

# Syntactic and semantic dimensions in design projects

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**ABSTRACT:** This work aims to contribute to a discussion in the educational field of design, considering a holistic and systemic approach to the teaching of design methodologies. Specifically, it emphasizes the formation of the ability to articulate the syntactic and semantic dimensions in the configuration of design solutions. As a methodological approach, the study used an exploratory transversal platform that converges two surveys. An investigation of the teaching / learning of design in fashion design and a research of methodological strategies for the delimitation of graphic-semantic guidelines in the teaching of graphic design. The clipping focused on the proposition of methodological strategies that could employ visual thinking to the synthesis of expressive concepts, generating a connection between the Expressive Categories Map and the Graphic-semantic Expression Map, two unpublished tools that confirm the advantages of graphic- and active pedagogies in the training environment of designers

## 1 INTRODUCTION

The expressive power is essential between the skills of a designer, since the evolution of the project depends on the ability for externalize, record and communicate ideas. Next on projetual trajectory implies living and observation cycles, analysis and synthesis that, indispensably, require means that favor the perception, manifestation and sharing of the fruits of these processes.

From this procedural approach, as Sanches (2017), On the way between the design problem and the corresponding solution, the decisions are connected to each other from a dynamic network that is assimilating new information and changing until finding a viable proposal. From this perspective, the project It involves a process of knowledge construction that lacks strategies for the flow and understand these connections.

On the other hand, besides the potential of contribution in the processes intrinsic to the organization of the project thought, expressive competence is also imperative to establish the interface in between the design solution and the sociocultural context that will welcome it. Manipulating aesthetic-formal codes, creating a recognizable statement in this context, is one of the central challenges of the design activity in its various fields of activity.

Thus, on the one hand -If highlights the expressive ability as a channel for managing specific design knowledge and, on the other hand, emphasizes the urgency of creating a visual support for the semantic load of design object. Considering these aspects, this reflection focuses its efforts on the study of strategies that facilitate the expression and synthesis of aesthetic-symbolic concepts in the training of designers.

In view of more holistic and systemic approaches to teaching / learning design, the article It presents the intersection of two surveys built on the educational universe: one that investigates the teaching / learning of the project and another that studies methodological strategies for the delimitation of graphic-semantic guidelines in the teaching of graphic design.

The convergence of research provided the theoretical basis for multidisciplinary and field experience was the framework for the present study. From a clipping that associates the precepts of meaningful learning and visual thinking, it was possible to transpose a tool created in the field of fashion design for the universe of graphic design. In both cases, the investigation started from the problematic about the difficulty of transposing the parameters of the design delimitation into elements of syntax and to impel the generation of proposals.

The inferences reached reaffirmed advantages the graphic-visual tools and active pedagogies as facilitating strategies of articulation visual syntax design projects.

## 2 THEORETICAL BASES

### 2.1 *Materializing concepts: visual syntax and design thinking*

The design is occupying to propose interfaces that mediate human integration with the environment. A project arises from the demands of the sociocultural context and ends up submerging, again, in the same conjuncture that defined it. Therefore, managing the design process means to act in a pertinent and effective way before a request of reality, requesting a mobilization of knowledge, values and decisions that help to conceive this channel of interaction.

Therefore, in teaching / learning design, plead -If strategies that facilitate the transformation of context variables into delimiters for the materialization of a solution that establishes an effective dialogue with such scenario.

In this sense, Sanches e Barbosa (2015) emphasize that each project involves investigating scenarios, identifying demands, formulating objectives, synthesizing concepts, trying out proposals and communicating solutions.

It should be emphasized that design, as an interdisciplinary and coordinating activity, requires the student to develop the ability to connect variables to find the best solution in integrating the delimiting factors of the project. However, the architectural design knowledge is consolidated through a reasoning structure mark by the cycles of progress, setbacks and shifts pen Samento (LAWSON, 2011). Through recurrent cycles of analysis, synthesis and evaluation, aided by specific methods, the projective act matures and converges towards the clarification of a concept for the project.

Sanches e Barbosa (2015) explain that in the educational environment, the synthesis of concepts acts as a guide in the processes of contextualization, definition of parameters, evaluation and consolidation of ideas.

Para Lessa (2009), the artifact of the concept refers to a summary of the main features and characteristics that drive the design solution is the essence of experience in human daily life. Lawson (2011) calls the same conception as the central idea.

For clarity, Munari (2006) explains that every visual message has two components, information and visual support: the information comprises the content to be communicated and the visual support the form that expresses such content. The support is

composed by the set of visual units and the compositional relations that make the information visible. The author also cautions that there is an inseparable connection between visual support and interpretation of information.

