



DESIGN THINKING IN THE DEVELOPMENT OF NEW PRODUCTS: A CASE STUDY

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ABSTRACT

The goal of this study is to understand how the Design Thinking tool helps the identification of opportunities, creation and development of new products or services developed by academics. Therefore, the stages of identification, inspiration, ideation and implementation of the development of products and services were studied through observation, interviews and questionnaires applied to the teams of academics who developed a product as a curricular activity to be presented at the Entrepreneur Fair, which happens every year. It was observed that empathy with the user or client was essential in all stages of the process that guided the thoughts related to invention, intuition, and concretization. It was also identified that innovative thinking was fundamental in promoting competitive advantage among teams by either improving, reinventing or aligning products, processes or services in new perspectives.

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INTRODUCTION

The concept of innovation has been widely discussed among academic and scientific communities. For Caldeira et. al. (2012, p.5), innovation is the ability to transform ideas into products and services, in other words, it is responsible for creating a product or bringing new perspectives to a product, a business practice, a new or significantly improved process. Innovation can be translated as the successful exploration of new ideas, essential to sustain competitiveness and wealth generation as competitiveness requires the presence of innovative and creative systems. The exploration of new ideas comes from professionals that perform several services such as product and process improvement. Professionals that fail to adopt an innovative consciousness to rediscover themselves and/or to reinvent themselves continually are likely to be fixed at an operational level, not strategic or tactical. Thinking about a better, more economical, efficient and resource-efficient solution is part of our culture, but rather than generating ideas, the big challenge lies in implementing innovative projects. In this context, this study seeks to understand how occurs the identification of opportunities, creation and development of new products or services developed by future management

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professionals. To do so, it maps the teaching experience in terms of global view and the processes inserted in the life of the academics of a university using the Design Thinking tool.

The innovation and the design thinking: Although innovation has its main goal to bring several benefits and contributions to humanity, innovation can be seen as an obstacle for some organizations that insist on resisting the power of the changes that this interaction brings. In order to obtain a competitive advantage against the competition, innovation becomes a fundamental part of an organization's success. Santos, Fazon e Meroe (2011, p.3) argue that "seek innovation as a competitive difference of your activities and consider the investments needed for its implementation, through your own resources or from third-partners: public or private". In addition, it is known that the process of innovation without the complete and comparative deepening to others is not 100% effective; the article *The Role of the Users in the Innovation Process* of Conway presents a research that compares 50 successful innovations with others that failed. In these researches, it was possible to register the importance of the company's different internal activities (production, marketing, sales and others). Thus, it defined as the main attributes of the success cases: the bound with external research sources, innovators that have obtained success not only had a R&D (Research and development) laboratory itself, but also made a

considerable use of external sources. Meanwhile, the lack of communication between the internal and external researchers were noticed at the failure cases. Therefore, the effectiveness of an innovation depends directly of a high and well-developed investment degree, always thinking about the future and the continuous competition. In Laruccia's view (2007, p.9), the disadvantages of innovation encompass an environment in which "some organizations can be hostile to creativity, and any person that manages the creativity is likely to find obstacles, for example: free expression suffocated by a dominant culture or guilt; general resistance to changes; reluctance to think or change strict schemes of work; failure being considered as a cause of penalties, not an opportunity to learn; a view that the best ideas come from a higher hierarchy, communication that is bad or only moves from higher to lower levels; formalities or rigid rules; inadequate or non-existent incentives; slow decision-making". In contrast, according to Silva et al. al. (2003, p.4), some advantages of the innovation process for organizations include, for example, easier access to sources of information about technology, flexible organization charts due to adaptations and search for better placements, especially for large companies. There is great difficulty in defining design thinking and its origin. According to Endeavor (2018), "in this tool, DT is a method that can be applied by any entrepreneur. However, the entrepreneur should absorb the DT as a business development philosophy. Successful entrepreneurs were design thinkers when this term did not even exist, hence the difficulty in defining its origin. Nevertheless, the term only gained popularity with the work of Ideo, a renowned consultancy, initially of design, now in DT or Human Centered Design (HCD), a new term presented by the company.

This approach is developed in four steps

- Identify where to find innovation opportunities - in this stage the knowledge of the external environment, internal, the strengths of the company/product, using tools that help identify an innovative product/process.
- Discover the Innovation Opportunity - this stage is where qualitative researches are done, as well as working with solutions found in a database of consumer behavior that can indicate the opportunity that the product/business will generate.
- Develop the Innovation Opportunity (Product or Service) - In this stage, the product or service is developed and it is possible to discover the diagnosis and the creative process to generate the product possibilities.
- Test the ideas - prototypes - Observation of how the product will behave in the market. This is a period of testing and verifying, without great expense, if your idea really meets the needs of your final consumer.
- Implement the solution - is the product's launch on the market.

MATERIALS AND METHODS

The methodology was to observe and interview 12 teams of business academics who developed projects of new products or services. Furthermore, the Design Thinking tool was applied through a structured questionnaire and observation in all stages of product development. The research theme was based on Lakatos (2003, p. 158) premises based on the "knowledge, aptitude, inclination and tendencies of the theme to be

elaborated, and also that the object should be a theme that presents the characteristics of research that deserves attention, formulation capacity and focus on the delimitation of research". In this case, products and services developed by the academics were analyzed based on presented characteristics related to the concept of Design Thinking from the perspective of the stages of identification, inspiration, ideation and implementation of product development. The first step was the indication where it was verified how the groups identified the opportunity for the development of the product and if they used tools. In the second stage, aspects related to inspiration were analyzed where the insights that contributed to the development of the product/service were verified. At the stage of the analysis of the ideation, in other words, the construction of the prototype, it was necessary to observe if the firing of insights from the previous stage was fundamental and if the closing phase was designed. For the last stage, the implementation, or the launch of the product/service, the groups received opinions of possible clients, through the application of a questionnaire. The concept of innovation also goes into this theme, as it is what makes this process feasible. Innovation also seeks to change, to bring new perspectives to a product or service, or to create a new one, as stated by Caldeira, Santos, Barbosa, Pires, Palma and Cintra (2012, p.5).

