



# Assistive Technology Guide for Massachusetts Schools

November 2002



---

**Massachusetts Department of Education**  
**address** 350 Main Street, Malden, MA 02148  
**telephone** 781-338-3000 **TTY** 1-800-439-2370 **internet** [www.doe.mass.edu](http://www.doe.mass.edu)



# Massachusetts Department of Education

---

This document was prepared by the Massachusetts Department of Education  
Dr. David P. Driscoll, Commissioner of Education

## **Board of Education Members**

James A. Peyser, Chairman, Dorchester

Henry M. Thomas, III, Vice-Chairman, Springfield

Charles D. Baker, Swampscott

J. Richard Crowley, Andover

Jeffrey DeFlavio, Belmont

Judith I. Gill, Chancellor, Higher Education

William K. Irwin, Jr., Wilmington

Roberta R. Schaefer, Vice-Chairperson, Worcester

Abigail M. Thernstrom, Lexington

David P. Driscoll, Commissioner of Education

The Massachusetts Department of Education, an Affirmative Action employer, is committed to ensuring that all of its programs and facilities are accessible to all members of the public. We do not discriminate on the basis of age, color, disability, national origin, race, religion, sex, or sexual orientation.

Copyright © 2002 Massachusetts Department of Education  
Permission is hereby granted to copy any or all parts of this document for non-commercial educational purposes. Please credit the Massachusetts Department of Education.

*This document printed on recycled paper.*

350 Main Street, Malden, Massachusetts 02148-5023  
voice (781) 338-3000 TTY (800) 439-0183



# **The Commonwealth of Massachusetts Department of Education**

---

350 Main Street, Malden, Massachusetts 02148-5023

Telephone: (781) 338-3000  
TTY Relay 1-800-439-0183

David P. Driscoll  
Commissioner of Education

November, 2002

Dear Educators and Other Interested Parties:

I am pleased to share with you this guide, *Assistive Technology for Massachusetts Schools*, which offers guidance to school districts in providing assistive technology devices and services to students with disabilities. In this guide you will find information on evaluating students' need for assistive technology, supporting the use of assistive technology in your schools, and selecting technologies and services that will enable all students to access the curriculum. Also included in the guide is a list of commonly asked questions to help you better understand the state and federal regulations regarding assistive technology.

Assistive technologies are currently being used successfully by many students with disabilities in Massachusetts. This guide highlights the effective use of assistive technology across the Commonwealth, focusing on individual students, statewide projects, local resources, MCAS testing, and data collected from school districts.

I hope this guide will help promote the Department's goal of providing learning environments that enable all students to achieve to their fullest potential. I look forward to working with you to realize that goal.

Sincerely,

David P. Driscoll  
Commissioner of Education

# Table of Contents

---

Introduction.....	1
Effective Practices .....	2
Evaluating the Need for Assistive Technology .....	2
Providing Support for the Use of Assistive Technology .....	3
Moving Towards Universal Design .....	4
Assistive Technology Tools.....	5
Low-Tech Devices .....	5
Mid-Tech Devices.....	6
High-Tech Devices .....	7
Accessibility Features in Software.....	9
Online Resources .....	9
Massachusetts Initiatives .....	10
Professional Development .....	10
Planning and Data Collection .....	10
Student Assessment .....	11
Other State Programs and Services.....	12
Case Studies .....	14
Student Spotlight 1.....	14
Student Spotlight 2.....	15
Student Spotlight 3.....	16
Assistive Technology Requirements: Questions & Answers .....	17
Assistive Technology Resources .....	22
Acknowledgments.....	inside back cover

# Introduction

---

The Individuals with Disabilities Education Act (IDEA), a federal law reauthorized in 1997, requires schools to consider a student's need for assistive technology devices and services whenever an Individualized Education Program (IEP) is written. In addition, the Americans with Disabilities Act (ADA) and Section 504 of the Rehabilitation Act require schools to provide assistive technology for students with disabilities, if needed to assure equal access to the school's programs and services.

In Massachusetts, as a result of a recent addition to the Education Reform Bill (Ch. 71, Sec. 38Q½), all school districts must adopt and implement curriculum accommodation plans to ensure that all efforts have been made to meet students' needs in the general education environment. Schools are encouraged to develop strong instructional support practices, including varied learning activities, a wide variety of instructional materials, and opportunities for multisensory input and output. These instructional support practices can include the use of assistive technology.

Great strides have been made in the field of assistive technology over the past twenty-five years. Today assistive technologies have the ability to change dramatically the lives of students with physical disabilities and learning disabilities, making it possible for them to access the curriculum and focus on achieving academic standards. Because assistive technologies are so powerful, it is important for educators to be aware of their capabilities. An understanding of the field will help school personnel make informed decisions when they evaluate students' needs for assistive technologies. Better still, this knowledge will help schools develop educational environments and programs that will help meet the needs of all students, regardless of whether they have been referred for special services. It is with this goal in mind that this publication was developed.

# Effective Practices

---

According to the Individuals with Disabilities Education Act (IDEA), assistive technology is 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.”

## **Evaluating the Need for Assistive Technology**

The principal reason for providing assistive technology is to enable students to meet the instructional goals set forth for them. School personnel should look at tasks that the student needs to accomplish, the difficulties the student is having, and the ways that various devices might help the student better accomplish those tasks.

There are many factors that need to be examined when assistive technology devices and services are being considered for a student—including educational goals, personal preferences, social needs, environmental realities, and practical concerns. A careful evaluation of the options will help schools avoid spending money on devices and services that do not meet a student’s needs. See, for example, the case study of Julie on page 15 for the importance of performing a thorough evaluation.

When exploring assistive technology devices for a student, it is important to consider the full range of devices that are available, beginning with low-tech devices and considering high tech-devices only after the lower-tech options have been tried. Although some people assume that the most expensive, high-tech device is the best solution for a student, this is not necessarily true. In fact, a low-tech device is sometimes more effective, since it is frequently easier to use.

