Chapter 12 Theory of Mind in Autistic Children: Multimedia Based Support

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ABSTRACT

The authors discuss how multimedia learning systems and analogical reasoning could be used to help autistic children cope with the demands of reasoning abstractly and to develop their Theory of Mind. Learners with autism have problems reasoning about other's mental states and beliefs, which has been coined Theory of Mind. The specially developed systems proved beneficial for the autistic children, which highlights the potential benefits that a multimedia system can have as a learning tool for Theory of Mind. However, there is some doubt over the usefulness of interactivity for learning beyond its enhancement of enjoyment and sense of participation. It is intended that the results will stimulate a reassessment of current multimedia theories as they relate to non-typically developing learners, and provide new directions for research in the area of support for children with ASD.

INTRODUCTION

Theory of mind refers to the ability to appreciate another's perspective on a situation. Of particular interest in this chapter will be the issue of whether or not children with Autism (ASD) can develop a Theory of Mind through the use of multimedia learning tools. Typically developing learners have a wide range of software to assist with their education. In contrast children with learning difficulties or special education needs have not benefited from software focusing on their learning needs. As a result children with special needs tend to be taught without specialist software tools. In the interest of inclusiveness it is desirable that all children, including those with special needs, have the opportunity to benefit from the latest technological advances. There has been insufficient investigation into the efficacy of multimedia learning tools for supporting learners with ASD, and particularly, there is scarcely any attention given to the issue of Theory of Mind. The work of Baron-Cohen

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is one important exception, which has laid the ground for recognizing the difficulties that learners with ASD experience when trying to understand the thoughts of others. It is the objective of our research to examine a basic question: "Could children with ASD successfully develop a Theory of Mind from using multimedia learning tools?" Our approach to studying this question was to build two multimedia learning systems aimed specifically at learners with autism, and to test whether there was evidence of significant learning from each group of learners. The systems were designed from educational technology principles, best practice and observations of actual teaching scenarios, so that it would be transparent how it sought to support particular learning needs.

The chapter will begin with a review of current understanding of autism (ASD) and how it impairs learning in children. The prominent work of Baron-Cohen on Theory of Mind will be reviewed and used as the defining theory, and the target subject of learning. Alternative interventions previously developed to help ASD sufferers overcome their difficulties and actually develop a theory of mind will be described, particularly Gray's work on Social Stories. The chapter will then proceed to discuss theories of how technology enhanced learning systems should/could be developed with special consideration given to Mayer's work on multimedia learning. The discussion will consider the suitability of Mayer's theories to special needs learners. Supporting theories, such as Sweller and Chandler's Cognitive Load Theory will be covered also since cognitive loading is central to the difficulties that children with ASD experience. The theme here is that interventions to ameliorate an ASD learner's difficulties in learning should focus on managing cognitive load primarily. Best practice derived from literature and from observations will be discussed, and lessons learned from the reported experiment will be presented. Future directions that stem from the research conclusions will be discussed.

AUTISM

Autism is a biological and neurological disorder that affects many children and adults worldwide. It affects people to different degrees, so it is often referred to as Autistic Spectrum Disorder (ASD). Sufferers will be affected in many ways, for instance, children like routine and may become distressed when routines are interrupted. Another significant impairment is the inability to communicate fluently. Some children will learn to communicate slowly throughout their lives, while on the other extreme of the spectrum sufferers may never be able to talk. A further characteristic of Autism is the lack of emotionally based contact with others (Rieffe et al, 2000). It has also been proposed that autistic children are socially impaired because they lack a theory of mind (Muris et al, 1999). Difficulty in understanding other minds is a core cognitive feature of autism (Baron-Cohen & Howlin, 1998). The cognitive and social impairments of autistic children include difficulties in the expression and understanding of emotion, as well as problems in discerning facial affect (Dennis et al, 2000). It has been found that autistic children find immediate social environments to be un-predictable, so they often treat people and objects alike (Baron-Cohen et al, 1985). By not understanding that other people think differently from one another and from themselves, many autistic individuals have problems relating socially and communicating with other people. The characteristics of an Autistic child are typically represented in the form of a triangle known as the triad of impairment (Figure 1).

Theory of Mind

Theory of mind is the ability to represent one's own or other's mental states such as beliefs, intentions, desires and knowledge (Baron-Cohen et al, 1985). First order belief describes what people think about real events, whereas second order beliefs relate to what children think about other people's thoughts 11 more pages are available in the full version of this document, which may be purchased using the "Add to Cart" button on the publisher's webpage:

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