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SUSTAINABILITY AND DESIGN EDUCATION: FROME PRODUCTS TO PRACTICES

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ABSTRACT
The first and main part of this paper discusses the importance for the field of *design for sustainability* to encompass approaches that both consider the notions of eco-efficiency and sufficiency. The implications of a greater integration of these two notions or principles in design education—the former being more directly related with production issues, and the latter being more closely linked with consumption and lifestyles—are explored. The paper stresses that, in order to more significantly contribute to the project of a sustainable, viable future, designers will increasingly need to be skilled in proposing concepts that move from product-focused to practice- or use-focused solutions. It emphases that, within a sustainable perspective, design education curriculum should support "rethinking" approaches that go beyond "redesigning". The second part of the paper introduces an undergraduate design studio aimed at supporting this shift. The design of the studio itself invites students to define the object of their project by conducting fieldwork research to identify practices and habits of life that are problematic from an ecological point of view, or practices that cannot be supported. The structure of the studio also encourages students to frame their project in terms of what it is that the design solution has to do or to support, in contrast to directly premising the project on the redesign of a given product.

Keywords: Design for sustainability, design education, context-focused approach, efficiency, sufficiency, sustainable consumption.

1 INTRODUCTION

Sustainability represents a real challenge for product design, and by extension for design education, as it is not only about things, but about how we relate to them and how one's daily life is organized [1]. It defies many conventions and practices of everyday life, be they aesthetics, or social conventions or norms, and calls for new and alternative models and practices to become accepted and valorised [2, 3]. This represents a particular area where design has an important role, as the ability to imagine and communicate the unknown is the strength and potential power of the designer's contribution. Indeed, design has the capacity to envision and materialize new avenues or possibilities, and in that sense has a contribution to make in creating a better, more sustainable world. From this perspective, designers will increasingly need to be capable of *redesigning* and *rethinking* traditional products by reconsidering how objects are conceived, developed, produced, distributed, used, reused, recycled, and disposed.

In relating to the new conditions of practices that sustainability calls for, this paper first discusses the rationale for integrating into design education curriculums, activities where students are invited to revisit how daily life is organised and supported through sensitive design solutions, and ecological practices. The paper presents theoretical arguments supporting the need for activities that integrate both the issues of eco-efficiency and sufficiency. While the former is more directly related to quantitative production issues (sustainable production) and mainly concerns the object itself, the latter principally concerns the qualitative consumption sphere (sustainable consumption) and is principally linked with objects in relation to people's aspirations, expectations, and how they organise their daily lives. The main contribution of this paper lies in the presentation of the rationale for a greater integration of activities that, notably, prompt students to approach projects with a broader perspective with regards to the way they formulate the initial project definition. Additionally, it seems important to underline that these approaches are not only relevant in the area of design for sustainability, but in product design innovation in general.

The above reflection has provided the basis for the development of an undergraduate industrial design studio aimed at 1) introducing students to eco-design tools and, importantly, at 2) raising students' awareness about the importance of considering practices, habits, and lifestyles in relation to design and sustainability. Being modest and limited in its response to the considerable theoretical issues raised in the first part of the paper, the second part of the paper introduces a studio entitled "Towards a Sustainable Kitchen: The Integration of the Notion of Pleasure". The studio is intended to allow students to experiment a practice- and context-focused design process—in contrast to a product-focused approach. The main approach used to develop this activity, was inspired by the work of Sherwin and Bhamra [4] who conducted workshops aimed at stimulating ecodesign innovation. The main contribution of the paper lies in the presentation of theoretical arguments for further integration of activities that consider the issues and implications of sustainable consumption and sufficiency for product design, and which imply a move from product-focused solutions to result- and need-focused solutions [5].

2 DESIGN AND SUSTAINABILITY

2.1 The contribution of product design

The contribution of the product design discipline in reducing the environmental impacts of products is significant. Indeed, it is estimated than more than 80% of all product-related environmental impacts are determined during the product-design phase [6, 7]. This proportion is substantial, and supports the proposition that product design is in a position to positively respond to the contemporary challenge that is sustainability.

Still, product designers are invited to acknowledge the limitations of design interventions aimed at making existing products more resources efficient. Indeed, in a context where "[e]vidence suggests that environmental gains from technical improvements in product efficiency have historically been outweighed by an overall increase in consumption" (Carley, Spapens, after [8] p. 51), designers are called to address both the issues of *efficiency* and *sufficiency* when approaching a problem in order to more fully contribute to this still blurry objective that is sustainability. As described by Reisch and Scherhorn [9], "[w]hile *efficiency* largely depends on technical innovations as well as on an eco-design of products, *sufficiency* relies on individual behavioural changes as well as on social innovation" (p. 678). The former asks the question "*how can we produce out of less and with less impacts*," while the latter asks the following question: *"how can we improve our lifestyles with less consumption?"* Designers are therefore growingly invited to consider practices, lifestyles, and habits of life. Ecological problems are not limited to the physical nature of the objects we consume, but how we use (and dispose of) them, and more fundamentally, how we respond, ecologically speaking, to our needs. Design can potentially intervene in this last area by questioning how we respond to a particular need, the need for mobility for instance, by imagining and proposing alternatives and more sustainable ways to respond to it.

