Chapter 5

Experience-Centred Design and the Role of Computer-Aided Tools in the Creative Process

Folasayo Enoch Olalere
Vaal University of Technology, South Africa

ABSTRACT

In this chapter, the author examines the levels of a cognitive process (visceral, behavioural, and reflection design) in experience-centred design and their applicability in developing effective products. The study further explores the role of computer-aided tools (CAD) in engaging users as the fundamental participants in the creative process. This was achieved by developing two products digitally (CAD models) based on Norman’s three design levels, and evaluated using a semantic differential scale to test the emotive response towards the designs. The findings show that CAD is a viable tool for gaining insight into users’ perceptions towards a design idea. Also, the results revealed that the process of supporting or sustaining cultural values through design also enhances the affective quality (reflective level) of the design.

INTRODUCTION

The economic development and technical progress have transformed the product demands from the mass and quantitative consumption to customised and perceptual consumption. Despite the importance of technology capability, technology is not
only what it takes to captivate customers (Boatwright and Cagan 2010); they want products that are functional at a physical level, usable at a psychological level and attractive at a subjective and emotional level. Hence products are meant to satisfy some functional requirements such as aspiration, cultural, social, and emotional needs.

Research by Boatwright and Cagan (2010) revealed that people pay for products that address their cultural and emotional needs in all types of businesses. This is because; emotion in its various forms is a strong driving factor for a consumer want. Thus, a sustainable user-centred design approach can help to establish an emotive connection and resilience of relationship between product and user (Chapman 2009; Overbeeke and Hekkert 1999). Although collaborations between manufacturers and supplies are becoming increasingly more usual, it is still far from common for the customer to be considered as a fundamental participant in the collaborative design chain (Camarinha-Matos and Afsarmanesh 1999). The different types of customers that will filter the product throughout its life cycle are stakeholders in the process and should be given preferences from the very earliest design stages.

Against this backdrop, this chapter investigates the knowledge regarding how user-centred design approach can be employed to develop emotive products. Furthermore, the chapter elaborates on the three-design level and the resulting appraisals that elicit emotions. Based on this understanding, an experimental study was conducted where two products were designed using computer-aided design (Solidworks software). The 3D CAD models were evaluated to know the emotive response towards the design and the result shows some interesting findings by demonstrating the theories in practice and also reveals that 3D computer-aided design can help to engage potential customers as fundamental participants in the collaborative design chain.

**Computer-Aided Design as Creative Tool in Product Development**

Improving productivity has been one of the major economic growth that has developed the world; that is, getting more output per worker. The advent of twenty first century has brought alongside the digital revolution where the process of making things has gone digital. The use of computer aided tools has impacted significantly in the execution of technological innovation in almost all spheres of industrial design products development. With the use of computer-aided design (CAD), product ideas can now be expressed all through the whole spectrum of the production process; from design initiation and decision making through to technical design and subsequent link to the machinery (“Computer Aided Design” 2008).

According to Fredriksson (1994), up to 80 per cent (%) of the total cost is often committed in the concept development phase; this is because decisions made at the
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