

Technology Integration

Berent, G., & Clymer, E. (2003). Use of instructional technologies to train international teachers of English to deaf students. In *Papers from Instructional Technology and Education of the Deaf: Supporting Learners, Preschool-College* [On-line]. Available: <http://www.rit.edu/~techsym/2003/proceedings.html>. [AN 1802]*

This paper discusses the planning, development, delivery, and evaluation of a weeklong teacher-training workshop for teachers of English to deaf and hard-of-hearing students at postsecondary institutions in Russia, the Czech Republic, Japan, and the Philippines. Workshop presenters used a combination of technological resources and traditional teacher-training techniques to familiarize workshop participants with best practices in teaching English. Given the unique challenges of teaching deaf and hard-of-hearing students in non-English-speaking countries, the workshop sessions reviewed state-of-the-art methods and materials both for teaching English as a second language generally and for teaching English to deaf and hard-of-hearing students specifically. A post-workshop CD-ROM containing all workshop materials to be used for international dissemination has been produced. Participants' high ratings of the workshop reveal that the combination of technological and traditional resources contributes to highly successful teacher-training experiences.

Egelston-Dodd, J. (2000). Interactive technology: Empowering teachers and motivating students. In R. Rittenhouse, D. Spillers (Eds.), *The Electronic Classroom: Using technology to create a 21st century curriculum*, (pp. 206-228). Hillsboro, OR: Butte Publications. [AN 1678]

While computer technologies have been available to schools in substantial numbers for about 15 years, we are now in a period of transition for technology in education. Choices made now will determine whether our schools successfully make the transition.

Elliot, L., Foster, S., & Stinson, M. (2003). A qualitative study of teacher's acceptance of a speech-to-text transcription system in high school and college classrooms. *Journal of Special Education Technology*, 18(3), 45-59. [AN 1803]

Student success using an assistive technology may be partially attributed to educators' acceptance of the technology. High school and college educators in New York and California participated in a qualitative study of the implementation of a speech-to-text support service for students who are deaf or hard of hearing. Educators' interviews were analyzed using criteria from Rogers (1995) model of diffusion of innovations. Educators accepted the support service due to its relative advantage to other notetaking services, perceived simplicity of the system, and perceived potential for students. Acceptance was less clear-cut in the domains of compatibility and trialability. Educators were less certain that it was compatible with their expectations for student learning in the classroom and trialability of the service was influenced by educators' perceptions of how they were approached for the trial of the service in their classrooms. Results of this study suggest that successful implementation of assistive technology depends on the ability to satisfy both student needs and educators' values.

Elliot, L., Foster, S., & Stinson, M. (2003). Using notes from a speech-to-text system

for studying. SIG Best Paper Award. Bridge: Newsletter for the AERA SIG: Education of Deaf Persons, 22(1). [AN 1827]

Lectures remain the predominant instructional technique in many high school and college classrooms (Armbruster, 2000) and note taking stands out as the valued way of capturing the knowledge transferred during these lectures (Dunkel & Davy, 1989). We also know that study skills, including those related to notes and note taking are important for academic success. However, the literature on studying contains very few studies that look at students' actual study skills and there are even fewer studies that include deaf students. One critical problem with much of the study skills and note taking literature is that it assumes that all students take their own notes. However, many deaf students do not take their own notes, but rather rely on a note taker support service. Today, many note taker support services use computer-assisted speech-to-text note taking systems. The purpose of this study is to explore how high school and college students and their teachers utilized the notes produced by the C-Print® speech-to-text support service. The research was guided by three questions: (a) How did students use the notes produced by the speech-to-text support service? (b) How did teachers use the notes? and, (c) How do notes enhance student understanding and class participation?

Elliot, L., Foster, S., & Stinson, M. (2002). Student study habits using notes from a speech-to-text support service. *Exceptional Children*, 69(1), 25-40. [AN 1764]
Thirty-six mainstream high school and college students who are deaf and hard of hearing received notes from a speech-to-text support service called C-Print. The students, 26 classroom teachers, and 10 teachers of the deaf were interviewed about their perceptions of how students use their notes to study. Consistent with research on hearing students, high school students in this study typically would read the notes only, while college students used multiple study strategies with the notes. Teachers tended not to know how their students used their notes for studying, and they were sometimes reluctant to teach students about effective note usage. This study supports the idea that both students and teachers could benefit from further instruction on note usage and study skills.

Elliot, L., McKee, B., & Stinson M. (2002, May). C-Print captionist survey. Technical report from the Department of Research, National Technical Institute for the Deaf, Rochester Institute of Technology, Rochester, NY. [AN 1828]
A survey was mailed to 247 individuals who participated in C-Print captionist training workshops over the past 5 years. One hundred ten individuals responded for a response rate of 45%. This paper describes the results of the survey.

Elliot, L., & Stinson, M. (2003). C-Print update: Recent research and new technology. *NTID Research Bulletin*, 8(2), 1-5. [AN 1804]
C-Print refers to a family of computer-assisted, speech-to-print technologies. Here, we briefly describe the service and review recent findings and forthcoming enhancements to the system.

