

76. TECHNOLOGY: STANDARDS, CURRICULUM, INTEGRATION, ASSISTIVE TECHNOLOGIES

ALABAMA ADMINISTRATOR TECHNOLOGY STANDARDS

The Administrator shall learn to effectively:

- i. Describe mechanisms for creating a shared vision for the comprehensive integration of technology, communicating that vision, and facilitating a process that fosters and nurtures a culture to achieve the vision.
- ii. Develop a technology plan including resource alignment (e.g., funding, staff and time, hardware/ software, total cost of ownership) and demonstrate leadership skills necessary to integrate technology to support effective learning and administration.
- iii. Facilitate the selection and use of technologies appropriate for curriculum areas, instructional strategies, and student-centered learning environments to maximize learning and teaching to meet the individual needs of all learners.
- iv. Apply and model technology applications and professional practices that demonstrate: knowledge of available technologies; existing Alabama and national technology standards for students, teachers, and administrators; related trends and issues; current research, and; professional development resources in order to enhance professional practices of educational leaders, increase job-related technology use, and improve the productivity of self and other school personnel.
- v. Use prevalent technology-based managerial, financial, and operational systems used in Alabama schools.
- vi. Use technology to facilitate effective assessment and evaluation, including:
 - The collection, analysis, and interpretation of data and communication of findings to improve instructional practice and student learning;
 - The use of assessment of staff knowledge, skills, and performance in using technology to facilitate quality professional development and guide personnel decisions;
 - The use of technology to assess and evaluate managerial and operational systems; and
 - Assessment and evaluation of, using multiple methods, appropriate uses of technology resources for learning, communication, and productivity.
- vii. Demonstrate responsible decision- making that reflects understanding of social, legal, and ethical issues related to technology.

Alabama Code 290-640-030-.01: Approved by the Alabama Board of Education, August 12, 2004; effective, September 16, 2004.

ALABAMA TEACHER TECHNOLOGY STANDARDS/K-12

The Teacher shall learn to effectively:

- i. Identify and evaluate technology resources and technical assistance (i.e., those available on-line and on-site within a school and district setting).
- ii. Assess advantages and limitations of current and emerging technologies, and on-line/software content to facilitate teaching and student learning .
- iii. Develop and implement a classroom management plan to ensure equitable and effective student access to available technology resources.
- iv. Model safe, responsible, legal and ethical use of technology and implement school and district acceptable use policies including fair-use and copyright guidelines and Internet user protection policies.
- v. Design, implement, and assess learner-centered lessons and units that use appropriate and effective practices in teaching and learning with technology.
- vi. Use technology tools (including, but not limited to, spreadsheets, webpage development, digital video, the Internet, and email) for instruction, student assessment, management, reporting purposes and communication with parents/guardians of students.
- vii. Facilitate students' individual and collaborative use of technologies (including, but not limited to, spreadsheets, webpage development, digital video, the Internet, and email) to locate, collect, create, produce, communicate, and present information.
- viii. Design, manage, and facilitate learning experiences incorporating technologies that are responsive to diversity of learners, learning styles and special needs of all students (e.g., assistive technologies for students with special needs).
- ix. Evaluate students' technology proficiency and students' technology-based products within curricular areas.
- x. Use technology to enhance professional growth (e.g., through accessing web-based information, on-line collaboration with other educators and experts, and on-line professional courses).

http://www.alsde.edu/html/sections/section_detail.asp?section=61&footer=sections

ALABAMA STANDARDS FOR INSTRUCTIONAL LEADERS STANDARD 6 - TECHNOLOGY

Standard 6: Rationale

This standard addresses the need for effective leadership for technology in schools. An underlying assumption of this standard is that instructional leaders should be competent users of information and technology tools common to information-age professionals. The effective educational leader should be a hands-on user of technology. While technology empowers instructional leaders by the information it can readily produce and communicates, it exponentially empowers the instructional leader who masters the tools and processes that allow creative and dynamic management of available information.

Instructional leaders who recognize the potential of technology understand that leadership has a responsibility to ensure technological equity. They must also know that technology can unlock tremendous potential in learners and staff with special and diverse needs.

Standard 6: Technology

Plans, implements, and evaluates the effective integration of current technologies and electronic tools in teaching, management, research, and communication.

