EDUCATIONAL STRATEGIES FOR DEVELOPING FORM LANGUAGE IN PRODUCT DESIGN

André LOPES DE CASTRO[1] **and José VICENTE**[1, 2]
[1]Faculdade de Arquitetura, CIAUD, Universidade de Lisboa, Portugal
[2]IADE, UNIDCOM, Universidade Europeia, Portugal

ABSTRACT

This paper presents educational strategies for improving student's skills regarding form language development in product design. This was made by developing and testing educational methodologies in exercises with product design students in three Portuguese universities.

Form language and visual recognition of products has become a central competitive factor within various product categories and design presents itself as the main tool to answer this demand. Companies must develop products with designs that carry distinctive references to the 'character' of the brand identity.

To prepare students for design practice in which they are able to develop distinctive products for brands, the authors developed an exercise in which students have to design a product within the framework of a brand form language, but one from an unrelated product universe. The exercise was developed and has been tested in 1st and 2nd cycle design degrees with more than one hundred students in three Portuguese universities, from 2012 to 2018.

Results show that the exercise enables students to deconstruct the form language of a brand and build a library of design elements, which then enables them to incorporate them in a newly designed product. The paper will present results of the exercises, examples of the students work and discuss the main findings of using this methodology.

Keywords: Product Design; Education; Form Language; Brand Identity;

1 INTRODUCTION

In the process of creating and developing our material culture, product design is generally recognised as a fundamental discipline to build a company's brand identity because it is able, in an efficient and temporally reasonable way, to integrate such wide range of criteria such as aesthetics, materials, production techniques, price, functionality, environment, amongst others [1]. By using tools from hard science and from the arts, design presents itself as a hinge discipline [2] between these two universes and as a central tool to, in the context of product semantics [3], give shape to brand values through specific form languages. As stated by Krippendorff [4], form and meaning are deeply related. Products must have form to be seen and must make sense to be understood. Therefore, the task of form giving is essential because it shapes the references to the user's understanding of the product.

The importance of form giving in the design is reflected on the necessity of developing appropriate educational methodologies that can equip future designers with knowledge and skills to better answer both users' and companies' needs. To tackle this subject, the authors developed an exercise entitled "Brand Swap", which has been developed and implemented from 2012 to 2018 in 1st and 2nd cycle design degrees with more than one hundred students in three higher education institutions in Portugal; Lisbon School of Architecture, Gallaecia School and Beira Interior University.

2 METHODOLOGY

This article presents information centred on the analysis of the process and results of an educational exercise in product design. The methodology behind this research is mainly mixed (qualitative and quantitative), is based on a literary review of relevant issues for this pedagogical exercise, namely the form language concept, and the assessment of the progress and results of the projects developed by the students.

3   FORM LANGUAGE

Form language can be defined as the visual language which focuses on communicating the three-dimensional features of a product – its syntax [5]. This syntax is comprised by a number of design elements, organised through design principles which together may convey certain meanings (semantics) to a user or observer [5].

The use of a specific form language associated with branding – evoking strategic associations through various means of communication [6] – is a common practice in the consumer product market as a way to differentiate products and brands. This is one of the strategies used by brands in product categories in which technical differences between products are diminishing [6]. This results in a shift towards communicative product qualities which should be attributed by designers through form giving strategies and interpreted by consumers. Designers are asked to build a distinctive form language, based on brand values and identity, which is able to transmit a consistent and holistic message to customers [7]. As visual recognition of products has become a central competitive factor within various product categories, learning how to develop a consistent and attractive form language in a brand's portfolio, which carries distinctive references to the 'character' of the brand, is a skill professional designers need to learn.

Although a brand is more than just a product as it embodies different communication media (such as marketing tools, digital tools, etc.), this research focuses on the ability of a product to express brand identity through form language. Currently, in consumer products market, the product remains probably the strongest manifestation of the brand and should reflect and communicate the brand identity [7].

