 - C27 - C25 - C26 - C24 - C22 - C21 - C20 - C19 - C38 - C37
Necessidades	A25	C28 - C27 - C25 - C26 - C24 - C22 - C21 - C20 - C19 - C38 - C37
Necessidades	A26	C31 - C27 - C26 - C24 - C22 - C21 - C20 - C19 - C38 - C37
Necessidades	A27	C30 - C27 - C26 - C24 - C22 - C21 - C20 - C19 - C38 - C37
Necessidades	A28	C29 - C27 - C26 - C24 - C22 - C21 - C20 - C19 - C38 - C37
Necessidades	A29	C28 - C27 - C26 - C24 - C22 - C21 - C20 - C19 - C38 - C37
Necessidades	A30	C32 - C27 - C26 - C24 - C22 - C21 - C20 - C19 -

		C38 - C37
Necessidades	A31	C23 - C22 - C21 - C20 - C19 - C38 - C37
Necessidades	A32	C33 - C22 - C21 - C20 - C19 - C38 - C37
Necessidades	A33	C36 - C35 - C34 - C22 - C21 - C20 - C19 - C38 - C37
Qualidade	A34	C9 - C8 - C1 - C38 - C37
Qualidade	A35	C10 - C8 - C1 - C38 - C37
Qualidade	A36	C11 - C8 - C1 - C38 - C37
Qualidade	A37	C12 - C8 - C1 - C38 - C37
Qualidade	A38	C13 - C15 - C14 - C1 - C38 - C37
Qualidade	A39	C16 - C15 - C14 - C1 - C38 - C37
Qualidade	A40	C17 - C15 - C14 - C1 - C38 - C37
Qualidade	A41	C18 - C15 - C14 - C1 - C38 - C37
Comunicação	A42	C2 - C44 - C1 - C38 - C37
Comunicação	A43	C3 - C44 - C1 - C38 - C37
Comunicação	A44	C4 - C44 - C1 - C38 - C37
Comunicação	A45	C5 - C44 - C1 - C38 - C37
Comunicação	A46	C6 - C44 - C1 - C38 - C37
Comunicação	A47	C7 - C44 - C1 - C38 - C37
Mudanças	A48	C48 - C45 - C43 - C41 - C40 - C39 - C38 - C37
Mudanças	A49	C46 - C43 - C41 - C40 - C39 - C38 - C37
Mudanças	A50	C47 - C43 - C41 - C40 - C39 - C38 - C37
Mudanças	A51	C42 - C40 - C39 - C38 - C37

[Cx]: Ligação a outro *cluster*

Ramos do Mapa Cognitivo.

Baseado nas linhas de argumentação buscamos detectar os ramos do mapa, ou seja, o conjunto de linhas de argumentação que congregam preocupações similares no contexto.

A tabela 6 mostra os ramos detectados em nossa análise.

Tabela 6 – Ramos do Mapa Cognitivo Congregado.

Cluster	Ramos	Linhas de Argumentação que compõem o ramo
Gestão	B1	A1, A2, A3
Gestão	B2	A4, A5
treinamento	B3	A6, A7, A8, A9, A10, A11
Ferramentas	B4	A12, A13, A14, A15, A16, A17
Processos	B5	A18, A19, A20
Necessidades	B6	A21, A22, A23, A24, A25, A26, A27, A28, A29, A30
Necessidades	B7	A31, A32
Necessidades	B8	A33
Qualidade	B9	A34, A35, A36, A37
Qualidade	B10	A38, A39, A40, A41
Comunicação	B11	A42, A43, A44, A45, A46, A47
Mudanças	B12	A48, A49, A50, A52

Fig. 3 Mapa congregado exibindo *clusters* e Ramos.

Árvore dos Pontos de Vista Fundamentais

Para a identificação e análise dos Pontos de Vista Fundamentais (PVFs), utilizamos a teoria de Ensslin com base no tipo de mapa cognitivo “mapa causal ou de influência”.

Como mencionamos, anteriormente, o mapa cognitivo representa uma hierarquia de conceitos relacionados por ligações de influência entre meios e fins. Montibeller (2000).

Os clusters são aspectos essenciais e desejáveis de serem levados em consideração durante a avaliação de ações – eixos da avaliação do problema.

Isto posto, foram identificados os candidatos aos Pontos de Vista Fundamentais do modelo a partir do mapa congregado validado já com a identificação dos “clusters” Montibeller (1996), Lima (1997) e Ensslin (1998).

