Chapter 8

Using Augmented and Virtual Reality to Improve Social, Vocational, and Academic Outcomes of Students With Autism and Other Developmental Disabilities

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ABSTRACT

Some individuals with disabilities are unable to work independently and often require additional instruction to complete basic tasks. To prepare students with disabilities for life after school, practitioners need to help them learn the skills necessary to live a happy, productive, and fulfilling life. Two technologies showing promise for such learning are augmented reality (AR) and virtual reality (VR) applications. This chapter will discuss how AR and VR can successfully be used to teach academic, social, and vocational skills to students with disabilities, including research that has been conducted to date. Additionally, guidance is provided for teachers seeking to use AR and VR in classroom and community learning environments. The chapter will conclude with directions for further research and future applications of AR and VR with students with disabilities.

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INTRODUCTION

Many students with disabilities need specialized instruction in order to access the general education curriculum. Progress may be achieved in general education or special classroom settings by intensifying instruction or using specially designed interventions. Traditional interventions have involved changing the intensity of instruction (e.g., frequency of teaching a skill), changing the modality of instruction (e.g., explicit instruction, applied behavior analysis, small group versus large group), and changing the environment (e.g., resource/support classroom, authentic experiences in the community). As technology has increased in sophistication and access, new directions are developing in how traditional interventions are used.

Wong and colleagues (2015) identified many interventions currently used in schools as evidenced-based practices, among them “technology-aided instruction and intervention.” Technology is not only becoming more common in schools, but is also proving successful in helping students with disabilities gain valuable skills. Students with disabilities have progressed in academic skills (e.g., Burton, Anderson, Prater, & Dyches, 2013), social skills (e.g., Macpherson, Charlop, & Miltenberger, 2015; Tetreault & Lerman, 2010), and vocational skills (e.g., Aldi, Crigler, Kates-McElrath, Long, Smith, Rehak, & Wilkinson, 2016; English, Gounden, Dagher, Chan, Furlonger, Anderson, & Moore, 2017) through incorporating various forms of technology in school and community-based learning environments.

This chapter begins by highlighting the history of technology use in interventions for students with disabilities, from the introduction of video modeling to current and future practices of virtual reality (VR) and augmented reality (AR). The focus then moves to implications for practitioners and suggestions for research, concluding with the vision of the authors for VR and AR use in the advancement of special education services. The objectives of this chapter are to (a) orient readers to VR and AR use within special education contexts, (b) provide guidance to practitioners on how to use VR and AR to support special education students, and (c) offer direction in furthering research and practice.

BACKGROUND

Current advances in technology have made innovative interventions available that in the past were either too expensive or simply not possible. Some of these interventions are well suited for students with disabilities. Two of these technologies that build upon the research-based strategy of video-based instruction are AR and VR as means of delivering video-based instruction.

Video-based interventions can be traced back to Bandura’s (1978) social learning theory, which demonstrated how using video models of aggression could shape human behavior. Since Bandura’s work, researchers and practitioners have explored video modeling applications across domains, including social and play skills, vocational skills and tasks, and academic learning.

Social skills were a logical first step for individuals with autism spectrum disorder (ASD) and other intellectual and developmental disabilities (IDD), since deficits in social communication and understanding are identifying characteristics. Video modeling has been used to teach students to initiate conversations (Nikopoulos & Keenan, 2004) and to maintain social skills. Focus on vocational skills followed. Researchers used video modeling to teach adults how to entertain customers in a retail establishment (Allen, Wallace, Renes, Bowen, & Burke, 2010). Kellems and Morningstar (2012) demonstrated how video modeling could be used to teach a variety of vocational skills to young adults with autism in au-