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Articulating the Shape: transversal pedagogical actions for the construction of knowledge on visual syntax

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RESUMO
This paper emphasizes the development of the ability to articulate the visual / formal syntax as a fundamental way for the consolidation of project thinking among fashion design students. From an exploratory approach, it integrates two research focuses: the first investigates the self-regulation of learning in project teaching; the second addresses methodological strategies for the development of the ability of compositional synthesis. Thus, the study examines practices for Visual Methodology learning in the Bachelor of Fashion Design course at the State University of Londrina, searching for effective contributions in the experimental creative manipulation and decomposition of visual messages. With that aim, a combination of pedagogical actions (assignments) is analyzed, aiming at proving its didactic efficiency. Results confirm the potential of such actions and self-regulated learning strategies as facilitators of the ability to generate expressive concepts and create artifacts in the field of fashion.

Keywords: fashion design; visual syntax; project.

Articulando a Forma: ações pedagógicas transversais para a construção do conhecimento de sintaxe visual

RESUMO

O artigo enfatiza a formação da habilidade para articular a sintaxe visual/formal como via fundamental para a consolidação do pensamento projetual entre estudantes de design de moda. A partir de uma abordagem exploratória, integra dois enfoques de pesquisa: o primeiro estuda a autorregulação da aprendizagem no ensino de projeto e o segundo aborda estratégias metodológicas para o desenvolvimento da habilidade de síntese compositiva. Nesse sentido, o recorte proposto examina as práticas dirigidas à aprendizagem de Metodologia Visual no Bacharelado em Design de Moda da Universidade Estadual de Londrina, indagando sobre as contribuições efetivas da manipulação criativa experimental e da decomposição de enunciados visuais. Para tanto, analisa uma ação pedagógica combinada, visando à comprovação de sua eficácia didática. As inferências resultantes confirmam o potencial da referida ação e das estratégias de aprendizagem autorregulada como facilitadoras da capacidade de gerar conceitos expressivos e configurar artefatos no campo da moda.

Palavra-chave: design de moda; sintaxe visual; projeto.

Forma articulada: acciones pedagógicas transversales para la construcción del conocimiento de sintaxis visual

RESUMEN

El artículo enfatiza la formación de la capacidad de articular la sintaxis visual/formal como una forma fundamental de consolidar el pensamiento de diseño entre los estudiantes de diseño de moda. Desde un enfoque exploratorio, integra dos enfoques de investigación: el primero estudia la autorregulación del aprendizaje en la enseñanza de proyectos y el segundo aborda las estrategias metodológicas para el desarrollo de la capacidad de síntesis compositiva. En este sentido, el corte propuesto examina las prácticas dirigidas al aprendizaje de Metodología Visual en la Licenciatura en Diseño de Moda de la Universidad Estatal de Londrina, indagando sobre las contribuciones efectivas de la manipulación creativa experimental y la descomposición de los enunciados visuales. Con este fin, analiza una acción pedagógica combinada, con el objetivo de demostrar su eficacia didáctica. Las inferencias resultantes confirman el potencial de esta acción y las estrategias de aprendizaje autorreguladas como facilitadores de la capacidad de generar conceptos expresivos y configurar artefactos en el campo de la moda.

Palabras clave: *diseño de moda; sintaxis visual; proyecto.*

1. INTRODUCTION

The fashion apparel is an important perceptive/expressive channel for human interaction. This type of artifact, when connected to the user's body, establishes a space of mutual influences, where sensorial experiences flourish and foster adaptation and signification processes. Thus, the formal structures of clothing embrace the corporeal space – as a second skin – creating a dynamic compound that moves between different environments and actively participates in connecting individuals and context.

In this sense, we highlight Saltzman (2004; 2008) and Souza (2008), who see the clothing as the first space inhabited by the body, emphasizing that its configuration transforms the corporeal anatomy and promotes an interface with the exterior surroundings at the same time. In the same train of thought, this study considers that the object of planning in fashion design1 is a system that embodies spatial relationships – through the connection between body, artifact, and context – in which each element is, simultaneously, a means of physical adaptation to the material environment and a mediator of individual expression and social representation (SANCHES, 2017).

Therefore, the shape of the clothing artifact accepts multiple purposes, by the association of material, pragmatic, and – especially – communicational requirements. For that reason, a big challenge in the education of fashion designers includes developing strategies that improve the skills to articulate what is expressed by the product configuration, since the planning of the formal/visual composition

[1] In the academic field studied, the term "fashion design" means the project process of wearable artifacts filled with fashion content. For this reason – and according to many references in the specialized literature – we adopt the same nomenclature and the same focus – fashion clothing.

intimately ties the body with the manifestation of cultural codes. Thus, in the field of fashion, the design process requires a strong connection between the investigation of representative signs of the sociocultural context and the creative experimentation, highlighting the study of non-verbal communication as a fundamental aspect of project thinking.

Silva et al. (2017) reinforce that the mutualism established between the clothing object, body, and expression requires from the fashion designer a deep level of knowledge on visual composition in order to articulate aesthetical elements in creating sensorial experiences.