Standard 6: Key Indicators

1. Ability to implement a plan for the use of technology, telecommunications, and information systems to enrich curriculum, instruction, and assessment
2. Ability to develop a plan for technology integration for the school community
3. Knowledge to discover practical approaches for developing and implementing successful technology planning
4. Ability to model the use of technology for personal and professional productivity
5. Ability to develop an effective teacher professional development plan to increase technology usage to support curriculum-based integration practices
6. Ability to promote the effective integration of technology throughout the teaching and learning environment
7. Knowledge to increase access to educational technologies for the school
8. Ability to provide support for teachers to increase the use of technology already in the school/classrooms
9. Ability to use technology to support the analysis and use of student assessment data (http://www.alsde.edu/html/sections/doc_download.asp?section=70&id=3577)

National Education Technology Plan

“No Child Left Behind requires the Secretary to update and publish a national long-range technology plan, based on an assessment of the continuing and future needs of the nation’s schools in effectively using technology to provide all students the opportunity to meet challenging state academic standards. The plan highlights 7 action steps that states, districts and schools can take to evaluate their use of technology to improve student achievement”

(<http://www.ed.gov/about/offices/list/os/technology/facts.html>). The plan was released in January 2005 and can be accessed at <http://www.nationaledtechplan.org/>

Alabama State Department of Education Technology Initiatives

ACCESS Distance Learning

“ACCESS is a statewide distance learning initiative that provides high-quality classroom courses and teachers, via technology. Full implementation of ACCESS in the Fall of 2006 will ensure Alabama students, especially those in smaller, rural schools, will have

the ability to take advanced level courses and electives that might not otherwise be available to them” (www.accessdl.state.al.us).

Alabama Learning Exchange (ALEX)

“Alabama’s educational web portal where teachers and administrators can find courses of study, lesson plans, and web resources aligned to Alabama Course of Study content standards” (www.alex.state.al.us).

ALT4 Project – Teens & Teachers Teaming for Technology

“The T4 Alabama Project involves over 50 schools in Alabama which offer an innovative class where students learn technical and collaborative skills necessary to partner with one of their teachers to develop technology-infused lesson plans aligned to district or state curriculum standards” (www.alsde.ua.edu).

APT PLUS

More than 4,000 educational programs for classroom use anytime--FREE for Alabama teachers. (<http://www.aptv.org/Learning/APTPlus/index.asp>)

E-Rate/Children’s Internet Protection Act (CIPA)

“In general terms the E-Rate program is a program by which schools and libraries may apply to receive 20%-90% discounts off of telecommunications, Internet access, internal connections and basic maintenance on internal connections” (<http://erate.alsde.edu/>).

Technology in Motion

The mission of Technology in Motion is “To provide professional development that enables educators to become and remain proficient in the use of technology so they can better facilitate learning” (<http://www.technologyinmotion.state.al.us/>).

Alabama’s K-12 Technology Education Curriculum

National Educational Technology Standards for Students

The *National Educational Technology Standards for Students*, produced by the International Society for Technology in Education (ISTE), have established technology literacy as a national goal. The six strands as defined by ISTE are: (1) basic operations and concepts; (2) social, ethical, and human issues; (3) technology productivity tools; (4) technology communications tools; (5) technology research tools; and (6) technology problem-solving and decision-making tools.

The Code of Alabama

The *Code of Alabama* (1975) §16-35-4, specifies the minimum required content standards students need for achieving technology literacy. These content standards are consistent with the ISTE standards. In developing local curriculum, school systems may go beyond the minimum standards.

The Alabama Course of Study: Technology Education

The *Alabama Course of Study: Technology Education* defines the minimum required content needed by students for achieving technology literacy in the State of Alabama. The contents are consistent with the requirements of both the *Code of Alabama* (1975), §16-35-4 and the *National Educational Technology Standards for Students*. At a minimum, implementing the Course of Study involves making decisions about integrating technology into all areas of the curriculum, about where computers should be physically located, and about how to assess student performance. The Course of Study can be found on the Alabama State Department of Education's web site at: (<http://www.alsde.edu/html/sections/documents.asp?section=61&sort=7&footer=sections>)

Integrating Technology into the Curriculum: A Definition

The technology content standards are designed to enhance learning within and across all curricula. The International Society for Technology in Education describes the curricular integration of technology as follows: "Curriculum integration with the use of technology involves the infusion of technology as a tool to enhance the learning in a content area or multidisciplinary setting. Technology enables students to learn in ways not previously possible. Effective integration of technology is achieved when students are able to select technology tools to help them obtain information in a timely manner, analyze and synthesize the information, and present it professionally. The technology should become an integral part of how the classroom functions—as accessible as all other classroom tools" (*National Educational Technology Standards for Students*, p. 6).

Where Should Computers be Located?

Integration of technology into the classroom does not require a computer lab. Nevertheless, computer labs are recommended for every school. In classrooms with one computer, placing the computer in a central location available to all learners is recommended. With three to five computers in the classroom, creating computer stations with two chairs around each computer is recommended in order to promote collaboration and cooperative learning. For greatest accessibility by students, computers should be available for use in each classroom and in the library media center as well as in the computer lab.

How Should Technology Literacy be Assessed?

