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APPLICATION OF INNOVATION PRACTICES IN THE DEVELOPMENT OF BUSINESS MODELS FOR UNIVERSITY ENTREPRENEURS

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SUMMARY

This article presents a constructivist approach to new business development based on the design thinking approach and presents its application in a program to foster university entrepreneurship at the Federal University of Santa Catarina - UFSC. Using a constructivist approach, we sought to build knowledge in the entrepreneur about his business idea based on his values and preferences, as well as the results of his experiences in developing his business idea. Thus, the illustration of three cases of the pilot development program is presented, which presented, in addition to the working method, lessons learned for the program itself. As a result, the demand for business model development programs as a university extension was identified and the need to create a program for the development of facilitators who act as promoters of knowledge, that is, in addition to the student-entrepreneur emerges the relevant figure of the student-facilitator, who wants to learn product and service development techniques in a practical way, but does not necessarily want to open his business. Finally, it was found that the pilot suggested the modification for a personalized service to the student-entrepreneur, called Clinics of Innovation and Entrepreneurship. but you don't necessarily want to open your business. Finally, it was found that the pilot suggested the modification for a personalized service to the student-entrepreneur, called Clinics of Innovation and Entrepreneurship. but you don't necessarily want to open your business. Finally, it was found that the pilot suggested the modification for a personalized service to the student-entrepreneur, called Clinics of Innovation and Entrepreneurship.

Keywords: constructivism; innovation; university entrepreneurship; design

1. INTRODUCTION

Currently, innovation is a key factor in the competitiveness of organizations, however, few methodologies have been developed to assist and meet changes in the needs of organizations, particularly in dynamic contexts characterized by uncertainty and complexity (JOUNINI; MIDLER; SILBERZAHN, 2016).

Within a scenario of uncertainty, problems are initially poorly structured and technologies

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and the needs of customers are not necessarily known in the structuring of a business model (VIANNA, 2012; HUARNG, 2013). Thus, the success of the business and the quality of planning are closely linked to the degree of knowledge of the entrepreneur about the problem to be solved (JOUNINI; MIDLER; SILBERZAHN, 2016).

Therefore, for the entrepreneur, the development of his business idea is an activity that involves the discovery, evaluation and taking advantage of opportunities to introduce new products and services in the market, creating value for the parties involved (BONINI; SBRAGIA, 2011; HUARNG , 2013).

Thus, in contexts where innovation is a primary competitive factor, the use of creative approaches from the design school is increasingly spread, with emphasis on design thinking (LEAVY, 2010).

So, this research is based in the constructivist approach to the creation of business models based on design thinking techniques, with university students participating in an extension project. The referred project, called University Entrepreneurs, constitutes a team of student facilitators, together with a professor, whose objective is to help university entrepreneurs to develop their ideas and create their business models.

Thus, the objectives of this article are (i) to present theoretical constructs that relate design thinking to constructivism; (ii) select business model development procedures based on these constructs; (iii) illustrate the implementation of such procedures with cases from a university entrepreneurship program and (iv) present comparisons between cases and qualified literature in order to present future challenges in the use of these approaches and learning about the university entrepreneurship program.

The article is arranged in the sections: theoretical framework, which addresses the context in which design thinking is found and its epistemological origin; section of methods adopted by this research; final considerations and bibliographies used.

2. THEORETICAL REFERENCE

Next, the theoretical framework of the theme of this research is exposed.

2.1 *Design thinking*

Design thinking was originally developed with the aim of bringing principles, approaches, methods and tools from designers to solve problems (BROWN, 2010).

It is opposed to linear and analytical approaches to problem solving, which are not susceptible to solving complex problems, which are characterized by a high degree of

uncertainty and ambiguity (MAHMOUD-JOUINI, MIDLER AND SILBERZAHN, 2016). These situations require an uncertainty reduction strategy that can be achieved through an approach centered on learning, based on hypotheses and tested in an abductive and qualitative way (CLARCK, 2010).

In this way, Buchanan (2001) highlights that design has become a new form of learning, paving the way to build and integrate knowledge and transform it into productive results. But so that companies can better absorb and use the tools of design thinking, managers need to recognize and confront their intrinsic predisposition to favor analytical and statistical thinking, allowing themselves to develop the necessary competence to use the most important design tool - abductive logic (LEAVY, 2010; FRASER, 2010).

