

Section 1

# **Introduction to Assistive Technology**

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## What Is Assistive Technology?

Any adaptive device or service that increases participation, achievement, or independence for a student with a disability may be considered assistive technology (AT). Adaptations may be as simple as a pencil grip or as complex as an adapted computer system.

For a school district, consideration of AT is required during the development of every individualized education program (IEP). This task is the responsibility of the IEP team that determines the special education services necessary to ensure that each student with disabilities receives a free and appropriate public education. If the team determines that the student needs AT, the school district must provide the necessary devices and services. Given this requirement, it is imperative that administrators, teachers, and related service personnel develop skills and knowledge related to AT.

The legal definition of assistive technology was originally issued in the Technology Related Assistance Act of 1988 (Tech Act), amended as the Assistive Technology Act of 1998. It continues to be the accepted definition, and as such is used in all related legislation, including the Individuals With Disabilities Education Act (IDEA, 2004), which mandates the special education and related services that school districts must provide for students' unique needs.

**Assistive technology device means 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 that device.**

(IDEA, 2004, Part A, Definitions, 300.5; Operating Standards for Ohio Educational Agencies Serving Children With Disabilities, 2008, 3301-51-01 (B)(2).)

## What Are Assistive Technology Services?

The definition of assistive technology includes both the devices and the services that are necessary to maximize a student's participation and progress in the educational program.

**Assistive technology service means any service that directly assists a child with a disability in the selection, acquisition, or use of an assistive technology device.**

(IDEA, 2004, Part A, Definitions, 300.6; Operating Standards for Ohio Educational Agencies Serving Children With Disabilities, 2008, 3301-51-01 (B)(3).)

The school district is responsible for:

- **Evaluating the needs:**
  - Evaluating the needs of a child with a disability, including a functional evaluation in the student's customary environment
- **Obtaining/acquiring the device:**
  - Purchasing, leasing, or otherwise providing for the acquisition of assistive technology devices for students with disabilities
- **Providing necessary modification and customization:**
  - Selecting, designing, fitting, customizing, adapting, and applying use of assistive technology equipment
- **Training the student to use the device:**
  - Training or technical assistance for a student with a disability or, if appropriate, that student's family
- **Training for professionals:**
  - Training or technical assistance for professionals (including individuals providing education or rehabilitation services), employers, or other individuals who provide services to, employ, or are otherwise substantially involved in the major life functions of that student
- **Coordinating therapies, interventions, or services with assistive technology:**
  - Coordinating and using other therapies, interventions, or services with assistive technology devices, such as those associated with existing education and rehabilitation plans and programs
- **Maintenance, repair, and replacement as needed:**
  - Maintaining, repairing, or replacing assistive technology

## Levels of Assistive Technology

The focus of this manual is to address the types of AT that are relevant to the educational needs of a student. However, it is important also to understand the scope of AT as it applies to all aspects of a student's life. Assistive technology impacts many areas of a student's life, and consideration of these adaptations must be influenced by his/her specific needs.

Assistive technology solutions may be described by "level," which is generally a correlation between:



In some instances, all levels of AT are needed. However, the continuum of options – from high to low – must be considered, and the selection of equipment should be a match between the student’s abilities and the purpose of the AT in enabling the student to participate in the educational setting.

Low technology refers to devices that are easy to use and generally do not require electrical power. The training period for use of such devices is relatively short. Many times these are simply referred to as accommodations or modifications, and educators may not realize that they have already considered and implemented this type of AT. For example, creative teachers often utilize “common sense” accommodations that allow students to accomplish given tasks within the classroom. Often low-tech systems are the foundation for other levels of assistive technology, developing skills that can be transferred into more significant phases of independence or participation.

Higher-level technology systems incorporate a wide range of levels for all aspects of life skills. Manufacturers specialize in equipment to accommodate specific disability conditions and the performance tasks to be accomplished. Such systems may involve complex construction or internal structures and may require specific training in order for the user to take full advantage of their capabilities. However, most are “user friendly,” which means that the user does not have to understand how the device works in order to use it successfully.

For an insightful discussion of levels of assistive technology and other key issues, see the article “Hindsight, Understanding What We Got Wrong, and Changing Directions” (Edyburn, 2009).

## **Overview of Assistive Technology**

It is helpful to classify AT according to the task it enables the student to perform. The list below is only an example of AT systems that may be considered. As such, it is not inclusive of all AT options that are available.