A transição dos mapas para a elaboração da árvore de Pontos de Vista Fundamentais foi realizada sem a presença dos decisores, conforme orientação de Montibeller. Belton apud Montibeller (1996), Belton (1997).

O método adotado foi o descrito por Ensslin. Os ramos do mapa foram percorridos em busca da identificação dos pontos de vista, no sentido meios-fins, observando-se o grau de essencialidade do ponto de vista expresso pelo decisor no ramo analisado, e no sentido fins-meios, o grau de controlabilidade dos conceitos que compõem os ramos. Desta forma foram identificados os elementos para a composição da árvore de pontos de vista fundamentais conforme apresentada, a seguir: Ensslin (2001).

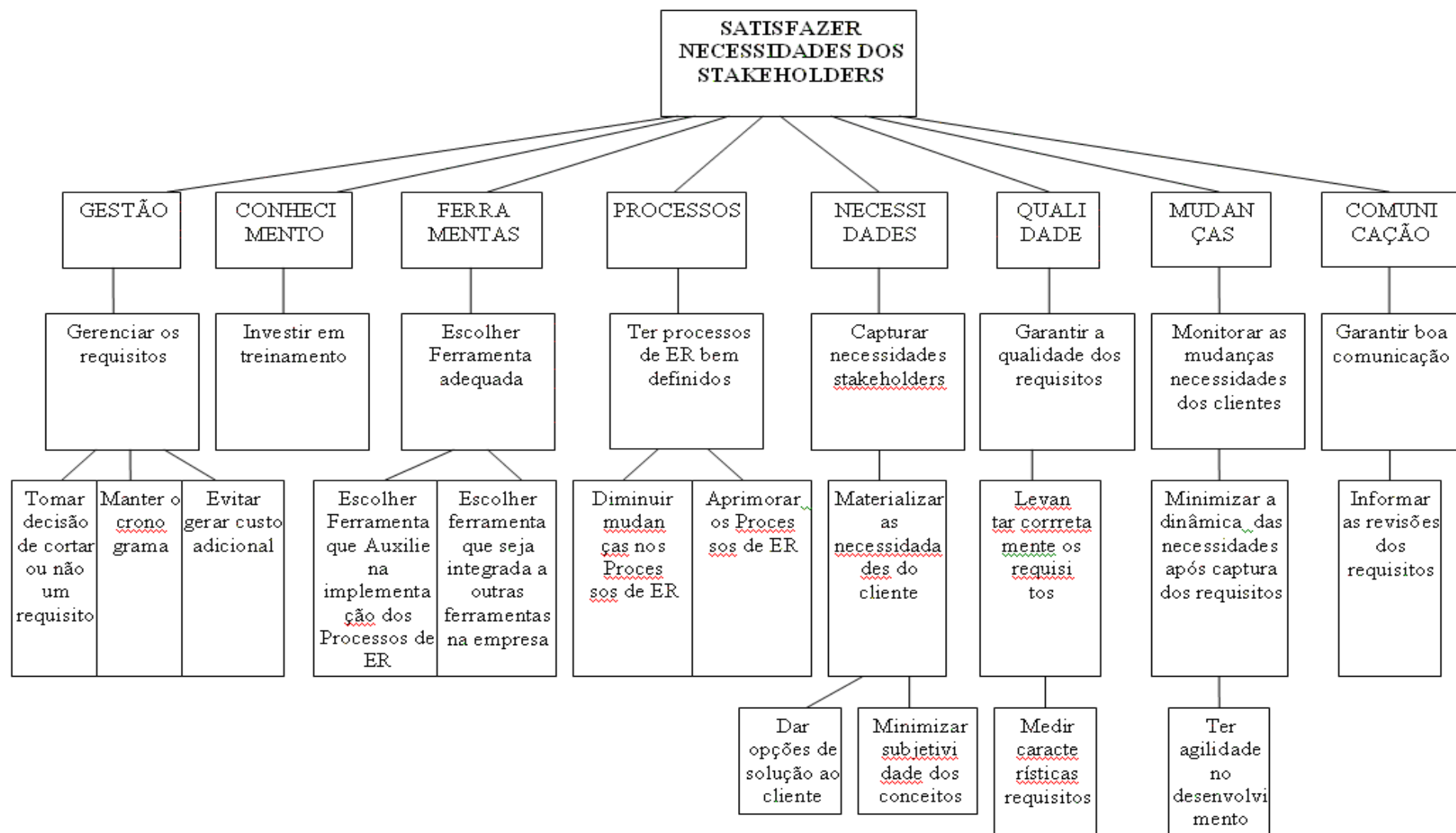


Fig 4 – Árvore de Pontos de vista fundamentais.

