The Need for Assistive Technology in Educational Technology

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Abstract
This paper will address definitions, services, leve ls of technology and application of assistive technology concepts as they relate to education. An overview of the NCATE and ISTE guidelines concerning assistive technology, and the current elements of the graduate educational degrees concerning assistive technology is provided. Federal legislation concerns the application of assistive technology in an educational setting and its possible impact on educational technologists. A model is proposed for a course concerning assistive technology and universal design to better prepare instructional technology graduates to enhance the performance of students with disabilities and design educational material for increased accessibility. This session is intended for educators in instructional technology and exceptional education programs.

The Need for Assistive Technology in Educational Technology

Disabilities rights leaders have said that the application of technology will be the equalizer of the 21st century (Flippo, Inge, & Barcus, 1995). Through the use of assistive technology (AT) devices, many students can decrease their isolation and become an important part of a regular classroom, their least restrictive environment. Assistive technology is a basic tool in the educational process for any individual who may experience a disability. Technology that is used as tool in education is the basic definition of educational technology.

This paper will address assistive technology and services, overview the current elements of the graduate educational degrees, and present a model for including assistive technology to better prepare instructional technologists to participate and enhance the performance of students with disabilities.

What is Assistive Technology?
The Technology-Related Assistance for Individual with Disabilities Act of 1998 (PL 100-407) gave us the first legal definition of assistive technology devices and services. An assistive technology device was defined as "any item, piece of equipment, or product system, whether acquired commercially off the shelf, modified, or customized, that is used to increase, maintain, or improve functional capabilities of individuals with disabilities." An assistive technology service was described as "any service that directly assists an individual with a disability in selection, acquisition or use of an assistive technology service."

What are the Levels of Assistive Technology Use?

In considering assistive technology, you must consider the environment, the individual, and the characteristics and levels of the technology (Gitlow, 2000). Assistive technology may be classified as high-, middle-, or low-tech. The concept of a high technology device usually includes items that require computers, electronics or microchips to perform a function. Low technology usually does not require an outside power source. An example of high technology is a computer. An example of the application of technology could range from having a computer read a book (high tech) to printing out the material in a larger font to the student using a magnifying glass (low tech), to reading the required material.

Along with considering the level of the technology, consider the levels of how the necessary assistive technology item will be applied. The levels in applying the assistive technology application include whether the item is personally, developmentally, or instructionally necessary (Judd-Wall, 1999). Personally necessary refers to assistive technology devices that are for use by an individual student, such as a pair of color-blind glasses to enable learners to more effectively interact with their environment. Developmentally necessary devices may be shared among individuals. These devices help meet an educational need based on a developmental delay, which ideally would be improved, eliminating the need for the item in an individual's future. Lastly, instructionally necessary devices are those that modify the instructional process at a course or grade level, and do not need to be moved with the user as they progress to the next level.

What is Educational Technology?
Educational or instructional technology can be hard to define. At its simplest, it can be the application of technology in teaching or education, but many feel that it is much more than that. Perhaps the most encompassing definition is from University of North Carolina Media Services (1997), which states that educational technology "is the application of research, learning theory, emergent technologies, and child and adult psychology to solving instructional and performance problems." The Presidential Commission on Instructional Technology highlighted four areas in which educational technologists perform: 1) design of instruction, 2) production of instructional products and services, 3) management of instruction, and 4) evaluation of instruction.

Assistive Technology in the Graduate Educational Technology Program
The National Council for Accreditation of Teacher Education (NCATE) accreditation, in association with the International Society for Technology in Education (ISTE), requires that assistive technology be addressed within such programs as educational computing and technology leadership. The guidelines and standards for those programs state that a graduate of such a program should "demonstrate awareness of resources for adaptive assistive devices for students with special needs." A graduate should also be able to "identify and classify adaptive assistive hardware and software for students and teachers with special needs and locate sources to assist in procurement and implementation" (National Council for Accreditation of Teacher Education [NCATE], 2000).

However, assistive technology is, for the most part, only discussed as a small component of other technology integration classes, or is thought of as being part of the "special education" section. There exists the need for the addition of a course devoted to the application of assistive technologies and awareness of the possible limitations of users and universal design in the design of instruction in a graduate educational or instructional technology program.

A review was conducted of instructional and educational technology programs within the colleges of education across Florida's state university system. According to the published programs of study, none of the state colleges of education were offering a course specifying assistive technology in its title or available description. A similar limited review was conducted of universities nationwide that offered graduate programs in educational or instructional technology. From this survey, it was found that less than 20% of the colleges offered an educational technology degree provide courses focusing on assistive technology.

Impact on Instructional Technologists
As part of the federal IDEA amendments, there are statements that now require assistive technology devices and services to be considered on an individualized basis and become a part of the individual education plan (IEP) if the child needs them to benefit from his educational program. Based on NCATE accreditation requirements, it would be reasonable for a school administrator to expect that an educational or instructional technology graduate from an NCATE accredited program would be able to effectively participate on a student's IEP team. These expectations would include that such a graduate be able to make effective judgments and recommendations concerning assistive technology.

Assistive Technology Course Development
With the rapidly aging population of the United States and their growing need for assistive technology and universal design, along with the concept that to receive federal funding organizations must be IDEA compliant, there exists a need to provide instruction on assistive technologies and methodology to make technology products such as computer programs and web pages handicapped accessible.

To provide more extensive experience and education to instructional and educational technology specialists concerning assistive technology, a course should be devoted to the presentation of the basic concepts and applications of assistive technology. This course could be offered as a required course in the current university master's instructional technology programs and as an elective in its masters of education or exceptional education programs. The NCATE and ISTE standards state that for initial certification, a teacher should "demonstrate awareness for resources for adaptive assistive devices for students with special needs." These standards would be well met by such a course. The technologies and strategies presented in a course concerning the application of assistive technology would also address many of the other NCATE guidelines associated with such a specialty program as educational computing and technology leadership.

An assistive technology course could be designed as an introductory or survey course in the application of technology as assistive and adaptive devices. This course could present strategies for students who are physically or mentally impaired, and may be in a mainstreamed situation. The purpose of the course material is to learn about and use technologies to overcome handicaps and improve functionality. Course topics could include: basics of assistive technology; legal/ethical issues associated with assistive technology; assistive technology and the individual education plan (IEP); levels of assistive technology; technology adaptations; Windows and Macintosh built-in accessibility tools; text-to-speech and speech-to-text; universal design and the Internet; and physical and learning disabilities. An additional facet of such a course should also be designing material to be universally accessible, covering such topics as making web pages more accessible and designing multimedia to overcome user handicaps. The assessments and activities of the course should include hands-on experiences with assistive technologies.

In preliminary discussions with professionals in the assistive technology community, I found that such a course would be appreciated. Course delivery through distance learning would be preferred. I found many potential students who are interested in taking such a course, but who were unable to travel to a university. As an educational technology program course, it would have an added benefit as a recertification course for ESE professionals and general teachers.

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