### **Seating and Positioning**

*Allow students greater access to the educational activities.*

- non-slip surface on chair (e.g., Dycem)
- blocks for feet
- bolster or rolled towel for positioning
- adapted or alternate chair
- side-lying frames
- standing frame
- floor sitter
- chair insert
- wheelchairs
- custom-fitted wheelchair
- straps
- head supports
- trays
- adapted desk/table
- bean bag chairs

### **Activities of Daily Living (ADLs)**

*Allow independence in the area of daily living.*

- adapted eating utensils
- adapted drinking devices
- adaptive dressing devices
- specially designed toilet seats
- restroom modifications
- aids for grooming
- robotic and electronic feeders
- adapted cooking tools
- universal cuff to hold items

### **Environmental Control**

*Enables students to independently use equipment in the classroom and home.*

- switch interfaces for appliances (e.g., VCRs, tape recorders)
- adaptable on/off switches
- remote-control switch access
- switch latch timers
- switch interface for battery-operated devices

### **Mobility**

*For students with physical disabilities, these items may be considered to enable students to get around the classroom and school environment.*

- walkers
- grab rails
- manual or powered wheelchairs
- powered recreational vehicles
- building modifications and adaptations

*For students with vision impairments, these items may be necessary to navigate the school.*

- white canes
- electronic image sensors
- telescopic aids

**Assistive Listening**

*Assists students in gaining auditory-presented educational information.*

- hearing aids
- classroom amplification
- personal FM system
- captioning
- signaling device
- TDD/TTY (Telecommunications Device for the Deaf/TeleTYpewriter)
- screen flash on computer
- phone amplification

**Visual Aids**

*Enable students with visual impairment to gain information from educational activities.*

- increased contrast
- enlarged images
- tactile and auditory materials
- books on tape
- eye glasses
- magnifier
- large print books
- low-vision aids
- screen magnifier
- screen magnification software
- closed-circuit TV (CCTV)
- screen reader
- Braille keyboard or notetaker
- Braille translator software
- Braille printer/embosser
- Brailled materials
- scanners
- optical character readers
- reading machine

**Augmentative Communication**

*Assists students in effectively communicating when spoken communication is not effective.*

- communication boards and wallets with pictures, words, or letters
- eye gaze board

- simple voice-output device
- electronic communication devices
- speech synthesizers for typing
- communication-enhancement software
- computer-based communication systems

### **Physical Education, Leisure, and Play**

*Enhance students' social interaction and participation in recreational activities.*

- adapted toys and games
- adapted puzzles
- switch activations with battery interrupter
- adapted sporting equipment
- universal cuff to hold crayons, markers
- modified stampers and scissors
- beeping balls
- arm support for drawing
- drawing software
- adaptive computer games

### **Reading**

*Adaptations that make reading materials accessible.*

- change in text size and color, spacing, background color
- use of pictures with text
- adapted page turning
- book stands
- talking electronic dictionary
- scanner with talking word processor
- electronic textbooks
- highlighted text
- recorded material
- multimedia presentation formats
- books on tape, CD, or MP3
- optical character reader
- Braille books
- CCTV
- screen reader/text reader

**Writing**

*Adapted modes to produce text material.*

- pencil with adaptive grip
- adapted paper (e.g., raised lines, highlighting)
- slant board
- typewriter
- portable word processor
- talking word processing
- computer with word processing
- word processing with spell/grammar checking
- word prediction
- electronic dictionary/ thesaurus/spell checker
- word cards/ word book/ word wall
- voice-recognition software
- Braille keyboard or note taker
- Braille printer

**Computer Access**

*Means for students to access the computer. This may include input and output.*

- keyboard with built-in accessibility options on standard computer
- key guard
- arm support
- track ball/track pad
- joystick with onscreen keyboard
- alternate keyboard
- mouth stick/head pointer
- head mouse/head master, tracker
- touch screen
- voice-recognition software
- switch with Morse code
- switch with scanning
- screen reader
- word prediction/abbreviated expansion



## Guiding Principles

The mandates of No Child Left Behind (No Child Left Behind [NCLB], 2001) as well as the Individuals With Disabilities Education Act (IDEA, 2004) emphasize high expectations for all students and access to the general curriculum to the maximum extent possible. To meet these demands, teachers are expected to facilitate student achievement through high-quality instructional activities. Students typically engage in these activities through participation, communication, and productivity. For students with disabilities, certain aspects of their disability may prohibit them from reaching the desired level of achievement.

Assistive technology offers many students with disabilities the ability to meet their full potential within their educational program. The consideration and provision of AT for students with disabilities is mandated in the law. A great deal of attention has focused on properly interpreting these laws to ensure that school districts understand their responsibility. However, many questions remain.