In light of this context, this investigation takes place in the educational environment, and the object of study is the methodological approach used to support the formal/visual syntax teaching in fashion apparel projects. We focus on the teaching and learning of visual composition fundamentals, and the main objective is to analyze the didactic strategies for composition synthesis, by considering an integrated comprehension of the shape. Specifically, we examine the effects of pedagogical actions (assignments) aimed to the experimental manipulation and decomposition of visual messages, in the undergraduate course of Fashion Design at the State University of Londrina, with the purpose to prove their didactic efficiency. The analyses were conducted according to an exploratory qualitative approach, employing the observation and the documental analysis as strategies to the verification of evidences in classroom.

Aligned with a multidisciplinary approach, the investigation embodies design, visual communication, and pedagogy principles. From such fields, we draw essential guidelines such as the Meaningful Learning proposed by David Ausubel, the experimentation (SOUZA, 2008); SOUZA; SILVA, 2018); PALLASMAA, 2015), and the

graphical-visual strategies (SANCHES; SILVA, 2018; ROAM, 2010) as facilitators of knowledge construction.

This study starts from the assumption that the designing of shapes results from the interaction between multiple variables and a diversity of perspectives. Such understanding points to a direction where the development of composition skills emerge from a holistic and systemic attitude in the teaching and learning process, as well as from the promotion of an environment that supports the transversal knowledge exchange. This approach is the pedagogical basis of the course at the University, which requires group planning and frequent assessment of the pedagogical actions. As a consequence, professors must both elaborate integrative pedagogical strategies and assess their effects in classroom. This allows the improvement of the strategy itself and the re-planning of curricular and interdisciplinary processes – if needed – through the validation of the pedagogical actions (assignments) proposed so far.

In searching for this collective growth, the present study converges two researches that take place in the same educational context and that are shared by the authors of this paper: the first investigates the self-regulation of learning in the project teaching; the second studies methodological strategies for the development of composition synthesis skills. From the overlapping of both researches, we analyze pedagogical strategies that aim to promote an integrative understanding of the shape, through the experimental manipulation and the study of the shape as a perceptive and sensorial space, which conveys an expressive intentionality.

As a result, we present inferences that supported the composition manipulation as a channel to propel the project thinking. Such conclusions, extracted from the analyses in

classroom context, show the maturation of the configuration thinking and, consequently, the possibility to pave novel ways for teaching the shape syntax in future and more complex activities.

2. THEORETICAL FOUNDATION

2.1 The shape: material, sensorial e informational compound

Every day, humans use different artifacts to interact with the world. Daily life is experienced with the help of several objects that promote sensorial experiences and make them meaningful. Such experiences allow the formation of multiple values that become part of the artifact, from the ease of use to the affective appeal. Thus, the formal configuration of the object acquires a multi-dimensional and interdependent sensorial quality, which is perceived through aspects such as surface, volume, shape, space, and point of view. In light of that, the designer – a professional whose concerns include the configuration of those attributes with the context – must consider these relationships during the project evolution.

Sanches (2017), Cardoso (2012), and Lessa (2009) agree that, during the project process, the shape comes to life from the material and expressive equations between its configurative elements. Those authors helped to determine the concept of shape used in this study, which is defined as a material/aesthetical/informational compound that can be sensorially experienced in multiple dimensions and perceived as information expression. Its qualities act mutually, harmonizing material attributes with visual composition and expressive content to define practical and aesthetical-symbolic aspects of interaction between user, artifact, and context.

In this sense, we understand the shape as a solution of design, which is materialized and refined along the project process, from the integrated experimentation with constructive, productive, and – especially – interactive variables (both physical and psychological). Bomfim (2014) confirms that, in order to plan the configuration of use of an object, the objective-subjective interaction between product and user is more important than the object itself. The author highlights that the experience with the product/artifact is determining of the formal orientation.

In the case of clothing, the use experience embraces the surface, the space, and the volume both of the body and of the artifact itself. From this connection, the sensorial perception and the cultural repertoire regulate the human adaptation to the environment on a physical and psychological level. For that reason, the education of fashion designers must consider that the development of composition skills depend, intrinsically, on the comprehension of the spatial system that connects corporeal space, clothing space, and the surrounding space. Aligned with this idea are Saltzman (2004; 2008) – who approaches the apparel project through a transversal gaze that embodies design, art, and architecture – and Souza2 (2008) – who investigates the processes of shape construction in fashion design. Their research considers the clothing as the first habitat of the body, highlighting the concepts of interiority and exteriority to explain that the textile surface transforms the corporeal anatomy by outlining the shape,

2 Souza (2008) advocates that the material experimentation strongly contributes to the perception and integration of technical, aesthetical, and ergonomic elements in the clothing configuration. Through her research (Master's, doctoral, and post-doctoral research), the author effectively contributed to the application of the tridimensional modeling as a tool for creative research in the field of fashion.

volume and silhouette and, at the same time, creates interfaces with the exterior surroundings. Therefore, boundaries are established in the sensations and perceptions that influence the relationships with the successive contexts humans experience everyday. In line with the aforementioned authors and also with Souza and Silva (2018, p.119) – who embrace the same holistic approach in their studies addressing the educational scenario – the shape and the clothing configuration must be thought and designed in an integrative manner, including the material experimentation – surface, color, texture, volume, space – and the investigation of an expressive message that works in favor of the body and the context.

