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DIAGNOSIS OF THE OBSERVATION PROCESS AS A TOOL TO DESIGN PRODUCTS. CASE STUDY OF THE UNIVERSIDAD DEL BIO-BIO SCHOOL OF DESIGN

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ABSTRACT
Observing is an ability which some of us have developed more than others. However, for designers, observation is a cognitive tool which appears as a key stage in the creation process, focusing on the study and understanding of the environment/context through a phenomenological approach, covered from the personal vision of the observer. After 5 years of analysing results of evaluations associated to the application of observation in teaching design workshops for the concept creation process in students of Universidad del Bio-Bio's Industrial Design School, it was possible to detect differences in methodological approaches when teaching this process. This research, whose intention is to implement improvements in these methodologies, has a goal of diagnosing and gathering the perception of the role of observation within the education of industrial designers, making a qualitative investigation using a case study approach, interviewing 145 designers chosen by sampling done by convenience and accessibility, on-line surveys and two focus groups. As a main result, 117 meaningful units associated to the observation process are gathered, grouped into 16 conceptual codes and 4 categories of study. As a main conclusion, a categorisation of the observation stages and identification of the key stages to consider while teaching product design are highlighted.

Keywords: Product Design, Problem solving, Observation, Phenomenology, Method.

1 INTRODUCTION

In Chile, the education of the industrial designer, or product designer, is faced closely following the Bauhaus School [1] – which has also inspired the art and architecture degree schemes - which from a project-based and reflexive perspective [2], looks to have a more direct and less theoretical approach of reality, through experiences. As such, a more in-depth level of understanding implies experiencing the world directly as a basis to say something about it. This means that one must focus on the phenomena in the living world, where the subject must enter the context of these phenomena before theorising about them [3]. In this context, Izuquiza (2006) [4] highlights the importance of observation, understanding that all reality depends on what you see, and in that sense, reality is a construction that is made between the observer and what is observed. It is therefore, that the observation process, from this approach, has been embedded in the teaching of design in Chile.
For this study, observation will follow the proposal that Fabio Cruz (co-founder of Universidad Católica de Valparaiso's Architecture and Design School) gives us, who defined it as: "*a way of looking and contemplating to see something for the first time*", without prejudice and where a "*dialog between the mind that abstracts (=chooses, separates) and the hand that interprets and does*" is given, accompanied by a "word which investigates about what is being contemplated and drawn, a word that names, that gives names" [5]. As a result, observing is the first step towards understanding anything about the surrounding environment and its naming gives rise to concepts. For Misha, Koehler and Henriksen [5], observation is a carefully perfected ability that is based on an intended approach, the attention and the curiosity about the information gathered by the five senses.

According to what Christiaans and Venselaar [7] set out, competences to design can only be acquired by experiencing the design process (learning while doing) and that this process runs from understanding how its different stages, the integrated application of theoretical knowledge and physically making of a design are linked. While it is possible to identify that one of the main aspects involved in this process, to produce something new, is creativity [8] [9].

As the design process does not guarantee the generation of a "creative" event [10], some authors analysed creativity in design-teaching. In this context, Hasirci and Demirkan [11] [12] [13], made a study focused on distinguishing the cognitive stages of creative decision-making that a designer has in a professional design studio, considering the relations between person, process and product, and they concluded that creativity was mainly evaluated in the resulting product, rather than in the design process or person. Regarding the design process, Cross [14], set out that the design cognition process, where creativity is essential, comprises three areas: (i) definition and formulation of problems; (ii) generation of solutions and (iii) the strategies used. This author also suggests that, for designers, unlike engineers, the creation of a development concept exists, which guides the generation of solutions and that this concept is born both from the analysis of the problem and of the existing solutions, with said concept being able to remain unaltered throughout the process or be modified depending on the findings in the investigation during the design process. Related to this, Fricke [15] acknowledges the existence of a direct relationship between a good generation of concept (to provide a solution) and the definition of the problem, where the clearer the problem, both the generation, the concept during the design process and the solution to the problem, will be more accurate and will provide a better solution. On the other hand, the more limited the definition of the problem, the less defined and less complete and satisfactory both the concept and the solution will be. While, Akin and Akin [16], regarding the generation of concepts and creativity itself, establish that these are the bridges between the problems and the solutions and that these are generated from a "reflexive conversation with the situation" though a draft [17], in a dialogue between a reflexive criticism and an analogue reasoning or reinterpretation of how they see what is being observed [18]. In this same context, Akin and Lin (1995) [19], outline that, in the concept generation design process, designers move between reflection, sketches and thinking. With this point being where the creative act crosses with the observation, because according to Alberto Cruz (founder of Universidad Católica de Valparaiso's Architecture and Design School), it is in the act of thinking through the drawing and the written word, where a creative act is produced which creates the work. All this implies showing with the word and the drawing what is not named, because observation allows unveiling or renaming. This game between thought and the senses exposes both the observer and what they observe, in a single creative act, because it cannot be repeated and committed with the subject that is doing it. For Husserl, founder of the phenomenological school of thought, observing is not just a sensorial act, or solely a rational or intellectual one, it is a transcendent experience because *it is knowledge of the subject who knows* [20]. These principles have brought to prominence the philosophical dimension of observation in design, because they do not distinguish limits between the subject who observes and what is observed, or between the latter and its environment.

