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A systematic review of modalities in computer-based interventions (CBIs) for language comprehension and decoding skills of children with autism spectrum disorder (ASD)

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Abstract

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This paper presents a systematic review of the literature on the modalities used in computer-based interventions (CBIs) and the impact of using these interventions in the learning, generalisation, and maintenance of language comprehension and decoding skills for children with autism spectrum disorder (ASD), ending with an appraisal of the certainty of evidence. Despite the importance of both skills in the reading comprehension and overall learning, a limited number of studies have been found. These include seven studies on language comprehension and seven studies on decoding. The shortlisted studies were analysed and a very limited number of modalities were found to have been used; text, graphics, audio, video, and mouse movement are used in all the studies and are termed basic modalities. Statistical analysis was also conducted on three parameters: (1) outcome of the study; (2) generalisation; and (3) maintenance. The analysis showed that CBIs were effective in facilitating these children's learning; there was a significant improvement in the performance of children from the baseline to during and the post-intervention period. The analysis of generalisation has revealed positive results, indicating that the children were able to transfer information to a different setting or situation. Positive results are also noted from the analysis of maintenance, which indicate that the children retained information following the withdrawal of intervention. The combination of teachers' instructions and CBI has provided better results than using either of them separately. This study has discovered 23 potential modalities and 2 potential CBIs including serious games and virtual learning environments that can be explored for language comprehension and decoding skills. © 2019, Springer-Verlag GmbH Germany, part of Springer Nature.

Author keywords

Autism spectrum disorder (ASD) | Computer-based intervention (CBI) | Decoding skills | Language comprehension skills | Modalities, serious games, virtual reality, augmented reality | Multimodal interfaces

Indexed keywords

Engineering controlled terms: Augmented reality | Computer aided instruction | Decoding | Diseases | Maintenance | Mammals | Serious games | Virtual reality

Engineering uncontrolled terms: Autism spectrum disorders | Children with autisms | Language comprehensions | Multi-modal interfaces | Post interventions | Reading comprehension | Transfer information | Virtual learning environments

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