Student involvement is a critical part of the assistive technology evaluation. If at all possible, the student should have an opportunity to try out a device before a decision is made. A trial period should include an observation by one or more professionals to assess whether the student is physically and cognitively able to use the technology effectively. This observation should also include an assessment of the time and staff support needed for the student to learn to use the device independently. School personnel may be able to make arrangements with vendors for a loan or short-term rental of a device for evaluation purposes. This trial process will be easier for schools that have already invested in some of the commonly used devices for students to try.

In addition to the student’s technical comfort level, the evaluation Team should explore the student’s feelings about a particular device. There can be no educational benefit if a student is unwilling to use the device. If, for example, a student feels embarrassed about using the device in front of his or her peers, it is probably not a good choice.

When evaluating assistive technology for a student, it is also helpful to consider where the student will be using the technology. Ideally, the evaluation takes place at a student's school, as well as in the home, if the device(s) will be used there. Examining the environment should include a consideration of the physical arrangements, any special environmental challenges, and the technical infrastructure. The evaluation Team should identify how the technology will enable the student to be included in classroom activities to the greatest extent possible. An example of an ineffective environmental arrangement is a situation requiring the student to sit in a corner of the room throughout the day in order to be near an electrical outlet for a computer.

In selecting assistive technology devices, there are many practical issues that should be considered. For example, questions should be asked about each product's reliability, durability, maintenance requirements, and warranty. It is also wise to learn how long a device has been on the market and whether other students have used it successfully.

Another critical issue involves the various services that will support the student's use of an assistive technology device. These services can include customizing a device, maintaining or repairing the device, and providing training and technical support. Depending on the device, training may be needed not only for the student but for any family members and teachers who may assist the student. It is important that these services be considered, planned, and documented at the time of the evaluation.

Finally, evaluation should be an ongoing process. Assistive technology devices and strategies should be constantly reviewed to ensure that they are meeting the changing needs of the student.

### **Providing Support for the Use of Assistive Technology**

In order for students to get the maximum benefit from assistive technologies, there must be broad administrative support for their use in the schools. Districts need to include assistive technologies when planning their infrastructure and budgeting for technology purchases. School districts must also have clear guidelines and procedures for assessing and documenting the need for assistive technology. Moreover, instructional staff members need to understand the importance of working together to ensure that the use of assistive technology is integrated into the daily activities of the students who require it.

One of the most important ways districts can support the use of assistive technology is to provide professional development, for instructional staff, administrators, and others involved with purchasing and using these devices and services. It is clear why teachers need training on devices that their students will be using. Perhaps less obvious is that school administrators and other personnel need to be aware of the range of devices that are available. Equipped with that knowledge, school personnel

are better able to consider and recommend devices when they are confronted with students who need help.

Today there are thousands of assistive technology devices on the market, plus many more items that can function as assistive technology devices. Moreover, new solutions are being developed every day. Clearly, it is difficult for individual teachers to become knowledgeable about all of these devices. Thus, it is helpful to provide opportunities for staff to share their knowledge and to network with others who are using assistive technologies.

### **Moving Towards Universal Design**

Universal design in education means using instructional tools, materials, and methods that remove barriers to learning, making it possible for all students to succeed. To achieve universal design, educators need to take into account students' varying abilities.

By planning in advance, schools can reduce the need for special services since accommodations for various learning challenges will be available from the start. In addition, the use of universally designed curriculum tools and materials can reduce the time teachers need to spend in modifying the curriculum to meet students' needs.

Technology can reduce the amount of effort required to implement universal design in the classroom, enabling educators to transform the curriculum to meet the students' varied learning needs. When text is available in a digital format, for example, a number of adaptations are possible:

- A student with low vision can enlarge the text or change its color to make it easier to read.
- A student who is blind can use a software program that translates the text into Braille and then print it out using a Braille printer.
- A student with dyslexia can listen to the text using a software program that converts the text to speech.
- A student learning English may also benefit from using text-to-speech software, which makes it possible to see each word highlighted as it is read.

Because of the advantages presented by digital formats, many states now require that educational publishers make available digital versions of their materials. Currently U.S. copyright law allows schools and other organizations to create alternate versions of materials for students with disabilities, making it permissible, for example, to scan a book for a student who requires a digital version in order to access the material. See the case study of Peter on page 16 for the benefit of providing instructional materials in a digital format.



# Assistive Technology Tools

---

Assistive technologies provide creative solutions that enable students with disabilities to be more independent and productive. These tools can also help students with disabilities participate more fully in both the academic and social activities in a school.

Assistive technology devices can be grouped into three categories: low-tech, mid-tech and high-tech. Low-tech devices are typically easy to use, inexpensive to purchase, widely available, and involve little or no training. Mid-tech devices are somewhat more complex, often requiring a battery. High-tech devices tend to be more costly and frequently require some training.

Many of the devices in this section can also be helpful to students who have not been identified as having disabilities. Providing all students with access to these devices helps realize the goal of universal design: accommodating the needs of all students, not just those with disabilities.

Because there are thousands of assistive technology devices on the market, this publication will not attempt to describe them all. Rather, it will offer some examples of commonly used tools. The Resources section presents resources for learning more about assistive technology devices.

## Low-Tech Devices

When exploring assistive technology solutions for a student, the evaluation Team should first consider whether low-tech solutions can meet the student's needs. Not only is this approach cost effective; it is also beneficial to the student. Since low-tech devices are typically portable and easy to use, their use may be virtually transparent. For example, a rubber pencil grip can enable a student with poor motor control to grasp a pencil more securely and produce more legible work. Using the pencil grip is far less likely to embarrass the student than using an awkward piece of equipment, especially if all of the other students are writing with pencils.