Therefore, design thinking is based on abduction, that is, the use of experiences and knowledge to solve problems and experimentation involving multiple solutions and alternatives that actively measure a variety of tensions between possibilities and limitations, being more suitable for decision contexts. where uncertainty and ambiguity are high (MAHMOUD-JOUINI, MIDLER AND SILBERZAHN, 2016). Learning and experimentation takes place through iterations between reflection and action, and is seen as a continuous and central task of abductive thinking (LIEDTKA, 2014).

2.1.1 LEARNING

In contexts of intensive innovation, characterized by complexity and uncertainty, going beyond an analytical problem-solving approach requires cognitive processes that enable the acquisition of new knowledge (MAHMOUD-JOUINI, MIDLER AND SILBERZAHN, 2016).

During the creative process proposed by DT, several insights can be perceived by the entrepreneur. These new insights should have new perspectives as inspiration, expanding the field of thought and making connections that would not have been thought without these points of view (BUCHANAN, 1992; BUCHANAN, 2001).

Being more specific, Mahmoud-Jouini, Midler and Silberzahn (2016) highlight that DT contributes mainly in the cognitive perspective from the learning dimension. In view of the statements presented, the theoretical constructs of this research emerge.

Through the cognitive perspective, Liedtka (2014) explains that DT helps in the learning perspective since its tools address and mitigate some biases manager's cognitive skills that can affect the creative process.

In view of the statements presented about learning, the first theoretical construct of

this research emerges.

Construct 1: The process must be done in a way that values the learning of the participants, through feedback loops and valuing abductive thinking.

2.1.2 SINGULARITY AND LIMITED RATIONALITY

In the current competitive environment, there is a demand that new businesses need to meet the needs of users and more and more these users are participating in the design process (SIMONS, GUPTA, BUCHANAN, 2011).

To meet this prerogative, empathy is a key point of DT for allowing the world to be imagined from different perspectives of the parties involved (Brown, 2008). In this way, Mahmoud-Jouini, Midler and Silberzahn (2016) present ethnography, prototypes to test hypotheses and simulations as the main tools and practices of design thinking. These tools work with the involvement of stakeholders, during the process of developing an innovative business model.

However, the tools proposed by the DT are of no use if the manager does not assume a position of limited knowledge, where it is accepted that they do not understand all the factors that influence a problem and seeks to explore as soon as possible the premises that need to be tested and challenged (SIMONS, GUPTA, BUCHANAN, 2011). At this point, the use of abductive thinking is used to mitigate risks by legitimizing ideas and premises with consumers, investing the least possible financial and economic effort in a prototype, allowing to test and explore abstract or extreme concepts (FRASER, 2007) .

Mahmoud-Jouini, Midler and Silberzahn (2016) point out that managers and executives must deal with decisions in times of uncertainty and ambiguity, situations that are not suitable for analytical thinking, with the possibility of benefiting from a new way of developing business and for solving complex organizational problems.

It is also noteworthy that the operationalization of design thinking happens in a specific way to each context, therefore, it is necessary to consider that different DT techniques are appropriate according to different contexts and to achieve different purposes (KIMBELL, 2011).

Therefore, from the statements presented about singularity and limited rationality, the second and third theoretical constructs of this research emerge.

Construct 2: The application of the proposed techniques must respect the premises of limited rationality, where the entrepreneur recognizes the need to develop his knowledge regarding the context in which he wants to start his business.

Construct 3: Propose a process that respects the uniqueness of each entrepreneur and the context in which he is inserted.

3. METHODS ADOPTED

This section aims to highlight the fundamentals of the scientific methodology used in this article.

3.1 Methodological framework

As for its approach, the current research is characterized as qualitative. Qualitative research has as central concern the process and not simply with the results found, the researcher's direct and in-depth contact with the environment and the situation being studied is valued (LAKATOS; MARCONI, 2010; PRODANOV; FREITAS, 2013). The use of qualitative research is crucial, since the structuring of the model to support decisions, follows the values and preferences of decision-makers given a certain circumstance (ROY, 1993; MARAFON et al., 2015).