According to Dondis (1997), it is pertinent to mention a syntax reasoning for visual statements. There are general guidelines for the creation of compositions, in which basic elements can be learned, understood and used, together with manipulative techniques, for the creation of clear visual narratives.

We don't intend to discuss the appropriation of the term's syntax and language in the non - verbal level. Only it will be appreciated that the use of the term syntax, in this explanation, consists of the characterization of compositional units of the visual set and its principles of interaction, safeguarding the assumption that, despite appropriation, the nature of visual language is very different from verbal

A visual arrangement is a body of data that can be used to compose and understand messages at various levels of practical application. Such an arrangement groups that exert mutual influences, provide a impel the construction of meanings, establishing the semantic dimension of the design object.

From the foregoing, the importance of training manipulates visual syntax and shape an expressive concept. Establish a visual support and consolidate a semantic load for the design object depends intrinsically capacity of articulation of a compositional intent. However, building this knowledge is a transversal knowledge path that involves the use of visual thinking, knowledge of the fundamentals of visual language and the application of didactic actions that stimulate reflexive learning and the perception of the system of variables that influence the project. Therefore, the tools presented in this report rest on the basis of active pedagogies and holistic and systemic approaches to project methodology.

### 2.2 *Learning the significative and visual thinking as a pedagogical platform*

In Project design, each action is accompanied by a conjunction of thought operations to decide the procedures that will be performed. The process is based on the interaction of information, the synthesis of concepts and the transformation of these concepts into a meaningful knowledge to produce a coherent response.

As a result, Sanches (2017) clarifies that, in the education sector, it is vital to generate a proper environment for the active participation of the student in the strategies it uses to articulate this route. The context of teaching / learning is also a space to reflect

about the design practice, where students should be encouraged to decide on the methodological strategies they will use, and employment prior knowledge already exercised. Under this guideline, the study adopted the Line of Significant Learning of David Ausubel. In summary, Ausubel (2003) proposes that, in addition to the content indicated by the teacher, the previous knowledge of the student be valued in the course of the learning process. According to the author, this supports the construction of structures and mental schemes and provides a pleasurable and effective learning.

Agreeing with Sanches e Barbosa (2015), the teaching experience of the present authors confirmed that learning becomes significant when new information is incorporated into the student's knowledge structures, acquiring meaning from the relationships established with their previous knowledge. For this reason, in the methodological tools proposed here, the student repertoire functions as a cognitive anchor.

To facilitate this meaningful construction of knowledge, we added the advantages of visual thinking as a vehicle for the operationality of methodological tools.

According to Sanches (2017) the graphic-visual representations serve as a vehicle for building knowledge and collaboration as a strategy to organize and connect knowledge therefore and new ideas as they allow a look Panoramic and the simultaneous on the set of relations established between the information.

Among the advocates of visual thinking, Roam (2011) stands out. The author clarifies that visual, spatial and syntactic thinking, in conjunction with the verbal mind, linear and analytical, generates graphic organizations that facilitate the expression and sharing of ideas. He calls this "lived thought" this interactive way of articulating images and words, revealing that a lived idea is part of drawing up a setting that makes the idea tangible and propels a broader understanding experience. Sanches (2017) quotes Roam (2011) noting that, in his "lived grammar", the author emphasizes the use of maps and diagrams graphic-visuals as a means to represent relationships and synthesize interactions in simultaneous directions.

In the same line of reasoning, Sanches' research (2017) proposed a graphical-visual instrument (REC Diagram and Map of Expressive Categories) that help, respectively, the design delimitation and the expressive direction in the design of fashion design. However, although the survey focusses the design in the fashion field, Expressive categories Map is applicable to other areas, opening a range of paths to

explore. In this sense, we present the following methodological approach and the connection of the results of this tool with the creation of Expression Graphic Map without semantics.

### 3 METHODOLOGICAL APPROACH

The methodological approach of this study part of a large methodological platform, since here two researches are integrated. Consequently, the procedures leading to the construction of each are summarized below, just to clarify this specific targeting cutout. Research on methodologies for fashion design had qualitative approach, through a bibliographical survey, documentary analysis and participant observation in action research. In view of these procedures, the Map Categories Expressive was validated projective practices with the participation of 77 students and 8 teachers Course of Fashion Design at the State University of Londrina, Brazil.

On the other hand, the study about strategies for graphic-semantic delimitation in graphic design education, was set up as a research for the setting sun will of a methodological method, which helps the process of synthesis of the expressive code and also enhances the relationship between graphic expression and semantics in the design practice. Under the same qualitative position, combining scientific research with teaching practice, the present study connects the two researches and forms the use of the Expressive Categories Map as a cognitive bridge for the construction of the Chart of Semantic Expression Map.

