Analyzing the Use of Augmented and Virtual Reality to Teach Social Skills to Students with Autism

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Abstract : A systematic literature review was conducted to explore the evidence base on the use of augmented reality (AR), virtual reality (VR), mixed reality (MR), and extended reality (XR) to present social skill instruction to school-age students with autism spectrum disorder (ASD). Specifically, the systematic review focus was on a. the participants and intervention agents using AR, VR, MR, and XR for social skill acquisition b. the social skills taught through these mediums and c. the social validity measures (i.e., goals, procedures, and outcomes) reported in these studies. Forty-one articles met the inclusion criteria. Researchers in six studies taught social skills to students through AR, in 27 studies through non-immersive VR, and in 10 studies through immersive VR. No studies used MR or XR. The primary targeted social skills were relationship skills, emotion recognition, social awareness, cooperation, and executive functioning. An intervention to improve many social skills was implemented by 73% of researchers, 17% taught a single skill, and 10% did not clearly state the targeted skill. The intervention was considered effective in 26 of the 41 studies (63%), not effective in four studies (10%), and 11 studies (27%) reported mixed results. No researchers reported information for all 17 social validity indicators. The social validity indicators reported by researchers ranged from two to 14. Social validity measures on the feelings toward and use of the technology were provided in 22 studies (54%). Findings indicated both AR and VR are promising platforms for providing social skill instruction to students with ASD. Studies utilizing this technology show a number of social validity indicators. However, the limited information provided on the various interventions, participant characteristics, and validity measures, offers insufficient evidence of the impact of these technologies in teaching social skills to students with ASD. Future research should develop a protocol for training treatment agents to assess the role of different variables (i.e., whether agents are customizing content, monitoring student learning, using intervention specific vocabulary in their day to day instruction). Sustainability may be increased by providing training in the technology to both treatment agents and participants. Providing scripts of instruction occurring within the intervention would provide the needed information to determine the primary method of teaching within the intervention. These variables play a role in maintenance and generalization of the social skills. Understanding the type of feedback provided would help researchers determine if students were able to feel rewarded for progressing through the scenarios or if students require rewarding aspects within the intervention (i.e., badges, trophies). AR has the potential to generalize instruction and VR has the potential for providing a practice environment for performance deficits. Combining these two technologies into a mixed reality intervention may provide a more cohesive and effective intervention.