Based on the proposed objectives, this research is characterized by being descriptive. Descriptive research aims to describe the characteristics of a given population. They can also be developed in order to identify possible relationships between variables (GIL, 2007).

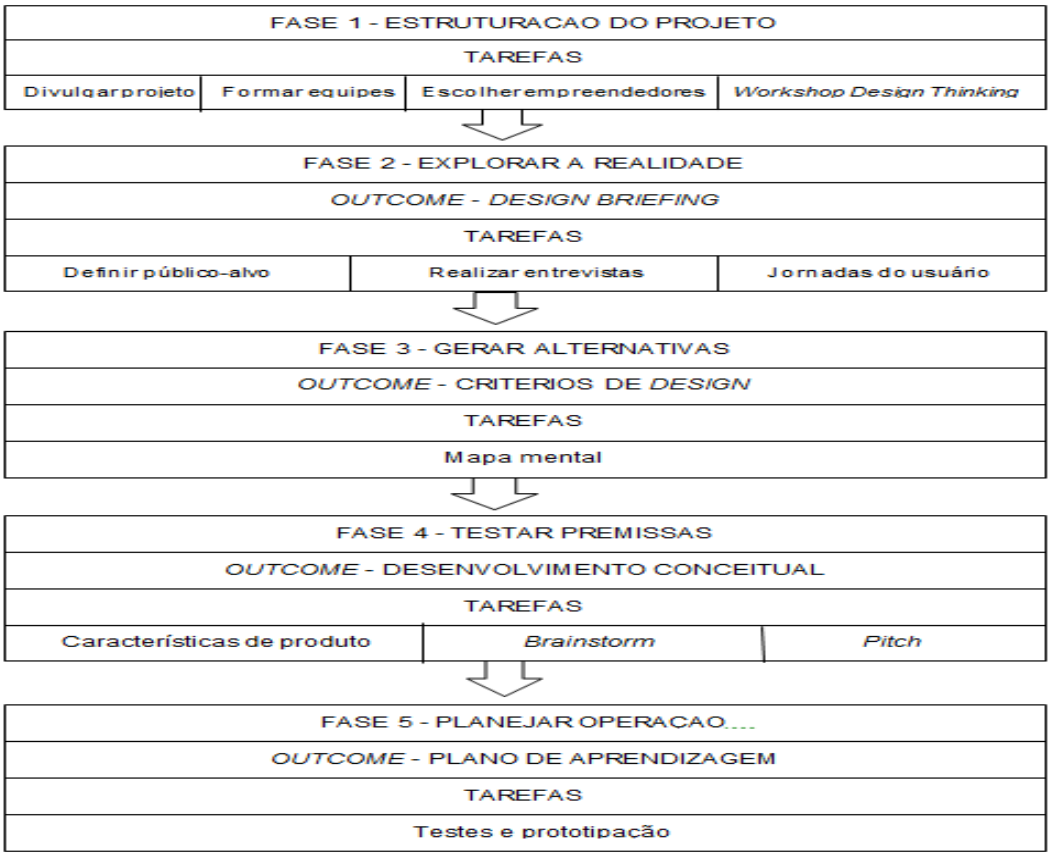
Finally, as a research strategy, the case study was used. The case study is an empirical study that investigates a certain phenomenon within a real context (CAUCHICK MIGUEL, 2007).

3.2 Technical procedures

The current section is intended to guide the reader on the work steps developed throughout the development of the research. It is noteworthy that the methodology used in the cases of this work is based on the constructivist approach of developing business models and focuses on building knowledge on the entrepreneur about his business idea based on his values and preferences.

Figure 1 shows the activities developed during the course of the developed project.

Figure 1 - Technical procedures



Source: Adapted from Liedtka (2014).

For a better understanding, each phase described in figure 1 is described in the subsequent topics.

3.2.1 PHASE 1: STRUCTURING THE PROJECT

The project's initial procedure is planning and dissemination. This is done through e-mails sent to students of the administration course at the Federal University of Santa Catarina, with the objective of prospecting facilitators who want to learn and help the project's entrepreneurs. After the selection process, 13 students started the project as facilitators.