We can segment different functions in products such as proposed by Gros [8], by Warell [9] and Karjalainen [7] in which syntactic and semantic elements represent important features. Product (or Form) syntax describes the compositional structure of product form [9]. It can be stated that syntax is comprised by different design elements which make up the building blocks which are organised through a specific grammar of design principles. Professional designers working for a specific brand can use their knowledge to create specific form syntax in which they embed specific brand values and incorporate them in a coherent product portfolio. By doing so, they hope to communicate and attribute symbolic qualities (semantics) into the products. The users will then interpret, each in its own way, the "message" conveyed by the product which can be, or not, the one intended by the designer.

Each brand develops its own form language and uses it to convey symbolic meaning and thus embed specific attributes and values in the products, which then are interpreted by users and hopefully (for the brand) influence their choice of buy.

4   "BRAND SWAP" EXERCISE

The visual recognition of products and associated brands has become a central factor in the competitiveness of companies. Products must be decoded in terms of functionality but also in aesthetic terms, differentiating characteristics that associate them with brand values and specific market segments. With the miniaturisation of electronic systems, the product design and the user-interfaces become the main differentiating elements of the brand. These features - design elements and their organisation - can be more or less explicit depending on the companies' strategy and can be used more or less consistently in the product portfolio.

In order to promote students' skills in developing specific form language and understand the meaning it conveys to the user, a creative exercise was developed in which students have to design a new product with the framework of a brand from an unrelated product universe. This exercise aims to introduce the themes of form language and strategic brand communication to the students. It was based on a design exercise by Karjalainen [10] in which students were asked to design products and interiors for automotive brands.

4.1 Briefing

The students start this exercise with the choice of a product with a mechanical and electronic (or electrical) component. After the initial selection with the teacher, a brand is chosen to redesign the product. The student should create a new design that can be placed formally and functionally in tune with the needs and possibilities provided by the technology (or new technologies) of the brand. The possibility of substitution and/or application of new functionalities in the items in development are valued, possibly breaking ties with the previous technological design and establishing connection with associative links of another nature, for example, new scenarios of use of the objects. It is also intended

that the students will analyse a brand - disconnected from the initial market of the proposed object - and propose a new object (new formal and functional solutions) that is clearly identified as representing the form language of the chosen brand. This briefing was presented to 3rd year students of the 1st cycle (BSc in Industrial Design) and to 1st year students of the 2nd cycle (MSc in Product/Industrial Design).

4.2 Process

The exercise is organised in four parts: research, concept design, development and model making/prototyping. In the research phase, students start by choosing a consumer product from the market which they bring to class. Then they identify and interpret the product by using drawing as a tool to analyse the object, through the parts that constitute the essence of its design, aesthetic, mechanical and/or electronic operation. Students decompose the current product in its components, by using sketching, written notes, illustrations, photographs and other chosen media. Included in the research phase is the choice of a new brand – which cannot be related to the market segment of the initial product chosen - and its analysis: positioning, values, formal, material, technological and functional characteristics. Specific methodologies for brand analysis are given to the students such as the design format analysis [9]. The research phase is presented in a booklet which includes information both from the product chosen and from the brand chosen.

In the concept design phase students develop one to three concepts for different ways of solving the problem briefed – that is, to redesign the consumer product associating it with a new brand. This phase consists of sketches and sketch refinement drawings, as well as a presentation and discussion in class. From the three concepts developed for the "new" brand, students – together with teachers – choose only one to further develop in the next phase.

The development phase of the project consists of the detailing of the chosen concept, which includes three-dimensional CAD modelling of the concept, general technical drawings (views with dimensioning, exploded perspective, constructive sections, etc.), renders, and frequently study models in simple, affordable materials (such as cardboard, foam, etc.).

The final phase of the exercise - which was only executed in 2nd cycle degrees - includes detailed technical drawings, presentation renderings and the construction of a model/prototype, typically in a 1:1 or 1:2 scales. These prototypes are not fully functional, but should convey the form language of the newly chosen brand as interpreted and developed by the students.

Students were evaluated both on the skills development and final product presented. The skills included drawing skills, brand elements analysis, sketching abilities, 3D surface development, feasibility of the concept, etc. The final product was evaluated on the quality of the design in its successful brand expression.

