Technology Integration

Berent, G.P., Janakova, D., & Clymer, E.W. (2005). A multimedia design model for planning and delivering professional development for teachers of deaf and hard-of-hearing students in the Czech Republic. *In Instructional Technology and Education of the Deaf Proceedings* [On-line]. Available: http://www.rit.edu/-techsyrn/proceedings.html. [AN 1891]

An innovative multimedia instructional design model was devised for the planning, development, and delivery of a weeklong professional development conference for teachers of English to deaf and hard-of-hearing students at secondary and postsecondary levels of education in the Czech Republic. The August 2004 Prague conference consisted of eight multimedia lectures and nine workshops focusing on English language teaching and general educational topics. Every aspect of conference planning, preparation, format, materials development, presentation, dissemination, evaluation, and archiving was driven by the organizers' multimedia instructional design model. Central to the model is a comprehensive conference web site on which materials were posted as they were developed, through which all conference materials and related resources could be accessed during the conference, and on which the complete conference experience remains archived and accessible. The conference organizers' instructional design model facilitated this invaluable international effort.

Implications

Prague conference participants completed evaluation surveys for every lecture and workshop and for the conference overall. The survey data were submitted to statistical analysis and revealed very high participant satisfaction with the weeklong conference. Survey results indicated that the conference was a very positive professional development experience, participants felt relatively comfortable asking questions and interacting with others, the conference topics were largely relevant to participants' needs as teachers, participants intended to make changes in their course planning and teaching, and the conference experience inspired in participants a new commitment to address critical language teaching and general educational issues affecting their deaf and hard-of-hearing students. The very high participant ratings validate the organizers' multimedia design model as a successful general strategy for teacher training initiatives.

Grosshans, R., & Berent, G.P. (2005). An online technical vocabulary reference tool for deaf students. *In Instructional Technology and Education of the Deaf Proceedings* [On-line]. Available: www.rit.edu/-techsym/proceedings.html. [AN 1892]

Deaf students in technological programs face a major challenge in developing sufficient knowledge of the specialized technical vocabulary required for success in their fields of study and in their future careers. To help students address this challenge, the authors developed an Online Technical Vocabulary Reference Tool for deaf students enrolled in college-level science and technology programs. The user-friendly reference tool utilizes best practices in technical education, instructional technology, and vocabulary teaching. Currently, students can access definitions of 150 technical terms from four engineering sub-fields. Each

definition is illustrated within its real-world technological context along with actual photographic images or diagrams depicting the tool, process, or description conveyed by the targeted term. Survey feedback from faculty and deaf students who have used the Vocabulary Reference Tool not only affirms its usefulness and educational importance but also suggests that its design can be broadly extended to vocabulary teaching and learning in multidisciplinary contexts.

Implications

The goals established for the Online Technical Vocabulary Reference Tool are to help deaf students improve their receptive and productive knowledge of the language of engineering technologies, infuse English teaching principles and practices across the curriculum, establish a model for vocabulary teaching and learning for other discipline areas, and increase the number and quality of transfer opportunities for NTID students who wish to continue their education in other colleges of RIT. Preliminary feedback on the use of the Vocabulary Reference Tool suggests that this resource has a high likelihood of reaching its established goals. Motivated by the positive reactions of faculty and students who have used the resource and offered suggestions for refinement, the authors are expanding the Reference Tool to include other pedagogically sound components such as cross-referencing of terms by topical groupings and semantic associations, illustration of technical terms in larger segments of naturalistic scientific discourse, practice exercises, and assessment activities with corrective feedback.

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 1652]

Thirty-six deaf and hard-of-hearing mainstreamed high school and college students 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 normal 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.

Implications

This study suggests that students can benefit from instruction in a variety of study strategies. These diverse strategies could be applied to notes from the speech-to-text system, as well as to other study situations (e.g., text books). Teachers can help students develop a repertoire of study skills and apply them appropriately to a particular study task. Even the best students can profit from additional instruction on study skills. Students who can apply several strategies to a study situation, such as using the speech-to-text notes, will more fully benefit from it. Thus, it seems desirable for teachers to foster such study skills. Additionally, students may benefit from direct instruction on how to best use the notes from the speech-to-text system. For such guidance to occur, teachers need to appreciate the importance of direct instruction and know how to provide it. Teachers' connections with some aspects of learning with the speech-to-text system appeared to be limited. Therefore, student success with the speech-to-text system can be related to the teacher's support of the service and the teacher's ability to reinforce student learning with the support service.

Elliot, L.B., Foster, S., 8r-Stinson, M. (2003). A qualitative study of teachers' 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 over 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 the 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.

Implications

Although assistive technologies, like C-Print®, are designed to support the student, the student is part of a system comprised of other individuals as well. All of the members of the system are likely to be influenced in some way by the presence of the support service and the success of the support service will be influenced by the attitudes and behaviors of all the members of the system. In introducing a technology-oriented support service such as C-Print, providers should be aware of the five qualities of innovative assistive technologies and carefully consider how the assistive technology support service will affect the system into which it is being introduced.

Kelly, R.R. (in press). Technology and individuals who are deaf; hard of hearing, blind, and partially sighted. In J. D. Lindsey (Ed.), *Technology and exceptional individuals* (4th Ed.). Austin, TX: PRO.ED. [AN 1893]

This book chapter for the 4th edition of an undergraduate text for special education covers C-Print speech-to-text for the classroom, web resources, ASL Video Dictionary, communication technologies, smart classroom technology, desktop video conferencing, assistive listening devices, computer access for text-to-speech, screen and text magnification, and access to cell phone and personal digital assistants (PDA). An extensive reference list is provided as well as the contact information for the hardware and software resources presented in the chapter. Furthermore, an historical and current perspective on the learning needs and related educational issues of these learner populations is provided, as well as a brief summary of the history of technology use in educating students.

Implications

This chapter provides an updated overview of practical technology applications specific to deaf, hard-of-hearing, blind, and partially sighted learners. The applied discussion of technology applications for these learner populations is designed to help teachers identify and locate technology that could potentially enhance students' learning.

Kelly, R.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]

Based on extant research, and supported by a grant from the Fund for the Improvement of Postsecondary Education (FIPSE), U.S. Department of Education, the PROJECT SOLVE web site (www.problemsolve.rit.edu) provides web-based problem-solving instruction and guided practice for mathematical word problems. The web site provides a range and variety of word problems presented in language typically found in high school and college mathematics courses. An optional help menu provides clear concise written and graphic information to guide students with a range of reading abilities (8th-12th grade) through each mathematical word problem. There are five help buttons available to guide students through each word problem—The Question; Given; Find; Definitions; and Graphic—that provide animated illustrations or other graphic representations of the word problem. After the students understand and solve the problem, they type their answer in the window labeled "Your Response" followed by clicking on the "Submit Response" button. Subsequently, the correct answer then appears along with a "Show Me How" button that gives one clear example of a step-by-step procedure for solving that specific word problem. There are over 300+ mathematical word problems in the PROJECT SOLVE item pool that include both arithmetic problems (fractions, variations, percents, averages, conversions) and algebra problems (symbols, coins, consecutive integer, age, investment, mixture, motion/distance, work, probability, and logarithms).

Implications

Problem Solve addresses a critical problem facing most deaf college students and other learners with special needs—inadequate preparation and practice in problem solving and analytical thinking. While deaf students are the primary audience, this project is appropriate for other learner populations at both the high school and college levels for whom reading and mathematical word problem solving is difficult.

Note: *[AN XXXX] represents a local NTID publications designation. Please include when requesting copies of these publications.*