2.2 Beyond the product

Product-centred approaches are highly appropriate in working to improve product *efficiency*, but are not adequate for encouraging *sufficiency* through reduction in current levels of consumption. While being an essential aspect and strategy for sustainability, efficiency alone does not represent a viable solution, as its implementation does not question current structures. Rather, it can be seen as encouraging the belief that we can maintain our current ways of doing and thinking:

> *Eco-efficiency is an outwardly admirable, even noble, concept, but it is not a strategy for success over the long term, because it does not reach deep enough. It works within the same system that caused the problem in the first place, merely slowing it down with moral prescriptions and punitive measures. It presents little more than an illusion of change. Relying on eco-efficiency to save the environment will in fact achieve the opposite; it will let industry finish off everything, quietly, persistently, and completely.* [10, pp. 61-62]

Moderation in lifestyles and more efficient capital use are demanded. In an ideal scenario, designers would be able to propose eco-efficient products or product-service-systems, and would also use their skills to promote lifestyles that are less intensive in capital use, through the development of

appropriate alternatives. The capacity to integrate the two principles discussed when approaching a project provides a veritable opportunity for renewing and extending the contribution of the product design discipline in the face of the global ecological crisis. In such context, the *motto* for designers is: redesign *and* rethink.

2.3 Design as an Interface Between Production and Consumption (Use)

The concept of sustainable product design, as with sustainability itself, needs to be informed by two fundamental considerations: sustainable modes of production, and sustainable consumption patterns and lifestyles. Therefore, in addressing the nature and implications of sustainable goods, it is essential to consider both of these interdependent facets.

As illustrated in Figure 1, the issue of sustainable production is closely related to the principle of efficiency and to the supply side, while the emphasis of sustainable consumption is on sufficiency and the demand side. Sustainable product design, as it sits at the intersection of these two spheres, represents a considerable challenge, both in theory and practice, especially as it calls for technical innovation as well as social innovation, including new ways of living, and new cultural and social models.

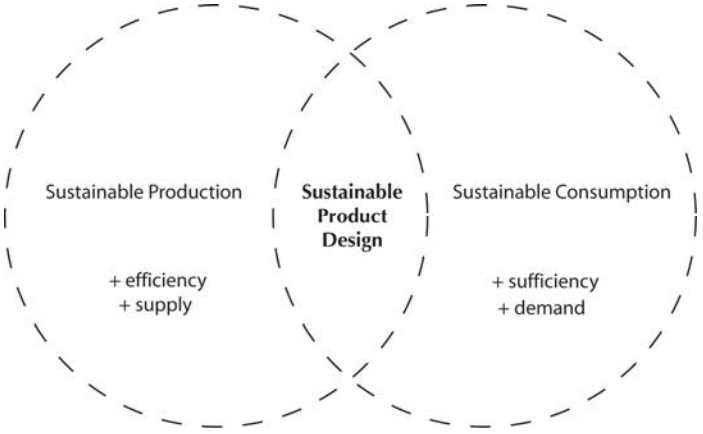

Figure 1. Sustainable product design as it relates to the principles of efficiency and sufficiency

As Cooper [11] has written, sustainable consumption involves rethinking how needs are met and products are conceived. According to him, product development in the context of sustainable consumption "[…] will involve finding a mix of products and services through which consumers will be able to buy less, use less, and dispose of less without suffering a loss of wellbeing" (p. 50). He further suggests that "[a]s a consequence, designers and other actors involved in the product development process will, increasingly, need to be skilled in understanding consumer psychology and the forces which drive consumerism as much as the commercial pressure to improve the technical efficiency of products" (p. 50). Therefore, sustainable consumption represents a challenge for design and design education in terms of capacities, abilities, values, culture, and methodologies.

At the scale of the individual, sustainable, responsible consumption is about minimizing the negative environmental and socio-cultural impacts of consumption choices through the amount of goods and/or services that are consumed, throughout the acquisition, use, maintenance, and disposal phases of a product's lifecycle. It involves consuming less and consuming "differently". It could further be said that it also requires "[…] getting more with less, not more stuff but more satisfaction […]" [12, p. 67]. This closely relates to the notion of sufficiency. More globally, sustainable consumption implies lifestyle changes.