Elliot, L., Stinson, M., McKee, B., Everhart, V., & Francis, P. (2001). College students' perceptions of the C-Print speech-to-text transcription system. *Journal of Deaf Studies and Deaf Education*, 6(4), 285-298. [AN 1733]

C-Print is a real-time speech-to-text transcription system used as a support service with deaf students in mainstreamed classes. Questionnaires were administered to 36 college students in 32 courses in which the C-Print system was used in addition to interpreting and note taking. Twenty-two of these students were also interviewed.

Kelly, R. (2003). Using technology to meet the developmental needs of deaf students to improve their mathematical word problem solving skills. *Mathematics and Computer Education*, 37(1), 8-15. [AN 1742]

Project Solve addresses, in an innovative and practical way, a critical problem facing most deaf college students and other learners with special needs – inadequate preparation and practice in problem solving and analytical thinking. Supported by a grant from the Fund for the Improvement of Postsecondary Education (FIPSE), U. S. Department of Education, Project Solve will provide web-based problem-solving instruction and guided practice for mathematical word problems. While deaf college students are the primary audience, this project has clear implications for other college students for whom reading and comprehension of mathematical word problem solving is difficult, especially Learning Disabled (LD) students. This project also has instructional implications for high school students who are college bound, and who face similar difficulties with reading comprehension, problem-solving logic, and organization.

Kelly, R. (2000). Technology and individuals who are deaf, hard of hearing, blind, and partially sighted. In J. D. Lindsey (Ed.), *Technology and exceptional individuals* (3rd ed., pp. 353-374). Austin, TX: PRO.ED. [AN 1711]

This chapter provides an overview of the educational applications of technology for students who are deaf, hard of hearing, blind, or partially sighted. It describes and discusses current, state-of-the-art instructional and educational technology along with practical examples of utilization for each of the identified student populations. Examples from actual classroom applications are included.

Spencer, P., & Marschark, M. (2003). Cochlear implants: Issues and implications. In M. Marschark & P.E. Spencer (Eds.), *Oxford handbook of deaf studies, language, and education* (pp. 434-448). New York: Oxford University Press. [AN 1776]

Cochlear implants have given many late-deafened adults renewed access to auditory information and to their habitual social and communicative networks. For many children, cochlear implants also have provided access to the world of sounds and of auditory-based language. The process of learning to use information generated by a cochlear implant is typically lengthy, however, and focused practice and therapy are necessary. Eventual speech perception, production, and spoken language skills (including vocabulary and syntax development), are interrelated and vary widely, with some children receiving almost no benefits and others acquiring skills much like those of their hearing peers. Preliminary evidence indicates some reading and academic skill benefits from children's increased access to audition, but results are mixed, and more research is needed.

Stinson, M., Elliot, L., McKee, B., & Coyne, G. (2002). Speech recognition as a support service for deaf and hard-of-hearing students: Adaptation and evaluation. Final

report to the Spencer Foundation. National Technical Institute for the Deaf, Rochester, N.Y. [AN 1841]

This project adapted new automatic speech recognition (ASR) technology to provide real-time speech-to-text transcription as a support service for deaf and hard of hearing (D/HH) students. In this system, as the teacher speaks, a hearing intermediary, or captionist, dictates into the speech recognition system in a computer that converts the dictated words of the teacher into print. The process of the captionist repeating the teacher's words is called "shadowing." One of the purposes of the project was to conduct this work to adapt ASR so that it could function successfully as a support service. The second purpose of the project was to evaluate the effectiveness of the ASR system. This evaluation focused on the ability of D/HH students to remember information presented with ASR and the perceptions of the students regarding the extent they could comprehend information that was presented with the ASR system. This report has three parts. The first part focuses on the work to apply ASR to the support of D/HH students in regular classes. The second part discusses the evaluation. The third part discusses and interprets the outcomes of these two components of the work and makes suggestions for further work.

Stinson, M., Elliot, L. McKee, B., & Francis, P. (2001). Accessibility in the classroom: The pros and cons of C-Print. *Volta Voices*, 8(3), 16-19. [AN 1765]

This article explains, discusses, and reviews the pros and cons of using C-Print technology in the classroom.

Stinson, M., McKee, B., & Elliot, L. (2000). Development and implementation of the C-Print speech-to-text support service. In H. Strauss & J. Albertini (Eds.), *Festschrift zum 70 Geburtstag*. Heidelberg: Necker Verlag. [AN 1751]

In the past 25 years, the number of deaf and hard-of-hearing students being educated in classes with hearing students in the United States has increased significantly at both secondary and postsecondary levels. This article describes features of the C-Print system.

Stinson, M., McKee, B., & Elliot, L. (2000). C-Print project completes 10th year. *NTID Research Bulletin*, 5(2). [AN 1784]

For the past 10 years, a research and development group at NTID has been working to develop a speech-to-text classroom support systems that we call C-Print. Over these years, the group has made continuous improvements in C-Print and in strategies for implementing the system in high schools and colleges. The group also initiated nationwide training to C-Print captionists to support deaf and hard-of-hearing students, from Maine to California and from North Dakota to Louisiana. In this article we describe and reflect upon the emergence of C-Print from an idea to a system that hundreds of deaf and hard-of-hearing students depend on everyday for classroom communication access and learning.