In order to do so, Sanches (2017) finds, through active investigation with fashion design students, three types of knowledge that are fundamental in the process of shape construction: a) material resources knowledge, especially the textile material, which brings attributes such as color, texture, and structural possibilities; b) constructive resources knowledge, given by the modeling and the production technology, that allow the transformation of the textile surface in a volumetric composition over the body (silhouette); and c) syntactic principles knowledge, which supports the planning of the articulation on the configurative elements (color, texture, structures, etc.) and the organization of the aesthetical-formal message.

We consider that, in any artifact, the organized articulation of composition elements (colors, shapes, textures, etc.) expresses non-verbal information that can be recognized as a system of signs. Thus, there must be a syntax reasoning to establish relationships between such elements and shape the expressive content of the artifact. In this sense, the syntactic principles are defined as the repertoire of theoretical foundation that guides the visual

composition. According to Dondis (1997), it is possible to define general guidelines for designing visual messages. The author mentions the existence of basic elements to articulate the visual syntax reasoning, which can be learned along with manipulation techniques to create visual messages.

Therefore, knowledge and the application of syntactic principles are essential to the education of fashion design, since the material and constructive resources depend on the integration of the syntax reasoning, so that the material to be transformed can convey expressive intentionality.

2.2 Syntactic Principles: the heart of the matter

The configuration of fashion apparel can be designed as a visual narrative, as a system of signs that are recognized by the user. There is a close relationship between meaning and the composition structure, between semantics and syntax. Arnheim (2016) highlights that every visual message is composed of a shape and its content, and that there is an unbreakable link between the organization of visual elements and the interpretation of the information (content).

Planning the syntax of the shape requires the understanding of the user's context and the creation of a message that is integrated to the current flow of codes in such context, which opens possibilities for meaningful experiences. This process, according to Niemeyer (2003), includes two active components: the sender of the message (designer/company) and the interpreter (users and individuals that may not be the end-users, but are involved in the course between message, commercialization, and diffusion). In this course, the designer takes great part of the responsibility in choosing the communicational strategies for the project and deciding on how to organize the object's formal/composition structures (SOUZA

and SILVA, 2018). This responsibility reinforces the importance of knowledge regarding the visual syntax in providing support for the product configuration.

Although the objective of this section is not to provide a detailed description of visual syntax principles, it is important to highlight some of them. Despite the diversity of terms and classifications present in the literature about the topic, many authors share a common understanding (LUPTON and PHILLIPS, 2008; LEBORG, 2006; WONG, 2010; DONDIS, 1997) on the basic units that, when used in coordination, compose the (2D and 3D) shape: point, line, plane (surface) and volume (dimension). Other fundamental elements are color and texture, which are also related to the surface. Those authors agree that the composition requires structuration axes in order to organize the units over space.

The interaction between those basic units in the composition space constitutes the communicational object. However, such relationships depend on the functioning of human perception. Gestalt – a school on experimental psychology – studied the forces of the perceptive process and helped us understand how the elements of the shape can be visually integrated or opposed, thus defining relations of harmony, contrast and visual tension in the composition.

Gomes (2003) synthesizes the Gestalt principles, highlighting the internal organization forces that support the visual perception: a) unification and segregation – they act according to the contrast of the visual stimulus (equality or inequality), favoring the perceptive skill of separating, identifying, or emphasizing the formal units in a composition (or part of it); b) closure and continuity – our perception seeks a spatial ordering that tends to fix unclosed or unfinished edges. The brain produces imaginary lines to complete an unfinished logical structure by giving it a sequence of continuous stimuli; c)

proximity and similarity – close elements are commonly perceived as a group. Also, similar formal units tend to bond together and form groups.

Despite of the fact that those principles are not universal, and that the dynamic tridimensional nature of the clothing offer multiple points of view, understanding such forces helps training our perception towards the pragnanz in the composition. On this concept, Arnheim (2016) explains that, at a first glance, humans perceive a global organization scheme, that is, the general group of relationships that determine the balance and the areas of maximum visual attraction. This means that the better the visual organization of the object's shape is – in terms of comprehension and easy interpretation or reading – the higher the pragnanz level will be.

By understanding the forces that collaborate to the cohesion between the composition units, it is possible to analyze and decide on the level of importance of each element within the visual message, creating opposition (segregation/contrast) and aggregation (continuity) judgments in order to focus on a specific area of the composition. In a clothing piece, it is possible to manipulate color contrast and texture to, for instance, emphasize certain surface areas of the silhouette and establish a perception hierarchy of visual information.

In the context of the Visual Methodology subject, the very first efforts to build knowledge lie in the attention to the heart of the matter of visual syntax; that is, creating cohesive links between the shape units and defining the focus of perception. In this sense, the strategies used in classroom aim at encouraging the exploration of combination possibilities between formal/visual elements and promoting the understanding on the co-relationships between surface (plane), volume, and space – which comes from the discoveries

emerged with the analysis of visual messages of the context and the expressive experimentation.