No Child Left Behind requires that all students be technology literate by the time they finish the 8th grade. To support this requirement, the Department of Education provided assistance to the 21st Century Skills Forum. The Forum is a public-private partnership among government, business and education, which "created a framework to define technological literacy and 21st century skills; identify best practices for applying these skills in the classroom; provide assistance to states and schools to see how these skills

and basic skills can be taught in complementary ways; design a self-assessment tool on technological literacy and 21st century skills; create tools to define, teach, and assess 21st century skills” (<http://www.ed.gov/about/offices/list/os/technology/facts.html>). The framework can be found at <http://www.21stcenturyskills.org/>.

The intertwining of the knowledge, processes, and applications of technology in the standards necessitates a variety of assessment methods to ensure that all students, including students with disabilities, acquire the needed knowledge of technology and skills of technology use. Assessment must include the use of a variety of assessment instruments such as multiple-choice items, pre- and post-exams of performance, checklists, open-ended essay items, journals, lab reports, creative dramatics, verbal explanations, portfolios, and projects.

Integration into Classroom Practice

Technology integration into K-12 classrooms refers to the use of technologies within subject areas of the curriculum to enhance learning. The technology should not drive the curriculum, but rather the curriculum should drive the technology. Technology should be used as a tool to support and enhance instruction, not an end in itself. Technology integration is an ongoing process and will never be complete as new technologies are continuing to be developed that will lend themselves to educational uses.

Types of Technologies

Technologies generally used in the classroom include hardware, software, e-mail and the Internet. Types of hardware include computers, printers, scanners, digital cameras, assistive technologies, projection systems, and personal digital assistants (PDAs). Types of software include operating systems and application software. Application software has been categorized in a number of ways, generally by its function. Software used for instruction has been called computer-assisted instruction (CAI), while software used for classroom management has been referred to as computer-managed instruction (CMI). Computer-assisted instruction software includes:

- *Drill and Practice* - Provides repetitive practice for factual information and skills. Most current software programs are not truly just drill and practice. They teach skills such as ABCs at the same time that they practice them. Many games also include drill and practice within the game. Examples include *Millie & Bailey Preschool* (Edmark) and *Schoolhouse Rock* (The Learning Company).
- *Tutorial* - Interactive software that teaches new concepts and/or skills. Many types of software (e.g., *Microsoft Windows*), have built-in tutorials demonstrating

how to use the software. There are also many tutorials available on the Internet (e.g., creating web pages - <http://www.webteacher.org/windows.html>; Amphibian Embryology - <http://worms.zoology.wisc.edu/frogs/welcome.html>; Technology Tutorials for Teachers <http://www.internet4classrooms.com/on-line2.htm>)

- *Simulation* - Interactive, computerized models of real life situations or objects. Users can manipulate various aspects of the model and see the results. Examples include *SimCity* (Electronic Arts) and *Zoo Tycoon* (Microsoft).
- *Problem-Solving* - Interactive software used to enhance the teaching and learning of higher-order problem-solving strategies. Emphasis is placed on critical thinking, analysis, logic and reasoning. This software is similar to simulation software, but does not necessarily model real-life situations or objects. Problem-solving software is available for most grade and age levels. Examples include *Logical Journey of the Zoombinis* (The Learning Company), *Pajama Sam* (Humongous Entertainment), *ClueFinders* (Broderbund) and *Decisions, Decisions 5.0* (Tom Snyder Productions).
- *Instructional Games* - Instructional games can be found in all the other areas of CAI. They may consist of any combination of drill and practice, tutorial, simulation and problem-solving. Software given as examples in the other areas are also considered games (*SimCity*, *Zoo Tycoon*, *Zoombinis*, etc.).
- *Tools* - Tool software includes word processing, spreadsheets, databases, graphics, multimedia authoring and presentation programs and can also be classified as CMI software. It is used by students for a variety of educational activities and also by teachers for classroom management.
- *Integrated Learning Systems* - Comprehensive software packages that provide both computer-assisted instruction and computer-managed instruction. They typically provide individualized instruction and include student diagnostic data, instruction based on the diagnostic data, monitoring of student performance, and multi-level and multi-grade content.

Before software is used to support the curriculum, it should be evaluated for appropriateness and value in supporting the curriculum. Many evaluation schemes are available. Generally, evaluation of software should include examining the following areas:

- Software title
- Subject area the software will support
- Publisher
- Date published
- Goals of the software
- Objectives
- Prerequisite skills
- Hardware and operating system requirements
- Installation space requirements
- Memory requirements

- Type of software (i.e., drill and practice, etc.)
- Grade or age level
- Which content and technology standards are covered
- Content (accuracy, appropriateness, meets goals and objectives, curriculum support, free of bias and stereotypes)
- Navigation (logical, exit from screens, return to screens)
- Ease of use
- Appropriateness of graphics, sound and video
- Cost-effectiveness of software
- Types of licenses available
- Availability and ease of use of help functions

