

Chapter 99

A Task Assistant for Individuals with Autism Spectrum Disorder

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ABSTRACT

This chapter introduces the use of software technology that is used to create a Web application system called iPAWS to help individuals with Autism Spectrum Disorder (ASD) accomplish simple tasks. These individuals can repeatedly access tasks for assistance or learning through a mobile tablet. For post-school employment, the use of this software technology can help lessen the burden of supervision needed for individuals with autism. For school age children at different levels, iPAWS can serve as training or as a learning tool. This chapter starts with a review of computer-based interventions that have been used in the past. Next, the overall design of the Web application system is introduced. Sample cases that are suitable for children and post-secondary employment are then discussed. Two case studies that were conducted with individuals on the autism spectrum, follow. Finally, possible future improvements to iPAWS are presented.

INTRODUCTION

Individuals with autism often require structure and systematic procedures in order to learn. These comprise the basis for discrete trial training (Smith, 2001), which is both difficult and tedious for a human teacher to replicate. In general, software technology fits well with this learning method to simplify instruction for children on the autism spectrum. By transferring academic teaching to a computer instructor, individuals with ASD can receive the structure and repetition they need to learn. Customized mobile technology (Hourcade, 2012) can be created to meet the needs of individuals with autism of all ages. Researchers (Shane, 2008) found that “individuals on the autism spectrum have a preference for instruction to be delivered by computers.”

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BACKGROUND

Today, 1 in every 88 children (DSMIV, 2013) is diagnosed with some form of autism. Computer-supported activities have been used for many years to enhance the abilities of children with ASD. More specifically, software applications (apps) have been developed for mobile devices such as smart phones and tablets. While the behaviorist approach (Bailey, 2002; Elkeseth, 2009) to intervention for children with ASD has gained increasing positive results over the years, other studies (Bill et al, 2005; Eaves & Ho, 2008; Howlin, 2004) have shown that the number of adults with ASD who are able to live independently is still relatively low. Furthermore, many of these individuals have not been able to achieve a high quality of life (Müller, Schuler, & Yates, 2008; Shattuck et al., 2012). The integration of mobile computing into the daily lives of individuals with autism may be able to help them live a fuller life (Wehman, 2012). Software apps utilize visual and intuitive interfaces which may be matched well to an individual with autism's visual learning style. Furthermore, mobile technology cuts down on the costs of bulky devices that often lack portability. Not only has mobile technology increased the portability of the tools, but also has the effectiveness of techniques for learning. Research (Dettmer, 2000; Hayes, et al., 2010) suggests that learning strategies which include visual presentation can greatly enhance the lives of people with ASD. Grace Picture Exchange (REF) and Picture Exchange Communication System (Charlop-Christy, 2002) are examples of two popular apps which utilize this technique for instruction.

For years, different methods for teaching children with ASD have been adapted to computer software format (Cafiero, 2008; Hess 2008; Koch, 2012). There is, however, a noticeable shortage of software intended for post-school life usage. There is a definite lack of software for adults who might be capable of being employed. This is important because the transition from academia to post-school life, such as employment, can be stressful, both economically and socially. To this end, a web application system (Duncan, 2012) that is targeted towards individuals with mid-level autism spectrum disorders (MLASD) was designed and a prototype system developed. The system aims to help lessen the amount of supervision necessary for a person with MLASD to perform tasks. This was accomplished by creating a web application (webapp) that can, in many ways, act as the coach or supervisor. Although this system was originally targeted towards adults with MLASD for post-school employment, it can easily be adapted for use by children with ASD. Therefore, it has the potential to become a helpful tool for parents as well as educators.

MOBILE WEB TECHNOLOGY

Mobile technology in the form of smartphones and tablets uses various modes of interaction that can greatly enrich the lives of people with autism, including children in school as well as post-school life such as higher education or employment. In an article published at SheKnows.com (Beaudry, 2013), Webber states that "the iPad has become a great tool when working with students on the autism spectrum, because it gives them the ability to control a piece of their environment and an opportunity to communicate (Page 1)." Mobile learning through the creation of a web application system that meets the goals of offering visual and auditory modalities of learning makes it ideal for usage by learners on the autism spectrum. Keefe (1991) describes how learning styles differ among different people and how each individual has a distinct and consistent preferred way of learning. Some people are better visual learners; others are better as auditory learners; yet some learn best using a mixed style. Since mobile devices already cater

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