4.3 Results

This exercise was applied in total of 110 students, from 2012 to 2018. The results of the exercises were analysed by using the student's grades for each exercise. Students were graded from 1 to 20 in the typically Portuguese university grading scale. This scale uses a 1 to 9 scale for negative results, and a 10 to 20 scale for positive results.

Table 1. Overall results

	1st Group (Grades 0-9)		2nd Group (Grades 10-14)		3rd Group (Grades 15-20)		Total
	Students	%	Students	%	Students	%	
1st Cycle Students	19	38.8%	20	40.8%	10	20.4%	49
2nd Cycle Students	3	4.9%	13	21.3%	45	73.8%	61
Total							**110**

We can identify three general groups of projects within the exercise. The first group includes the exercises which were negatively graded, as the students were not able to comply with the necessary work or were not able to respond to the briefing according to the evaluation criteria (Example of Figure 1). The second group – with grades from 10 to 14 - is the group which responded to the brief and was able to successfully design the product by using the main product typology, its functions and

layout of components, but using new design elements which only superficially convey the "new brand" form language (Examples of Figure 2 and 3). Finally, the third group – graded from 15 to 20 – managed to fulfil all the functional requirements, as well as understand the brand values and interpret them in such a way that a new form language - clearly associated with the chosen brand – was developed. These are considered to be the best within the different groups (Examples of Figure 4 and 5).

Figure 1. 1ˢᵗ cycle student Carolina Barata sketch and 3D render of new vacuum cleaner - brand choice Dodge
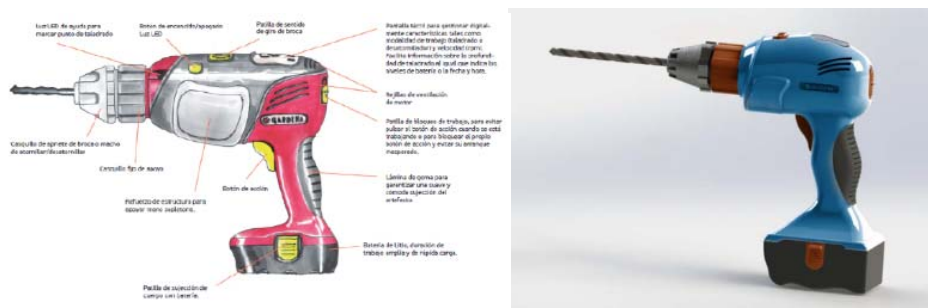

Figure 2. 1ˢᵗ cycle student Jose Gestal sketch and 3D render of new cordless screwdriver - brand choice Gardena

Figure 3. 2ⁿᵈ cycle student Maria Geraldes sketch and 3D render of new mixer - brand choice Nespresso

Figure 4. 1st cycle student Carlos Pires sketch and 3D render of new vacuum cleaner - brand choice Tesla

Figure 5. 2nd cycle student Fábio Martins sketch for concept design "Bugatti" coffee maker and final 3D rendering of the developed model

5 DISCUSSION

The results of this exercise show that students learn how to improve their traditional product development skills, as clearly showed in best cases, with new form language development skills which account for the understanding of the brand values and the ability to create/adapt specific form syntax which embodies the brand values. This means the methodology used – drawing based research, form analysis and form language development through sketching, 3D modelling and model making – enables the students to build a library of form elements and combine them into new designs. These tasks are essential for students to conceptualise and materialise the new proposals.

In the best cases, students were able to, not only redesign the product using a different form language, but also improve the functionality of the product, by adding new functions or improving existing ones by changing the product architecture and interior component layout. Also, in the best cases students were able to use implicit and explicit design elements (e.g. the use of certain lines and curves expressing speed and integration) as well as certain brand philosophy elements such as the use of minimalist approach, or the use of natural finishing materials. These students distil the initial designs and found common design elements, which were then applied in a different product typology successfully expressing the brand.

The less successful exercises resulted in pastiches from the initial product (e.g. a vacuum cleaner in the form of a car) instead of a correct development of a form language which expresses the brand identity (e.g. the use of clean, crisp design lines, a dynamic contour, etc). So, less successful products were based on literal, explicit interpretations, without the correct skills to design a brand expression in a different product typology.