As for university entrepreneurs, the prospecting also took place through e-mails, however, this time, sent to the entire university, with no distinction of course. In this email, entrepreneurs fill out a form, where they briefly describe their business idea. Altogether there were 21 entrepreneurs registered.

With registration closed, for both facilitators and entrepreneurs, an initial meeting was held to present the project and form teams. In the formation of teams, the mentor presents the facilitators with a description of the business ideas that the entrepreneurs described in their application. The facilitating students carry out a reflection where their personal preferences

culminate in the choice of the entrepreneur they wish to help, thus forming teams.

At the next meeting, the entrepreneurs present their idea freely and orally, followed by questions from the facilitators regarding their enterprise. In that same meeting, the mentor explains to those present how the business model development process will be based on design thinking (LIEDTKA, 2014). Among the steps of the DT, the characteristics of the design brief were emphasized, this being the delivery that must be carried out at the next meeting.

3.2.2 PHASE 2: EXPLORE THE REALITY

In phase 2, called exploring reality, activities are carried out to define the target audience, conduct interviews and prepare user journeys, thus generating the design briefing as a way out of the process. It is at this stage that the entrepreneur will, with the help of facilitators, present specific information about his business.

The first step is to perform an activity called user journey. The journey is a visual demonstration of the day-to-day of the target audience defined by the entrepreneur, so that one can understand how this user's behavior is. It is an empathetic activity, where the entrepreneur puts himself in the user's shoes and assumes his behavior assumptions.

To confirm the premises, it is necessary to contact the possible target audience and investigate which points correspond to reality. For this, an interview script is prepared, with open questions so that information and sensations perceived in the public can be extracted. With the interview script, the team goes to the field with the entrepreneur who is assisting and interviews about 10 people who are compatible with the target audience that was defined in the design briefing. Each item and a brief description of what the design brief should present are shown in table 1.

Painting1 - Design briefing items

DESIGN ITEM BRIEFING	DESCRIPTION
Description of the idea	The entrepreneur briefly describes his business idea.
Purpose	Entrepreneur explains why he is in the project.
Target Audience	Here is a list of possible target audiences, describing their specifications.
Preliminary questions	Doubts and questions that the entrepreneur wants to have answers throughout the project.

Source: Adapted from Liedtka (2014).

3.2.3 PHASE 3: GENERATE ALTERNATIVES

With the conclusion of the design briefing, the Design Criteria are constructed, which is the compilation of the users' feelings identified in the interviews at each point of the journey, including points that both make the user very satisfied, as well as moments of annoyance and difficulties of run your journey.

In this stage, usually, a cognitive map is elaborated where the answers obtained are arranged so that, in this way, it is possible to cluster the field results and find the key sensations that a given user feels when trying to perform a certain function of his dia- the day. These key sensations are called design criteria.

3.2.4 PHASE 4: TEST PREMISES

After identifying the design criteria, the entrepreneur, with the help of university facilitators, brainstorms in order to create product or service characteristics that can address the identified sensations.

The mind map tool is again used here, connecting the characteristics of the product or service with the respective needs met.

Finally, the pitch is developed, a technique used to allow the entrepreneur to express his idea from the moment, a criterion for design and conceptual development. It is at this point in the process that the entrepreneur can reflect on how reliable he is about his venture.

At this point in the process, the entrepreneur summarizes the business validation that was carried out, emphasizing which needs of his user he will be meeting with his product, and what competitive advantages he has from his competitors.

3.2.5 PHASE 5: PLANNING OPERATIONS

In the prototyping of the business, the entrepreneur lists the main risks or uncertainties that may affect his business model and orders such risks in order of criticality and that consequently need to be validated first.

To perform the validation of these risks, also called assumptions or hypotheses, the 5W2H technique is used, where action plans are drawn up for each premise to be validated.

From now on, the entrepreneur is able to carry out the experiments, having a low cost prototype to validate if the sensations he detected are true and deserve to continue to develop his knowledge about the business.

3.2.6 FACILITATORS

College students here are called facilitators. Facilitators have the role of assisting entrepreneurs, supporting their activities, while remaining as neutral as possible. In other words, not taking a position regarding the business, this being a unique assignment of the entrepreneurs.