2.3 The Syntax of the Shape in Classroom: design visual messeges

2.3.1 Facilitation principles

As mentioned previously, the shape in fashion apparel carries a non-verbal message, which integrates to the visual expression of the body that wears it and of the context, generating expressive, sensorial, and meaningful processes. For that reason, one of the main objectives in the education of fashion design is to develop in students the ability to design shape messages. However, the construction of knowledge in this field does not depend exclusively on knowing the concepts of visual composition, but also on investigating the non-verbal codes of the context and, especially, experimenting with expressive and diverse possibilities.

The relevance of experimentation in the creative process was stressed by Ostrower (1999) long ago. The author stated that "the thinking only becomes imaginative through materialization, otherwise it is just uncommitted rambling, 'without destination or purpose'." (OSTROWER, 1999, p.32). According to the author, experimentation is fundamental to the evolution of the shape.

In the academic environment of fashion design, the facilitation of manipulating basic productive techniques allows the materialization of models and prototypes made by the students themselves. This approach transforms tangible experiments in powerful creative tools, allowing the designer to move between phases of the process and evolve ideas

along the way. Regarding that assumption, Souza (2008) highlights that, in practice:

> the project process operates in the perceptive dimension, encouraging associative processes and the reflective visual practice, which is capable of capture novel formal perspectives and possibilities of appropriation and use of space; it is capable of perceiving morphological transformations created through the interaction between the movements of the body and the textile material, suggesting new shapes from previous shapes. (SOUZA, 2008, p. 344)

Since the configuration of a clothing artifact is perceived through the visual and tactile senses, the experimentation allows each composition unit to incorporate formal, functional, and informational elements at the same time. In order to do so, it is essential to promote strategies to the development of a holistic approach and to the training of perception integrated to the principles that relate each of the shape's units, thus revealing the expressive intention.

In a previous study, we synthesized a group of actions that can be performed through several didactic strategies and promote the maturing of the expressive ability and the visual synthesis to support the fashion design process. From that synthesis, four basic actions emerge: know; decode (recognize and decompose); synthesize (relate and compose); transpose. After the first contact with the fundamentals of visual composition (know), the combination of actions helps the student observe the surroundings, distinguish the elements in the visual messages and perceive the syntax structures that connect them. By understanding such connections, the student will be able to synthesize patterns of visual representation into expressive content and use it to design composition possibilities. Designing, in turn, refills the perception and expands the knowledge, which helps the student to transpose the codes extracted from the

sociocultural context to the configuration of new products (SANCHES; MARTINS, 2015).

Given that the shape is revealed during the design process, it is obvious that, during the path described previously, the student experiences cycles that include the sensorial stimulation, the perception of formal/visual relationships (decompose), and the recombination of elements into new possibilities to, finally, the definition of a visual support (shape) that contains the expressive content of the shape (compose/transpose).

Therefore, the development of the composition ability in classroom depends on the integration of four dimensions of actions (Figure 1): a) know the syntactic principles attached to the visual narratives; b) observe and recognize the representations of such elements in the context around; c) record perceptions and analyze the composition structures (decompose); d) experiment with expressive options (compose) in order to consolidate concepts in the cognitive structure. Based on this train of thought, the proposed assignment provided opportunities that included all four dimensions, aiming to promote a reflection over the expressive practice.

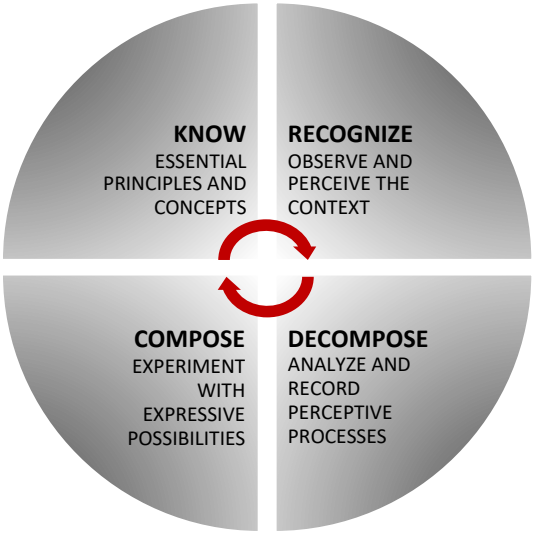

Figure 1: **Actions to develop the composition ability** (elaborated by the authors)

The aforementioned cycles, when supported by the materialization of composition possibilities, help the perception of simultaneous stimuli and provide the opportunity to rearrange thoughts, promoting a panoramic view over the process and multiple associations, which are fundamental to a systemic approach for the project evolution. This is the key point in this study, since the systemic approach is of great importance for project teaching in the given educational context.

It is important to mention that Sanches (2017), during an investigation of the same context through documentary analyses and participant observation (active investigation), found three action focuses of the systemic practice of project teaching in classroom: a) delimit – explore the context, identifying relationships and requirements; b) generate – experiment with combinations of the requirements and multiply possibilities; c) evaluate/consolidate – select and channel possibilities towards a feasible solution. Then, the author relates the three focal points with the categories of thinking present in the project process, described by Lawson (2011) and Khaidzir and Lawson (2013). Although the scheme representation does not portray the dynamic interactions to the best, in this case the organization in columns facilitates the general understanding of the conceptual relationships between the actions. However, despite the apparent logic between phases, the dotted lines and double-sided arrows reinforce that the cognitive processes and the project actions are tied in a transversal and, many times, simultaneous manner, resulting in concurrent cycles of analysis, synthesis, and evaluation (Figure 2).