Sites Available on the Internet

- Children's Technology Review (<http://www.childrensoftware.com>)
- All Star Review (<http://www.allstarreview.com/mecc.html>)
- Superkids Educational Software Review (<http://www.superkids.com/>)

The Internet and e-mail can be used in the classroom to provide constructivist activities by presenting students with opportunities for communicating and working collaboratively with people from around the world, conducting research, publishing their own writing, reading other students' writing, and accessing a wealth of projects and activities available on the Internet. Such opportunities enrich and improve the learning environment by connecting classrooms to outside resources, experts, new curricula, and communication avenues. E-mail provides opportunities for working collaboratively using on-line discussion groups, electronic penpals, student-to-student projects, class-to-class projects, and school-to-school projects. E-mail allows communication with virtually anyone in the world who also has e-mail, and e-mail discussions strengthen students' higher order thinking skills as they think about the best way to communicate their ideas in a public forum. The Internet provides opportunities for virtual fieldtrips, research projects, webquests, and experiencing scientific explorations as they take place. There are many web sites created specifically for educators that provide lesson plans, tutorials, professional development opportunities, and software programs.

Many individuals use the terms Internet and World Wide Web (WWW) or Web interchangeably, but the World Wide Web is actually just one aspect of the Internet. The Internet has been in existence since the early 1960s, but the Web made its appearance in the early 1990s. The Web consists of electronic documents from all over the world containing hyperlinks to other related documents. These links allow users to navigate from one Web site or page to another with relative ease. A Web page is an electronic document containing text, graphics, video and/or audio and hyperlinks, and a Web site is a collection of related Web pages. Every Web page has a unique address called a Uniform Resource Locator (URL) that consists of a protocol (http, which stands for hypertext transfer protocol), a domain name that identifies the computer on which the Web page is stored (i.e., www.ua.edu), a directory path that identifies where on the

computer the Web page is stored, and the name of the Web page. For example, a Web page for a university course might be <http://www.ua.edu/AEL556/index.html>. Not all addresses will have a directory path or name -- the Alabama Department of Education's main Web page can be accessed at <http://www.alsde.edu>.

Web pages or sites used in the classroom should be evaluated for appropriate content, etc. Evaluation of web sites typically includes examination of the following areas:

- Whether author's name and e-mail address are included on the page
- Information about the author(s) of the web site
- Information about the producer(s) of the web site
- Date when the web site was created
- Date when the web site was last updated
- Type of site (e.g., edu, org, net, etc.)
- Purpose of the web site
- Intended audience
- Content (accuracy, appropriateness, meets goals and objectives, curriculum support, free of bias and stereotypes)
- Navigation
- Reliability of information presented
- Documentation of web site
- How quickly the web site loads
- Appropriateness of graphics, audio and video

Classroom vs. Computer Lab

There are varying opinions on whether students are better served by having computers available in a classroom or having students move to a computer lab for computer-based activities. Many schools find it more cost effective to create computer labs where teachers can take an entire class for a class period. Most schools also have media centers that can be used by students. However, research indicates that technologies are more effective when they are integrated into subject content and are located in the classroom where they are available and easily accessible by teachers and students throughout the day. For example, if a teacher is conducting a lesson on space and students begin to ask questions, with a computer in the classroom, the teacher could easily access the Internet and find additional information about space. The availability of the technology is important to that "teachable moment," which would be lost if the teacher has to wait until the students can get to the computer lab.

While it would be ideal to have several computers in each classroom, many classrooms contain only one computer, which is still beneficial. In these classrooms, with the addition of some type of projection system, the computer can be used for classroom presentations and demonstrations by teachers and students. Students could also be rotated in groups to conduct research, writing activities, Internet-based projects and e-mail. This would also engage the students in collaborative activities. Many schools

also have carts of wireless notebooks, Alpha Smarts or Danas that can easily be moved from classroom to classroom. Research is currently being conducted on the use of PDAs in classrooms as a less expensive way to provide access.

Barriers to Technology Integration

When attempting to integrate technology, teachers typically encounter barriers such as a lack of or inadequate training and staff development in using the technology, knowledge of how to integrate technology into the curriculum, teacher pedagogical beliefs, access to equipment, time to learn and practice technologies, and administrative support (Brzycki & Dudt, 2005; Faison, 1996; Laffey & Musser, 1998; Langone, Wissick, Langone, & Ross, 1998; Myrhe, 1998; Siegel, 1995; U.S. Congress, Office of Technology Assessment, 1995). Brzycki and Dudt (2005) hold that not only do these barriers persist, but they tend to reappear with new technologies.