RESULTS AND DISCUSSION

The main goal of stimulating new ideas through the Design Thinking methodology is its own promotion and dissemination, as there is a need to present how important and promising a project can be, using few resources. This study aimed to observe the planning of new products using the design thinking stages and twelve teams raising questions and debates about the main motivating factors that influenced the teams to the development of innovative ideas during the experiment. The results are presented below:

Based on their experiences in developing new products, most interviewees (66.7%) pointed out that the team planning grade represented a scale of 4 (from 1 to 5) on average related to the planning of the product or service that is being innovated. Planning is essential for any product's design and several tools must be used, including Design Thinking that stimulates new thinking and improvement for products. Every team carried out a research with possible clients questioning their expectation for the product or service that was being created. Most customers answered that they had good or excellent expectation. However, more than believing in the product, understanding the expectation that the customer may have in the product or service is essential. The customer's view makes feasible the use of new strategies to innovate, but monitoring their expectations is also relevant for this accomplishment. As for Design Thinking, this issue mainly involves empathy, which is the act of placing yourself as the customer to understand what is expected of your product or service. Identifying strengths and weaknesses, opportunities and threats are essential for the development of a new product and the analysis for this issue must be back to the point of identifying possible problems and searching for new solutions. When questioned, 50% of the respondents indicated that they had a known degree of the weaknesses of their significant product competition. This is correlated with the fact that in order to develop a new product, most people who plan something new for a given business or market analyze the general context of the areas they will operate and their competitive advantages

must be beyond those being developed competition. After being questioned if the product or service developed have a differential regarding the competition, everyone agreed that the product was somehow positively different. Analyzing the differentials of your product against the competition, or vice versa, can be classified as an opportunity for an entrepreneur and strategist. By idealizing a market research, such as understanding the client behavior can bring new perspectives as well as developing and implementing new skills and generating solutions that possibly have not been reviewed by the competition.

Regarding ideation, 66.7% of the interviewees pointed out that each team member proactivity to generate new ideas and think differently was significant during the development of a new product. Nowadays, especially in the information age, actions such as their sharing of views is seen differently from before. Ideas are stimulated and swift thinking through a brainstorming scheme brings results never imagined before and can significantly transform a flawed process. In addition, for the elaboration of more complex projects such as the development of new products, the members' engagement has to be representative since it promotes a greater development through the stimulus and cooperation focused on what the customer has expected. In addition, a certain level of engagement can encourage creativity and solutions through innovative ideas, assuming that the greater the number of ideas, the greater the number of solutions. Part of the decision-making process of a project, such as the development of new products, involves the search for solutions to complex problems that a particular segment faces. A team must integrate innovation into its planning until it helps solving these problems. In this principle, the motivation comes as a support for the group to be engaged. As part of the research, 83.3% of the interviewees believe that contributing to innovation is related to the search for a problem's solution. Innovation and problem-solving issues are also related to the transformation of ideas into insights, so there is an important issue of bringing together interdisciplinary groups to share their visions. This integrative thinking challenges and encourages groups to venture into their creative process. Even the construction of prototypes enlarges the vision of a group that is in search of a solution. During the period of idealization of a product not yet presented in the market, several teams found unexplored segments that worked as a motivating factor for their conception, which corroborates with the affirmation chosen by the majority of interviewees (87%) on this question. "The motivation of the group to contribute to innovation is related to the will to create an innovative product". By seeking this motivation, teams also realized the role that a product or service can play after its implementation. The innovation in current times is related even to the solution of problems caused mainly by the man himself. Since the search is no longer primarily exploratory, but rather a conscious exploration with a view of the impacts that its process can cause to the environment in which it is inserted, the Design Thinking has become the act of putting itself in another's place or to be empathic. When questioning the main aspects present in a particular problem that a community faces, the majority of the

teams chose the following statement: "To contribute to innovation, one must be related to the possibility that the product will help other people". What can be concluded is that embracing the problems provided new perspectives, where it is possible to align their objectives with the presented reality. Although the theme of Design Thinking was little discussed between the interviewed teams, during the development of new products there was a correlation between the design of a new product and the presented theme. This is because the steps were related to the concept that the customer is the center of all decisions made, that innovation brings new views for a new product, and that everyone's teamwork was critical to the project development through sharing of ideas, planning and engagement.

Conclusion

By idealizing projects such as the recent number of companies that emerge from university incubators, there is a great chance of growth, especially because it is made up of academics and teachers who seek to solve complex problems. The almost identical view regarding the responses of the teams shows that it is essential to brainstorm several insights during the innovation process. This corroborates the fact that the sharing of visions initially transforms information into good ideas and completely changes a process. In current times, especially in the information age, sharing views is seen differently and positive. Ideas are encouraged and swift thinking through a brainstorming scheme brings unimagined results and can significantly transform a flawed process. The main idea of stimulating new ideas through Design Thinking is to understand that there is a need to present how important and promising a project can be by using few resources. In addition, encouraging debates, bringing together interdisciplinary groups for decision-making, understanding opportunities, the process of creation, identifying barriers and generating alternatives to transpose them is a major challenge for broadening the theory learned in the classroom that not only will serve the academic's learning, but can be extrapolated to all entrepreneurs.

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