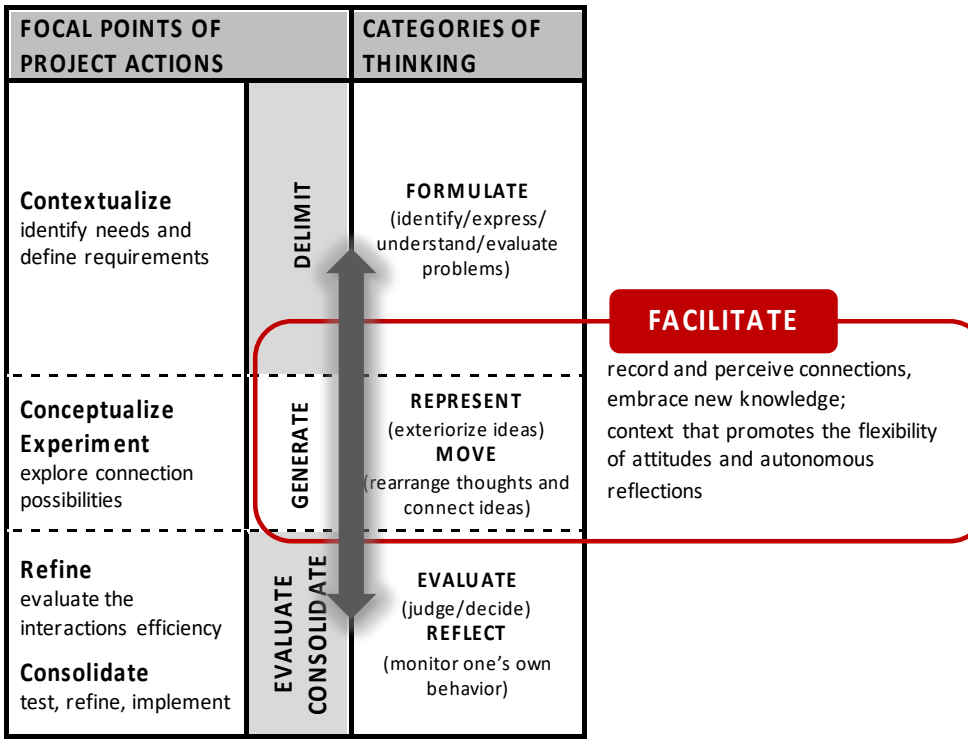

Figure 2: **Focal points of project actions**, corresponding abilities and the advantages of visual/formal research (elaborated by the authors, adapted from Sanches, 2017)

The methodological strategies to manage the process need flexibility and must be planned according to the project focus, aiming to improve the corresponding abilities. Thus, the pedagogical action (assignment) proposed emphasized the experimental visual manipulation as a means to stimulate the abilities to represent and move, supported by the combination of actions to compose and decompose.

As basis for the planning, we take into consideration another previous work, which proved the pedagogical efficiency of graphical-visual strategies to the cognitive organization, the perception of simultaneous relationships, the convergence of overlapping information, and the group communication – core aspects of the holistic project teaching. In classroom, applying the visual thinking

facilitates the recording and association of concepts, allows the perception of parallel trains of thought and favors collaborative actions, thus promoting the openness to novel approaches and the construction of meaningful knowledge (SANCHES; SILVA, 2018).

Regarding the visual thinking, Roam (2010) points out that every human being can take advantage of three innate characteristics: the eye – that captures the stimulus; the mind's eye – that articulates the perception and interpretation of the stimulus; and the coordination between eye and hands – that helps express/refine/communicate the response to such stimulus. Pallasmaa (2015) complements this idea by stressing the value of the handcrafting to the improvement of the attitude and as an instrument to think, since the hands capture the physical qualities of the thoughts and converts them into concrete images. The author stresses the importance of the material manipulation and the tactile sense in the education of architects and designers, because the more the sensorial knowledge advances, the more the experimental shape opens up for the planning of spaces that were not predictable at first.

In pedagogical terms, the combination of the visual and tactile senses improves the expression of abstract ideas and expands the perception over the object of study, which helps bridging the cognitive gap between previous and new knowledge. As a didactic resource, such approach provides students with a diverse experience, open to an investigative attitude, oriented towards the identification and connection of ideas, welcoming of autonomous perceptions, and willing to create an environment that favors reflection and the construction of new knowledge.

2.3.2 Pedagogical Position of the Context

From what was explained so far, the members of the educational environment are entitled to define the strategies to benefit the transversal construction of the expressive ability, applying the composition synthesis as a facilitator of design thinking. In this sense, the position of the pedagogical context is fundamental, since it supports discovery and proactivity in the knowledge construction over the project, through transformative educational actions.