3 AN ATTEMPT TO DEVELOP A DESIGN STUDIO RESPONDING TO THE CHALLENGES OF DESIGN FOR SUSTAINABILITY

3.1 Moving from Products to Practices or Use-Focused Approaches

As discussed in the previous sections of this paper, sustainability raises many exciting challenges for product design. Designers will increasingly be required to consider ecological issues from both production and consumption perspectives. As to implications for design education, if the discipline wishes to fully engage in design for sustainability, curriculums will have to include within their programs, activities that integrate both.

Design for sustainability importantly calls for design education curriculum that: 1) integrates tools and strategies for improving the ecological nature or character of objects and processes, as well as 2) contents that invite students to consider practices, lifestyles, and habits of life. In terms of tools and strategies, evaluation tools and approaches such as life cycle assessment (LCA) [13], design for disassembly (DfD) [14], cradle to cradle thinking [10], and biomimicry [15], can aid in this transformation. Although limited with regards to rethinking traditional products, they can be used to support the generation and/or the assessment of product redesign and of creative solutions whereby the outcomes of traditional consumption goods are achieved in a different and more sustainable way. In relation to 2) practices and habits of life, designers are invited to get closer to users and to be sensitive to the use phase.

3.2 Towards a Sustainable Kitchen: Integration of the Notion of Pleasure

The elements discussed above have provided the theoretical basis for the development of an undergraduate design studio aimed at introducing students to eco-design tools, and more importantly, at raising students' awareness about the importance of considering practices, habits, and lifestyles in relation to design and sustainability. Entitled "Towards a Sustainable Kitchen: The Integration of the Notion of Pleasure", this ten week studio (total of 140 hours) has been designed to allow students to experiment with a practice- and context-focused design process—in contrast to a product-focused approach. Three main characteristics of the studio or workshop are intended to support this objective:

1) In the first phase of the studio, students conduct research in the field—namely in kitchen areas with users—in order to identify by themselves relevant areas of intervention in relation to sustainability. In teams, they are also invited to prepare meals together and to note areas of potential pertinent design interventions. **During the fieldwork, students identify not only *products,* but also *practices and habits of life* that are problematic from an ecological point of view. They are also invited to identify positive practices that could be supported.**

2) In the second part of the studio, once all the teams have identified ten (10) potential areas of intervention, each student then selects for themselves one theme that has emerged from the work conducted by the entire class. **Students must frame their project by stating what it is that the design solution has to do or to support, instead of simply stating that they are redesigning a giving product.** Such a framing of the project is expected to spur creativity in supporting design solutions that go beyond redesigning a given good by following eco-principles.

3) In the design phase of the project, **students have then to integrate eco-design tools and strategies into the process, while also integrating the notion of pleasure in use into their design.** This approach aims at reminding students that a focus on the ecological aspects of the project does not mean according less importance to the experience of the products of the product-service-system (PSS). On the contrary, to support the integration of more sustainable practices, it seems essential to propose alternatives that are pleasurable.

The studio is presently being conducted. Based on this initial experience, the approach seems to be welcomed by students, who have as a whole, responded well to its objectives. However, perhaps partly due to the traditional product-oriented approach that still mainly defines the profession, it appears difficult for some students to initiate and frame the project via a problematic (eventually leading to a product or product-service solution), and not with the redesign of a given product. The author believes that prior to offering such a design studio oriented towards sustainability—and by extension towards technological and social innovations—a workshop exclusively dedicated to design approaches for innovation would be appropriate. It could provide students with the reflexive approach to innovation *before* integrating of the notion of sustainability, in order to facilitate a more progressive acquisition of knowledge.

4 CONCLUSIONS

The paper has put forward theoretical arguments for the integration of curriculums in design education for sustainability that prompt students to think beyond product-centred approaches in the early stage of projects. The discussion points out that such an approach, while usually leading to the adoption of eco-efficiency strategies, is not alone sufficient to address the level of creativity and innovation required to fully engage in a more sustainable, viable world. The notions of sufficiency and lifestyles should be equally considered in the curriculums. The structure of a design studio aimed at introducing students to eco-design tools, and importantly, at raising student' awareness about the importance of considering practices, habits, and lifestyles in relation to design and sustainability has been presented. The studio comprises three elements that are intended to support this objective: 1) instead of focusing on products, students are to identify desirable practices, as well as practices and habits of life that are problematic from an ecological point of view; 2) in relation to 1), they must frame their project by stating what it is that the design solution is to do or to support, and not by stating that they are redesigning a giving product; and 3) when proposing a design solution in response to their identified issue, they are called to integrate eco-design tools into the process while also incorporating the notion of pleasure in use into their design. This studio is presently being conducted, and the initial experience, although positive, gives indications that it would be appropriate to offer a prior workshop aimed exclusively at exploring conceptual and strategic approaches to innovation, before integrating the notion of sustainability into the design process.

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