

# Linking Emotions and Ergonomics: The Case of Spectacle Design for Teenagers

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**Abstract** – *One of the major effects of globalization on consumer market is that consumers are able to gain access to vast variety of products across the globe more easily than before thanks to the rapid development of the Internet. This has made consumers to be more selective and demanding than ever. In meeting such demands, product designers will have to use various means to increase consumer satisfaction by designing products that appeal to the intended target group. This paper describes the use of Kansei Engineering methods as one of the means to create desirable products. In particular, it presents the preliminary stage of an on-going research and development work done on a design support system, which aims to aid the design selection of spectacles. With the aid of three-dimensional graphics, subjective evaluations using Kansei Engineering methods are conducted to examine the relationship between users' assessments and design elements.*

**Keywords:** Kansei Engineering, spectacle design, emotions, ergonomics, teenagers

## 1 Introduction

With the development in production technology and advancement in market research, it is not uncommon to note that many products available in the market today share similar design, functions as well as usability. For product manufacturers, such situation has created a highly competitive market and any mistakes in estimations of market trends can prove to be very costly [1]. For consumers, the globalised market has driven them to be more selective in deciding what fits best to their needs and requirements. Moreover, the accessibility to various products worldwide thanks to the rise of electronic commerce (e-commerce) [2] has resulted in a more demanding consumer market. Hence, it has become even more crucial for product designers to take into consideration the impression of their products make to the consumers. It is necessary to accurately identify various consumers' requirements based on their subjective judgements and to transfer those requirements into the design of a particular product [3]. Therefore, the trend of product development is now very much consumer-oriented, in which consumer's feeling and needs are recognised as essential in influencing the final product design [4].

Realising such need, many product manufacturers or company are paying greater attention to development activities that consider consumers' subjective properties by using various tools, which can translate feelings about a product into actual design parameters [1]. Kansei Engineering is one of the tools created for such purpose. It is an effective technique that is capable of quantifying human Kansei (feelings, emotions and sensitivity) into product design elements [5]. Though Kansei Engineering is not a new concept and has been widely used universally, its potential application in a range of products is still being investigated and explored. Traditionally, the inclusion of Kansei Engineering concept in product design is done by "order-made" design in which a product designer will try to capture a customer's needs and demands and proceed with actual design. [3] However, it is noted that this method can be very time-consuming and costly. As such, numerical computer-based support systems that can aid product designers to predict customer's thought and display a model which matches their preference has been developed and introduced [6]. Jindo, Hirasago and Nagamachi [7], for example, created a design support system for office chairs using three-dimensional graphics, which has proven to be useful for manufacturers in formulating design strategies.

In this paper, the preliminary stage of an on-going research and development work on a Kansei Engineering design support system on teenage spectacles with the integration of desktop virtual reality is presented. This