The problematization for the creativity in design

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Abstract: This paper discusses the relations between stages of design projects. The literature review is based on authors who already discussed the subject to present a reflection on the stages of the process, focusing on the stage of problematization in order to establish relationships and show the importance of this stage in projects. It is intended to show that the problematization has an impact on the creativity phase and, consequently, on the results of the project. The literature review shows the link between the problematization and the design process as a whole. Besides proposing that with a well developed problematization the designer acquires the necessary knowledge about the project so that the creativity stage is well-done and the project results are more assertive. In this way, it is considered that the problematization has importance in the whole project process. So article shows the importance of this step for a design project.

Keywords: Design, Creativity, Problematization, Process, Methods

1. Introduction

The designer is the professional who develops creative projects based on perceived needs, and is increasingly requested to mix customization, creativity, innovation and technology in their work results, which generates satisfaction and reaches stakeholders. It is known that the race against time reigns for the delivery of work to customers, because this is how the economy works. However, it is necessary to remember that each design project is unique, that is, the references, needs, contexts and backgrounds always need to be studied and expanded for each new result. When discussing design, with the minimum of knowledge in the area, the whole project process that involves the activity is considered. In this case, terms related to design, method, steps, tools, etc. are mentioned. Design has its essence of activity, above all, in the project, which must be performed with competence (Matté, 2008). This statement validates the intrinsic activity of the professional in the area, since the process of research, investigation and creation of the designer always occurs for project purposes. The project method issue is constantly on the agenda for discussions and reflections. In addition, the field of design is continuously evolving along with technological advance, creative innovation and the complexity of the scope of the designer's work. As the project activity is the central target in his performance, it is necessary to reflect on its practice, which is based on the use of methods. Each project begins with a need or opportunity, which comes from a "problem", this problem is the starting point for what should be done. Faced with a problem, the designer, as an agent who seeks to improve the quality of life, has as mission to find the best possible solution, understanding it as a project opportunity. This article, which proposes theoretical reflection, focuses on the problematization stage and its impacts on the creative phase and results of design projects.

The bibliographic cutout presented comes from a PhD thesis developed in partnership with institutions in Brazil and Portugal, where studies and analyses are under development and will be finalized in Finland in view of the educational technology that its result intends to present. The study focuses on the literature of previously structured problems as it seeks to assist undergraduate students in the understanding and development of design projects.

2. Theoretical Reference

The objective of this study is to discuss the normally initial step of a design project, the phase in which the problem received or perceived is studied, where research and analysis are carried out in order to understand what the real opportunity of project in the existing context is. This topic has become an objective to deal with because it is the phase that demands more work and less creativity from the designer in a project, but it is the essential for the professional to really know how to be creative afterwards. Creativity is only useful when it respects limits and when the designer uses it wisely, so it takes a lot of study and understanding of the reality of each project to make it possible. When receiving a project demand, anyone can soon create an idea that could even be the result delivered, but certainly would not take into account several pieces of information that are collected and very important at the beginning of the design project study. This way, we present considerations divided in three moments: first regarding the problematization in the design methods, then addressing the relationship between creativity and problematization, and finally confronting the problematization and the project results, in order to consider the importance of the problematization step in the whole design process.