3.2.7 MENTOR TEACHER

The university professor and project coordinator here is appointed as a mentor. The teacher has a fundamental role as a mediator between students and university entrepreneurs. He is responsible for mediating the meetings and also for passing on knowledge in a constructivist way to the students who participate in the project. That is, he does not go over the solutions, but he instigates to go to the field and starting from this interaction with reality, the student and the entrepreneur find the answers.

4. CASES

4.1 **Historical Retrospective of the University Entrepreneur Project - UFSC**

In order to strengthen students' contact with the job market, the first project carried out was Learning in Action, which consists of a startup, incubated by MIDI - Tecnológico de Florianópolis, coming to the project with a problem, and the team proposes to solve this problem in 8 to 12 weeks. For details of this project, seeLacerda et al. (2017).

After the Learning in Action project was completed, the student participants themselves questioned whether they are helping an outside company, why not help university colleagues who wish to undertake, but do not know how?

It was with this reflection that the University Entrepreneurs project originated, seeking to help university students who wish to undertake.

In its first version, the project had a team of facilitators of 15 students, which served 4 entrepreneurs. This project started with a model where each entrepreneur had a team of 3 facilitators to assist them in carrying out the tasks, and these meetings took place simultaneously, always with the presence of the mentor.

Thus, in the next topics, the cases of three university entrepreneurs who resorted to the university entrepreneurs project to help in the development of their business are exemplified.

4.2 Case 1

The “Case 1” entrepreneurinitially presented the business idea for the development of an energy efficiency consultancy. Based on the business idea, the stage of exploring reality begins, together with the facilitating students. In this way, the team develops activities for defining the target audience, conducting interviews and making user journeys, resulting in the design briefing.

The first difficulty faced by the entrepreneur for the elaboration of the design briefing was in the stage of defining the target audience. This happened, therefore, the entrepreneur did not understand that to carry out the subsequent work steps, the target audience would need to be segmented and specific and not broad, as previously defined, in this way, the public was reworked and changed a few times with the team assistance. Initially, the entrepreneur had defined his target audience in large and medium-sized companies in the industrial and textile sectors, and after due corrections, he was defined as restaurants.

From the definition of its target audience, the entrepreneur was able to elaborate the user's journey. Therefore, a visual demonstration of the target audience's day-to-day life was created, that is, a step by step of how restaurants perform the processing of solid waste. At this stage, the entrepreneur and the facilitators find it difficult to identify which points of the journey left the customer dissatisfied, since both the facilitators and the entrepreneur did not have the necessary prior knowledge about the restaurant routine.

Thus, it was necessary to have a brief conversation with a businessman, a restaurant owner, to extract the correct and accurate information and, consequently, redo the user's journey previously made. The final version of the journey is shown in Figure 2.

Figure 1 - Case 1 user journey

Source: Prepared by the authors (2017).

After the end of the day, a script of interviews was prepared to be conducted with restaurant owners. These interviews were aimed at identifying which points identified in the user's journey leave them satisfied or dissatisfied.

For this, the entrepreneur listed 15 restaurants to conduct the interview. However, in order to conduct the interviews, the difficulty faced was access to these restaurants, since many refused to conduct the interview. With that, the solution found by the entrepreneur and the team was to contact the Chamber of Shopkeepers - CDL of Florianópolis requesting a list of restaurants that could be more receptive.

Thus, from the answers obtained in the interviews, it is possible to extract which sensations are observed in the behavior of restaurants processing their solid waste.

Following the work steps, after completing the structuring stage of the design briefing, the generation of alternatives started, which results in the construction of design criteria, where the users' feelings, identified in the interviews, are compiled.

The answers were compiled in a mind map and in this way the main sensations and behaviors of these restaurants were extracted.

Therefore, to carry out the premise testing stage, the entrepreneur together with the facilitators braimstorming, this is intended to imagine what are the main characteristics that can be attributed to your product. Thus, 3-5 characteristics were listed that will serve as a basis for the development of the product. Again, on a mind map, the identified characteristics were placed.