Por último o mapa congregado e a árvore dos candidatos à pontos vista fundamentais foi enviada aos decisores para análise conjunta com os facilitadores sobre as ações estratégicas que poderão reduzir dificuldades no processo de engenharia de requisitos para desenvolvimento de sistemas complexos.

Atendimento às propriedades dos Pontos de Vista Fundamentais (PVFs)

- Compreensibilidade: Os pontos de vista fundamentais foram concebidos de forma que todos os envolvidos na construção do modelo demonstraram compreensão.
- Consensualidade: Os PVFs representam o consenso do grupo de decisores.
- Aceitabilidade: os PVFs foram aceitos por todos que fizeram parte do processo decisório;
- Exaustividade: não existem ações pontuadas pelos decisores da mesma forma.
- Coesividade: existe compatibilidade entre o papel que cada PVF em relação às preferências dos decisores em torno dos objetivos
- Não-redundância: Os PVFs prestam-se à avaliação de aspectos diferentes.

5 Resultados.

O resultado deste trabalho consistiu na elaboração de quatro mapas cognitivos individuais, e um congregado. (Anexo1) que possibilitaram a identificação das dificuldades enfrentadas ao longo do processo de levantamento de requisitos para construção de sistemas complexos, neste caso, direcionados para o desenvolvimento de produtos aeroespaciais em São José dos Campos, SP.

Os mapas revelaram oito áreas de interesse (*clusters*) sobre as quais convergem a maioria das dificuldades detectadas.

A Tabela 7 mostra as ações estratégicas, reveladas pelo mapa, para análise posterior de ações que poderão impactar as áreas de interesse .

Tabela 7 – Áreas de impacto e ações estratégicas para cada área.

Área de Impacto	Ações estratégicas.
1) Gestão	1) tomar decisão se corta ou não um requisito. 2) Manter o cronograma. 3) evitar gerar custo adicional.
2) Conhecimento	1) Investir em treinamento.
3) Ferramentas	1) escolher ferramenta que auxilie na implementação dos processos de Engenharia de Requisitos. 2) escolher ferramenta que seja integrada a outras ferramentas da empresa.
4) Processos	1) Diminuir mudanças nos processos de Engenharia de Requisitos. 2) Aprimorar os processos de Engenharia de Requisitos.
5) Necessidades	1) Dar opções de solução ao cliente. 2) minimizar a subjetividade dos conceitos.
6) Qualidade	1) Medir as características dos requisitos.
7) Mudanças	2) Ter agilidade no desenvolvimento
8) Comunicação	3) Informar as revisões dos requisitos.

6 Conclusão

Os objetivos pretendidos deste trabalho foram alcançados de forma satisfatória, criando oportunidade para o estabelecimento de ações que minimizem os problemas detectados e fontes de conflitos entre fornecedores e clientes de sistemas complexos, específicos do domínio aeronáutico.

O mapa cognitivo revelou-se uma ferramenta eficiente para a captura de percepções individuais subjetivas já que considera o perfil de cada envolvido como substrato de suas experiências, formação de valores, e poder de decisão no domínio estudado.

De acordo com os desenvolvedores e clientes pesquisados neste estudo, a atividade de validação foi considerada a mais importante, e os problemas de comunicação foram considerados como a fonte principal de conflitos e dificuldades em todo o processo de desenvolvimento, por vezes provocando mudanças tão expressivas que culminam na especificação de um novo produto.

Este estudo levantou as principais dificuldades enfrentados por desenvolvedoras de produtos aeroespaciais, considerados complexos, durante o processo de engenharia de requisitos. Os principais resultados do estudo incluem os aspectos descritos, a seguir:

7. Comprometimento do cronograma e atendimento aos requisitos dos clientes.

8. Para os entrevistados os problemas elencados tem como fator gerador a falta de conhecimento de todo o ciclo de desenvolvimento por parte dos desenvolvedores, e falta de clareza das solicitações do clientes e, principalmente, comunicação deficiente dificultando a interação desenvolvedor-cliente.

