Introduction to the special series: Technology and disabilities in education

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Introduction to the special series: Technology and disabilities in education

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ABSTRACT

In the nearly 30 years since the passage of the Technology-Related Assistance to Individuals with Disabilities Act of 1988, technology-mediated instruction has been implemented successfully with both students without disabilities and students with a range of disabilities to help them meet the demands of instruction. In this special issue of Assistive Technology, a number of noted scholars contribute research findings designed to add to the growing body of knowledge validating the use of assistive and instructional technology in the classroom.

It has been nearly 30 years since the passage of the Technology-Related Assistance to Individuals with Disabilities Act of 1988—better known as the Tech Act. During that time, technology-mediated instruction has been implemented successfully with both students without disabilities and students with a range of disabilities to benefit their learning (Gray, Thomas, & Lewis, 2010; Seok, DaCosta, & Yu, 2015). The results of using assistive and instructional technology to support students with disabilities have been documented over the past three decades across many areas and groups of students. Specifically, instructional benefits have been reported for students with visual impairment (Rush, 2015); physical, visual, severe, and multiple disabilities (Coleman & Cramer, 2015); high-incidence disabilities (Bouck, Meyer, Satsangi, Savage, & Hunley, 2015; Bryant et al., 2015); and low-incidence disabilities (El Zein et al., 2016; Moore & Calvert, 2000; Stromer & Mackay, 1993; Stromer, Mackay, Howell, McVay, & Flusser, 1996; Vedora & Stromer, 2007). In addition, technology-supported assessments and augmentative and alternative communication devices have been proven to be effective for students with as well as students without disabilities.

A 1991 training program by International Business Machines (IBM) included the following statement: “For people without disabilities, technology makes things easier. For people with disabilities, technology makes things possible” (p. 2). This basic truism applies to all aspects of life, including the classroom, which is the focus of this special issue.

In preparation for this special series, scholars with expertise in educational technological applications for students with disabilities were asked to share their research with Assistive Technology readers with a particular focus on how students with disabilities have opportunities to succeed in an increasingly complex educational environment. With the passage of No Child Left Behind in 2001 (and with its 2015 reauthorization), Every Student Succeeds Act (along with the most recent reauthorization of the Individuals with Disabilities Education Improvement Act of 2004), higher educational performance standards have emerged, resulting in increasing expectations for students with disabilities to meet the intensified demands of the general education curriculum. Although such changes should be applauded, it must be acknowledged that higher expectations for students with disabilities require advances in teacher preparation and technological innovation. This special series focuses on the latter.

In the first article, Berninger and colleagues present research that focuses on the development of technology-supported writing instruction for students with persistent specific learning disabilities (SLDs). Their work involves changes in pretest–posttest assessment results and analyses of performance during computerized learning activities to determine (a) the effects of computerized writing instruction on modes of letter production and writing achievement and (b) the relationships between input modes (read or heard source material) and output modes (letter production by stylus versus pencil with indented grooves to facilitate pencil grip and somatosensory feedback or by hunting and pecking versus touch typing on a keyboard) in learning to take notes and write summaries. Their results demonstrate the effectiveness of computerized writing instruction on multiple modes of letter production and in teaching note-taking and summarizing for multiple modes of language input and modes of letter production output.

In the next article, “Comparing Performance on Paper- and Computer-Based Math Curriculum-Based Measures,” Hensley, Rankin, and Hosp present the results of a study comparing math fact fluency on paper versus the computer for 197 upper-elementary students. Students completed identical sets of probes on paper and on the computer, which were then scored for digits correct, problems correct, and accuracy.
Results showed a significant difference in performance between the two sets of probes—with higher fluency rates on the paper probes. Implications involving measures of progress for students with disabilities are presented.

Seok and Boaventura investigated the relationship between digital propensity and support needs as well as predictors of digital propensity in the context of support intensity, age, gender, and social maturity. A total of 118 special education teachers rated the support intensity, digital propensity, and social maturity of their students (N = 352) with intellectual disability. Descriptive statistics are reported, in addition to the results of correlations, multiple regressions, and regression analyses. The findings revealed significant relationships between digital propensity and support needs. Further, significant predictors of digital propensity were also found with regard to intensity of supports, age, gender, and social maturity.

In “Employing Mobile Technology to Impact Language Skills of Young Students With Language-Based Disabilities,” Draper, Rodriguez, and Cummong report on an exploratory study that investigated the effects of a language-building iPad application, Language Builder, on the receptive and expressive vocabulary, as well as sentence formation development of third-grade students with language-based disabilities. The study utilized a pretest–posttest control group design, in which students in the treatment group used the iPad application for 30 minutes each day for 8 weeks. Although the data indicated students in the treatment group made significantly greater gains in the area of sentence formation than the control group, no significant differences were found between the two groups with regard to expressive and receptive vocabulary. A discussion of the effectiveness of iPad applications in education concludes the article.

Gevarter and colleagues’ article, “Assessing the Acquisition of Requesting a Variety of Preferred Items Using Different SGD Formats for Children With Autism Spectrum Disorder,” presents the findings of a study in which five children with autism spectrum disorder were taught to request preferred items using four different augmentative and alternative communication (AAC) displays on an iPad-based speech-generating device. Acquisition was compared using multielement designs; results showed that individualized display effects were present for the manner with which students mastered requesting items. The results have important implications for AAC assessment and implementation protocols.

In the final article, entitled “The Effects of Text-to-Speech Software Use on Improving Reading of High School Struggling Readers,” Roberts, Park, Takahashi, and Delise discuss the challenges faced by many high school students struggling to comprehend grade-level text in a Common Core State Standards environment. This experimental study specifically examined the effects of Kurzweil 3000, web-based literacy software, in content-area classes with 164 ninth-grade struggling readers. Results indicated that after one semester of software use, the unaided reading comprehension and vocabulary gains of the intervention group surpassed those of the control group. Additionally, changes in grades and engagement were noted, and students and teachers reported on their experiences using the software. Based on their findings, the authors provide practical recommendations for integrating Text-to-Speech (TTS) software to improve content-area reading.

This special series could not have been accomplished without the assistance of Assistive Technology editor-in-chief, Dr. Rich Simpson. Thanks are also afforded to the authors and the many editors who provided constructive reviews and suggestions when needed. Readers are urged to share their comments and experiences, and researchers and practitioners are encouraged to continue to develop and use evidence-based practices to help students with disabilities meet the demands of an ever-changing academic environment.

References