Here is a sampling of low-tech devices that can be used to help students with disabilities participate in the general curriculum:

- **Reading frames**, cut from cardboard or heavy paper, can help struggling readers focus on one line of text at a time.
- **Sticky notes** and **removable highlighter tape** can be used by students or teachers to mark important words or sections of text.

- **Graph paper** or paper grids made on a computer are useful to students who have difficulty aligning numbers when doing mathematical computations.
- **Small whiteboards** or **blackboards** can be helpful for students who find it challenging to answer questions orally in class.
- **Communication books** with pictures representing frequently used messages can help a nonverbal student to communicate.
- **Timers** can be used show how much time an activity will take, helping students pace themselves through activities.
- **Line magnifiers**, which enlarge a line of text, can be helpful to students with vision impairments, as well as students with learning disabilities.
- **Seat cushions** can help students with physical disabilities maintain the posture needed to use their arms or hands effectively. For students who have difficulty with attention, some seat cushions can also have a calming effect.

### Mid-Tech Devices

Mid-tech devices offer many of the advantages of low-tech devices. They tend to be relatively inexpensive and usually do not require extensive training. In addition, they are often lightweight and portable, allowing them to be used anywhere.

Here are some examples of mid-tech devices that can help students with disabilities:

- **Recorded books** allow struggling readers to listen to text as they look at the words in printed books.
- **Tape recorders** provide a way for students to practice reading aloud. They can also be used by teachers or students to record reminder messages.
- **Amplification systems** can be useful for students with hearing impairments, as well as for students who have difficulty focusing on what the teacher is saying.
- **Specialized calculators**, such as those with large displays or speech output, can be helpful to students with vision impairments.
- **Hand-held talking dictionaries** can be useful to students who have difficulty with reading or spelling.
- **Electronic organizers** are sometimes helpful for students who have difficulty remembering their schedules and assignments.

- **Switches** allow students with physical limitations to easily activate other devices, such as toys, wheelchairs, and computers.
- **Talking switches** can help nonverbal students participate more fully in classroom and social activities. The teacher can record short messages, which the student can play back as needed.

## High-Tech Devices

When low- and mid-tech solutions are not useful, the evaluation Team should consider a variety of high-tech assistive technologies. It is important to remember that the most expensive assistive technology is not necessarily the best choice.

The Team should take into account the effort needed to obtain and learn to use a device. For a device to be effective, the student should be able to use the technology in a short, reasonable period of time and feel comfortable using the technology. If a device takes months to master, the student will lose valuable instructional time.

The following is a sampling of high-tech devices that can be used to help students with disabilities participate in the general curriculum. See the case study of Amanda on page 17 to learn how some of these devices are used by students.

- **Alternative keyboards** come in many sizes and configurations. For example, keyboards with either large or small keys are available to accommodate a student's motor impairments. To assist students with cognitive or visual limitations, keyboards with alternate arrangements of letters are available. Programmable keyboards can be used for a greater degree of customization.
- **Mouse emulators** allow physically challenged students to operate computers in a variety of ways. Examples include trackballs, headsticks, touchscreens, and eyegaze systems. Students who are unable to use keyboards can use these devices to select letters from an onscreen keyboard.
- **Scanners** are especially helpful when used in conjunction with optical character recognition (OCR) software. After a printed page is scanned, the software converts the scanned image into digital text, which can be opened in a word processor and read aloud by a computer.
- **Digital whiteboard devices** make it possible to save and print anything that is written on a whiteboard. These devices can be useful to students who have difficulty copying notes from the board.

- **Text-to-speech software** enables a computer to speak digital text. Digital text can include, for example, a word-processed document, an encyclopedia on a CD-ROM, or an article on the Internet.
- **Talking word processing software** provides students with auditory feedback, enabling them to more easily correct spelling and grammar errors. Some programs include a library of pictures that can be used along with words.
- **Screen reading software** is similar to text-to-speech software. In addition to speaking the text in documents, the software speaks a computer's menu items, enabling blind students to use the computer independently.
- **Word prediction software** can be helpful to students with learning disabilities, as well as students with physical disabilities, because it minimizes the number of keystrokes needed to complete a word or a sentence. After a student types the first letter of a word, the software presents a list of choices that begin with that letter.
- **Speech recognition software** allows a student to speak into the computer through a microphone and have the text appear on the computer screen. The use of this type of software can involve substantial training for each user.
- **Augmentative communication software** enables non-verbal students to communicate with others through graphics, text, and sound. The software is customizable to the learner's needs.
- **Graphic organizers** allow teachers and students to brainstorm and organize ideas electronically and view the information in various formats, such as outlines or story webs. This visual representation of information can be a useful organizational tool for some learners.
- **Braille translation software** converts standard text into Braille. Used with a Braille printer, it helps make it possible for blind students to participate in the same activities as their sighted classmates.
- **Electronic math templates** are useful for students who have difficulty with handwriting, as well as students who are physically unable to write with a pencil. The software aligns the numbers correctly, making it possible for students to do calculations such as long division or multiplication on the computer.

## **Accessibility Features in Software**

Many common software applications have built-in capabilities that can be useful to students with disabilities. For example, most applications allow the user to modify the size and color of text, which can be useful for a student with low vision. Also many popular word-processing applications offer a text-to-speech feature, which is useful for students with a variety of disabilities. In addition, most computer operating systems have accessibility features, for example allowing the user to magnify the screen, change the size of icons, and adjust the way the mouse and keyboard react.

## **Online Resources**

Online materials can either eliminate barriers or erect new ones for students with disabilities. A properly formatted Web page offers all of the advantages of other digital text, making it possible for the student to use software to enlarge the text, hear it read, translate it into Braille, and so on. Moreover, the Internet offers a vast collection of digital resources, including classic works of literature, which can be downloaded and accessed by students with disabilities.