Which students need AT? What kind of technology is needed? What process must be completed to make AT decisions? How will the AT be used in the classroom? Why should AT be included?

There are no quick-and-easy answers to these questions. However, when a district has a well-defined plan for AT, it is fairly certain that service delivery will be legally correct and will ultimately help students with disabilities realize their educational potential.

The following overarching guidelines, written by Joy Zabala (n.d.), should be embraced by all educators as they consider the AT needs of individual students with disabilities.

- The primary goal of assistive technology is the enhancement of capabilities and the removal of barriers to performance.
- Assistive technology can be a barrier.
- Assistive technology may be applicable to all disability groups and in all phases of education and rehabilitation.
- Assistive technology is related to function, not disability.
- The least complex intervention needed to remove barriers to performance should be the first consideration.
- Assessment and intervention involve a continuous, dynamic process of systematic problem solving.
- Regularly scheduled followup and adjustments are expected.
- Assistive technology does not eliminate the need for social and academic skills instruction.
- A team approach is required.

## Quality Indicators for Assistive Technology (QIAT)

The Quality Indicators for Assistive Technology (QIAT) Consortium (2012) has defined a set of descriptors that serve as a guide for quality AT services. The basics of these indicators are included here to assist districts as they integrate AT service delivery into current district policies and procedures and/or continuous improvement plans. More detailed descriptors may be found at the QIAT webpage: [www.qiat.org](http://www.qiat.org). Additionally, QIAT matrices may be used to guide a collaborative self-assessment conducted by a school district team and used to plan for changes that lead to improvement in attainable steps.

## Quality Indicators for Administrative Support of Assistive Technology Services

This area defines the critical areas of administrative support and leadership for developing and delivering assistive technology services. It involves the development of policies, procedures, and other supports necessary to improve quality of services and sustain effective assistive technology programs.

### **1. The education agency has written procedural guidelines that ensure equitable access to assistive technology devices and services for students with disabilities, if required for a free, appropriate, public education (FAPE).**

**Intent:** Clearly written procedural guidelines help ensure that students with disabilities have the assistive technology devices and services they require for educational participation and benefit. Access to assistive technology is ensured regardless of severity of disability, educational placement, geographic location, or economic status.

### **2. The education agency broadly disseminates clearly defined procedures for accessing and providing assistive technology services and supports the implementation of those guidelines.**

**Intent:** Procedures are readily available in multiple formats to families and school personnel in special and general education. All are aware of how to locate the procedures and are expected to follow procedures whenever appropriate.

### **3. The education agency includes appropriate assistive technology responsibilities in written descriptions of job requirements for each position in which activities impact assistive technology services.**

**Intent:** Appropriate responsibilities and the knowledge, skills, and actions required to fulfill them are specified for positions from the classroom through the central office. These descriptions will vary depending upon the position and may be reflected in a position description, assignment of duty statement, or some other written description.

### **4. The education agency employs personnel with the competencies needed to support quality assistive technology services within their primary areas of responsibility at all levels of the organization.**

**Intent:** Although different knowledge, skills, and levels of understanding are required for various jobs, all understand and are able to fulfill their parts in developing and maintaining a collaborative system of effective assistive technology services to students.

### **5. The education agency includes assistive technology in the technology planning and budgeting process.**

**Intent:** A comprehensive, collaboratively developed technology plan provides for the technology needs of all students in general education and special education.

### **6. The education agency provides access to on-going learning opportunities about assistive technology for staff, family, and students.**

**Intent:** Learning opportunities are based on the needs of the student, the family, and the staff and are readily

available to all. Training and technical assistance include any topic pertinent to the selection, acquisition, or use of assistive technology or any other aspect of assistive technology service delivery.

### **7. The education agency uses a systematic process to evaluate all components of the agency-wide assistive technology program.**

**Intent:** The components of the evaluation process include, but are not limited to, planning, budgeting, decision-making, delivering AT services to students, and evaluating the impact of AT services on student achievement. There are clear, systematic evaluation procedures that all administrators know about and use on a regular basis at central office and building levels.

### **COMMON ERRORS**

1. If policies and guidelines are developed, they are not known widely enough to assure equitable application by all IEP teams.
2. It is not clearly understood that the primary purpose of AT in school settings is to support the implementation of the IEP for the provision of a free, appropriate, public education (FAPE).
3. Personnel have been appointed to head AT efforts, but resources to support those efforts have not been allocated. (Time, a budget for devices, professional development, etc.)
4. AT leadership personnel try to or are expected to do all of the AT work and fail to meet expectations.
5. AT services are established but their effectiveness is never evaluated.

