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CULTURAL AFFORDANCE OF PRODUCTS: COVERAGE WITHIN INDUSTRIAL DESIGN EDUCATION

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ABSTRACT
Products are regarded as possessing not only physical properties but also subjective qualities such as culturally-based user preferences. To communicate these cultural aspects, products must "afford" conversation with their intended users using some type of language. Being initiators of product creation, industrial designers are supposed to facilitate the communication of the products' physical and non-physical attributes to users in a self-explanatory way.
In this paper, the authors argue that if the cultural affordance of products is deemed to be important, then industrial design education must accordingly cover this topic in the curricula. To that effect, we examined the courses of study for industrial design from 39 universities worldwide, to determine if the relationship between culture and design is convincingly addressed within the training of designers. It is found that the majority of industrial design curricula suffer from a relative lack of subjects related to the links between culture and design. This paper concludes with propositions to integrate and enhance cultural affordance within the curricular structure of industrial design degree programs.

Keywords: Cultural affordance of products, culture, design education, industrial design curricula

1 INTRODUCTION

The word "affordance" was coined by Gibson [1] to refer to the interactive possibilities of a particular object or environment in the physical world. Norman [2] adapted the term into the fields of product design and ergonomics, when he wrote about "perceived affordance", which looks at those qualities of an object that suggests how it might be used or interacted with. Norman [3] proposed that the perceived affordance of a product is determined by several factors, including:

1. the context, environment or process in which the object is displayed;
2. the culture or influential societal norms on the individual's understanding and use of a object;
3. instinct, which is an unconscious association often linked to physical characteristics, such as the size of an object in relation to the human form;
4. the mental model or the user's understanding and expectations of interaction with the object.

The concept of affordance thus helps to establish how a user can interrelate with a product. As a result, if we want products to afford their usability and facilitate a pleasurable communication, then designers should design products with an inclusive understanding of the users' culture, experiences, expertise and knowledge [4]. Without this understanding, the designers leave an extra load on users in re-learning or even un-learning about the product.

2 CULTURAL FIT: THE NECESSITY

The necessity of integrating the users' culture into product design has been propounded by many researchers [5-10]. Nevertheless, culture is still regarded as a neglected concept [11]. The literature on design and cultural theory points to the existence of at least five main causes for the negligence of culture in design:

1. The additional costs for the research and development of culturally-oriented products [12],
2. The lack of cultural integration know-how amongst industrial designers, stemming from a possible gap in their education [13];
3. The globalization of products and services [14];

4. The preference of technology-focused designers and engineers to innovate on technological grounds rather than to address cultural fitness [15]; and
5. The customization of products being viewed as contrary to the nature of mass-manufactured industrial production [6].

Countless studies have been undertaken in the disciplines of marketing, business, psychology, management, politics, and social sciences, all addressing the impact of culture on varied aspects of human interactions with people, environments and situations. For instance: Berg-Weitzel and Laar [16] studied the relation between culture and the idea of communication in packaging design. They found five distinguishing factors influencing the communication; Ellsworth et al [17] studied the design of refrigerators in the United States, in Japan and in the European countries. Significant cultural differences were identified among user expectations in those countries; Siu [18] conducted a case study of Hong Kong public rubbish bins and came up with propositions as to how designers should understand and respect the culture of the residents; Honold [19] studied German washing machines being used in India and found eight cultural-specific factors which lead to a stronger bond between users and products; Interaction design is also classified as culture-bound products and the integration of culture into these has been the subject of many studies, including Fernandes [20], Khaslavasky [21], and Lee [22].

We know that products act as a means of communication. However when products cross cultural borders there is no guarantee that the meaning and functions invested in products by their designers will be recognized by their users from another culture [23]. Corporations worldwide have started to realize that insight in embedding functional, cultural, mythical, symbolic, and ethical meaning into products are becoming more important now than in the past [24]. A significant part of human understanding, feelings, and behaviors stem from cultural values. Accordingly, “culture” can be regarded as a foundation on which our understanding of objects is built up.

Today’s products have a tendency to confuse us with their functions and seductive exteriors [25], rather than emphasize the fine qualities or “soft values”. Users need to be pleased by the satisfaction of their genuine needs, including the emotional, cultural, social, and spiritual. Since the fundamental concept of pleasurability is rooted in culture [3], it can be assumed that pleasurability can only be achieved in full when the users’ cultural wants and attributes are integrated into the design of products along with all the other physical requirements.

Products are part of our cultural identity and therefore they must reflect our values in one way or another. Lambourne et al [26] contend that people in the current era are looking for their own identity more than in any previous age and they do this in a variety of forms such as wearing different clothes. Theorists from different disciplines assert that culture can be manifested in a variety of indicators such as symbols, artifacts or products, modes of communication, values, behaviors, institutions and social systems [27-32]. Therefore it can be inferred that products are part of our identity and material culture.