Access to online materials can sometimes be problematic because many Web pages today are not accessible to all types of learners. The Web Accessibility Initiative, an international organization, has established guidelines to make the Web more accessible to people with a wide range of disabilities. For example, to increase access for people with hearing impairments, the guidelines recommend that any video or audio on the site be accompanied by captioning and transcripts. To assist people with visual impairments, who may be using a screen reader, the guidelines recommend ways of organizing the text logically. When evaluating Web sites for classroom use, teachers need to be mindful of these guidelines to ensure equal access to all students.

# Massachusetts Initiatives

---

At the state level, the Massachusetts Department of Education has been working in a variety of ways to increase awareness and promote the use of assistive technology for students with disabilities.

## Professional Development

Over the past four years, the Department administered an assistive technology program, with funding from various federal grants. This program provided more than 130 grants for school districts and collaboratives to develop, train, and support schoolwide assistive technology teams. These teams attended a series of monthly professional development workshops on topics such as conducting assistive technology assessments, using assistive technology devices effectively, and developing strategies to increase awareness of assistive technologies in their districts. As part of the grant program, each participating school also received an assistive technology toolkit, as well as on-site consultation.

In the schoolwide assistive technology team model, educators with a range of specialties come together to support the use of assistive technology throughout their district. A typical team is comprised of one or two special educators, a general educator, a speech and language pathologist, an orthopedic specialist, a technology specialist, a paraprofessional, and a school administrator. The team meets regularly to develop plans for increasing awareness of assistive technology among their peers, for assessing the assistive technology needs of classes and individual students, and for implementing the technologies that are purchased by their district.

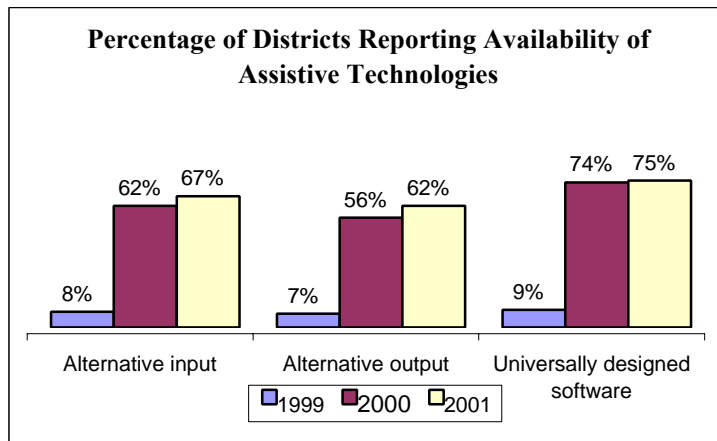
Another grant program, Project MEET (Massachusetts Empowering Educators with Technology), has included assistive technology in its professional development workshops. A five-year project, Project MEET has provided training to teams of educators in 66 school districts across the state.

## Planning and Data Collection

School districts are required to submit technology plans and annual updates to the Department in order to qualify for technology funding. The Department encourages districts to include assistive technology and universal design in their technology planning. Recent reports suggest that providing access to technology to all students is becoming an integral part of technology planning in many districts. According to data submitted by schools to the Massachusetts Department of Education in 2001, ninety-three percent (93%) of schools across the state consider accessibility for students with disabilities when making technology purchases.

As a result of this increased commitment to assistive technologies, the availability of these devices in schools has increased dramatically over the past several years. In the

Department's 2001 survey, school districts were asked about the availability of alternative input methods, alternative output methods, and universally designed software. Examples of alternative input devices included switches, touch screens, and modifications to keyboards, while alternative output devices included text-to-speech technologies, refreshable Braille, and large print output. Universally designed software was defined as software designed with built-in alternatives for students with disabilities. The results of the 2001 survey are shown in the graph below.



### Student Assessment

Students with disabilities have participated in the MCAS since 1998, as required by federal law. A student's Team (either the IEP Team or the 504 team) is responsible for determining how the student will participate in MCAS testing. If the Team deems it necessary, a student may use certain accommodations, including assistive technologies, when taking an MCAS test. In most cases any testing accommodations will be aligned with the accommodations used by the student for instructional purposes. The Team may recommend, for example, the use of a word processing device for a student who has difficulty with handwriting and uses word processing as part of his or her instructional program. Guidelines for these accommodations are spelled out in the Department's publication *Requirements for the Participation of Students with Disabilities in MCAS*.

While the use of word processing technology for taking MCAS tests has been permitted for students with disabilities for several years, the use of other technologies is in the early stages. For example, in 2002 the Department began to allow the use of word prediction software under certain circumstances. Other technologies, such as text-to-speech software, are being piloted on a selective basis when requested by a student's Team.

If a student has significant disabilities, the Team may recommend the MCAS Alternate Assessment, which involves compiling a portfolio throughout the school year. In 2000, the Department began to pilot the use of electronic portfolios, which

schools can submit on CD or Zip disk in place of paper portfolios. An electronic portfolio can include, for example, digital video or audio clips of the student completing various tasks, scanned samples of student work, as well as student work samples created on a computer.

To assist educators in creating and organizing MCAS Alternate Assessment “electronic portfolios,” the Massachusetts Department of Education has funded the development of a software package called AIMS (Assessment and Instructional Management System).

Additionally, since the year 2000, the Department has offered grants to school districts for purchasing the AIMS software and related equipment, as well as training teachers to use it. Districts’ use of the AIMS software is increasing; 25 electronic portfolios were submitted in 2001, while 145 were submitted in 2002.

### **Other State Programs and Services**

At the Massachusetts Hospital School, which serves 125 students with severe physical disabilities, nine out of ten students use some kind of assistive technology. Located in Canton, this school has a unique resource: a group of highly skilled technicians and computer specialists who design, build, adapt, and repair devices to meet the needs of individual students at the school.