The high percentage of good results in students of the 2nd cycle proves the validity of this strategy in teaching students form language development skills in product design. But, since the less successful results were more frequent in the first cycle of studies, we can infer that brand identity expression was generally beyond the skills of beginner design students, because they are still acquiring basic skills - drawing, sketching, 3D modelling - and are still not able to integrate all the complex variables of brand expression in new product development, due to the need to develop a translation between intangible brand values and its formal and material representations – form language.

6 CONCLUSION

Through this exercise the development of different skills is approached – drawing, sketching, brand analysis, 3D modelling - directly relating the work to current market trends and brands. This generally enables the students to learn the different skills and be motivated by the fact the work relates to contemporary brands and products they are familiar with.

The way students analyse the brand elements using different tools (drawing, design format analysis, etc) enables them to create a library of design elements and understand which to use, how and when to use them. Common design elements, explicit and implicit references create a library of choices and solutions developed by the students. These skills are clearly important in markets where the technical aspects of the products are solved (such as consumer electronics, car design, etc) and the communicational/brand elements became the main differentiators of the brands.

The proposed methodology for this exercise proved adequate for the objectives, particularly in the context of the 2nd cycle of design studies. The development of an in-depth preliminary work of analysis of the brand, its values and form language, is a determinant element for the success of the adequacy of the new design. The conceptualisation phase – mainly the sketching, 3D modelling and model making - are also fundamental to design a new product which embodies the brand values by means of a specific design language.

In the best cases, students are able to interpret the design elements of a specific brand (unrelated to their product of choice) and adapt their design to the brand's form language. Since this process is quite complex, it could be argued that the difference in the number of phases requested between the two cycles and, therefore, the depth of the exercises, are a differentiated factor that could enable better results in the 1st cycle. It can also be argued that after two years of design studies, most of the students in the universities are not yet prepared for the complexity of interpreting intangible brand values and embodying them in different products with specific form language. In any case, the exercise could be redesigned for 1st cycle students by, for example, proposing that the new brand could be from a "product universe" closer to the product at hand. This means students would develop products similar to the brand's current products, enabling a more direct interpretation of the brand form language.

Further studies are needed to improve the exercise methodology, which could include student's feedback on the exercise.

REFERENCES

[1]   Vicente, J. *Contributos para uma metodologia de design sustentável aplicada à indústria do mobiliário. O Caso Português*. PhD Thesis. 2012 (Universidade Técnica de Lisboa, Portugal).

[2]   Costa, D. *A Integração do designer no mundo empresarial*. In Calçada, A., Mende, F. Barata, M. (coord.) *Design em Aberto – Uma antologia.* 1993 (CPD: Lisboa).

[3]   Krippendorff, K., & Butter, R. Product semantics: Exploring the symbolic qualities of form. *Innovation The Journal of The Industrial Designers Society of America*, Spring 1984 4-9.

[4]   Krippendorf, K. On the Essential Contexts of Artifacts or on the Proposition that Design is Making Sense (of Things). *Design Issues*, 1989 Vol V No 2. 9-39.

[5]   Bonollo, E., Montana-Hoyos, C.: Drawings and the Development of Creativity and Form Language in Product Design Education. *'Creativity: brain, mind, body', 2011 ACUADS Annual Conference.*

[6]   Karjalainen, T.-M. Strategic Brand Identity and Symbolic Design Cues. In *6th Asian Design Conference*, Japan, October 2003.

[7]   Toni-Matti Karjalainen, T. k. *Semantic Transformation in Design: Communicating Strategic Brand Identity Through Product Design References,* 2004 (University of Art and Design, Helsinki, Finland).

[8]   Gros, J., Progress by Product Language. *Innovation The Journal of The Industrial Designers Society of America*, Spring 1984, 10-11.

[9]   Warrel, A. *Design Syntactics: A Functional Approach to Visual Product Form*. PhD Thesis. 2001 (Chalmers University of Technology, Goteborg, Sweden)

[10] Karjalainen, T. M. It Looks Like a Toyota: Educational Approaches to Designing for Visual Brand Recognition. *International Journal of Design*, 2007, (1) 1.