However, the transformative potential of an educational action depends on the willingness of the student towards learning. In order to foster the active participation of students in the learning processes of the context provided in this study, the project teaching is oriented by the principles of Meaningful Learning. Proposed by David Ausubel, this approach highlights the active role of students with a focus on the individual cognition, studying the cognitive processes involved in storing, transforming, and applying knowledge. The basis of Meaningful Learning is relating the object of study to previous knowledge in the student's cognitive structure, handling existing resources to bridge the gap with new concepts (AUSUBEL, 2003).

Therefore, in order to elaborate meaningful and engaging pedagogical strategies, the procedures examined in this study were grounded in the self-regulated learning, which emphasizes the cognitive and metacognitive processes and the emotional and motivational factors involved in the teaching/learning context. According to Silva and Alliprandini (2018), the project process involves cognitive and metacognitive levels, requiring specific learning contexts and stressing the importance of self-regulation in the teaching of design.

As stated by Whitebread et al. (2009), the self-regulated learning embodies three main levels: a) metacognitive

knowledge, related to one's level of awareness over their own cognitive process3; b) metacognitive regulation, which involves monitoring, planning, controlling and evaluating the process to accomplish goals in a more structured manner; c) emotional and motivational regulation, related to the monitoring and controlling of emotional and motivational experiences over the tasks to be performed.

In classroom, all three levels require the application of strategies that embrace the cognitive and metacognitive processes. Cognitive strategies can be understood as the actions used to improve the cognitive process. In turn, the metacognitive strategies embrace the attitudes of monitoring and evaluating the cognitive process and its progression (FLAVELL, 1987; JOU; SPERB, 2006). Thus, the self-regulated learning requires a participative and motivated student, with active teaching methods in which the collaboration, the exploratory attitude, and the experiences are essential features for the teaching/learning process.

In the fashion design educational context, Souza and Silva (2018) proved that the concrete experimentation, as means of creative investigation, promotes the tactile and perceptive knowledge regarding the behavior of resources (materials) over the body; expands the ability to manipulate the surface; provides continuous feedback along the exploration of solutions.

In teaching the principles of visual syntax, experimentation can be an instrument to favor perception and the construction/deconstruction of the shape, through the investigation of different composition possibilities. Over

[3] The cognitive processes include: perception, learning, memory, reasoning, and problem solving. Those are the internal skills applied by the individual to receive and connect new information with previous knowledge.

the body, experience can become more assertive in relation to the intentional composition of the shape, since it promotes the understanding of the mutual interferences between the spaces of body and clothing. Experimenting enables the awareness in students during a continuous education that favors the learning to learn. Obviously, this requires the organization of concepts, procedures, and behaviors in an intentional manner throughout the learning process, with the aim to increase the knowledge acquisition, retention, and recovery – whenever necessary.

3. METHODOLOGICAL APPROACH

The present study in inserted in a context that aims at promoting a transversal construction of the expressive ability. To do so, the course includes curricular units on the principles of visual syntax and the experimentation of non-verbal language in interdisciplinary project practices, namely: Visual Methodology, Composition and Expression Laboratory. The assignments examined in this paper focus on the Visual Methodology subject, which takes place in the first year and is responsible for the basis of study on the communicational value of fashion products and/or systems. In order to introduce the knowledge related to the elaboration of visual messages and the intentional composition of the shape, we proposed – in the first semester of the subject – a pedagogical action (assignment) aimed at the experimental manipulation of basic elements in the visual communication.

This assignment associated the handcrafting to the visual thinking and was performed following a sequence of procedures: a) the experimental manipulation of interrelationships between basic shapes to develop a

surface; b) the designing of a wearable object for the upper part of the body, from the surface developed previously; c) decoding composition elements of visual messages in fashion, through photographic images; d) composition analysis of clothing products; e) feedback cycle through reflective action and self-evaluation, favoring the information acquisition and retention.

In order to record the individual process and the metacognitive strategy, we used the Learning Diary, also called Diary Board. According to Fabriz et al. (2013), the diary is useful both for the student – for it promotes self-monitoring – and for the professor – who can gather information on the individual development of each student during the teaching/learning process. This instrument allows a reflective process over their own learning, in addition to providing professors with feedback, having a continuous impact on all the agents involved in the educational process.

Students' records provided data for an exploratory analysis and consequent inferences on the effects of the assignment. The analysis and treatment of the information in the dairies were performed through a content analysis, with the identification of categories and descriptive topics that served to classify and interpret data based on theoretical background. The analysis steps are: 1) initial analysis; 2) selection of units of meaning; 3) categorization and sub-categorization with inferential interpretation.

With the help of the diaries, it was possible to understand the effects of the assignment. Students described success, challenges and difficulties along the process. The content analysis allowed the classification of evidences on: the manipulation of shapes in non-conventional ways; the ability to dissociate from the first idea; the synthesis and transposition of the concept in the configuration of the shape syntax; the project of the shape through experimentation;

the collaborative learning and the knowledge sharing among peers.

In order to detail those inferences, the next section highlights the procedures taken in classroom, as well as a summary of the analysis related to the pedagogical effects. Also, it includes excerpts from the Learning Diaries, which are identified with alphabet letters.