Our judgment and decision-making has a subjective nature in our mind [12] and could be heavily influenced by our culture. In crowded marketplaces, cultural fit in products is crucial and can help promote success at the point of purchase [33, 34]. De Souza [6] also classifies the integration of culture into products as a new dimension of competitiveness.

Innovation is central to design activities, and culture can be a major source of design inspiration and innovation. It can help deliver the diversity which is essential in satisfying varied users’ needs. Culture is also a factor in our intuitive use of products, since our intuition returns to our conception of things which has already been built up within our cultural context. For instance, a light can be turned on by flipping a switch either upward or downward, depending on the norms in different countries [35]. These culture-based expectations are especially important to consider when health and safety issues are mandated in a design project.

One of the features of globalization is the convergence of different cultures into a single culture in order to have a unified taste to deal with. Despite this trend, De Mooij [36] reports that cultural diversity is gaining importance among nations. Singer [37] makes a case that a re-appreciation of cultural expressions in the design will bring easier-to-use and more economically successful products. Figure 1 illustrates some of the aspects of the product design process where cultural considerations play a role.

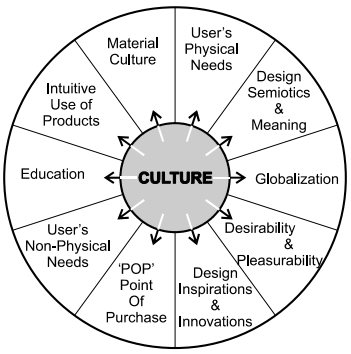

Figure 1. Cultural considerations in product design.

3 THE STUDY

200 universities worldwide were approached for the curricula of their bachelor's degree programs in industrial design. The study was aimed to determine the extent by which students are subjected to material that considers culture and its affordance in product design. Only 39 universities responded to our call, and of these 22 provided us with descriptions of the subjects they offered. The participating institutions came from Australia, Belgium, Botswana, Brazil, Canada, China, Costa Rica, Finland, France, Germany, Iran, Italy, Japan, Malaysia, Mexico, Singapore, Sweden, Thailand, Turkey, United Kingdom, and the United States.

A review of curricula from those universities revealed the following points:

1. The curricula are generally geared towards providing students with broad-based design knowledge, including intellectual, professional, and transferable skills, usually delivered through a project-based modular system. As expected, there is a strong emphasis on visual communication and representational techniques, including drawing, rendering, drafting, CAD, and model making; and also on the technologies of materials, mechanisms, and manufacturing.
2. By and large, the social aspects of design, including the cultural affordance of products, are only superficially touched in most courses of study, with only a few exceptions.
3. Topics on society and culture are presented either within theory classes or within design studios, where they find application as design problems. It is worth noting that the existence of subjects particularly dealing with the concept of culture is rare in industrial design curricula.
4. The range of subjects under which the concept of cultural affordance is addressed varies enormously. They tend to be covered in such design courses as "design, technology and society", "universal design", "organizational culture", "human factors and ergonomics", and "semiotics". They are also covered in non-design electives such as "anthropology" and "marketing", particularly "international markets".
5. The level at which the concept of culture is studied differs markedly as well. Some subjects partially cover the issue, as in some "ergonomics" and "design studio" courses. On the other end, certain subjects profoundly involve students with the notion of culture: at the National University of Singapore, they offer a course on "design for culture and identity". In some universities they have subjects with a particular stress on the culture of their countries. The Centro Universitário Positivo in Brazil teaches "Brazilian art history"; in Iranian universities they have courses on "Islamic arts & civilization" and "design of objects in Islamic civilization"; and at Takushoku University in Japan "Kansei Design Studio" and "Japanese Traditional Design" are part of the curricula.
6. Design subjects that embrace the consideration of culture in products are mostly offered in the second and third years of industrial design programs.
7. Cultural affordance is also addressed through research projects, where students investigate user needs, which include social and cultural needs. In final year projects the understanding gained from this user research is applied and translated into major design projects.
8. In some universities, students are prepared to be global designers; this assumes that graduates will have an appreciation, respect and knowledge of the different cultural needs of the different regions and countries of the world. Strate College in France envisions that its graduates would be able to face the challenges involved in international design.