The Massachusetts Hospital School’s staff also develops custom software programs to help students access the school’s curriculum and activities. All of these programs are designed so that they can be accessed with either a keyboard (or alternative keyboard), a mouse (or alternative pointing device), or a switch. Examples include an accessible coloring program, a concentration game, and a spinner that can be used with various board games. All of these programs can be used to create curriculum activities.

A particularly interesting software program, called Simple Script, was designed to make the school’s drama program more accessible. With this software, a computer becomes a teleprompter for students who are unable to memorize their lines. Simple Script also allows non-verbal students to trigger spoken text or sounds effects using wireless switches. As a result, many more students have been able to take active roles in the school’s theater productions.

As time permits, the Massachusetts Hospital School offers the services of its adaptive design specialists to Massachusetts school districts, charging the districts only the cost of the materials for any devices they build. During the 2001-2002 school year, they provided services to 40 school districts. In addition, the software developed by the school’s computer specialists is available to other schools free of charge.

Also located in Canton is the state’s Vision Resources Library, which lends Braille and large print books to visually impaired students. Responding to requests by vision specialists in schools, the library provides accessible versions of textbooks,



workbooks, and works of literature. For books that are not available in its collection, the library borrows, purchases, or contracts with vendors to produce the needed books. In 2001-2002, the library circulated approximately 4500 new book titles, including 3000 Braille and 1500 large print titles. Moreover, nearly two-thirds of the library's collection of 22,000 items are in circulation at any point in time. The library also circulates aids available through the American Printing House for the Blind, such as computerized Braille notetakers, variable-speed cassette players, and talking scientific calculators.

# Student Spotlight 1

---

Julie\*, a student in southeastern Massachusetts, used to spend most of her school days observing and passively participating in classroom activities. The second grader, who has delays in communication and cognitive skills, was viewed as essentially non-speaking since she spoke only a few words now and then. One activity that Julie really enjoyed was completing word searches, finding hidden words in a grid and circling them. When the regular classroom work was judged to be too difficult for Julie, her teacher gave her word searches to complete instead.

As part of an initial assistive technology assessment Julie was given the opportunity to use word prediction software with audio. The assessment team did not expect this program to be useful to Julie, since she did not seem to have phonetic awareness.

Julie was given the starter phrase “I like . . .” She quickly learned how to make the computer read the phrase aloud. With prompting, she completed the phrase verbally, saying “stars.” Julie’s teacher then typed “Why?” into the program, asking Julie to listen and read the question. Julie then responded appropriately with “because . . .” and with prompting typed the initial letter “b.” When the word “because” appeared on the monitor, Julie recognized it immediately, reading it aloud and then selecting it with the mouse.

Julie continued to verbalize her ideas, typing the initial letter for each word, and then searching the word list on the screen for her choice. After just a few trials, she learned that if the desired word did not appear, she needed to type the second letter of the word. In just 20 minutes she went on to type: “I like stars.” *Why?* “Because they are beautiful. I like to clean my room. I like sleeping up in my bed. I like getting up and going to my school bus.”

Julie’s special education teacher had tears of joy in her eyes as she watched what Julie was able to do on the computer. The teacher said she didn’t realize that Julie had that much to say. She had heard Julie say more in those 20 minutes than she had all year. Additionally, this was the first time Julie had written a complete sentence.

Additional evaluation sessions resulted in recommendations for low-tech and high-tech assistive technology accommodations and modifications for Julie.

\* “Julie” is a current Massachusetts student, but her name has been changed to protect her privacy.

## Student Spotlight 2

---

Peter\*, a high school senior in western Massachusetts, is getting ready to send out applications to colleges. Because he enjoys creating artwork on his computer, Peter is thinking about majoring in communications, graphic design, or video production.

Peter, who has dyslexia, says he has always had trouble in school. Initially he experimented with various tools, such as audio books, which he says didn't work for him because it was difficult to find his place on the tape. Today Peter uses a text-to-speech software program that he credits with his changing his life, saying that his grades have gone up and he doesn't have to suffer as much in school.

When he gets a reading assignment, Peter scans the pages of the book, using the program's optical character recognition (OCR) feature. Once the text is in a digital format, the program's text-to-speech feature can be used. The program then "reads" each sentence aloud for Peter, highlighting each word as it is read. If Peter wants to take notes, he can type them and highlight them on the computer screen. When Peter needs to take a test, he scans the test, types his answers, and then prints out the completed test. When he needs to write a paper, Peter proofreads what he has written by having the computer read it aloud to him.

Peter says that his ability to read has improved since he began using this software, although he's not sure why. He says that although the software program doesn't teach him to read, hearing and seeing the words highlighted at the same time and at his own speed helps him remember how to read them.

Peter's advice to educators is to try to be open to new technology. He also suggests that schools try to get digital versions of textbooks, so that students won't have to scan the pages.

\* "Peter" is a current Massachusetts student, but his name has been changed to protect his privacy.

# Student Spotlight 3

---

Amanda\* is an intelligent, self-assured high school student with cerebral palsy. Because of her disability, she is unable to speak or move her arms or legs. Amanda attends high school at the Massachusetts Hospital School, using a motorized wheelchair to move around the campus. She controls the wheelchair through the use of four switches in the chair's headrest.

Attached to Amanda's wheelchair is a specialized laptop computer system that allows Amanda to participate in both educational and social activities. Amanda uses a head mouse, a wireless device that allows her to operate the computer by moving her head. To converse with others, Amanda uses an augmentative communication software program, which offers a selection of frequently used phrases and sentences. Amanda makes a selection, and the program's speech output feature "talks" for her. When Amanda has something more specific in mind, she uses the computer's on-screen keyboard, clicking individual letters using her head mouse. As soon as she types the first letter of a word, the software's built-in word prediction feature presents her with a list of words beginning with that letter. Amanda quickly scans through the list and selects the word she wants. If she doesn't see the word, she types the second letter of the word she wants, and a new list of words appears on the screen. Once Amanda has created a sentence, the computer reads the sentence aloud.