When exploring the technology use challenges faced by public K-12 teachers, the U. S. Department of Education (2000) found that 83% of the teachers surveyed reported a lack of release time to learn, practice, and plan ways to use computers and the Internet in the classroom; 68% reported a lack of support for integrating technology into the curriculum; 66% reported a lack of training opportunities; 64% reported a lack of technical support or advice; and 43% reported a lack of administrative support. Sheingold and Hadley (1990) maintained there are three conditions that need to be met before teachers successfully adopt technology: (a) computers are accessible to teachers and students, (b) teachers are supported in learning and planning to use technology, and (c) the school structure encourages technology use.

The school leader plays an important role in classroom technology. Norum (1999) reported that administrators have a critical role in technology integration and resulting changes in classroom practices. An administrator's support or lack of support for technology sends a message to the school community about technology's importance to that school or district.

Digital Divide

In the past, the Digital Divide has referred to the divide between those individuals with access to computers and those without access. Currently, the term is being used to refer to the gap between those who know how to effectively use technologies and those who cannot.

When it comes to the digital divide, literacy is an issue that is often overshadowed by access. But think of it this way: if every family, every community had Internet access tomorrow, would the digital divide be solved? Unfortunately, the answer is no. Unless all

citizens are able to learn and apply a wide set of literacy skills, mere access to technology will mean very little to them (Wilhelm, Carmen, & Reynolds, 2002).

Statistics from a U.S. Department of Commerce report (2000) showed that despite efforts to affect a decrease, the digital divide is increasing. Swain and Pearson (2002) view the digital divide as stemming from “ethnicity and socioeconomic status” (p. 327). Holloway (2000) discussed a survey conducted by the National Center for Educational Statistics that showed that in schools with high concentrations of poverty, 39% of the instructional classrooms had Internet access, while in schools with lower concentrations of poverty, 74% of the instructional classrooms had Internet access.

Swain and Pearson maintain that it is up to educators to decrease the Digital Divide and that the “implementation of technology standards may facilitate or act as a catalyst in this process” (p. 326). Professional development for teachers is one aspect of working toward decreasing the digital divide. Teachers who integrate technology into the curriculum are teaching students how to use the technologies for learning.

Professional Development

According to a U.S. Department of Education report (2000), states and school systems should make technology-related professional development a priority. The report stated that there is a need to “increase the quantity, quality, and coherence of technology-focused activities aimed at the professional development of teachers” (p.6). Alabama currently has "Twelve (12) Standards for Effective Professional Development in Alabama" adopted on June 13, 2002. Alabama also has administrative technology standards related to professional development:

- **Ability to: (ii)** develop a technology plan including resource alignment (e.g. funding, staff and time, hardware/software, total cost of ownership), and demonstrate leadership skills necessary to integrate technology to support effective learning and administration.
- **Ability to: (iv)** apply and model technology applications and professional practices that demonstrate knowledge of available technologies; existing Alabama and national technology standards for students, teachers, and administrators; related trends and issues; current research; and professional development resources in order to enhance professional practices of educational leaders, increase job-related technology use, and improve the productivity of self and other school personnel.

Myhre (1998) conducted a case study involving a mathematics teacher's classroom practices. Myhre concluded that the preparation for technology use by teachers has focused on hardware and software rather than addressing the use of computers in conjunction with the teachers' understanding of subject matter and pedagogy, which the

author believes is not sufficient for changing classroom practices. Professional development opportunities need to include not only learning how to use technologies, but learning about pedagogy and how the technologies can be used to enhance learning. Alexander (1999) suggested that teachers need to develop new pedagogical skills and that these skills should be constructivist in nature and use collaborative teaching.

Administrators need to develop a plan for professional development. Components of effective professional plans include providing a variety of learning experiences; active participation; hands-on activities; ensuring a connection of what is learned to student learning; learning applications specific to the curriculum; sufficient time for learning, practicing, and planning; technology support; administrative support; adequate resources; funding; evaluation; and the opportunities should be ongoing, not just a one-time workshop.

Online professional development has become a more widely accepted alternative for teachers in the last decade. The U.S. Department of Education has created an e-Learning professional development web site as part of its Teacher-to-Teacher Initiative at (<http://www.ed.gov/teachers/how/tools/initiative/index.html>). This website provides free training for teachers focused on content knowledge and instructional skills; 32 digital workshops on a wide variety of topics, including elementary-level reading, vocabulary, reading in content areas, algebra, turning data into information, and differentiated instruction; and a searchable database of more than 1,500 free teaching resources and lesson plans.

There are a number of professional development opportunities provided by a variety of organizations in Alabama as well as on the Internet. They are listed under Web Resources below.