4. PEDAGOGICAL STRATEGIES: experimenting with visual messeges

The assignment had the purpose of exploring the many spatial effects resulting from the inter-relationships between basic shapes – square, circle and triangle – in developing a surface, which was later applied to design a clothing piece for the upper part of the body. The assignment had the following limitations: students had to establish a generative concept4 and a visual reference to guide the shape syntax of the final product; develop mechanisms to allow the dressing and undressing of the piece, without the use of trimmings. Permitted materials were paper, satin foam, and felt.

Students were expected to perform an active role of knowledge producer, handling the knowledge acquired during the first semester of the course, namely: perceptive mechanism (visual input and output); visual elements; abstract and concrete structures; inter-relationships between shapes.

The process required from the students the manipulation of visual elements over and outside of the body (Figure 3).

[4] According to Lessa (2009), the concept of artifact refers to a synthesis of its most determining traces and characteristics – the essence of its function in our daily lives. Lawson (2011) refers to it as the "core idea". Sanches (2017) uses the term "generative concept" and explains that, in fashion design, many products come to life simultaneously, linked by the same core idea. Thus, the concept may generate a group of artifacts that share the same essence.

That, according to the data collected, was one of the biggest challenges, but ultimately favored the connection between variables related to the organization of composition forces regarding the visual elements and the spatial reasoning, thus increasing the students' repertoire on the composition possibilities.

> I have never thought that with a square and a triangle I could create so many options. This assignment made me see far beyond what I knew. It also showed me I should not stick to the first idea because it may not be the best (Student A).

> I love it! It was hard to make it out of the sketch at first, but when I started cutting, pasting, and exploring the possibilities, I realized I could design several surfaces and products. I know I can use it in the future (Student B).

> I love the assignment. It is incredible to see the multitude of things we can create with basic shapes. It is also a good way to practice creativity. I put a lot of effort in this assignment and I am very happy with everything I have learned (Student C).

This strategy aimed at fostering the cognitive processes through an autonomous investigation and the emergence of new perceptions over the concepts applied. In pedagogical terms, the experience means a bridge to meaningful connections between new and previous knowledge – which exists in the cognitive structure of students – thus favoring the recovery of information.

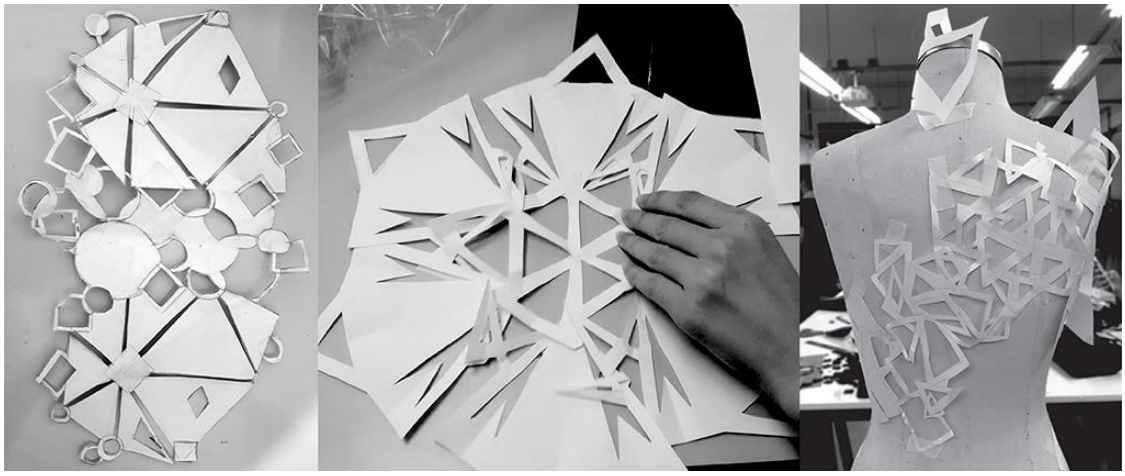

Figure 3: **Process**, manipulation of visual elements through experimentation. Source: elaborated by the authors.

Elaborating and organizing knowledge – while being aware of this action – was only possible due to experimentation, which allowed the verification of different potential organization possibilities of interaction between the visual elements in the construction of the surface over the body, in addition to the technical productive feasibility and its influence on the materialization of the proposed solutions (Figure 4).

Figure 4: **Examples of materialization of the selected option**, solutions proposed by the students Camila Paiva

(concept: metamorphosis), Gabriel Cordeiro (concept: layers to absorb stimuli) and Letícia Rodrigues (concept: fragility). Source: elaborated by the authors.

> I had never done anything like that before. It was really cool to generate options with this approach. Touching the shapes and seeing their interaction with the body helped me overcome the difficulties of imagining new possibilities. We often have lots of abstract ideas, but when it comes to reality we may fail or end up with common-sense solutions. It was different this time! (Student D).

The first assignment ended with a final exhibition of the projects for all the classmates, in order to promote the collaborative learning. Providing opportunities to share knowledge among students with different self-regulation levels also requires the use of several strategies for learning and behavior management, which favors the metacognitive regulation that is socially shared. This is considered the deepest level of social regulation and is extremely important for the promotion of collaborative learning (DE BACKER; VAN KEER; VALCKE, 2015; SANTOS et al, 2019).