In addition to her communication software, Amanda works with commonly used applications, such as word-processing software and an Internet browser. In mathematics class, she uses specialized mathematics software, which allows her to align numbers on the screen so she can do computations such as long division. Amanda's computer also contains software that enables her to do a number of things in the school's living area, such as turning on the stereo or opening the curtains. During the weekends, when Amanda is at home, she enjoys chatting with friends over the Internet.

As a member of the school's disability awareness team, Amanda has spoken with groups of students and teachers about disability issues. She is able to do so because she has become very adept at using assistive technology. When asked about her use of the tools, she acknowledges that while it is easy for her, she thinks that most people, including able-bodied ones, would have difficulty doing what she does.

\* "Amanda" is a current Massachusetts student, but her name has been changed to protect her privacy.

# Assistive Technology Requirements

---

**Question 1:** What is the responsibility of the school district in regard to assistive technology?

**Answer:** The 1997 Individuals with Disabilities Education Act (IDEA) mandates that districts provide assistive technology to all students with disabilities if it is needed for them to receive a free appropriate public education (FAPE). The Individualized Education Program (IEP) Team is charged with the responsibility for determining a student’s individual need for assistive technology in order to benefit from his or her education and to have access to the general curriculum. If it is determined that assistive technology devices and/or services are necessary, the IEP must specify the devices and services.

The range of recommendations can be very broad and can include both low-tech solutions and the use of more complex forms of technology. For example, a student with a fine motor difficulty may need a larger than standard pencil or may need to use a special keyboard, whereas a student who is unable to speak may need an augmentative communication device.

**Question 2:** What is an assistive technology device?

**Answer:** According to the Individuals with Disabilities Education Act (IDEA), an assistive technology device is “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 children with disabilities.” An assistive technology device can be as simple as a rubber grip that enables a student to hold a pencil or as complex as a talking word processor program.

**Question 3:** What is an assistive technology service?

**Answer:** Assistive technology services are those that ensure appropriate selection, maintenance, customization and repair of equipment; those that provide technical assistance, consumer or caregiver training, and peer counseling; and those that help fund equipment through loan, rental, lease, or purchase.

**Question 4:** Must the school district assume financial responsibility for the purchase of assistive technology devices and services if they are listed in the IEP?

**Answer:** In most cases, yes. The school district must assume financial responsibility for the purchase of assistive technology devices and services that are identified as necessary by the Team unless the cost is covered by third party benefits or insurance coverage and the parents agree to use such coverage to pay the cost, or a donation to the school district is made. School districts may seek funding internally within their own school budgets as well as seek support from other sources. However, the provision of assistive technology devices and services as determined necessary by the Team must not be delayed by efforts to obtain outside funding and/or donations. If parents utilize their insurance coverage, then the parents must not be responsible for paying their insurance deductible and must not be compelled to have home owners insurance to cover the assistive device(s). In short, there must be no cost to the parents.

**Question 5:** Is the school district obligated to provide state-of-the-art technology for students with disabilities?

**Answer:** No, the school district is not obligated to provide state-of-the-art technology if the student's needs do not require it or if the student is unable to utilize it. A determination as to whether an assistive technology device or service is required in order for a student to receive a free appropriate public education (FAPE) must be made on an individual basis, by the Team. If a specific device or service is necessary to enable the student to access the general curriculum in the least restrictive environment and to provide FAPE, then the district must provide the required device or service regardless of cost. However, if a less expensive device or service would accomplish the same goals, the IEP Team is under no obligation to choose the more expensive option.

**Question 6:** How should assistive technology be included in the IEP?

**Answer:** If the Team determines the need for assistive technology, the student's IEP should include information about the recommended assistive technology device(s) and service(s), along with the special education services, supplementary aids and services, or related services to be provided.

Assistive technology can be included in the IEP in a number of ways. Here are some examples:

- It can be included under the Student Present Levels of Educational Performance, page 2 of the IEP form. Example: *The student uses specially lined paper when there is written work that is not done on the computer.*

- It can be included as a goal statement when the student needs to develop technology skills in order to reach curriculum goals. Example: *The student will learn to use a word processing program with spelling, grammar, and punctuation checklist.*
- It can be part of a goal statement when assistive technology is needed to carry out specific goal(s). Example: *The student will use a cassette recorder to practice her oral language responses.*
- It can be included in the Service Delivery grid in section A, B, or C.  
Example:

Section A: Consultation

Focus on Goal #1

Type of Service: *Training for teachers and family members on student's augmentative communication software*

Type of Personnel: *Assistive Technology Specialist*

Frequency and Duration: *2 sessions at 30 minutes per session*

Start date: *September 1, 2002*

End date: *September 30, 2002*

**Question 7:** At what point in the IEP process should assistive technology be considered?

**Answer:** The current Massachusetts IEP development process requires the Team to consider assistive technology prior to developing a student's educational goals. In this way, the Team may be able to identify educational goals that would otherwise not have been attainable for the student with a disability.

**Question 8:** What professionals should be on the IEP Team?

**Answer:** The Team should include persons knowledgeable about the student, the meaning of the evaluation data, and the placement options. In addition, IDEA requires that a student be evaluated by a professional who is knowledgeable about assistive technology. However, recommendations for assistive technology devices and/or services can be made by any Team member.

**Question 9:** Is a school district obligated to allow a student to bring an assistive technology device home?

**Answer:** Maybe. If the IEP Team determines that a particular assistive technology device is required for home use in order for the student to be provided a free appropriate public education (FAPE), and this is communicated in the Individualized Education Program (IEP), then the device must be provided and allowed to go home in order to implement the IEP. Discussion regarding liability while the device is at home needs to be held and recorded in the IEP.