9. Religion is an important component of culture in many countries, and can be prominent in some design programs. The subjects “design of objects in Islamic civilization” or “Islamic arts and civilization” are compulsory for industrial design students in Iran, while in the University of Botswana the course “design, technology and society” addresses the impact of African religions and society over art and artifact design.
10. In capstone or final year projects, students are often required to address the social needs of their target market, inferring to the importance of discerning the culture of the users.
11. Links are established between culture and symbolism through providing modules on the cultural history of humanity, and on imaginary symbols and signs.
12. Where culture is addressed under the title of marketing, it is mainly considered as a tool for stealing the competition weapon of companies. The emphasis has been placed more on the economical argument rather than on equipping designers with strategies for ensuring user satisfaction.
13. Culture can also be seen as “the context”. In Carleton University in Canada, the design courses are aimed at giving students a sense of the context in which the product is going to be used by the end user. This relates back to Norman’s [3] definition of context and culture being factors for perceived affordance.
14. Cultural shift and the cultural profile of products are matters of interest in some curricula. They look at product landscape and the soft connections between objects and users in order to perceive a product within the context of cultural shift, consumerism, socially-responsible design, and the place of new technology for product design.
15. By evaluating the design of existing products, students experience a grasp of the impact of culture and gain a sense of current culture, user’s senses and emotions, and also the dynamics between the user and the product.
16. Commonly industrial design students are tasked to improve the quality of life by designing appropriate products. The concept of appropriateness of products can be said to be dependent on the cultural profile of a product and many other variables.
17. The social role of industrial designers, being agents of change, is highlighted in most curricula. Thus, aside from the typical focus on enhancing the physical attributes of products, some university programs also train industrial designers how to relate with the product’s context, empathize with the influences of society and culture, and comprehend how the user expects to interact with the product.

The analysis of the various curricula of industrial design programs revealed various ways by which the topic of culture is addressed within the teaching and learning of product design (Fig. 2).

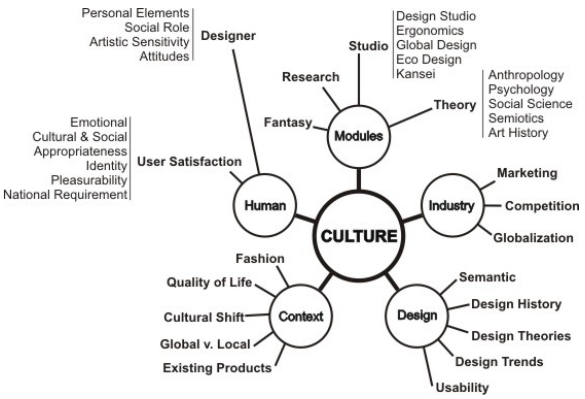

Figure 2. Key areas in industrial design curricula in which the notion of culture is addressed collectively.

4 DISCUSSION

It can be argued that industrial design is a socially- and culturally-oriented profession. It would be ideal for practitioners to be trained with a firm grasp of and respect for the social needs of users, which differ significantly across different cultures. Papanek [38] reports that the direction of the design profession is changing from one that follows a market model to one that subscribes to a social model. Therefore design education should be concerned not only with training designers with enhancing the

physical qualities of products and determining what would be profitable to sell, but also with producing solutions that are desirable or acceptable to a society and to its culture. While designers ought to be aware of the multifaceted social and cultural needs of users, they also need to be cognizant of the impact of their own cultural preferences, which inspire their creativity and innovation towards the generation of product concepts.

The design literature shows that a variety of methods of enquiry are being utilized by designers so as to obtain an understanding about users and customers. Portigal [34] believes that whilst many companies explore anthropological and cultural methodologies for the utilization of users' culture into the design of products, these methodologies suffer from broad and vague generalization, as they are poorly understood, hard to evaluate and often hit-or-miss. Consequently, we would like to suggest to the community of industrial design educators a special module to be added to the curriculum of industrial design to bridge the gap.

5 SUGGESTED LEARNING MODEL

We propose a special studio learning module titled "Culture and Design", to be offered in semester 6 of an 8-semester industrial design degree program. Within this course students are provided with visions on the idea of cultural affordance in products respective to social aspects of design. Through field research activities, they will develop an understanding of the varied cultural and social needs, and apply this learning into the design of culturally appropriate products. Another exercise in the studio might be developing concepts for culturally-divergent user groups, in order to stimulate their creative sensitivities towards satisfying varied user's needs across cultures. The module can be enhanced by student exchange programs and international online collaborative design studios, so that participating students will be able to experience and understand the cultures of students from other countries. One example of such a cross-cultural collaborative is the Omnium virtual design studio [VDS], which brought together interdisciplinary design students from 11 countries, engaging in verbal and visual dialogue, using the internet as their only communication medium [39]

6 CONCLUSION

This investigation discovered a relative insufficiency in the consideration of cultural affordances within industrial design curricula. A module is introduced and suggested to overpass this gap.

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