**Review of the Literature: Assistive Technology in Special Education**

This review of the literature looks at the various forms of assistive technology used by children who have special needs. In recent years, the use of technology in the classroom has increased for enhancing teaching, learning, and student performance (Hasselbring & Glaser, 2000). The potential for technology use in special education has endless possibilities for individuals with exceptionalities. Unfortunately, teachers, special educators, and administrators do not understand how implementing such digital technologies can benefit the student (Forgrave, 2002). Students with learning disabilities in reading and writing can benefit from various forms of assistive technologies such as speech synthesis programs, speech recognition software and organizational software (Forgrave, 2002). According to Forgrave (2002), assistive technology has two main purposes: to further develop strengths and to allow students to better perform a given task. Thus, embedding various forms of digital technology into the classroom might benefit students with special learning disabilities.

Many students with learning disabilities have difficulty decoding words, which leads them to make mistakes when reading (Forgrave, 2002). Speech synthesis technology works by reading aloud text that appears on the screen. Text can be entered either by typing directly into the computer program or by using word processing software. Students can choose whether they want the program to read words, whole sentences or the entire text. This allows students to recognize when they have made a mistake in reading, go back, and correct their pronunciation by hearing it through the program. Programs such as text-to-speech decrease frustration in students caused by incorrect decoding and allows for more comprehension of the text (Forgrave, 2002). Research has shown that students with word recognition problems have improved decoding words and word recognition when using speech synthesis software (Forgrave, 2002). According to Forgrave (2002), there have also been reports of student improvement in phonological decoding and spelling when using books with a computerized voice. In addition, these reports have shown that students improved their ability to recall textual information when it was accessible both visually and auditorily. Using speech synthesis technology can be valuable in subject areas such as science or history where students are exposed to unfamiliar vocabulary. Continuously using programs that use text-to-speech technology in classrooms can aid students with learning disabilities in becoming readers that are more independent (Forgrave, 2002). In turn, this will help them experience greater reading success.

Similarly, speech technology can aid students with special needs in writing. Speech recognition technology enables students to speak into a computer then turn that speech into text. For example, students who are unable to physically use a keyboard will use speech-to-text programs that assist them in writing a report. This form of technology allows students to complete their work faster and it allows students to gather all their ideas down before they forget because of slow typing speed. Thus, speech recognition potentially can help helps students with the content of their writing rather than focusing on the mechanics. Zaho (2007) found that students who used speech recognition programs over a period of time showed significant gains in reading comprehension, spelling and word recognition. Incorporating speech recognition software in the classroom will allow learners with special needs to produce text more easily and allow them to express themselves more efficiently (Zaho, 2007).

In addition to having difficulty decoding words, students with learning disabilities also have trouble with writing. Students with special needs usually lack handwriting, spelling and grammar skills (Forgrave, 2002). Due to this lack of skills, students are usually unmotivated and have a low self-esteem (Forgrave, 2002). Thus, they tend to avoid writing, keep their writing to a minimum, and/or avoid words they cannot spell (Forgrave, 2002). Organizational software can help student categorize information better. Through the use of webs and concept maps, these programs allow children to organize their brainstormed ideas into visual organizers. This then is used to create outlines for the students to follow when writing. Research (Forgrave, 2002) has shown that children who use such technology have improved in their quality of writing. In addition, a study (Forgrave, 2002) has proven that when students used organization software with social studies, their marks have significantly improved. However, it is integral that instructors know how to use the program effectively and are constantly monitoring their students while they are using the software (Forgrave, 2002).

The various forms of digital technology discussed above have the potential to improve performance and learning in children with special needs. The programs described above are readily available for children with special needs and are proved to be an asset in order for them to be educated alongside their nondisabled peers. There is research available on the barriers of use (Hasselbring & Glaser, 2000). Factors such as inadequate teacher training pose to be a problem in a more consistent application of these technologies (Hasselbring & Glaser, 2000). The most prominent barrier is lack of appropriate training for pre-service and in-service teachers and education programs (Hasselbring & Glaser, 2000). According to Hasselbring and Glaser (2000), very few teachers feel they have the skills to integrate such technologies and therefore bypass them in their classroom. This lack of training severely influences students with exceptionalities because technology use is often a part of their everyday learning (Hasselbring & Glaser, 2000).

In conclusion, various forms of assistive technology have educational potential for students with special needs. Research (Forgrace, 2002; Zaho, 2007; and Hasselbring & Glaser, 2000) has shown that proper and consistent use of synthesis programs, speech recognition software, and organizational software can result in positive outcomes. Further research needs to be done on the severity of special needs and appropriate learning technologies. In addition, more research needs to be conducted of the effectiveness of assistive technology on other core subjects such as math and science and the future of learning tools. Thus, this leads me to continue my research and readings to complete a portfolio on special education and technology. Zhao (2007) sums up the research topic by saying “we must understand the capacity of technology and of human beings and work to ensure the two complement each other when designing new learning tools” (Zhao, 2007, page 41).

**References**

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