**Question 10:** Can schools require students to bring a family-owned assistive technology device(s) to school?

**Answer:** No. There is no barrier to a student bringing his or her assistive technology device from home to school, but schools have no authority to mandate that this occur. If the family agrees to allow the device to travel from home to school, then a discussion regarding liability while the device is transported to or is at school needs to be held and recorded in the Individualized Education Program (IEP). If a separate rider is necessary for the device to be covered under the family's insurance, then the school district should reimburse the family for this coverage. The family can and may insist that schools provide the necessary devices as part of the student's IEP even if the student has identical device(s) at home.

**Question 11:** Is a school district responsible for retaining, repairing, or replacing assistive technology devices?

**Answer:** If purchased or secured by the school district, then the school district should retain, repair, or replace assistive technology devices, as long as the student requires them in order to receive a free appropriate public education (FAPE). It is suggested that the special education administrator or his/her designee examine all warranties and contracts that may accompany specific devices. Additionally, if the student's family has provided an assistive technology device that the Team has identified as necessary for the provision of FAPE and has included in the IEP, then the school district, with the agreement of the family, may use the device at school and is responsible to repair or replace the device if necessary.

**Question 12:** What is the responsibility of a school district when parents elect to purchase a needed device on their own and the family-owned device is written into the IEP?

**Answer:** Federal law is silent on this issue. However, it is reasonable to expect a school district to assume liability for an assistive technology device that is family-owned, but used to implement a student's IEP, either in school or at home. In the absence of the family assuming financial responsibility, a school district would be required to provide and maintain a needed assistive device that was written into the IEP. In circumstances where the family has provided the original device, the Department recommends that the school district clarify in its agreements with the family whether the family retains ownership of the device in the case of replacement.



**Question 13:** In addition to the student, who else should receive training on how to use the assistive technology devices?

**Answer:** Use of assistive technology without integration into the student's individual goals and objectives will result in less than optimal outcomes for the student. Individuals who live, work, or play with the student should be a part of this process. For a student with a disability it is often not enough to have the classroom teacher and specialists be the only ones trained in the use of the device. If the device is to be meaningfully integrated into the student's life and general curriculum, significant people such as family members and peers need to be familiar with the assistive technology. Often very limited instruction is needed.

**Question 14:** How can a staff member receive individualized training for a specific need?

**Answer:** In general, if the IEP Team specifies the use of an assistive technology device, it is the district's responsibility to train appropriate staff members, peers, and family members, depending on the individual need(s) of the student. In addition to a district-wide professional development plan, special circumstances might arise when it becomes necessary for individuals involved with a specific student to learn how to operate and integrate a device. It is the district's responsibility to either bring in a trainer or offer release time, tuition reimbursement, or pay conference fees for staff to get the necessary training elsewhere. Any training that is needed should be specified in the Service Delivery grid on the IEP.

**Question 15:** If a student requires the use of an assistive technology device(s), what happens to the device(s) when the student graduates?

**Answer:** Transition planning for technology users is particularly challenging because there is no legal requirement for the transfer of ownership for an assistive technology device from the school to the individual student or to an adult agency upon graduation. Under state and federal law, public schools assume financial responsibility for the assistive technology device and services, but as a student transitions to adult life, the financial responsibility ends, and possession of the device reverts to the school. While there are no formal state policies in place, there is nothing to prohibit creative arrangements that support a seamless transfer of technology as a student graduates. One strategy to consider is a collaboration with an adult agency to purchase the technology while the student is still in special education or to purchase it from the school district upon graduation.

# Assistive Technology Resources

---

## Federal Laws

### **Individuals with Disabilities Education Act**

<http://idea.ed.gov/download/finalregulations.html>

### **Americans with Disabilities Act**

<http://www.usdoj.gov/crt/ada/adahom1.htm>

### **Section 504 of the Rehabilitation Act**

<http://www.ed.gov/offices/OCR/disability.html>

## Evaluating the Need for Assistive Technology

### **Wisconsin Assistive Technology Initiative (WATI) Assessment Forms**

<http://www.wati.org/assessmentforms.htm>

These forms are used by many school districts across the country to help determine what assistive technology, if any, might help a specific student.

### **Introduction to the SETT Framework**

<http://sweb.uky.edu/~jszaba0/SETTintro.html>

Subtitled “Critical Areas to Consider When Making Informed Assistive Technology Decisions,” this framework is widely used when assessing the need for assistive technology.

### **Boston Public Schools Access Technology Center**

<http://www.boston.k12.ma.us/teach/technology/emmanuel.asp>

This site has a tool called the Student Access Map (SAM), which is useful for determining appropriate technology supports to aid students in addressing the curriculum standards.

## Using and Supporting Assistive Technology

### **LDOnline: Technology**

[http://www.ldonline.org/ld\\_indepth/technology/technology.html](http://www.ldonline.org/ld_indepth/technology/technology.html)

Created by the PBS station WETA, this site includes articles about assistive technologies, online videos showing students using assistive technology, and other resources.

## **QIAT Consortium at the University of Kentucky**

<http://www.qiat.org>

QIAT (Quality Indicators for Assistive Technology) is a national, grassroots group of people who provide input into the ongoing process of developing, disseminating, and implementing a set of quality indicators for assistive technology services. These indicators offer guidelines for districts wishing to improve their services.

## **Universal Design in the Classroom**

### **CAST**

<http://www.cast.org/teachingeverystudent/>

CAST is a Massachusetts organization internationally known for its expertise in universal design and its efforts to expand opportunities for all people, especially those with disabilities. Its Web site includes a variety of resources for educators, including the full text of the book on universal design, *Teaching Every Student in the Digital Age* by David Rose and Anne Meyer.

