



Assistive Technology

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What Is Assistive Technology?

According to the Individuals with Disabilities Education Act Amendments (IDEA) of 2004, an assistive technology (AT) device refers to "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 the functional capabilities of a child with a disability. The term does not include a medical device that is surgically implanted, or the replacement of such device (SEC 602[1]). The federal definition is quite broad and encompasses devices that are electronic (e.g., computer, scanner, tape recorder) and non-electronic (e.g., pencil grip, large print books), so long as those devices are "used to increase, maintain or improve the functional capabilities of individuals with disabilities." Additionally, the federal definition includes items such as computer-aided instructional software programs for reading or mathematics that can be used to remediate skill deficits.

As noted, the federal definition of AT includes instructional technology. However, this fact sheet uses a more focused definition that conceptualizes AT as electronic/computer technology that is used to compensate for specific learning disabilities (LD) (e.g., speech synthesis for reading, voice recognition for writing). In some instances, the technology may augment task performance in a given area of disability, whereas in others it may be used to circumvent or "by-pass" specific deficits

entirely. By accentuating an individual's strengths, AT can serve to maximize performance at an expected level based on general cognitive abilities.

What Kinds of AT Are Available?

Numerous research studies on both children and adults with LD have shown (a) word processors, spell checkers, speech synthesizers, graphic organizers, word prediction programs, speech recognition systems, and optical character recognition/speech synthesis systems can be effective in compensating for difficulties in writing and reading; (b) technologies can be helpful in multiple contexts, including school, home, social, and employment settings; and (c) AT can promote independence in persons with LD.

There are a number of AT products available that can help compensate for a wide range of difficulties. These products include computers, tablets, smartphones, and other mobile electronic devices (and enabled software/apps). It is important to note that many AT products are now integrated into mainstream consumer technologies (e.g., speech-to-text on smartphones) and no longer have to be purchased as specialized add-ons.

Writing Difficulties: AT devices to enhance writing skills include word processors, spell checkers/"talking" spell checkers, proofreading programs (grammar checkers), speech synthesizers/screen readers (convert electronic text to synthetic

speech), outlining programs, graphic organizers (create diagrams of ideas before writing), word prediction programs (predict and offer suggestions), alternative keyboards (customize key appearance and placement), paper-based computer pens (record and link audio to writing), and speech recognition systems (convert the spoken word to electronic text).

Reading Difficulties: Several AT devices can be used to compensate for reading LD, including audio books and publications (variety of formats, such as audiocassettes, CDs, and MP3 downloads), variable speech-control tape recorders (speed up/slow down pre-recorded text), speech synthesis/screen reading systems (including web readers and e-books with text-to-speech), paper-based computer pens, and optical character recognition/speech synthesis systems (scan hard copy text, convert to electronic text and synthetic speech).

Math Difficulties: Mathematics AT devices include talking calculators (use speech synthesis to speak numbers), paper-based computer pens, and electronic computer-based worksheets (provide automatic alignment of numbers).

Listening Difficulties: Individuals with listening LD can use a variety of compensatory AT devices, including personal FM listening devices (small transmitter and receiver that "brings" speaker's voice directly to listener's ear), paper-based computer pens, and variable speech-control tape recorders (slow down or speed up the recording).

Organizational and Memory Difficulties: Numerous AT devices can be used to help people with LD who have organizational and memory problems associated with LD. These devices include personal information/data managers -- now integrated into mobile devices like smartphones -- (store and retrieve phone numbers, addresses, notes, calendar, etc.), free-form databases (note

storage and retrieval software), paper-based computer pens, digital recording devices, and tape recorders.

How Do You Select the Most Appropriate Technology?

Selecting the appropriate device for an individual with LD requires careful analysis of the interplay among (a) the individual's specific strengths, limitations, special abilities, prior experience/knowledge, and interests; (b) the specific tasks/functions to be performed (e.g., compensating for a reading, writing, or memory problem); (c) the specific contexts of interaction (across settings -- school, home, work; and over time -- over a semester or a lifetime); and (d) the specific device (e.g., reliability, operational ease, technical support, cost, compatibility with other devices and the Internet).

How Much Does AT Cost?

The cost of AT varies widely and can range from no cost "free-ware" (including numerous free apps) to as much as \$1,500 for an optical character recognition system. There are limited resources to help offset the cost of AT. Under IDEA, public elementary and secondary schools must consider AT for children with disabilities if it is needed to receive a "free and appropriate public education." It is the school district's responsibility to help select and acquire the technology, as well as provide training to the student in the use of the technology at no cost to parents. However, this is done on a case-by-case basis. In accord with the Rehabilitation Act of 1973, postsecondary schools often provide (not necessarily purchase) AT to students with disabilities.

The Rehabilitation Act and the Americans with Disabilities Act state that employers have a legal obligation to provide "reasonable accommodations" -- which includes AT -- to employees with disabilities.

State departments of rehabilitation may also provide AT funding for their clients with LD. Medicare, Medicaid, and private insurance companies may help finance AT if it serves a medical need. In addition, some non-profit organizations and private foundations may provide assistance in acquiring AT. Whether or not an institution, agency, employer, or company is willing or is required to purchase AT is handled on a case-by-case basis.

AT training can be acquired from several different sources. For some products (e.g., tape recorder, spell checker), an informed salesperson or an instruction booklet may be sufficient. Several products also have on-line tutorials or instructional videos. Other products (e.g., speech recognition) may require several hours of training with a computer or AT specialist. A number of public and private centers provide AT services; however, only a limited number focus specifically on AT for individuals with LD. Fees, eligibility for services, and professional expertise vary considerably and should be investigated on an individual basis.

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Where Can I Get Additional Information on AT and LD?

Alliance for Technology Access
1119 Old Humboldt Road
Jackson, TN 38305
800/914-3017
<http://www.ataccess.org>

Center for Applied Special Technology (CAST)
40 Harvard Mills Square, Suite 3
Wakefield, MA 01880-3233
781/245-2212
<http://www.cast.org/>

GreatSchools
<http://www.greatschools.org/special-education/assistive-technology/702-assistive-technology-for-kids-with-learning-disabilities-an-overview.gs>

Learning Ally (formerly, Recording for the Blind and Dyslexic)
20 Roszel Road Princeton, NJ 08540
800/221-4792
<http://www.rfbd.org/>

RESNA
1700 N. Moore Street, Suite 1540
Arlington, VA 22209-1903
703/524-6686
<http://www.resna.org/>

Tools for Life
The Alternative Media Access Network
Georgia Institute of Technology
Enterprise Innovation Institute
512 Means Street, Suite 250
Atlanta, Georgia 30318
800/497-8665
<http://www.gatfl.org>

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