> I like it a lot! I had to think so much it hurt, but when I saw my results – and my classmates' results – I realized all the things we could do using the same shape. Besides me, many students used the triangle, but the final products or surfaces were different from each other! (Student E).

> It was nice to hear my classmates' explanations and see their products. It became clear their inspiration or, like the professor calls it: the aesthetics. It was tough in the beginning; I thought we would not make it. Now I see that besides what we could do, we also included a part of ourselves in the products. They are different from each other,

> although we used the same basic shapes (Student F).

The records in the Learning Diaries revealed that the sharing of the project process fostered critical reflections on the coherence between the expressive intention and the results achieved.

On the self-regulation, a new assignment was proposed immediately after the end of the first one, but this time oriented to the decoding of the composition elements of visual messages in fashion design. This phase involved the mapping of application of visual elements, visual principles (unification, continuity, closure, among others) and visual techniques.

Similarly, and in order to favor the collaborative learning, in this assignment students were asked to speak about and share their ideas, which was mediated by the professor. Images of different clothing objects were presented. At first, students should point the elements and principles of visual syntax in each product. Then, a discussion took place on the relationship procedures involved in the configuration of the objects, that is, how the visual units were intentionally organized to express information and generate visual impact – from the perception of principles such as pragnanz and visual hierarchy.

Once the discussion on the images ended, clothing products that are present in the students' daily lives were analyzed. Students formed groups of three and each team was responsible for the evaluation of a clothing product worn by one of the members of the group.

In opposition to the first assignment, when students designed a visual composition, this activity required the opposite process – decomposing a concrete visual message. This reasoning promoted the reflective-action and allowed

students to establish different conceptual connections between the content approached during the course. The expanded assimilation of concepts gave them feedback on their own products – designed in the first assignment – thus closing the pedagogical action with a self-evaluation.

> Decomposing helped me understand how to compose the visual language. Discussing this with my classmates made it easier to identify visual elements and the Gestalt principles – exactly what a fashion product must present, aesthetically speaking, and what influences its modeling (Student G).

> It is hard to transpose the concept we desire. Everything makes sense in my head, but when it comes to work on the product I feel stuck. This assignment helped identify the visual elements and apply them in a way to really convey the concept, especially after I worked with the shapes (Student H).

Both assignments approached the same curricular content. However, each procedure provided different means of approaching the information and establishing meaningful connections between knowledge. In order to manage information, students needed to use multiple cognitive processes during the assignments. Thus, the use of cognitive and metacognitive strategies was crucial – for instance, to explore different resources or identify and record success/difficulties in the teaching and learning process.

Since the project process involves cognitive and metacognitive abilities, the education of Fashion Design through the self-regulated learning favors the learning to learn, through a process in which the student is encouraged to engage in an autonomous and active role. The awareness of the self-regulation strategies allows the development of fundamental skills in the project process – such as the reflective practice, the management, and the action taking –

through the conscious use of internal (cognitive) and contextual (environmental) resources.

5. FINAL CONSIDERATIONS

Considering the importance of fashion apparel as a channel of interaction between the individual and the sociocultural context and, therefore, the need for designers that are able to articulate the tangible and intangible dimensions in the configuration of such interface, it is imperative to consolidate principles that facilitate the ability of integrating constructive elements and expressive content in the shape syntax.

As mentioned previously, the coherent integration of those dimensions is intimately tied to the understanding of the multiple relationships the shape establishes with the user and the context. Thus, the experimentation of composition possibilities over the corporeal space favors the syntax of non-verbal messages, since it brings the visual narrative to materialization and expands the understanding on the spatial connection between body, clothing, and context.

The experimental composition manipulation showed, according to evidence collected in field, the positive effects of experiencing the materialization of the shape. On the other hand, the assignment of decomposing the non-verbal messages in images and fashion objects helped the comprehension on the syntactic organization of the shape and provided feedback on the results of the previous assignment, thus favoring a reflective attitude over new concepts. Therefore, it is possible to argue that the knowledge constructed along the process achieved the goal of improving the thinking on configuration and start

preparing students to transpose expressive content into project solutions.

By providing a collaborative environment and integrating the abilities to compose and decompose, we encouraged the skills to ”represent” – exteriorize ideas – and “move” – rearrange thoughts and connect ideas (SANCHES, 2017; LAWSON, 2011). Such interaction creates an environment where perceptions can connect and be rebuilt, and where the process of composition generation can progress and evolve, fostering an integrative perception of the shape as material, sensorial, and informational element.

Analyzing the records on the Learning Diaries and the perceptions shared in classroom, it is possible to conclude that the proposed actions (assignments) were effective as a didactic resource and helped articulate the knowledge constructed during the Visual Methodology subject, as well as promote the project process and the strategic thinking in students. In this sense, it confirms the importance of providing opportunities for a more autonomous and reflective learning oriented to the shape composition and, consequently, promoting a critical and integrative attitude that leads to the maturing of the project thinking in fashion design.

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