Assistive Technology for Students with Visual Impairments

A Position Paper of the Division on Visual Impairments
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All students with visual impairments are entitled to the independence and efficiency afforded by technology, including assistive technology. Appropriate assistive technology enables students who are visually impaired to access information and to complete tasks efficiently, thereby enabling them to achieve the highest level of independence possible. Emerging research suggests that technology promotes acquisition of literacy, provides more equal access to information required for employment, and for access to information, in general, and facilitates social and community networks (Kelly & Smith, 2011).

Lowenfeld (1973) determined that there were three primary issues facing individuals with visual impairments: access to information, independent travel, and a lack of meaningful experiences. Assistive technology is used by individuals with visual impairments to compensate for these limitations. Assistive technology can enable students who are visually impaired to achieve educational success and gain competitive employment by providing tools for increased independent access to information and for effective communication. The current challenge is to provide appropriate access to and instruction on blindness and low vision specific assistive technology through individualized assessment of assistive technology needs, appropriate instruction in the use of assistive technology as tools, and equitable distribution of assistive technology.

Public Policy

In general, the legal support for providing assistive technology devices and services to students with disabilities in the schools is rooted in federal legislation that governs the provision of special education in the United States. Assistive technology was first defined in the legislation as both services and devices in the *Technology Related Assistance for Individuals with Disabilities Act of 1988* (Public Law 100-407, commonly referred to as *The Tech Act of 1988*). This definition was later adopted in the 1990 revision of the *Individuals with Disabilities Education Act* (IDEA;;Bryant & Bryant, 2003; Johnston, Beard, & Carpenter, 2003).

Included in the 1990 Amendments to the *Individuals with Disabilities Education Act* was the mandate that assistive technology devices and services must be considered when developing an individualized education program (IEP) for children with disabilities and that the local education agency must provide those devices and services

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when appropriate. The reference to assistive technology is found in the portion of the statue referred to as *special factors*, the same section of the law that mandates the consideration of instruction in braille. Therefore, IEP teams must at least discuss and determine whether or not assistive technology devices and services would help students achieve a free appropriate public education (FAPE).

Current legislation defines assistive technology 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” (IDEA 2004, Sec. 602, 20 USC 1401, § 300.5). On the other hand, *assistive technology services* are defined in this statue as “any service that directly assists an individual with a disability in the selection, acquisition, or use of an assistive technology device” (§ 300.6).

Issues

Despite the need for and benefit of assistive technology use that is well-documented throughout the literature, there are complex issues that often prohibit the use of assistive technology devices and software. As Augusto and Schroeder (1995) explained:

> Briefly stated, the principle barriers are: a lack of information about assistive technology; the high cost and severely limited sources of financial assistance for assistive technology; insufficient numbers of organizations and personnel able to provide instruction in the use of new technology; and developments such as the graphical user interface which hamper access to new computer and electronic information technology (p. 9).

While there are many issues related to the use of assistive technology by individuals with visual impairments, three areas surface as critical issues within the field. First, the provision of assistive technology is commonly based upon disability and not the particular needs of the individual. Secondly, instruction by qualified educational professionals is often hindered by lack of pre- and in-service training on assistive technologies. Lastly, forces such as location, cost, and personnel often hinder the availability of assistive technologies for individuals with visual impairments.

Assistive Technology Tailored to Individual Needs

No single solution for access to technology is appropriate for every student with a visual impairment. Even students with the same visual loss may require instruction in different types of assistive technology based upon their unique needs. Specifically, students with visual impairments may require assistive technology which may focus upon (a) speech access, (b) braille access, (c) print access, (d) tactile communication systems, or (e) any combination of these access modes. Determination of access mode(s) must be guided by skilled specialists in the education of students with visual impairments who have comprehensive expertise in blindness and low vision specific

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assistive technology and who can also access individual learning characteristics. These specialists must collaborate with other special educators, general assistive technology specialists, general educational technology specialists, and educational evaluators to conduct thorough diagnostic evaluations to determine the specific needs of students with visual impairments. Then they must insure that those needs are met by planning, implementing, and continuously monitoring instruction in the use of appropriate technology, including sufficient training in the efficient use of specific technology. Students with visual impairments must have access to and instruction with blindness and low vision specific assistive technology tailored to individual unique needs, learning styles, visual abilities, and preferences to maximize lifelong efficiency, interest, and productivity in their education, home, and community lives.