We can then say that observation can lead to creative thought as it allows understanding the relationships between individuals, objects and the environment [21], no longer scrutinising the context with the goal of understanding [22] and generating new relationships. It is renaming, through a creative reinterpretation, what would be a scenario and a space of the design to explore. In this way, observation bursts into the design schools in Chile at the end of the 1960s, as a key stage in the design process, focusing on the study and understanding of the environment/context through a phenomenological approach, which is addressed from the observer's personal vision. Observation is instilled as a great design methodology and has been inherited in other schools, like the EDI-Design School at the Universidad del Bio-Bio, which has applied this as one of the key competences for the graduate's profile since it was founded at the beginning of the 1990s. However, in spite of this, there is still no real consensus regarding not only the method, but also what observation in the context of design really is.

This is key, given that over recent times, Higher Education establishments have made important strides towards studying what the basic conditions to strengthen the development of creativity would be [23] [24]. To achieve this, explaining the particular aspects of the observational processes is a priority, considering that this acts as a primary tool in professional work, and with this being the inheritance of scientific research [25], it allows providing a key foundation in professional work.

2 METHODOLOGY

After reviewing the results of evaluation processes related with the application of observation in the product design process in UBB's industrial design school between 2012 and 2017, based on the observation of the research's context, it was possible to detect difficulties in the student's handling of observation, specifically in the concept generation process to make new products. This situation questions the methodological approaches implemented in the education of Industrial Designers in EDI-UBB's Design Workshops. This research, with the intention of implementing improvements in these methodological approaches, has the goal of diagnosing and gathering the perception of the role of observation within the education of the industrial designer, for which a qualitative investigation was made to address the phenomenon of observation in design from a comprehensive viewpoint [26], using the case study approach which has the purpose of investigating the characteristics of certain social groups as case units [27]. 145 designers selected by a sampling done by convenience and accessibility took part. An on-line questionnaire, validated by experts was used, after a prior informed consent process. Two focus groups were held. One with students from each year and another with the workshop professors. A content analysis was done using caqdas Atlas ti 7.5.2, which according to San and Cantero (2014) [28], allows systematising and organising the data to facilitate its analysis and comprehension.

3 RESULTS

117 meaningful units arose, associated to the observation process in designers. These units were grouped into 16 conceptual codes and these, in turn, into 4 categories of study. In figure 2 we can see the frequency detail obtained in each conceptual code which allowed, as a result, grouping into certain subcategories. The frequencies obtained allow showing the complexities of the properties and dimensionality of each category and their subcategory. Regarding this, it is seen that the first category mentions the "*perceptive predisposition to observation*", as an initial attitude that characterises the observational process. In this context, an attitude valued by these professionals is the predisposition to perceive the diverse elements of the user's environment, like being perceptively placed for the observation process, process where the designer must be placed considering the unclear elements of the environment and of the elements that have an impact and are related in the observed environment.

In addition, the designer must connect with the reflective experience of the initial observation process. In figure 2, it can be seen that the highest frequency appears in this sub-category; as such the designers tend to fundamentally value the process of carefully connecting to the environment's characteristic elements, as well as recognising and connecting with the context these are in. The second category refers to "*Rescuing the environmental stimuli perceived*", where the essential elements versus the accessory ones are identified. In said moment, the participants mentioned that it is key to identify the elements and phenomena of the environment observed, prioritising this observational step over the others in this category (figure 2), and thus extracting the concept of the environment, the primary principle that can be captured in this stage of the observation process. With this, the designer manages to transfer what is observed to the object and to differentiate it from its competence. A third category is called "*Processing of the information observed*", moment where the core issue of the design is analysed. The designer, by frequency (figure 2), in this point attributes this as a priority step, on analysing the design problem in the context of the user, by processing information, along with the relation and association of the elements identified in the environment. As a result, designers must process the search of elements, the method and the design problem. Finally, the fourth category that emerges in this study is the "*Conceptualisation of the observed events*", through which the final design proposal is made. In this way, a greater frequency is seen in the description of the problem's conceptual elements (figure 2), and this is considered as a priority step in this category. The second important process then emerges, with the definition of the conceptualisation and identification of the hypothesis. This is seen in the frequency obtained, which is the final conclusion of the proposal's conceptualisation (figure 2).