Web Resources

- Alabama Learning Exchange (ALEX) - <http://www.alex.state.al.us>
- Alabama Regional Inservice Centers - <http://aric.uab.edu/>
- Alabama Virtual Library (AVL) – <http://www.avl.lib.al.us>
- Intel Teach to the Future - <http://www97.intel.com/education/teach/in-service.htm>
- MarcoPolo Internet Content for the Classroom - <http://www.mped.org>
- Digital Divide Network - <http://www.digitaldividenetwork.org>
- North Central Regional Educational Laboratory (NCREL) - Technology Professional Development - <http://www.ncrel.org/sdrs/areas/pd0cont.htm>, <http://www.ncrel.org/tech/tpd>
- Technology in Motion - <http://www.technologyinmotion.state.al.us/>
- Technology Tutorials for Teachers - <http://www.internet4classrooms.com/online2.htm>

Software Resources

ClueFinders – Broderbund (<http://www.broderbund.com>)
Decisions, Decisions - Tom Snyder Productions (<http://www.tomsnyder.com>)
Millie & Bailey Preschool – Edmark (<http://www.scholastic.com>)
Pajama Sam - Humongous Entertainment (<http://www.kidsclick.com/humongous.htm>)
SchoolHouse Rock – The Learning Company (<http://www.learningcompanyschool.com/>)
SimCity -Electronic Arts (<http://www.simcity.ea.com>)
Zoo Tycoon – Microsoft (<http://www.microsoft.com/games/zootycoon/>)
Zoombinis - The Learning Company (<http://www.learningcompanyschool.com/>)

Technology-related Terminology

Asynchronous: literally means “not at the same time.” Blogs, threaded discussion boards and emails are examples of asynchronous technology tools. An asynchronous distance education course is one in which the instruction is delivered at one time and the work can be done at a different time.

Blog: A weblog, or blog, can be defined as an Internet diary. Weblogs (blogs) enable users to publish comments, images and ideas instantly for other people to read. Bloggers frequently include weblinks to other materials to enrich the content of their postings. Teachers and students may use blogs to extend class discussions, pursue collaborative projects, publish the products of their work, or communicates with parents, experts, students in other schools, etc. Free, easy-to-use weblog services like blogger make it simple for the non-expert to create a blog. For additional information on blogging see <http://www.blogger.com/start> and <http://www.blogwise.com/>.

Filtering: Filtering is the process of controlling access to a network by analyzing the incoming and outgoing packets of information from the Internet. School systems often use filters to guard against certain content reading students.

Podcasting: Podcasting is a method of distributing multimedia files, such as audio or video programs, over the Internet for playback on mobile devices and personal computers. Podcasts are often distributed using “rich site summary (RSS)” feeds. Teachers and students use tools like digital recorders and editing software to produce audio/video “podcasts” about things they are learning and classroom activities. Information about podcasting for educators and students is available from <http://www.stager.org/podcasting> and <http://www.blogwise.com/>.

Rich Site Summary (RSS): Anyone who creates Web content (webpages, blogs, wikis, etc.) can use RSS software to create a data feed that supplies headlines, links and article summaries to others who subscribe to your content source. Most free

blogging services include simple directions for including an RSS feed in your blog. Those who want to keep track of your new blog entries will subscribe, often by creating an account at a free “aggregator” service like Bloglines. A daily visit to your bloglines account will show you summaries of all new material at the blogs, wikis, webpages, etc. you subscribe to. Two sources of information about RSS and social software include <http://ripmixlearn.blogspot.com/> and <http://snipurl.com/DWandRSS>.

Social Networking: Social network theory emerged in the 1950s to describe the ways people are connected together through family, work, community, etc. In the context of Internet technology and the Web, social networking refers to the communications and relationships that develop through the use of social software—Internet, applications that help connect friends, business partners, teachers, students and others together using a variety of technological tools.

Social Software: Web-based tools that promote social networking, allowing people to connect and collaborate and to form online communities. Early examples of social software include email listservs, message boards, and similar sites. More recent examples range from publishing tools like blogs and wikis, to information sharing sites like Flickr or Delicious, to social network services like MySpace or eHarmony.

Wiki: Wiki is the Hawaiian word for quick. A wiki is a web site that anyone can edit at any time. Users can easily add, remove, or otherwise edit all content on a wiki page, very quickly and easily. This ease of interaction and operation makes a wiki an effective tool for collaborative writing, brainstorming, and project development. Typically, a wiki website provides an easy way to monitor changes and restore earlier versions of pages. Some free wiki services offer the option of password protection to prevent non-participants from editing pages. Information about Wikis can be found at <http://wiki.org/>.

References

- Brzycki, D. & Dudt, K. (2005). Overcoming barriers to technology use in teacher preparation programs. *Journal of Technology and Teacher Education*, 13(4), 619-641.
- Faison, C. L. (1996). Modeling instructional technology use in teacher preparation: Why we can't wait. *Educational Technology*, 36(5), 57-59.
- Laffey, J., & Musser, D. (1998). Attitudes of preservice teachers about using technology in teaching. *Journal of Technology and Teacher Education*, 6(4), 223-241.