Access to Appropriate Instruction

With appropriate instruction, assistive technology can provide a powerful array of tools for students with visual impairments. Appropriate instruction includes designing a plan of individualized assistive technology instruction and teaching a specialized hierarchy of skills that is based upon diagnostic evaluations. For example, developing the ability to navigate a computer desktop, using word processing software as well as other commonly used mainstream software programs, and effectively using the Internet to search for specific information, send e-mails, and participate in online learning may be goals for students with visual impairments. To develop these larger goals, most students will begin with keyboarding skills. These skills must be taught systematically and consistently. Students who master basic keyboarding can then be taught to use a word processing program to proofread, check spelling, and compose and revise documents. Students who master basic word processing can then be taught to use the Internet. The ability to effectively and efficiently use the Internet will allow students to have independent access to a wide variety of information and to participate in online communication.

Instruction in the use of appropriate assistive technology devices--speech, large print, and/or braille--must take place concurrently with instruction in keyboarding, word processing, and in use of the Internet. Also, appropriate instruction may include introduction to or mastery of other blindness and low vision specific assistive technology devices such as electronic note takers, video magnifiers (CCTVs), scanners, optical character recognition (OCR) systems, accessible global position systems (GPS), braille translation software, braille and print embossers, screen magnification software, etc. Students with visual impairments and additional disabilities must have access to instruction in the use of appropriate assistive technology such as switches and communication boards tailored to their particular visual abilities.

Access to Equitable Assistive Technology Devices and Instruction

Access to and instruction with assistive technology must be driven by individual needs, not by logistical constraints such as availability of equipment, location or model of service delivery, or funding restraints. Currently, some students with visual impairments have access to a wide range of blindness and low vision specific assistive technology devices, while others have none at all (Kelly, 2008). Also, some students

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with visual impairments have access to teachers who are well-prepared to deliver special instruction in blindness and low vision specific assistive technology, while others do not (Abner & Lahm, 2002; Edwards & Lewis, 1998; Kapperman, Sticken, & Heinze, 2002; Murphy, Hatton, & Erickson, 2008; Parker et al., 1990; Sahfi, Zhou, Smith, Kelley, 2009; Smith, Kelley, Maushak, Griffin-Shirley, & Lan, 2009). This inequity must be eliminated. To assure that appropriate assistive technology devices and instruction are available to students, educational teams must carefully assess students' needs—considering both current and future needs—and must specify goals and objectives for meeting these needs on the individual education plan, including intensity of instruction, who will provide the instruction, and the specific type of assistive technology required. As specified in IDEA (2004), school districts must assure that all students have equitable access to assistive technology devices and instruction as documented by the individualized education program. University programs must address the lack of blindness and low vision specific assistive technology knowledge in future teachers of students with visual impairments. Professional development opportunities must be provided through partnerships among school districts, universities, organizations, and assistive technology vendors to ensure that professionals stay abreast of emerging technologies and have the opportunity to become proficient in the use of the assistive technology that they will be teaching students with visual impairments to use.

Position

Instruction in blindness and low vision specific assistive technology is a fundamental component of the curriculum for students with visual impairments that must be tailored to individual needs through diagnostic and ongoing evaluation. All students with visual impairments should have appropriate instruction in the use of blindness and low vision specific assistive technology by a highly-qualified educator. Instruction should be goal-oriented; focused on academic, vocational, and independent living skills; and should build on a hierarchy of skills. Finally, logistical constraints must not impede access to assistive technology and appropriate instruction in the use of assistive technology for all students with visual impairments. Teachers of students with visual impairments and orientation and mobility specialists are responsible for collaborating with other professionals to identify and address individual needs while also staying abreast of current and emerging assistive technology. School districts are responsible for providing equipment and supporting professionals in the provision of instruction as documented by the educational team. Universities are responsible for providing instruction in the area of blindness and low vision specific assistive technology that effectively prepares professionals with expertise in the broad array of assistive technology that is appropriate for students who are visually impaired. Collaboration between all stakeholders will facilitate readily available, up-to-date, and on-going professional development.

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