Além de instrumento eficiente para a negociação, o processo de desenvolvimento dos mapas cognitivos permitiram a participação de um ou mais decisores promovendo aprendizagem a todos os envolvidos face à indução à reflexão e a natureza recursiva que dominam todo o processo, além de estabelecer um cenário rico para decisões racionais e confiáveis considerando que é específico para o contexto analisado e suas particularidades..

Este cenário é relevante quando tratamos de desenvolvimento de sistemas complexos em ambiente competitivo, heterogêneo, e com a presença de interesses conflitantes, bem como visões diferenciadas do processo de tomada de decisão e dos impactos propiciados pelo levantamento de requisitos de forma deficiente.

O estudo de caso do trabalho configurou-se na estruturação do ambiente para identificação dos problemas que impactam o processo de desenvolvimento de sistemas complexos. Construiu-se o mapa cognitivo, que demonstrou todos os conceitos e suas ligações, que expressaram os sentimentos e as visões dos decisores, matéria prima para a construção da árvore dos pontos de vista fundamentais permitindo a identificação dos problemas.

6.1 Recomendações

Cabe ressaltar que os resultados apresentados correspondem a um passo inicial para a estruturação dos problemas detectados, carecendo de continuidade, com agregação de maior número de fornecedores e clientes, com vista à tentativa de generalização dos pontos de gargalos no processo de levantamento de requisitos, à luz da Engenharia de Requisitos.

Recomendamos a partir dos mapas elaborados, a estruturação de cada problema detectado e o uso de ferramenta de decisão multicritério para a escolha das alternativas mais adequadas para introdução de melhorias nos processos de levantamento de requisitos e de relacionamento entre cliente e fornecedor, gerando base para tomada de decisões ao longo do ciclo de desenvolvimento dos sistemas complexos.

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THE ANALYSIS AND USE OF MECHANISM OF SERENDIPITOUS DISCOVERIES

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ABSTRACT

Accidental discoveries in serendipitous phenomena are often observed in our environments. The mechanism of this phenomenon is analyzed on “accidents” and “sagacity” as pointed out by Horace Walpole.

For the analysis, we applied mainly a theory of Japanese philosopher Shuzo Kuki on “accidents” and a theory of American philosopher Charles S. Peirce on “sagacity.” Kuki distinguished accidents into three categories which work in different ways for discoveries. Peirce formalized the process of discovery with an abduction theory on hypotheses.

We developed a cards system to make effective observations for increasing accidental discoveries. The cards system supports evoking memories with externalized cards in form of hypothesis on a subject. These accumulated cards kept in containers work in times when we solve various issues, and are useful in the time of comparing among subjects, improving on relating ideas. We have established a course named “Creativity and Serendipity” in a postgraduate school of University since 2006.

Keywords: serendipitous phenomena, accidents, sagacity, abduction, hypotheses

1. INTRODUCTION

Accidental discoveries are often observed in the daily lives and also in academic researches. As this phenomenon is known as serendipitous discoveries, the word “serendipity” coined by Horace Walpole has been recognized to express this phenomenon by many people over two centuries. Since the other word cannot express this concept so well like this word.

The Purpose of this paper is to analyze the mechanism of accidental discoveries or a serendipitous phenomenon, and to develop a methodology of using the mechanism for discoveries.

Walpole pointed out two factors for discoveries in the letter coined “serendipity,” which are written as “They were always making discoveries, by accidents and sagacity, of things which they were not in quest of” related to the three prizes of “Serendip” in a silly fair tale. The significance of this view point is to analyze a given circumstance in simplified two factors, which can expand to the view point for discoveries on different discipline.