- Langone, C., Wissick, C., Langone, J., & Ross, G. (1998). A study of graduates of a technology teacher preparation program. *Journal of Technology and Teacher Education*, 6(4), 283-302.
- Myhre, O. R. (1998). I think this will keep them busy: Computers in a teacher's thought and practice. *Journal of Technology and Teacher Education*, 6(2/3), 93-103.
- Norum, K. E., Grabinger, R. S., & Duffield, J. A. (1999). Healing the universe is an inside job: Teachers' views on integrating technology. *Journal of Technology and Teacher Education*, 7(3), 187-203.
- Sheingold, D. & Hadley, M. (1990). *Accomplished teachers: Integrating computers into classroom practice*. New York: Bank Street College of Education.
- Siegel, J. (1995). The state of teacher training: The results of the first national survey of technology staff development in schools. *Electronic Learning*, 14(8), 43-53.
- U. S. Congress, Office of Technology Assessment. (1995, April). *Teachers and technology: Making the connection*. OTA-EHR-616, Washington, DC: U.S. Government Printing Office.
- U.S. Department of Commerce. (2000). *Falling through the net III: Toward digital inclusion*. Retrieved on June 25, 2003 from <http://www.ntia.doc.gov/ntia>
- U. S. Department of Education. (December, 2000). *e-Learning: Putting a world-class education at the fingertips of all children*. The National Technology Plan. Washington, DC: The U.S. Department of Education. Retrieved on June 17, 2003 from <http://www.ed.gov/Technology/elearning/>
- Wilhelm, T., Carmen, D., & Reynolds, M., (2002). *Connecting kids to technology: Challenges and opportunities*, Annie E. Casey Foundation and Benton Foundation, http://www.aecf.org/publications/pdfs/snapshot_june2002.pdf.

Assistive Technologies

Definition

According to the Technology-Related Assistance for Individuals with Disabilities Act (Tech Act Legislation - P.L.100-407), which has been adopted in the Individuals with Disabilities Education Act (IDEA), an assistive technology device has been 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" [20 U.S.C. Chapter 33, Section 1401].

IDEA goes on to define assistive technology services to include "any service that directly assists an individual with a disability in the selection, acquisition, or use of an assistive technology device" [20 U.S.C. Chapter 33, Section 1401]. This law specifically mentions the following services:

- (A) the evaluation of the needs of such child, including a functional evaluation of the child in the child's customary environment;
- (B) purchasing, leasing, or otherwise providing for the acquisition of assistive technology devices by such child;
- (C) selecting, designing, fitting, customizing, adapting, applying, maintaining, repairing, or replacing of assistive technology devices;
- (D) coordinating and using other therapies, interventions, or services with assistive technology devices, such as those associated with existing education and rehabilitation plans and programs;
- (E) training or technical assistance for such child, or, where appropriate, the family of such child; and
- (F) training or technical assistance for professionals (including individuals providing education and rehabilitation services), employers, or other individuals who provide services to, employ, or are otherwise substantially involved in the major life functions of such child.
[20 U.S.C. Chapter 33, Section 1402]

This following site is designed to assist in answering questions about the **Individuals with Disabilities Education Act (IDEA)**: IDEA Practices (<http://www.ideapractices.org/>)

Why are Assistive Technologies Important?

There are many benefits to students who are disabled and given the opportunity to use assistive technologies. These include the development of a positive self-concept, increasing independence, inclusion in the regular classroom, strengthening of existing abilities, and improvement in academic performance.

What is the Involvement of Administrators?

The Alabama Technology Administrator Standards state that the higher education curriculum for administrators will provide prospective administrators with:

- *The knowledge of: (iii) technologies appropriate for curriculum areas, instructional strategies, and student-centered learning environments to maximize learning and teaching to meet the individual needs of all learners.*
- *The ability to: (iii) facilitate the selection and use of technologies appropriate for curriculum areas, instructional strategies, and student-centered learning environments to maximize learning and teaching to meet the individual needs of all learners.*

This means that administrators will need to be aware of

- The importance of Assistive Technologies
- The role these technologies play in providing students with disabilities equal educational opportunities and access to the same learning devices as other students
- The major legislation related to individuals with disabilities [Individuals with Disabilities Education Act (IDEA), Technology-Related Assistance for Individuals with Disabilities Act (Tech Act of 1988 - P.L.100-407), Rehab Act of 1973, Americans with Disabilities Act (ADA)]
- The use of Assistive Technologies
- The availability of Assistive Technologies
- Resources for assistance and information about Assistive Technologies
- Funding
- Professional development for teachers

The Council for Exceptional Children (1991) published strategic planning guidelines that can assist administrators in developing a plan for the acquisition and use of Assistive Technologies. The plan includes:

- Developing a common vision
- Scanning the environment (needs assessment)
- Assessing the problems (determining barriers to change)
- Selecting outcomes
- Choosing strategies and activities
- Building support
- Establishing accountability/metrics for evaluation

Types of Assistive Technologies

There are many types of Assistive Technologies available from eyeglasses and hearing aids to motorized wheelchairs. Of most concern to administrators are those Assistive Technologies that can be used to provide students with disabilities with an appropriate

education. These can range from pencil grips to aid in holding a pencil to Augmentative Alternative Communication (AAC) devices.