Finally, the entrepreneur prepared a formal presentation of his business, called pitch. The main difficulty faced in this activity was in relation to the structuring and selection of data for the presentation. The pitch contained a lot of statistical data and did not follow the indications provided by the method, in this way, the guiding professor helped the entrepreneur to arrive at a final result, giving feedback and guidance regarding his presentation, ending the project for that entrepreneur.

4.2. Case 2

This case deals with the idea of an entrepreneur opening an establishment with different drinks, which are replaced from time to time by others. These drinks are said to be homemade and handcrafted.

Initially, in the stage of exploring reality aiming at the elaboration of the design briefing, the entrepreneur found it difficult to define his target audience. At first, the definition of its audience was very restricted, which could cause the loss of customers. With

the help of the facilitators, it was defined that its target audience would be: doctors, students, teachers, servants and advertisers.

Thus, from the definition of the target audience, the activity of defining the user's journey began. In this activity, the main difficulty encountered was the collection of information as in case 1, thus, the help of the facilitators was important for the completion of the activity. With that, the final version of the journey is shown in Figure 4.

Figure 3 - Case 2 user journey

Source: Prepared by the authors (2017).

After defining the day, the subsequent activity was the structuring of the interview script to be carried out with its target audience. Something that caught the attention of the group was the facilitating teacher, repeatedly, stating that the objective was not the quantity of interviews, but the quality of them.

The students agreed with the teacher's argument, that interviewing a large number of people using questionnaires, would evade the proposal of the method that was being used, which was to be able to observe people's feelings in relation to each stage of the journey.

With that in mind, the problem for the group was to define the right questions they needed to ask the audience they had selected, questions that would allow them to get people's feelings. Therefore, the questions were designed in a more comprehensive way, where people could express opinions without the intervention of the members or induction of the questions.

The difficulty with this activity was that the entrepreneur oscillated a lot in relation to his ideas, which left the group confused.

Continuing, to carry out the premise testing stage, the entrepreneurs together with the facilitators perform a braimstorming. In this activity, the following characteristics were listed that will serve as a basis for the development of the product: Accessibility, identity, forms of payment and exclusive product.

Finally, the entrepreneur drew up his pitch. Again, as in case 1, the main difficulty

faced in this activity was in relation to the structuring and selection of data for presentation. The pitch contained excess data and did not pass the main information about the business, consequently, it did not follow the indications provided by the method, thus, the guiding professor helped the entrepreneur to arrive at a final result, passing on feedback and guidance regarding his presentation, ending the project for this entrepreneur.

4.3. Case 3

Initially, the entrepreneur in case 3 presented several ideas that he would like to explore, a fact that generated insecurity and lack of focus on the team throughout the project.

These difficulties arose from the first delivery suggested by the teacher-facilitator - the elaboration of the design briefing. The initial proposal made by the entrepreneur was that of an environmental consulting company, which among its main services would be offering environmental licensing and solutions for companies' solid waste management.

The first problem was detected in the choice of the target audience, as this was defined very broadly. Soon, the teacher guided the team to focus on only one service, turning it to a more specific target audience and with better reach by the team and entrepreneur.

The changes in the design briefing were constant throughout the other stages, due to the frequent change of interpretation by the team of facilitators in relation to the entrepreneur's business.

The first version of the day was then developed thinking about the daily life of restaurants and industries, but because it is a B2B audience it was difficult for the team to be empathetic in building the steps these companies go through when dealing with their waste.

Thus, the team initiated contacts with restaurant owners, but without success as they were not available. In order to capture the necessary information, the team sought support from a professor at the University who had already worked with chemical processing and had already acquired knowledge of this market. Therefore, the validation was superficial and based on premises and premonitions instead of facts.

It is important to mention that this process involved many changes and several weeks of development and was only finalized after the orientation of the teacher-mentor so that the team could move forward, even with incomplete data.

The lack of focus for the team caused frustration during the changes throughout the process. After the guidance of the teacher and help from the other groups, the team compiled the results and continued with the project, finalizing the project in the presentation of the pitch.

The pitch stage was one of the biggest difficulties for the entrepreneur, he was not able to be succinct and brought a lot of data that would not be necessary for the pitch proposal of this project. The entrepreneur had difficulties in presenting and defending his idea, so that the students interfered to argue with the teacher instead. During the presentation made by the entrepreneur, the professor made a series of observations, acting as an investor would, in order to guide the team and the entrepreneur towards the future.

