

Module: Computer- Aided Instruction (CAI)

Overview of Computer-Aided Instruction

Collet-Klingenberg, L. (2009). *Overview of computer-aided instruction*. Madison, WI: The National Professional Development Center on Autism Spectrum Disorders, Waisman Center, The University of Wisconsin.

Computer-aided instruction includes the use of computers to teach academic skills and to promote communication and language development and skills. It includes computer modeling and computer tutors.

Evidence

This intervention category meets evidence-based practice criteria within the preschool, elementary, and middle/high school age groups for promoting academic/cognitive and communication skills with a total of six studies (four single-subject; two group).

With what ages is computer-aided instruction effective?

The evidence-base for CAI includes studies conducted with learners ranging from 3 years to 18 years of age. Within the domain of communication skills and in the area of academics and cognition, the research has shown success with early childhood through secondary age learners. In short, depending on the targeted skill and the needs/preferences of the learner, CAI may be used with nearly any age.

What skills or intervention goals can be addressed by computer-aided instruction?

Computer-aided instruction can be used effectively to address academic and communication/language skills. In the academic domain, evidence-based research focused on vocabulary and grammar. Within the communication domain, evidence-based studies targeted communicative functions and initiations. One study taught the recognition and prediction of emotions in others.

In what settings can computer-aided instruction be effectively used?

Studies that comprise the evidence-base were conducted in clinical or school settings and across preschool, elementary, middle, and high school age groups. Although no research studies identified the home as a context for intervention, application of computer-aided instruction in this setting seems logical.

Evidence Base

The studies cited in this section document that this practice meets the NPDC on ASD's criteria for an evidence-based practice. This list is not exhaustive; other quality studies may exist that were not included.

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Preschool

Moore, M., & Calvert, S. (2000). Brief report: Vocabulary acquisition for children with autism: Teacher or computer instruction. *Journal of Autism and Developmental Disorders*, 30(4), 359-362.

Elementary School

Bosseler, A., & Massaro, D. W. (2003). Development and evaluation of a computer-animated tutor for vocabulary and language learning in children with autism. *Journal of Autism and Developmental Disorders*, 33(6), 653-672.

Hetzroni, O. E., & Shalem, U. (2005). From logos to orthographic symbols: A multilevel fading computer program for teaching nonverbal children with autism. *Focus on Autism and Other Developmental Disabilities*, 20(4), 201-212.

Hetzroni, O. E., & Tannous, J. (2004). Effects of a computer-based intervention program on the communicative functions of children with autism. *Journal of Autism and Developmental Disorders*, 34(2), 95-113.

Massaro, D. W., & Bosseler, A. (2006). Read my lips: The importance of the face in a computer-animated tutor for vocabulary learning by children with autism. *Autism*, 10(5), 495-510.

Moore, M., & Calvert, S. (2000). Brief report: Vocabulary acquisition for children with autism: Teacher or computer instruction. *Journal of Autism and Developmental Disorders*, 30(4), 359-362.

Middle/High School

Bosseler, A., & Massaro, D. W. (2003). Development and evaluation of a computer-animated tutor for vocabulary and language learning in children with autism. *Journal of Autism and Developmental Disorders*, 33(6), 653-672.

Massaro, D. W., & Bosseler, A. (2006). Read my lips: The importance of the face in a computer-animated tutor for vocabulary learning by children with autism. *Autism*, 10(5), 495-510.

Silver, M., & Oakes, P. (2001). Evaluation of a new computer intervention to teach people with autism or Asperger syndrome to recognize and predict emotions in others. *Autism*, 5(3), 299-316.

Selected Additional References

Blischak, D. M., & Schlosser, R. W. (2003). Use of technology to support independent spelling by students with autism. *Topics in Language Disorders*, 23(4), 293-304.

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- Goldsmith, T. R., & LeBlanc, L. A. (2004). Use of technology in interventions for children with autism. *Journal of Early Intensive Behavioral Intervention*, 1(2), 166-178.
- Heinmann, M., Nelson, K., Tjus, T., & Gillberg, C. (1995). Increasing reading and communication skills in children with autism through an interactive multimedia computer program. *Journal of Autism and Developmental Disorders*, 25(5), 459-580.
- Lahm, E. A. (1996). Software that engaged young children with disabilities: A study of design features. *Focus on Autism and Other Developmental Disabilities*, 11(2), 115–125.
- Light, J. C., Roberts, D. B., Dimarco, R., & Greiner, N. (1998). Augmentative and alternative communication to support receptive and expressive communication for people with autism. *Journal of Communication Disorders*, 31, 153-178.
- Mirenda, P., Wilk, D., & Carson, P. (2000). A Retrospective analysis of technology use patterns of students with autism over a five-year period. *Journal of Special Education Technology*, 15, 5-16.
- Panyan, M. V. (1984) Computer technology for autistic students. *Journal of Autism and Developmental Disorders*, 14(4), 275-382.
- Schlosser, R. W., Blischak, D. M., & Belfiore, P. J. (1998). Effects of synthetic speech output and orthographic feedback on spelling in a student with autism: A preliminary study. *Journal of Autism and Developmental Disorders*, 28(4), 309-319.
- Tjus, T., Heimann, M., & Nelson, K. E. (2001). Interaction patterns between children and their teachers when using a specific multimedia and communication strategy. *Autism*, 5(2), 175-187.
- Williams, C., Wright, B., Callaghan, G., & Coughlan, B. (2002). Do children with autism learn to read more readily by computer assisted instruction or traditional book methods?: A pilot study. *Autism: The International Journal of Research and Practice*, 6(1), 71-91.