2.1. Design method and problematization

In almost all of the methods proposed in the area of design, a constant can be seen in the logical sequence suggested as stages of the project process, which is "complex, dynamic and multidisciplinary" and despite all the discussions regarding its format, use and classifications remains the support often used in project teaching as well as in professional practice, with its sequence of steps and tools (Pazmino, 2015, p.19). The method needs to be understood as a flexible and dynamic way of solving problems, which is updated in front of each project (Coelho, 2014). Thus it is necessary to organize a project scope for each new opportunity to search for solutions, so there is a consensus that some things need to be done before others, in order to visualize the alternatives and possible paths that the designer can follow in the development of the project (De Moraes, 2010). The division of the method into phases or steps makes the designer search for the solution in a logical way and also demonstrates the progress throughout the project. The nomenclatures of each stage differ, but generally present the same objective and its order also does not present changes from author to author. Initially, a moment of research and reflection is always proposed, in the search for the understanding of the project opportunity; later the creative stage is carried out, where the information collected is used together with strategies that help creativity, selection and evaluation of results; and finally the detailing of the project, where decisions, peculiarities, tests and delivery for production are specified. This is the minimum division observed in a design project, which can be further divided and organized, in addition to the possibility of advances and returns between them according to the needs of the project. It is considered that the reflection before the action is essential to the act of designing, thus, planning a method to be used for each project is necessary. The method is used as a guide, but not as a cake recipe, being defined in view of the demand, situation and specific context of the project, it demonstrates the awareness of the professional and responsibility when planning before executing in the design. All design projects start from a demand popularly known as a project problem. This problem is passed on to the professional because it was a need identified in some specific context, so it is necessary that at each project opportunity the designer has to study and deepen his knowledge about the theme surrounding the design problem. This study includes immersion in the search for properties about the context, so that it is possible to develop a project that satisfies the needs identified by the project applicant, in order to deliver an assertive solution to the demand. Problematize involves the act of reflecting critically on a specific theme, which represents that the research aims at reasonable and effective results through autonomous thinking, consciousness about the theme addressed and exploration of the problem with definition of parameters (Miranda and Soares, 2016; Perry, 2016; Machado *et al*, 2016; Aride and Couto, 2018).

Problematizing can also be understood as the comprehension of the problem to "elaborate the synthesis of the investigated subject through the mapping of the state of the art", prioritizing "significant elements that can be the focus of new questionings, reflections and elaboration of new hypotheses" in order to avoid that surprises resulting from these topics come to harm the project development throughout the process. In this way, complex problems become clearer and more defined as insecurities and ambiguities are decimated (Okada, 2014; Machado *et al*, 2016; Possatti *et al*, 2015). Only after researching, analyzing and interpreting all the motivations and results of the problem could the creation and proposition of possibilities and solving hypotheses about the problem be initiated (Vilaça and Mabote, 2014). All the necessary connections for such activity, in addition to being based on tooling and technical knowledge, also come from a broad intellectual background; strategic thinking; visualization of possible scenarios and critical positioning before them; a refined analytical and cultural vision; in addition to notions of the need to adapt to the market (Ricetti, Martins and Ogasawara, 2016). Normally, in the methods, the problematization occurs as one of the first stages, for the collection of data, and several methods of the area present this initial organization, as those proposed by: Bruno Munari (1998), Bernd Löbach (2001), Bernhard Bürdek (2006), Gui Bonsiepe (1984), for example. The names attributed to the problematization stage also vary in the proposed models, but as a rule, it has the same objective and is at the beginning of the method (Vasconcelos *et al*, 2012). Thus, the methods and techniques help the progress of the project process in the field of design, and the solution of problems causes the designer to prepare and organize these practices beforehand in the search for success in the proposed solution, which is usually done regardless of how the problem was proposed - clarity, definition and structure (Alvares, 2004). In most cases the problems passed on to the designers are aimed at creativity and innovation, and are thus considered to be poorly formulated and very broad problems, which makes it difficult for the professional to understand the effort of the solution process (Simon, 1973, Cross, 1984, Dorst, 2006, Guidali and Scaletsky, 2012). The problematization serves the project method as a stage that establishes and recognizes the necessary interventions through a holistic perception of the project problem. Discussions about approaches, paradoxes, implications and classifications of design problems are reported in several publications, and there is no consensus to determine a specific format of what a design problem is. This only explains the difference between problems in general - which lead to the search for solutions; and design problems - which fit into those that lead to project development, as well as other project areas. There is no clear notion in the literature of what the taxonomy of a "design problem" is, nor its true meaning or what the description of a structure of a design problem would be. Some studies indicate a path in the search for patterns or connections in the attitude that the designer establishes when facing problems to try to define them. Thus it is not possible to determine a defined field for design problems, and there is much to research, analyze and test in the area (Harfield, 2007; Dorst, 2003; Ximenes *et al*, 2017; Dorst, 2006).