5. DISCUSSION OF CASES

The present research is based on three theoretical constructs presented above, by which considerations of the results of the three cases presented in this article will be made.

The first construct refers to valuing the participants' learning through reflection and student action. This construct was observed throughout the development of the program, since each presentation of results was followed by reflection, whose role of the mentor teacher is of fundamental importance.

The role of the mentor, in this case, does not refer to the classic role of the teacher in a teaching activity, but to ask constructive questions so that the participants and, especially the assisted entrepreneur student, can carry out their reflection of the paths they were following until then.

Sometimes the mentor did not personally agree with the path and procedures performed by the entrepreneur and the facilitators, but it was a constant exercise to make the students themselves experience their learning through action.

Thus, the way in which the mentor approached the students was mainly through questions to provoke reflection and also to propose subsequent actions that would make the students, in addition to confronting their ideas with the questions of the mentor, they would also be able to obtain in the external world. other information to form your own value judgment.

The feedback cycles were weekly and through triangulation of evidence, such as (i) the motivation to undertake as the main vector that encourages the entrepreneur to participate in the program, (ii) the discussion with facilitating students who asked questions so that the entrepreneur being able to expose his ideas, (iii) the mentor collectively asked questions so that again the entrepreneur could reflect on the enterprise that one wants to develop and (iv) the external world itself.

With this triangulation of evidence, it caused these feedback loops to become positive in the learning effect.

It is important to highlight that the program aims, in a low-cost way and as soon as possible, to make the entrepreneur student himself able to judge the potential of his idea and also the weaknesses. If the weaknesses are considerable within his value judgment, the entrepreneur himself would be able to evaluate each feedback cycle if his idea was still valid.

In other words, in this research, design thinking was not used as a business development tool, but mainly as a learning tool and that brought up the reality faced with the entrepreneurs' own value judgment, making it possible to assess the situation to reflect on whether the idea could be modified to overcome the weaknesses or, at some point in the process, that he give up the path he was thinking so that he could get around the situation in another way. The last resort, more radical, made him give up his idea - pivot.

In the cases studied, design thinking shows evidence to be an effective approach to abbreviate this assessment of the entrepreneur student about his idea, with expenditure of resources in the establishment of the company or product development to be carried out without practical and concrete evidence from the field bringing his knowledge. willingness to establish your business, the light on the values and preferences of the entrepreneurs themselves.

The second theoretical construct refers to the acceptance of limited rationality as a crucial element within the scope of entrepreneurship. This is due to the recognition that the entrepreneur does not have enough knowledge to know if his idea is promising and also the paths that will lead him to success or to a point where he observed that the idea was not promising.

In addition to this recognition of the entrepreneur's limited knowledge, there was also recognition among the participants of the cases that the decisions they faced could hardly be resolved by optimal solutions such as mathematical, economic or statistical models. On the contrary, what was observed during the three cases were situations where the participants and the mentor teacher had to deal with diffuse information and the certainty that they would not have mechanisms, economic or financial resources to obtain the “correct” answer.

When confronted with the situation of entrepreneurs with a more technological background and accustomed to mathematical optimization solutions, they sometimes found themselves in an uncomfortable and insecure situation, because motivation is what will move entrepreneurs to deal with situations where there is not even one way to obtain the information that will guarantee “success”.

In this line of thinking, the constructivist decision approach is important in business development so that the entrepreneur can motivate himself to seek mechanisms, at each stage

of the method and each week of the project, to dispel business doubts and even recognize those situations that only going to the execution will be able to obtain the concrete answers.

In some moments of the cases, entrepreneurs who found themselves in insecure situations of limited rationality and asked the teacher for their perception of the business. However, the mentor remained without objective answers, informing the entrepreneur that knowledge is the result of an action. In other words, only by going to the outside world can doubts be answered. It is not up to even a more experienced person or even successful entrepreneurs to provide answers. Rather, it is the search for ways and methods so that the entrepreneurial student can, by himself, within his values and preferences, obtain his answers. responses that provoked his motivation to remain entrepreneurial in his idea.