### 4 FACILITATING STRATEGIES

#### 4.1 *Conceptual Basis: Expressive Categories Map*

The Expressive Categories Map is intended to organize, gather and filter expressive codes, synthesizing a structure of connections to the visual statement of the designed artifact, which identified configurative units (Sanches, 2017).

Sanchez (2016; 2017) explains that the tool is designed by combining *mood board*, semantic differential scale, action verbs and mental map.

Their use is summarized in the following guidelines: a) starting from specific strategies for the investigation of the sociocultural context, the students identify expressive codes that permeate the user universe and are able to synthesize a concept for the artifact through keywords; b) the keywords direct the definition of an action verb, which acts as the impeller of the search for imagens; c) to stimulate the expressive channels a subjective collection of imag-

es is carried out, in which the participants of the project collect images that represent the action suggested by the verb; d) after collect the images, elaborates one mental imagery map were similar representations are associated and possible expressive categories are identified.

Then, to extract configurational elements, a semantic differential scale is applied by associating the imaging map with a set of independent sensorial perceptions organized at opposite polarities. For clarity, a semantic differential scale measures the emotional reactions that accompany a word, an object, or an image. From two opposite descriptors, located at the extremes of a range of values, qualifies the sensations caused by the object (word or image) as they approach more than one extreme or the other.

Fig. 1 shows an example application.

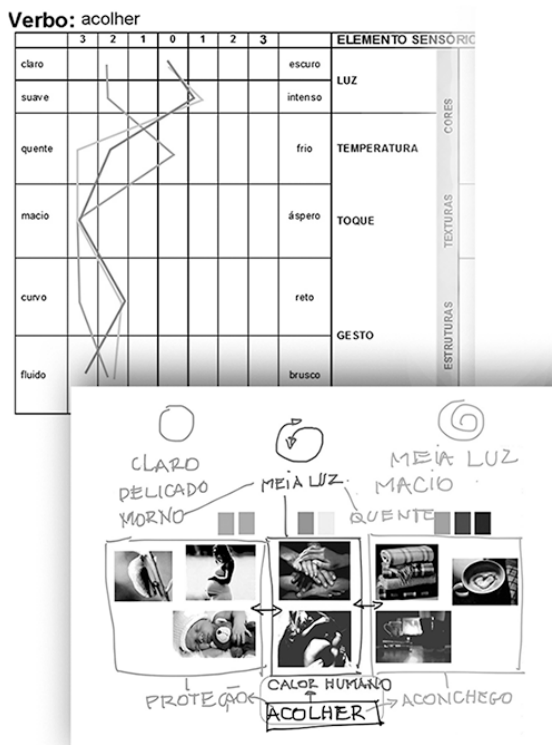


Figure 1. Example of Expressive Categories Map application. Adapted from Sanches (2017).

In this way, each expressive category is linked to the sensations of light, temperature, touch and gesture. Finally, the resulting measurements of the semantic differential are interpreted in color (light and temperature), textures (touch) and formal structures (gesture).

The validation of this tool in the field of fashion design has already confirmed that favors the directing of syntactic elements in an integrated and relevant way. Likewise, it promotes communication in a

project team and facilitates collaborative design initiatives, considering that it is possible to include the user in the elaboration of the image map.

Although these effects refer to the applications in the academic universe of fashion design, Sanches (2017) states that the tool can be applied to other experiments, since it is versatile and its essence, as a means of cognitive organization, is to facilitate the expression of abstractions and the synthesis of concepts.

#### 4.2 Results: Graphic-semantic expression map

Visual thinking is an essential tool because it helps clarify ideas or viewing images that represent concepts help in the interpretation of the problem and triggers ideas associations. In this way, the images are treated as information, so that, from them, innovative ideas are created. In this context, concept maps are a widely used tool in design teaching to help students visualize and unify concepts.

During the development of a design project, we need to articulate abstract concepts or are metaphorical through images, in order to give meaning to visual concepts. The semantic panel provides a visual form capable of stimulating and inspiring the process of design projects. It is a technique that helps the active method, which aims to represent meanings through the visualization of images, that is, a technique that translates verbal language into visual signals.

Based on the traditional conceptual map, we created a map of graphic-semantic expressions that aims to make the relationship between the various evaluative elements more understandable.

This is graphic-semantic expression map relies on communication through visual metaphors and is usually built by collages (manual or digital) with clippings of pictures, photographs or drawings.

This type of semantic panel offers a visual and sensorial channel of communication and inspiration for design research and development, which could be considered more logical and empathic within a context design than traditional verb-centric approaches.

Primarily, mood boards provide a mechanism for students and practicing designers to respond to perceptions about the brief, the problem as it emerges and the ideas as they develop. The construction of mood boards potentially stimulates the perception and interpretation of more ephemeral phenomena such as color, texture, form, image and status (Garner & McDonagh, 2002). Through this it's possible to communicate in a more tangible way abstract concepts.