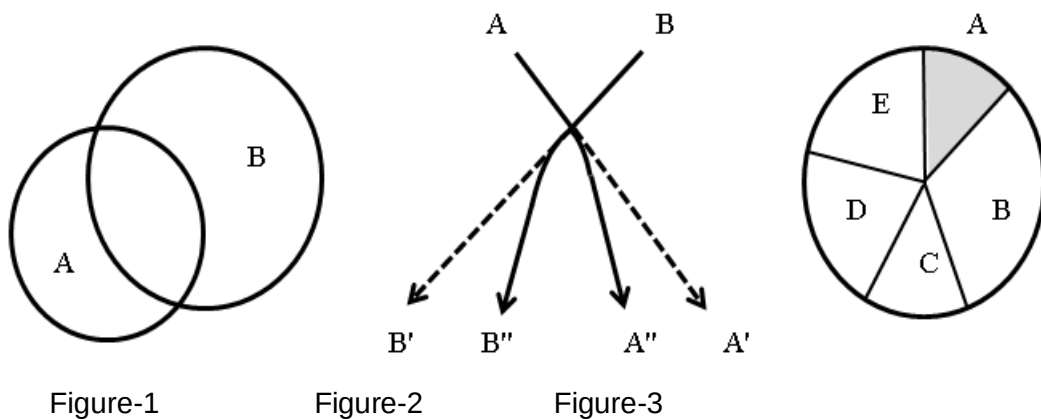
A mechanism of accidents and sagacity for discoveries is analyzed respectively with their roles on the bases in philosophical theories. A mechanism of accidents for discoveries is analyzed with theories by Shuzo Kuki who distinguished accidents in three categories. A mechanism and roles for discoveries are explained in different ways on each category. And a mechanism of sagacity for discoveries is analyzed with an abduction theory by Charles Sanders Peirce who formalized a system of discoveries with a hypothesis.

We confirmed quite naturally that memories of previous subjects have an important role to make an encounter with information from outside stimulus, because a hypothesis can be set up with ideas in brain. Then we developed a card system to have cleared subjects in brain and increase encounters for accidental discoveries. We also introduce effective use of this card system through the experience in the course of postgraduate school of University.

2. MECHANISM AND ROLE OF ACCIDENTS IN DISCOVERIES

Shuzo Kuki distinguished contingency into three categories those are “Categorical contingency,” “Hypothetical contingency,” and “Disjunctive contingency.” Imagery model of these categories are shown in Figure-1, Figure-2, and Figure-3 respectively.

In categorical contingency of Figure-1, Circle-A shows a previous concept and Circle-B shows a revised concept. The change from concept-A to concept-B gives one a feeling of accidents, as one cannot expect the change oneself.



In hypothetical contingency of Figure-2 shows that two independent persons A and B who are going to A' and B' change their course to A'' and B'' after they encountered unexpectedly. The change from A' and B' to A'' and B'' gives them a feeling of accidents, as they didn't expect this encounter.

In disjunctive contingency of Figure-3, the selection by others such as a lot on part-A gives a feeling of accidents, as one cannot determine oneself in one's mind on any one from part-A to part-E.

We applied these contingencies to analyze mechanism of accidental discoveries, as we recognize that accidents happen in these contingencies. Even the case of most discoveries have complicated categories, the basic categorization is still applicable to analyze the mechanism of discoveries.

2.1 CATEGORICAL CONTINGENCY

Every person has their own concepts in their mind. As one cannot always have true concepts, one sometimes has to correct untrue concept. In this correction, one feels accidental affairs or unexpected events, since these actions mean that one has to deny last oneself in that moment without foreseeing. Progress of the world also changes the truth of one concept in the current paradigm.

2.2 HYPOTHETICAL CONTINGENCY

As independent person cannot fully know actions of every other independent person and every other thing, one quite often meets with unexpected events. These events cause so often in daily life that one is not conscious of these events. However in the time when one has to change one's important purpose by these events, one feels accidents in this encounter. Hypothetical contingency contains three types; reasonable contingency, causative contingency, and objective contingency,

2.3 DISJUNCTIVE CONTINGENCY

One feels fairness in the equality in each classified standard. Even one recognizes the scattering of conditions and the importance of diversity, one still feels accidental happiness or accidental absurdity in the time when one has to belong in classified standard. As a lottery makes big difference of fortune in equal fairness, human beings often use lottery for giving a feeling of equality.

2.4 ROLE OF ACCIDENTS

The first role of accidents in discoveries is to provide unexpected circumstances which human beings can not plan deliberately. The second role of accidents is to loosen the constraints of the current paradigm. The third role of accidents is to make an incorrect conviction to execute an invention, while new technology or other person may assist successful completion. Umberto Eco called the force of false for incorrect conviction. We realize that given circumstances are various encounters for accidental discoveries, and we are required to habituate observation for them.

2.5 CHARACTERISTIC OF ACCIDENTS

As characteristic of accidental discoveries is significant, one may use the advantage of characteristic in planned width of action as shown in Figure-4.