2.2. Creativity and Problematization

It is not so simple to understand the project activity of the design area, since the demands of projects today are more dynamic, complex and avid for creativity. The initial understanding of the project articulates theoretical knowledge and practical application of the activities, besides valuing the capacity to solve problems in a creative way, it needs logical reasoning and consistency in the argumentation. The designer is the professional able to understand the needs of a product/service and offer it in new formats through creativity, analysis and logic. Perhaps more than professionals from other areas, the designer is aware of new challenges and new life lessons (Morris, 2010). Since 1980 designers have been freeing themselves and looking for new ways to solve old problems, and this is how the essence of design is being corrupted by society, which holds only the aesthetic exploration that the term brings (Cardoso, 2012). The design process involves creativity, but different from what many people think is not only inspiration, when it comes to design it refers to a logic, well structured, but not necessarily rigid, to be followed to achieve the desired result. This logic is the design method, so disseminated among authors in the area and that presents several organization proposals with various emphases of application and direction. The positive point of having several proposals of project method is precisely the fact that design is an interdisciplinary field by nature and complex regarding reality (Almeida and Almeida, 2016), thus it is possible to adapt project strategies in face of each identified opportunity that

can be solved by a project. The practice of design requires that the professional search for broad and constant knowledge, it is not just a matter of seeking technical knowledge but interdisciplinary, knowledge and understanding about various areas that surround design, this is what makes it capable of facing the dynamics of project appropriate to the complexity of today's world in view of the amount of information available (Thaler *et al*, 2016). The positive side of this understanding of interdisciplinarity in design is also the fact that the act of designing through systemic processes based on creativity based on data and reflection about contexts is now taken more seriously. This demystifies the need of recurrent use of a certain method as an imperative to be followed to validate the project, but precisely provides freedom to the designer to choose the design path he seeks to follow, mixing theory and practice according to the need of each project. In design, before knowing how to project it is necessary to observe and associate the different circumstances that present themselves. The reflection of the professional is what provides certainty in the path to be followed in the search for each project solution.

A very discussed issue that is being increasingly worked on in the teaching of design is creativity. It aims to foster the search for innovative solutions in each project context and stimulates new attitudes of professionals while they are seeking design solutions (Thaler *et al*, 2016). The design project process is a significant mix between chaos and order. To meet the challenges of innovation and creation proposed in the field of design, it is important to know the constant flow of work and allow some systemic disruptions due to the impact of other contexts that may arise in the middle of the process, there is always an oscillation between the predictable and organized structure of the process, and the amount of information and interactions that may interfere with this scope due to the other fields and areas of knowledge that merge throughout a design project. Knowing how to manage this and working within a logic, where some steps can be resumed and yet the work continues to evolve in the field of creativity and innovation, is one of the skills needed by designers (Bentz and Franzato, 2016). Every design project needs to rely not only on the help of knowledge from other areas, but also often on the professionals of these other knowledges. It can be said that most design projects are creative activities that need two or more people, that is, co-creation projects (Sanders and Srappers, 2008). However, it is not because it is considered a creative activity that co-creation happens only in the creative phase, it actually occurs throughout the project process. After all, the different backgrounds of the people who make up the development team include their own empirical and scientific knowledge, in addition to serving as a guide and inspiration outside the whole team (Aride and Couto, 2018). Several authors propose structured visual organizations to facilitate the understanding of the project development process (Lessa, 2013). Knowing these visual organizations is relevant for designers, as they serve as guidelines in the search for solutions to project opportunities (Perry, 2016). The more the designer is aware and seeks to apply combinations of these possibilities, the better can be his performance, after all "knowledge gives the designer autonomy of action and flexibility" (Thaler *et al*, 2016).

2.3. Problematization and project results

Just like design problems, the results of area projects are not fixed, accurate and do not mean they are unique answers. Inaccuracy is an intrinsic feature of design from definition to design solutions that allow more than one resolution considered correct in the face of the defined design opportunity, as long as they correspond to demand and meet requirements. This is because numerous factors can influence the choice between proposed solutions, such as issues of cost, aesthetics and socio-environmental impacts to the technologies employed, and all can be worked on and adjusted according to the vision of the project applicant. (Paes and Anastassakis, 2016; Perry, 2016; Pazmino, 2015). As already presented, a well constructed and structured problematization stage affects and influences directly and positively the resolutions presented by the designers. The method itself or the problematization does not guarantee the success of the project result, but both, if developed responsibly and seriously, serve as a solid basis for more precise responses to the project opportunities worked on (Vasconcelos *et al*, 2012; Oliveira and Couto, 2014). The question is that the vision that defines the approval or not of the project solutions is the client's, so it is essential that the designer clearly understands the demand received, and if necessary, has solid foundations and well constructed arguments to defend decisions that may be necessary to the project, but do not satisfy the client. The designer's background is also relevant in the development of answers to project problems, since it is in his empirical and projectual knowledge that he will look for