Ultimately, through the construction of mood boards, it is possible to stimulate the perception and interpretation of more ephemeral phenomena such as

color, texture, form, image and status, i.e. a semantic panel can extract references such as color, shape, textures, typography as well as subjective concepts, such as emotions.

It's a methodological map, which will assist the process of synthesis expressive code and also boost the relationship between graphic expression and semantics in design practice.

This map was tested and evaluated as an instrument to facilitate the creation and development of projects in the field of graphic design (fig. 2).

INVESTIGATION	ANALISE		
	TYPOGRAPHY	COLOR	SHAPE (FORM)
	<b>NEW DESIGN UNIVERSITY</b> <small>esad crte+ design</small> <b>ESCOLA SUPERIOR DE DESIGN</b> <small>OCAD UNIVERSITY</small> <b>LISBOA</b> <small>Universidade do Minho Instituto de Educação</small>		
	<b>Museo 300</b> <small>Helvetica Neue UltraLight</small> <b>DIN Alternate Bold</b> <b>Gotham Black</b>		
	<b>Tahoma</b> <small>Regencie LightAlt</small> <b>Roboto Condensed</b> <b>Helvetica</b>		<b>CURVED FORMS</b> <b>MOVEMENT</b> <b>FLUIDITY</b>
<b>FONT SANS SERIF</b> <b>STRAIGHT STEM</b> <b>LIGHT, REGULAR OR BOLD</b>			<b>CURVED FORMS</b> <b>MOVEMENT</b> <b>SOMETHING WITH STRAIGHT LINE</b>
<b>MAIN LOGO</b> 		<b>LOGO POSSIBILITIES</b> 	

Figure 2. Example of Graphic-semantic expression map application. Author Image.

## 5 CONCLUSIONS

Design is a process of mental ordering that, according to López et al. (2014), is to adequately resolve the abstraction, synthesis, organization, and transformation of form to propose a solution, in which concepts must be expressed and represented to materialize.

This study reports that the use of visual thinking, through graphic representations, favors the perception of simultaneous connections, imparting more agility in understanding the relations of the "design system" and in the association of information. Visual thinking is an essential tool because it helps to clarify ideas, i.e., the visualization of images that represent concepts in the interpretation of the problem and trigger associations of ideas. In this way, the images are treated as information, so that from them, innovative ideas are created. In this context, concept

maps are a widely-used tool in design teaching to help students visualize and communicate concepts.

In design teaching the intention is to simulate, as far as possible, real projects. Using active methodologies, the student is the main agent of their learning. The methodology that we approach here encourages criticism and reflection, in which, although accompanied by the teacher, the student is the center of this process. In this way it is possible to orient learning in a more participative way, since the involvement of the student brings fluidity and the essence of active methodology.

## 6 REFERENCES

- Arnheim, R. 2016 *Arte e Percepção Visual: uma psicologia da visão criadora* (edição revista). São Paulo: Cengage Learning.
- Ausubel, D.P. 2003. *Aquisição e Retenção do Conhecimento: uma perspectiva cognitiva*. Lisboa: Plátano Ed. Técnicas.
- Dondis, D. A.1997. *Sintaxe da linguagem visual*. São Paulo: Martins Fontes.
- Flusser, V. 2007. *O mundo codificado: por uma filosofia do design e da comunicação*. São Paulo: Cosac Naify.
- Lawson, B. 2011. *Como arquitetos e designers pensam*. São Paulo: Oficina de Textos.
- Lessa, W. D. 2009. Linguagem da forma/linguagem visual no âmbito do ensino de design: balizamentos teóricos; tópicos de pesquisa. *Arcos Design*. (4)2: 69-91.
- López, E. L., Vega, K.A. M., Maciel, C. A. V. 2014. La expresión y la representación, diferentes cualidades en el diseño. In: C. E. M. Carbajal, R. M. O. Villaseñor & C. A. V. Maciel. *La representación y la expresión como manifestación del diseño*. 416-447. Guadalajara: México.
- Munari, B. 2006. *Design e Comunicação Visual*. São Paulo: Martins Editora.
- Roam, D. 2011. *Bla, bla, bla: qué hacer cuando las palabras no funcionan*. Barcelona: Planeta.
- Sanches, M. C. F. 2017. *Moda e projeto: estratégias metodológicas em design*. São Paulo: Estação das Letras e Cores.
- Sanches, M.C., Barbosa, T.M., Hernandis. B. & Martins, S.M., 2015. Bases para o ensino/aprendizagem de projeto no design de moda: conectando diretrizes didáticas e estratégias metodológicas. *Revista ModaPalavra*, 9 (17):119-144.