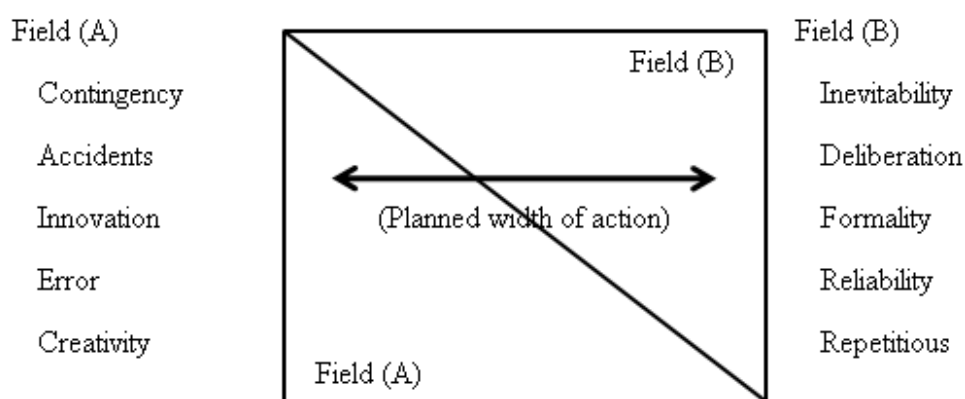


Figure-4

When one requires sureness on actions, one may make plan in main part of Field (B). And when one requires innovation and creativity on actions, one may plan in main part of Field (A) with risk of errors.

Characteristic concerned to accidental discoveries is expressed with words such as contingency, accidents, innovation, error, and creativity. And opposite conditions are expressed with words such as inevitability, deliberation, formality, reliability and repetitious. For the use of mechanism of accidental discoveries, we have advantages with manage of these concepts in proceeding works.

3. MECHANISM AND ROLE OF SAGACITY IN DISCOVERIES

Sagacity works to discover an unexpected subject in encounters with given circumstance. As sagacity depends on obtained knowledge and good judgement, it can be levelled up efficiently by training of practice based on the mechanism of accidental discoveries.

Role of sagacity is good judgement to relate a stimulus with a subject in brain as in memory. This judgement does not always require total insight of discoveries, and may require slight doubtful or strangeness on a truth in the current paradigm. Since some of serendipitous discoveries take a long period of time before obtaining results, role of sagacity is significant on sharpness of intellect in the moment of an encounter. A deep insight of subject in the current paradigm sometimes leads a miss judgement to give up a theme of research, and even a false insight in the current paradigm leads a fruitful result due to unexpected progress of the world. The first step of roles on sagacity is conscious to strangeness in a subject on observation. And second step of roles on sagacity is aware of significance to grow up a subject.

3.1 SAGACITY AND ABDUCTION

Charles Sanders Peirce proposed abduction inference which is added to deduction and induction to complete inference. In his theory, abduction is where we find some very curious circumstance, which would be explained by supposition that it was a case of a certain general rule, and thereupon adopt that supposition. Discoveries are led by this supposition in a form of hypothesis, when an encounter with interesting events or curious circumstance is appeared.

One usually meets many of such curious circumstance in daily life, and one forgets most of them without realizing. And most of knowledge lose chance to be used in the time when it is related, even one has enough knowledge in memory. Therefore, one has to habituates to notice curious circumstance with one's hypotheses. As subjects make encounters for accidental discoveries, one has to vitalize one's subjects in memory to increase numbers of encounters with some objects in observation. Herein, one's subjects mean such as issues, themes of research and purpose in one's life.

Then we developed a card system which makes conscious of subjects in memory. One recalls a subject in memory when one notices specified relation with an object in encounters.

3.2 ABUDUCTION INFERENCE

We use abduction inference in daily life, as abduction inference is easy and effective to use. In this inference, we may find out truth effectively in verification with risks that we sometimes have errors. Hypothesis is a good counterpart of abduction inference to make encounters for discoveries. We externalize a subject on a card in a form of hypothesis, because consideration for the hypothesis makes further clear memory than observation records. These externalized cards have a role of indexes for subjects in memory. Cards are also used to nourish subjects for further useful significance.

3.3 CARD SYSTEM TO SUPPORT SAGACITY

We developed "Serendipity Card System" to support sagacity which is difficult to keep in active conditions. We record "date," "theme," "hypothesis," and "5W + 1H" on a Serendipity Card in the size of name cards. And we add "Result" when we find new phase of encounters on a related subject on a same card. The card is so small that suitable for portability to record in every moment of encounters. Then a card is used in long time after externalizing subjects for encounters a subject in memory with an object on observation.