ways and means to structure possibilities of results, so it is important that the designer's portfolio is in line with the needs of the client or company requesting the project (Moraes and Meyer, 2016; Celaschi, 2010; Guidali and Scaletsky, 2012). Besides the projecting of solutions to poorly structured and complex problems that require the designer to think and take a holistic view of the process, the problems are transformed throughout the projects into new problems until they take the form of successful solutions. Therefore, even if the designer has freedom of choice in the process, he must deliver a result within what is expected and requested, thus being limited in certain issues involving the projects.

The criteria for evaluating the design results is related to the effectiveness of the proposal in the face of the problem addressed, and this effectiveness may be present in more than one form of solution, as well as should be maintained even after changes requested from the designer in the final delivery (Nicolau, 2013; Pereira and Scaletsky, 2008; Lessa, 2013). A validation strategy in design is the comparison between results and project requirements, but this is only possible when the objectives are clear and well defined from the beginning of the process or in the briefing. The fact that there are no exact and correct answers in the design solutions also does not allow us to think that any solution will serve as a project result, but only those that are perceived as satisfactory in view of the project opportunity identified. Therefore, the design process and its result is a system that refines, reformulates and constantly remodels the problem worked on and the hypotheses considered for the project. This also requires that in this process logic, new "analyses, summaries and evaluations between the two project idea spaces - the problem space and the solution space" (Phillips, 2008; Moraes and Meyer, 2016; Perry, 2016; Guidali and Scaletsky, 2012; Harfield, 2007; Dorst, 2003; Ximenes *et al*, 2017; Dorst, 2006). The project validation seeks to "certify, approve technical properties and performance of artifacts", as well as provide the "evaluation of characteristics of artifacts and product-service systems", but also "needs to deal with the expectations of the actors involved [...] in the process of validating a proposal" (Moraes and Meyer, 2016). This demonstrates how the objective of validating the results of the design process passes through the technical review, the specific knowledge of the area and the desire of the client. There are several factors involved in order to attest that the solution is effective or not, which should be considered that adjustments or arguments may be necessary during communication processes that seek to enable and implement the final proposal in common agreement between designer and client. The possible different solutions that can be generated by a design project depend on how the problem is constituted by the designer, that is, the perspective adopted by the professional in face of the project opportunity directly affects the hypotheses generated (Velloso and Costa, 2013; Harfield, 2007; Dorst, 2003; Ximenes *et al*, 2017; Dorst, 2006). In the same way that the user needs to interpret the product, discovering new alternatives and unforeseen uses, the designer can adapt this activity to the moment he receives the project opportunity, reinterpreting and analyzing the problem from various angles and forms of solution still in the phase he is problematizing and understanding its context. This means that the designer needs to put himself in the client's place, see the problem from the user's perspective and realize what is important to him in the search for a better understanding of which path to follow during the problematization and search for solutions. (Bentz and Franzato, 2016; Moraes and Meyer, 2016). Numerous project results are widely awarded in fairs and exhibitions in the area, but are not successful when available in the market. This shows how technical effectiveness does not always correspond to market success and it is up to the designer to perceive the balance between these spaces so that his product triumphs in both. These notions that allow the designer to balance his decisions between the effective technician and the one accepted by the public may result from a cohesive method used during the design process, but mainly from real research, which presents clear data and bases the design choices. In other words, a serious, coherent and conscientious problematization is necessary before attempting a random solution to the problem in question. The designer needs to perceive his responsibility towards the projects and use the principle that "no computational resource will ever be able to replace the designer in the project act" (Phillips, 2008; Celaschi, 2010, p. 17).