### **Is Special Education the Right Service?**

[http://www.doe.mass.edu/sped/2001/elig\\_drft01.pdf](http://www.doe.mass.edu/sped/2001/elig_drft01.pdf)

In this document, the Massachusetts Department of Education offers guidance on providing a responsive general education environment, including suggested ways to adapt the curriculum to meet the needs of a diverse student body.

## **Using Digital Text**

### **Using Text-to-Speech Technology Resource Guide**

<http://ves.mass.edu/cast/index.htm>

This resource guide provides information about free and low-cost text-to-speech software, sources for acquiring digital text, technical tips, and classroom ideas.

The guide was developed by CAST (Center for Applied Special Technology) as part of Project MEET, a statewide professional development project.

## **Assistive Technology Tools**

### **ABLEDATA**

<http://www.abledata.com/>

ABLEDATA is a federally funded project designed to provide information on assistive technology and rehabilitation equipment. Its database lists thousands of products, from low-tech to high-tech devices. Its listings contain detailed descriptions of each product, pricing information, and links to the manufacturers' and distributors' Web sites.

### **Boston Public Schools Access Technology Center**

<http://www.boston.k12.ma.us/teach/technology/emmanuel.asp>

This site offers a downloadable version of the Center's publication entitled *Supports Lists: Tools and Strategies to Support Access to Standards-Based Learning for Diverse Learners*. This document provides categorized lists of no-tech, low-tech, mid-tech, and high-tech tools and strategies that can address barriers to student learning in various areas.

## **Accessibility Features in Software**

### **Designing More Usable Computers and Software**

[http://www.trace.wisc.edu/world/computer\\_access/](http://www.trace.wisc.edu/world/computer_access/)

This resource page from The Trace Center at the University of Wisconsin offers links to information about accessibility features in operating software, as well as lists of freeware and shareware that increase accessibility to computers.

## **Using Online Materials**

### **Finding Digital Content**

<http://www.cast.org/udl/FindingDigitalContent389.cfm>

This Web page from CAST (Center for Applied Special Technology) offers resources to help educators locate and use electronic texts. These include a specialized search engine, a list of other resources on the Web, and tips on working with digital text in different formats.

### **The Web Accessibility Initiative**

<http://www.w3.org/WAI/gettingstarted/>

The Web Accessibility Initiative (WAI), in coordination with organizations around the world, pursues accessibility of the Web through five primary areas of work: technology, guidelines, tools, education and outreach, and research and development.

### **National Center for Accessible Media**

<http://ncam.wgbh.org/index.html>

Based at WGBH in Boston, this research and development organization studies issues of media and information technology for people with disabilities. Its Web site includes guidelines for making online resources accessible to learners with disabilities.

## Professional Development in Assistive Technology

The following service providers have provided assistive technology professional development for districts receiving technology grants. They offer their services to other districts for a fee.

**Collaborative Center for Assistive Technology & Training at HEC**  
<http://www.collaborative.org/ccattcenter.html>

**Institute for Community Inclusion (ICI) at UMass/Boston**  
<http://www.ici.umb.edu/AT/index.html>

**Massachusetts Elementary School Principals' Association**  
<http://www.mespa.org/mtc/assistive/about.html>

## Statewide Technology Initiatives

**Massachusetts Department of Education – Educational Technology**  
<http://www.doe.mass.edu/edtech/>

This Web site offers information about technology planning, standards, grants, projects, conferences, and other resources. The site also includes the annual *EdTech* report, which provides statistics about the use of technology in Massachusetts schools.

## Student Assessment

**Requirements for the Participation of Students with Disabilities in MCAS**  
<http://www.doe.mass.edu/mcas/2002/news/107spedreq.html>

This publication outlines various options for student participation in MCAS and the process by which decisions should be made. It also provides a list of standard and non-standard test accommodations that can be used by students with disabilities on MCAS tests and provides a brief overview of the MCAS Alternate Assessment.

**MCAS Alternate Assessment**  
<http://www.doe.mass.edu/mcas/alt/>

This resource provides information, guidelines, and materials needed to prepare student portfolios for submission to the Massachusetts Department of Education. This alternate assessment is intended for a small number of students who are unable to take standard MCAS tests due to the nature and severity of their disabilities.

## Other State Programs and Services

### **Massachusetts Hospital School - Adaptive Design Services**

3 Randolph St. – Box 9

Canton, MA 02021

781-830-8714

### **Massachusetts Hospital School - Computer Software Services**

3 Randolph St. – Box 9

Canton, MA 02021

781-830-8780

Jon Adams, Special Education Teacher

### **Vision Resources Library**

Massachusetts Hospital School

3 Randolph St. – Lower Baylies Cottage

Canton, MA. 02021

781-575-1843 or 781-575-9313

# Acknowledgments

---

This guide was written by:

Susan Hargrave, Instructional Technology Specialist

The following Massachusetts Department of Education staff also contributed to the development of this guide:

Richard Knox, Director, Educational Services in Institutional Settings

Connie Louie, Director, Office of Instructional Technology

Marcia Mitnacht, Director, Office of Special Educational Planning and Policy Development

Sandra Stotsky, Senior Associate Commissioner, Center for Teaching and Learning

Dan Wiener, Assessment Coordinator for Special Student Populations

The following sabbatical teachers participated in the development of this guide:

Joan Ciampa, Peabody Public Schools

Eleanor Kent, Swampscott Public Schools

The Massachusetts Department of Education wishes to thank the Maine Department of Education for allowing us to adapt and reprint questions from its publication, *Commonly Asked Questions About Assistive Technology Devices and Services: An Educators', Parents' and Advocates' Guide*.

The Department of Education also wishes to thank the Massachusetts educators and students who shared their knowledge and experiences with us as we prepared this report.