Phenomenon	Categories	Subcategories
OBSERVATION PROCESS IN DESIGN	PERCEPTIVE PREDISPOSITION TO OBSERVATION	BEING PERCEPTIVELY PLACED FOR THE OBSERVATION PROCESS
		REFLEXIVE EXPERIENCE OF THE INITIAL OBSERVATION PROCESS
	RESCUING THE ENVIRONMENTAL STIMULI PERCEIVED	IDENTIFICATION OF ELEMENTS AND PHENOMENA OF THE OBSERVED ENVIRONMENT
		IDENTIFICATION OF THE USER'S PROBLEM
	PROCESSING OF THE INFORMATION OBSERVED	ANALYSIS OF THE DESIGN PROBLEM FOR THE USER
		COMPARISON OF THE INFORMATION OBSERVED IN THE PROBLEM
	CONCEPTUALIZATION OF THE OBSERVED EVENTS	IDENTIFICATION OF ELEMENTS OF THE PROBLEM'S CONCEPTUALIZATION
		ANALYTICAL CLOSURE OF THE OBSERVATION PROCESS

Figure 1. Result categories outline. Source: Own Preparation

Subcategories	Conceptual Codes	Frequency
BEING PERCEPTIVELY PLACED FOR THE OBSERVATION PROCESS	Locate the unclear elements of the environment	5
	Locate the elements that have an effect on and are related in the observed environment	6
REFLEXIVE EXPERIENCE OF THE INITIAL OBSERVATION PROCESS	Carefully contact the characteristic elements of the observed environment	8
	Recognize and connect with the context in which the user works	8
IDENTIFICATION OF ELEMENTS AND PHENOMENA OF THE OBSERVED ENVIRONMENT	**Identify the particular elements of the observed environment**	**13**
	Extract phenomena of the observed environment	8
IDENTIFICATION OF THE USER'S PROBLEM	Identify the beginning of a problem being solved	5
	Identification of patterns, behaviours and agents of the observed environment	2
ANALYSIS OF THE DESIGN PROBLEM FOR THE USER	**Analysis of the processing of information observed**	**15**
	Relate and associate elements of the space and environment	8
COMPARISON OF THE INFORMATION OBSERVED IN THE PROBLEM	Contrast information of the environment and the subject	1
	Interpretation of the elements of the environment and the subject	7
IDENTIFICATION OF ELEMENTS OF THE PROBLEM'S CONCEPTUALIZATION	**Describe the conceptual elements of the problem identified**	**10**
	Define the conceptual elements of the problem identified	9
ANALYTICAL CLOSURE OF THE OBSERVATION PROCESS	Identification of hypothesis of the environment elements and the subject	2
	Conclude the conceptualization of the observed elements	**10**

Figure 2. Conceptual Codes and frequencies. Source: Own Preparation

4 DISCUSSION

Following the results obtained and the graduates' comments, it is possible to state that observation continues to be understood as a sequence of analysis processes that is ever more complex, however, is the observation of the analysis more important that other mental process? The answer is no, because although analysis allows going into greater depth and clearing up aspects of what has been observed, it does not form a sole prototypical logical act of the observation.

Observing is a Gestaltist act, capable of leading us to the concept because it unifies the analysis elements in a holistic state, just as emerged from the experience. This implies that it leads us again to this by means of a concept that addresses and is communicated as a synthesis of the event. But, considering the expressions made, there do not seem to be intermediate stages between analysis and synthesis (conceptualisation). But is this true? For example, if a lush thick leafy tree is observed on a windy day and the resulting concept were a "blanket of micro comings and goings", this is because the branches, leaves, the shape of the crown, its shade, the movement of the leaves, its height and the way each one of these elements is related to each other was analysed. The concept is presented as a synthesis, a conclusion of all this, because all this experience was grouped together. It is not left in the analysis. The analysis just provoked this unit. Conceptualisation requires suspending rational thought, that is to say, to the world the faculty of analysing belongs to, to move onto creative thought which lets us connect once again with the act perceived. This is the concept that leads us to the design. There are multiple ways in which it could represent that "blanket of micro comings and goings" and there could possibly be infinitive uses, but this does not deal with re-presenting the tree, it is rescuing the quality of the tree I want for the role that it must have.

5 CONCLUSIONS

Currently there is limited evidence regarding how the observation process is set up in industrial design in Chile. The results presented reveal, therefore, an initial proposal of those stages which could appear in the observation process from the designer's predisposition through to the conceptualisation of the product that they make. This provides an example what Rodriguez (2010), who emphasised how observation continues being an inheritance of the scientific investigation, set out. The theoretical value of the results is that they allow explaining specific aspects of how observation is going to be developed, confirming that this ability is based on an intentioned approach to collect information of the context (Misha, Koehler and Henriksen, 2011).

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