(THE QIAT Consortium, 2012, pp. 13-14)

## **Quality Indicators for Professional Development and Training in Assistive Technology**

This area defines the critical elements of quality professional development and training in assistive technology. Assistive technology professional development and training efforts should arise out of an ongoing, well-defined, sequential and comprehensive plan. Such a plan can develop and maintain the abilities of individuals at all levels of the organization to participate in the creation and provision of quality AT services. The goal of assistive technology professional development and training is to increase educators' knowledge and skills in a variety of areas including, but not limited to: collaborative processes; a continuum of tools, strategies, and services; resource; legal issues; action planning; and data collection and analysis. Audiences for professional development and training include: students, parents or caregivers, special education teachers, educational assistants, support personnel, general education personnel, administrators, AT specialists, and others involved with students.

**1. Comprehensive assistive technology professional development and training support the understanding that assistive technology devices and services enable students to accomplish IEP goals and objectives and make progress in the general curriculum.**

**Intent:** The Individuals with Disabilities Education Act (IDEA) requires the provision of a free and appropriate public education (FAPE) for all children with disabilities. The Individualized Education Program (IEP) defines FAPE for each student. The use of AT enables students to participate in and benefit from FAPE. The focus of all AT Professional Development and training activities is to increase the student's ability to make progress in the general curriculum and accomplish IEP goals and objectives.

**2. The education agency has an AT professional development and training plan that identifies the audiences, the purposes, the activities, the expected results, evaluation measures and funding for assistive technology professional development and training.**

**Intent:** The opportunity to learn the appropriate techniques and strategies is provided for each person involved in the delivery of assistive technology services. Professional development and training are offered at a variety of levels of expertise and are pertinent to individual roles.

**3. The content of comprehensive AT professional development and training addresses all aspects of the selection, acquisition and use of assistive technology.**

**Intent:** AT professional development and training address the development of a wide range of assessment, collaboration and implementation skills that enable educators to provide effective AT interventions for students. The AT professional development and training plan includes, but is not limited to: collaborative processes; the continuum of tools, strategies and services; resources; legal issues; action planning; and data collection.

**4. AT professional development and training address and are aligned with other local, state and national professional development initiatives.**

**Intent:** For many students with disabilities, assistive technology is required for active participation in local, state and national educational initiatives. Content of the professional development and training includes information about how the use of assistive technology supports the participation of students with disabilities in these initiatives.

**5. Assistive technology professional development and training include ongoing learning opportunities that utilize local, regional, and/or national resources.**

**Intent:** Professional development and training opportunities enable individuals to meet present needs and increase their knowledge of AT for use in future. Training in AT occurs frequently enough to address new and emerging technologies and practices and is available on a repetitive and continuous schedule. A variety of AT professional development and training resources are used.

**6. Professional development and training in assistive technology follow research-based models for adult learning that include multiple formats and are delivered at multiple skill levels.**

**Intent:** The design of professional development and training for AT recognizes adults as diverse learners who bring various levels of prior knowledge and experience to the training and can benefit from differentiated instruction using a variety of formats and diverse timeframes (e.g., workshops, distance learning, follow-up assistance, ongoing technical support).

**7. The effectiveness of assistive technology professional development and training is evaluated by measuring changes in practice that result in improved student performance.**

**Intent:** Evidence is collected regarding the results of AT professional development and training.

The professional development and training plan is modified based on these data in order to ensure changes educational practice that result in improved student performance.

### **COMMON ERRORS**

1. The educational agency does not have a comprehensive plan for ongoing AT professional development and training.
2. The educational agency's plan for professional development and training is not based on AT needs assessment and goals.
3. Outcomes for professional development are not clearly defined and effectiveness is not measured in terms of practice and student performance.
4. A continuum of ongoing professional development and training is not available.
5. Professional development and training focuses on the tools and not the process related to determining student needs and integrating technology into the curriculum.
6. Professional development and training is provided for special educators but not for administrators, general educators and instructional technology staff.

(The QIAT Consortium, 2012, pp. 15-16)

## **Summary**

This section provided an overview of the wide range of AT devices that are commonly used within the school setting for curriculum access and other school-related activities. Assistive technology services were also discussed, as well as the importance of those services in promoting effective student AT use. Finally, the QIAT Indicators were introduced. These indicators were created to help guide school districts and AT teams in developing and implementing effective AT services.

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