The significance of using "Serendipity Card" is shown as follows, herein after we call card(s) for "Serendipity Card."

- a. To externalize a subject on a card in a form of hypothesis.
- b. To clear subjects in memory with a card used for index.
- c. To keep cards in containers for long time uses.
- d. To look for cards on related subjects in containers.
- e. To relate a subject with another subjects using cards.
- e. To reevaluate a subject on a card in the current paradigm by any chances.
- f. To vitalize subjects through works on the above actions.

We named “Brain Inventory Works” to use this card system in any purpose, as we execute inventory works of memories in brain.

4. CURRICULUM OF “CREATIVITY AND SERENDIPITY”

We have established a curriculum named “Creativity and Serendipity” which consist of 14 times of each 90 minutes in the course of management of technology for postgraduate school of university since 2006. In the class, about 20 students in each year attend lectures and participate in training session of accidental discoveries on their own themes. The main training procedure is shown as follows.

- a. To set up more than 30 hypotheses on subjects in one’s research.
- b. To practice “Brain Inventory Works” for vitalizing memories.
- c. To discuss with each other for increasing encounters.
- d. To recognize one’s errors by serendipity cards.
- d. To present the result of one’s research with experience of encounters.

Significance of encounters in the first phase is usually so small that students have to practice for notice them. And students nourish a significance to grow up for discoveries. In this process, they level up the power of considerations on hypothesis with cards. They also recognize that they have to set up hypotheses in free from misgiving of errors, as errors on hypotheses suggest valuable result in their inference.

5. CONCLUSION

Training methods for accidental discoveries are available to many disciplines, since accidental discoveries happen in unexpected encounters of wide fields. We analyzed the mechanism of accidental discoveries with philosophical theories and expressed some part of them in explicit form. We developed the Serendipity Card System to force the effect of sagacity for increasing encounters. The card system clears one’s evidence and proves one’s error which one obtains valuable experience. The attendants of the lectures have interest in accidents in the first stage and then they are able to use this mechanism of phenomenon by habituating themselves with hypotheses. A procedure of applying this system is so simple that one applies to

practice one's researches and issues. One repeats considerations on both sides of changes in mind and circumstances with the Serendipity Cards. Significance of this method is to accumulate small notices and make vivid subjects in memory with repetitious considerations for accidental discoveries.

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LIVING INNOVATION, INNOVATIVE LIVING

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Abstract

Living innovation, innovative living Nowadays companies know for sure it's just innovate or die. But what about the people that has to do precisely that job? Why should they be personally interested? Usual motivation doesn't make it, because real cutting-edge innovation is about passion (the elder sister of motivation). And to be honest: real creative people doesn't behave like that out and not in (or vice versa) the company. Moreover, people are asking for a more holistic approach to life and work – barriers are falling down for talented people, and a new paradigm has to be attained. Living innovation, innovative living will try to ask the question about why (or how) people would be interested on innovation

CONCEIVING, EXPLORING AND EXPLOITING INNOVATIVE IDEAS – A CASE STUDY

Stella Bezergianni

Abstract

Innovation is a creative expression of practical new ideas aiming to simpler, less expensive and better performing products and processes. Even though there are many researchers, scientists and engineers involved in science and technology, only a few offer innovation technologies. The process of conceiving, exploring and exploiting innovative ideas is presented via an actual example of a new innovative process developed in the Center for Research and Technology Hellas in Thessaloniki Greece.

This new technology converts waste cooking oil (WCO) into a new 2nd generation biodiesel product. The steps of how such an idea was created, how it was explored as well as how it can be exploited are presented. In particular, the environmental problem that triggered research in this field, the means of research and the plans for technology licensing are the main focus of this presentation, aiming to give a good example for creating and exploiting innovative ideas.

And yet they create...

What can (very) creative industries teach us about innovation management ?

Thomas Paris

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Abstract

Creative industries are a very rich object to analyse, since they cope with huge challenges. When you think about it, they accomplish miracles day after day. Because creation seems antinomic with organization. Now, in these industries, some companies manage to be durably creative, sometimes independently of the people they host. Names like Pixar or HBO or Hermès are even synonymous of creativity. How do they do this? What are the challenges of creation, and how do these companies cope with them? And what lessons can we draw from these companies to promote innovation ?

The presentation will capitalize on a research focused of the creative industries in an organizational point of view, in order to propose some answers to these questions.