

Chapter 17

An Effective Conceptual Multisensory Multimedia Model to Support Dyslexic Children in Learning

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ABSTRACT

Multimedia has affected many areas in education and benefited users, including disabled ones. In this paper the authors propose an effective conceptual courseware development model specifically for dyslexic children. Five essential features are identified to support this model, namely, interaction, activities, background colour customization, directional text reading (left-right) identification, and detail instructions. A prototype courseware based on the proposed model was developed and tested with a small sample of dyslexic children from selected schools in Malaysia. The evaluation showed positive results in terms of performance whereby 60% of the users showed improvement in their performance, 30% showed unchanged results and 10% displayed a decrease in performance.

INTRODUCTION

Dyslexia is associated with difficulty or problem with words specifically in reading, spelling and expressing thoughts on paper (Greene, 2006). Dyslexic children are physically and mentally normal but have unusual difficulties in reading, spelling

and writing. According to a local press the New Straits Times (2009), it is estimated about 5% of school going children in Malaysia are dyslexic.

The word dyslexia is derived from the Greek word “dys” meaning poor or inadequate and “lexis” means words or language (British Dyslexia Association, 2008). Along with the difficulties mentioned above, dyslexia also affects memory, concentration, sometimes mathematics, music

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and self-organization (Hornsby, 1995). According to some psychologists dyslexia is not a disease (Vicari et al., 2005; Shaywitz, 2003; Berninger et al., 2008). This is supported by Sariah Amirin (The Berita Harian Press, 2009), the President of Dyslexia Association, Malaysia in the quotation below:

“Dyslexia is not a disease it occurs in children with normal vision and nothing to do with the hearing, sight and brain damage. It happens because the brain lacks of a function to translate the image seen or heard into something meaningful.”

Recently, there have been a number of researchers looking at the benefits of multimedia educational courseware and addressing various educational issues in the market. This indicates that multimedia applications are widely used within the educational domain. Among others, the use of multimedia as secondary learning tool could play an important role to motivate students' interest hence improving their performance in learning.

The main objective of this research was to study the problems faced by dyslexic children and to evaluate their preferred learning styles. In addition better multimedia tools could be developing for them to use in their learning.

CURRENT STATE OF EDUCATION FOR DYSLEXIC CHILDREN IN MALAYSIA

In Malaysia, the dyslexia program was initiated by the Education Ministry in 2004 where “*Sekolah Kebangsaan Taman Tun Dr. Ismail*” was the first school. At present, it is estimated around 5% or 314,000 of school going children in Malaysia are dyslexic (New Straits Times, 2009). Even though the figure is fairly high, the number of schools and trained personnel addressing the problems are relatively small; there are only about 30 schools that offer special programs for the dyslexic and 100

trained teachers in this field (Devaraj & Roslan, 2006; New Straits Times, 2009). Moreover, due to the lack of knowledge, dyslexic children are left behind and often misjudged as being lazy and slow learners (low ability children with low IQ).

Based on the above-mentioned limitations, a study was conducted on the problems faced by dyslexic children and also the awareness level of this problem in Malaysia. Based on the results gathered from readings (journals and articles) and also interviews (Dyslexic program teachers), it can be concluded that Malaysia still lacks materials and experts in the field (Lee, 2008; Devaraj & Roslan, 2006; Gomez, 2004). In a recent work, the causes and symptoms of dyslexia have been defined (Eze, 2010).

Problems Faced by Dyslexic Children

Dyslexia as mentioned earlier is a specific learning disability that leads to certain difficulties in the child's learning process. It is important for the people around them (parents, teacher, siblings and friends) to understand their problems so that they can get the necessary help. Among those difficulties as noted by Gross and Voegeli (2007) include: difficulties in forming associations between letters and sounds; remembering sequences of letters for spelling; difficulties in recognizing or confusion between letters or familiar words; mispronunciations; difficulty in carrying out instructions; directional confusion between left and right; math activities; problems with sequencing; difficulty organizing work.

All the above-mentioned difficulties have an impact on the children's ability to read, write, navigate, comprehend and recall relevant information (Rainger, 2003). On the other hand, the difficulty with visual processing leads to the problems of delay in visual object recognition and problems with visual concentration and over sensitive to light (Rainger, 2003). Additionally, dyslexic children sometimes see words juggle in a paragraph or riv-

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