The mentor sometimes had to remind the entrepreneurs that the one who has to get the answers to the questions in cloudy contexts is the entrepreneur himself, and the answer is in the market in which he works, because the search for early adopters is what will equip the security entrepreneur to continue his journey.

In other words, it is the market that will provide evidence for the entrepreneur student to be aware of whether he is on the right path or not. This responsibility is not that of actors external to the context, but of the customer who will enjoy the product or service developed.

As the third theoretical construct of this research, singularity is seen as a preponderant element in decision making throughout the development of the business. The singularity advocates that there are no optimal answers or universal answers for the success of an enterprise. This is due to the historical trajectory of an organization and the reaction that the entrepreneur will have in relation to the evidence and information obtained from the market and field studies.

The nature of the business, the entrepreneur's cognitive structure, the information resources and especially the motivation were the main factors observed in the three cases.

6. FINAL CONSIDERATIONS

This article presents the initial results of a university entrepreneurship development program based on a constructivist approach to business development. In this way, from these initial results, it was possible to identify the main challenges faced by a methodological step and, in this way, make the proposition of improvements.

During the stage of exploring reality, the main difficulty faced was in relation to the definition of specific target audiences. Entrepreneurs generally work with target audiences with broad age groups and / or with preferences that are difficult to select before further

investigation, such as: “people who like to walk outdoors”. The phase of exploring reality is important since it allows the researcher to expand his knowledge about the characteristics of his business model. At this point, the importance of identifying your segmented target audience is highlighted, since, with such knowledge, the entrepreneur can carry out a process of generating alternatives focused on real audience needs and not on assumptions of characteristics in a broad way that meet as many people as possible,

Another difficulty faced in the exploration stage was to make the entrepreneurs and facilitators understand that using the DT methodology what is aimed at is the depth in the identification of users' sensations and not in the purely statistical analysis of the frequency of the sensations. Mapping tools, such as mind maps, can be very useful at this stage - by providing representations of current and potential business models, entrepreneurs can quickly imagine many of the likely implications of making changes to their business models (CHESBROUGH; ROSENBLUN, 2002; CHESBROUGH, 2010).

In the alternative generation stage, one of the difficulties faced in this stage was to ensure traceability between the design criteria (sensations) and the characteristics of products / services that will meet the design criteria. Thus, it is important that brainstorming is carried out focusing on design criteria and not general product brainstorming.

Another difficulty was in generating a restricted set of requirements for MVP (Minimum viable product). With that, it is recommended that to restrict the number of requirements it is important that the entrepreneur has a focus on early adopters (having an end in mind).

Then, in the phases of generating alternatives / testing assumptions, entrepreneurs found it difficult to identify and synthesize the benefits that their business has for pitch presentation. At this point, as in the previous phase, the use of mapping tools is useful to identify and explain the main ideas obtained in the generation of alternatives. However, it is necessary to identify the extent to which the experimental conditions are representative of the larger market. Trying an alternative business model on real customers who pay real money on real economic transactions provides the highest fidelity to experimenting with the new business (CHESBROUGH, 2010).

Finally, the operations planning phase was never carried out, thus demonstrating a time limitation presented by the project. It is then proposed, for the realization of subsequent projects, a longer execution time to be carried out after the test in sufficiency of the business premises (value proposition). After this stage, you are concerned with ways to monetize the business

Regarding the objectives, the first research objective was intended, to present the theoretical constructs that relate design thinking with constructivism, the three constructs that align the design approach with constructivism were observed in the theoretical reference section, the first construct referring to the cycles of feedback and abductive thinking, the second construct referring to limited rationality and the third construct as recognizing the uniqueness of each business without resolution through optimal solutions or universal solutions.

To contemplate the three constructs, Figure 1 presents the four steps of business development, with the exploration of reality with the first step, the generation of alternatives as a second procedure, followed by the testing of business premises and then learning planning.

In the case section, it is possible to illustrate the execution of procedures with the difficulties faced by entrepreneurs in the development of their businesses, the third specific objective of this article being

Finally, in the previous section, it fulfilled the fourth specific objective, which is to compare the cases and the theoretical constructs that permeate this research.

As a limitation of the research, the absence of final data on the tests of business premises constitutes the final learning plan for each case.

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