3. Methodology

Aiming to present the connections between the stages of problematization, creativity and design results, it was sought to show the importance of carrying out the first of them in a coherent manner in projects to assist the other activities of the process. The bibliographic research was carried out together with the

publications in the study area, by means of data collection from the application of the term 'problematization', the inclusion criteria being the contexts involving 'teaching and design projects', in the delineation of specific research sites for data collection and subsequent practical activities. The study is of a descriptive nature, based on bibliography, and was carried out in a geographically defined cutout according to the HEIs involved, in order to collect information in the context of teaching in design. The positive point perceived in researches of bibliographic approach is the possibility that knowledge updates are carried out with new researches on the theme, being able to approach gaps in the study field, which foments the development of new researches, providing synthesis of what has already been produced and serving as aid or resource. Thus, the research began with the stage of bibliographic survey, which is based on material already published to provide theoretical foundation and knowledge on the subject through data collection (Gil, 2010). The objective was to explore the theme, presenting published studies and allowing the verification of gaps in the exposed review, in order to work on the issues observed in theory in practical workshops held concomitantly with the development of the thesis that encompasses this theoretical cutout. These workshops allow the analysis of activities performed by groups of designers in the development of a practical project that generates content that can be analyzed applied to the exposed reflection. The activities allow all the content approached in this theoretical review to be verified in the practice of the study group, in the specific context analyzed, which contributes to the development of the proposal of result of the thesis in question, which aims to assist academics in the stage of problematization. Thus, the presented cutout justifies the context chosen for work and seeks to make a link between the issues considered key points determined so far in relation to the stage approached with greater focus within design project methods: the problematization in the design process within the degrees. It is not fit in this same article to present the results of the practical stage in front of the bibliography raised, since they are in progress and still need analysis for definitions of their theoretical-practical connections. According to the content collected in bibliographic material, it is noticeable that the data that will validate the research are related to: a) the current format of teaching design through methods and its application in projects; b) the search for results of creative projects (market need and correct understanding of demand - problematization) and, c) the importance of assertiveness in the project results - directly related to the stage of problematization of projects. Thus, the execution of the stage of collection and treatment of these data is indicated as future work, in order to prove the proposed relationships. Therefore, the analysis of the results of the workshops is also of great value to ensure the practical veracity of the content presented, even if carried out in specific regions, since the material researched for use in the theoretical basis also comes mostly from these contexts, which justifies the search for possible links to be observed between theory and practice. The approach used to verify the contents presented takes into consideration the geographic cutout used for data collection and for the practice of the workshops. It also includes the empirical knowledge of the authors in face of the initial research question, which aimed to show the relevance and implications of the committed realization of the problematization stage in design projects by undergraduate academics.

4. Conclusion

Based on the material presented, it is possible to say that the problematization as a stage of the method is essential, multiform and profound, making the whole project progress be thought from the results that this stage provides. When not realized, the project may run more risks of abstract results, not related to the problem and more conflicting processes in its development. The project practice is "potentiator of the processes of change", and also "impeller of experimental practices", being these characteristics also derived from the objectives of the stages of the methods. This practice, together with the problematization and added to the designer's knowledge, provides the project result with greater chances of validation with the client (Machado *et al*, 2016; Moraes and Meyer, 2016). By being able to transmit correct messages regarding project demand through problematization, the designer assists the development of the creativity stage and provides greater coherence to the choices of project results. In this verification the design problem, or opportunity, has always been considered as defined, since the context addressed by the thesis that covers this synthesis discussed verifies the academic environment, where design problems are delivered previously organized and defined for the development of projects. At graduation, aiming at learning the design process, the academic usually receives the problem through

structured briefing and it is up to him to understand the request received and develop the project. In this way, it is possible to say that the problematization stage directly impacts the creative process of the project, as well as, the problematization and creativity are responsible for the outcome of the project. It must be considered, therefore, that it is indispensable in the formation of a designer who seeks to fulfill requirements indicated through the analysis of the phase of problematization, generating hypotheses and alternatives consistent with the demand for the project received. It is considered that the creativity stage must continue to be free and abuse the use of tools that foster disruptive moments aiming at the creation of new ideas. The point is that if this stage is developed on the basis of a well-done research, the probability of creative success in defining innovative results is better founded and coherent with the project opportunity. Consequently, the impact of a well done problematization along with the creative process supported by the collected information, the project is directed to present results more aligned with what was requested, allowing the acceptance of the final product to be greater with the stakeholder.

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