
The application of ergonomics aspect and Kansei engineering in designing communication aid for children with autism

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Abstract: Autism is a psychological disorder; the symptoms include impairment in verbal and nonverbal communication. The increasing number of children with autism is not followed by the number of inclusion schools and therapists, to the point that there is still a considerable number of autistic children with little access to proper therapy. To address this issue, a communication aid called PECS was designed to help autistic children. PECS is widely used worldwide, including in Indonesia. However, PECS have several drawbacks. This paper attempts to design better PECS media. The selected design of PECS media was 7×7 cm in size, and made from polypropylene layer pad. The media set was also complemented with aromatherapy oil blend. After being tested with 10 autistic children, it was measured by the time needed to pick the media. It was recorded that the picking time shortened from 48.06 to 41.49 seconds.

Keywords: autism; autistic children; communication aid; ergonomics; Kansei engineering; PECS; PECS in Indonesia.

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1 Introduction

Autism is one of the disorders which affects a considerable number of children. Its cause is yet to be identified. In 2008, one in every 100 children was affected with autism, and by 2012, the ratio had increased to one in every 88 (Pusponegoro, 2007). However, the number of therapists for autism cases is relatively constant every year. To help parents assist their autistic children at home, picture exchange communication system (PECS) is used. This method, which was first developed in the US (Tanjung and Elina, 2000), aims to train children with special needs to communicate, and particularly to improve their verbal skill. PECS, which employs picture cards, has been very successful in the US (Jennifer, Gidley and Yana, 2014).

This study attempts to design a communication aid to assist autistic children in developing their communication skill. Ergonomics aspect and users' emotion are considered as important factors in the design. From the ergonomics standpoint, the tool design is expected to be user friendly and materially benign for children. Users' emotion is also an important factor since it has been observed that autistic children tend to have mood swings (Micko and Antonia, 2013).

In the preliminary study, an observation was conducted in several autism therapy schools in Surabaya, Indonesia, and it was found that the schools made their own communication aids using paper or laminated paper. These proved difficult for autistic children to use, and in extension, played a significant role in their emotions. On the other hand, therapists had difficulties in finding suitable images mimicking real life applications in Indonesia since PECS was developed in the USA. Other drawbacks related to these are the thin and sharp corners, ease of being damaged, unstandardised size and the lack of anthropometrics consideration.

In general, children with autism are usually characterised by a triad of symptoms: restricted interests, impairment in communication and impairment in social interactions. Upon receiving sensory information, they do not show proper reaction or sometimes even