Chapter 14

Computer-Aided Ceramic Design: Its Viability for Building User-Centered Design

Folasayo Enoch Olalere
Universiti Malaysia Kelantan (UMK), Malaysia

Ab Aziz Bin Shuaib
Universiti Malaysia Kelantan (UMK), Malaysia

ABSTRACT

This chapter investigates the knowledge regarding how user-centered design can be achieved during ceramic product development with the aid of computer-aided ceramic design. The chapter gives the general overview of ceramics, computer-aided design, and its application in ceramic product development. It also illuminates on product emotion, its influence on consumers’ behaviour, and how it can be integrated into new products. With reference to desire emotion, the chapter elaborates on the determining factors and the resulting appraisal that will elicit the desire emotion. Furthermore, it analyses the systematic approach in building user-centred design in new products. Based on this understanding, a study is described where a newly developed mug design and a multi-functional ceramic pot were tested to know emotive responses of people towards the products. The results from the study show some interesting findings by demonstrating the theories in practice and also reveal the viability of computer-aided design as a tool for building user-centered design.

INTRODUCTION

According to Chapman (2009), an approach to sustainable user-centred design reduces the consumption and waste of natural resources by increasing the resilience of relationships established between consumer and product. With the arrival of economical development and technical progress, consumption demand has transformed from quantitative consumption to perceptual consumption. Therefore, despite the importance of technology capability, technology is not only
what it takes to captivate customers (Boatwright & Cagan, 2010), products are meant to satisfy some functional requirements such as; aspiration, cultural, social and emotional needs. This is because; consumer needs products that don’t just do the right thing but also make them feel the right ways. They want to use products that should be functional at a physical level, usable at a psychological level and should be attractive at a subjective and emotional level.

The concept of emotion in products has existed many decades ago. In 1970s, Professor Mitsuo Nagamachi developed Kansei engineering which focuses on the development or improvement of products and services by translating customer’s psychological feelings and needs into product parameters. Kansei Engineering parametrically links customer’s emotional responses (i.e. physical and psychological) to a product or service with their properties and characteristics. In consequence, products can be designed to bring forward the intended feeling. This was also the subject of Pieter Desmet’s research project where he tried to unravel the relationship between product and emotion. Along with his research, he also developed a Product-Emotion measuring instrument (PrEmo) with which emotion towards a product can be measured.

Research by Boatwright and Cagan (2010) revealed that people pay for products that address their emotional needs in all types of businesses. Therefore, product emotion is critical to the long-term success of any product that customers interact with directly or indirectly. In other words, engaging emotion as a partner to technology will deliver the next market place products that will captivate customers. In the present world of competitive and saturated market, corporations need to seek ways of engaging consumers in order to maintain their production rates. Thus, an emotive connection between product and user is imperative to the success or failure of a product (Overbeeke et al., 1999). This is because, emotion in its various forms is a strong driving factor for a consumer want; therefore, consumers needs to be captivated to desire, wanting new things even before the old had been invalidated.

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 et al., 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. In the light of this, this book chapter investigates the knowledge regarding how user-centre design can be achieved during ceramic product development with the aid of computer aided ceramic design. The chapter gives the general overview of ceramics, computer-aided design and its application in ceramic product development. It also illuminates on product emotion, its influence on consumers’ behaviour and how it can be integrated into new product. With reference to desire emotion, the chapter elaborates on the determining factors and the resulting appraisal that will elicits the desire emotion. Furthermore, it analysed the systematic approach in building user-centred design in new product. Based on this understanding, a study was performed where a newly developed mug design and a multi-functional ceramic pot were tested to know emotive responses of people towards the products. The result from the study shows some interesting findings by demonstrating the theories in practice and also reveals the viability of computer aided design as tool for building user centered design.

**CERAMICS OVERVIEW**

Ceramics is the art and science of making useful products for man from inorganic, non-metallic materials by the action of heat and subsequent cooling (CTIOA, 2011). It can also be defined as heat-resistant, non-metallic, inorganic solids that
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