For students who experience difficulty using a standard keyboard, teachers can begin by modifying a standard keyboard. Schmitt (1990) listed 10 ways to modify a keyboard:

- Positioning (wireless keyboard)
- Headstick, mouthstick, utility cuff, or other pointer
- Moisture guard
- Stickers to mark keys
- Removal of auto-repeat features
- Making the shift, control, and other keys locking
- Keyboard delay
- Rearranged keyboard
- Keyguard
- Speed enhancement (word prediction, abbreviations)

If modifying a standard keyboard is not sufficient, there are alternative keyboards available. These include:

Intellikeys

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

- Intelligent, programmable keyboard
- Provides computer access for persons who have difficulty using a mouse or standard keyboard.
- User touches a printed overlay placed over a touch-sensitive panel.

Large Print Keyboards

Large Print and Braille Labels for regular keyboards

The Key Connection

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

Discover:Screen

Madentec

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

- Talking on screen keyboard
- Point and click access to standard keyboard letters, whole words and communication phrases
- Keyboard can show keys with letters, pictures or words

Datadesk's Little Fingers™ Keyboard

Infogrip, Inc.

<http://www.infogrip.com>

Small 101-style keyboard designed specifically for small hands

Keys are 20% smaller than traditional keys
Keyboard spacing is more compact
Available in two models: Little Fingers Combo with a built in three-button trackball
and Little Fingers with a numeric keypad

Discover:Kenx®

Madentec

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

Software and hardware combination that offers changeable input options
Create computer access customized to each student.
Multiple input methods
Move from a mouse to a switch to a head pointer to an alternative keyboard quickly
and easily
On screen or alternative keyboard layouts

Alternative Input Devices

1) Penny & Giles Roller Joystick II

DonJohnston, Inc

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

- Functions like standard joystick
- Colored buttons for click and drag
- 3" high
- Includes three jacks so switches can perform button functions
- For Windows and Macintosh computers
- Uses PS/2 and USB connections
- Comes with interchangeable SoftKnob and T-bar joystick handles

2) HeadWay

DonJohnston, Inc

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

Mouse alternative that uses a small, infrared transmitter
Head movements control the mouse cursor on-screen
Adjustable sensitivity to reduce unwanted cursor movements due to unintentional
head motion
Switch for mouse clicks

3) TouchFree™ Switch by Edmark/Riverdeep

Infogrip, Inc.

<http://www.infogrip.com>

Use with single switch scanning software
No touch action required
Digital video camera and easy to install switch software

Flexible and customizable click capabilities
TouchFree Switch can be activated by a choice of large or small body movements;
can be customized
Point camera at arm, elbow, face or foot
Zoom in or out to capture small or large movements

4) *Tash's Switch Click*

Infogrip, Inc.

<http://www.infogrip.com>

Enters a left mouse click
Plugs directly into mouse port
Can use Switch Click alone with scanning software or plug pointing device into
Switch Click and use pointing device to move cursor and Switch Click to handle
left mouse clicks
External switch jack; can choose to use size switch to best fits needs

5) *Eyegaze Communication System*

LC Technologies, Inc.

<http://www.lctinc.com/2Products/Disability/Disabilitymain.htm>

Communication and control system controlled by eyes
Look at control keys displayed on screen to synthesize speech, control environment
(lights, appliances, etc.), type, operate a telephone, run computer software,
operate a computer mouse, and access the Internet and e-mail

6) *ScanSoft's Dragon NaturallySpeaking®* (Speech Recognition Software)

Infogrip, Inc.

<http://www.infogrip.com>

True continuous speech
Speak to computer naturally, at normal pace of up to 160 words per minute, without
pausing between words
Create, edit and format word or phrase using intuitive commands

7) *Commodio's QPointer Voice*

Infogrip, Inc.

<http://www.infogrip.com>

Complete and intuitive computer control by voice
Allows operation of any application and complete control over Windows
Dictate directly into any application, write and send email, surf the web and emulate
all mouse functions

8) *Visual Impairment*

For students who are visually impaired, there are several options, including voice
output, large screen monitors, and Braille text. Voice or speech output devices use
digitized human speech or synthesized robotic-sounding speech.

9) *BIGSHOT Screen Magnifier by Ai Squared*

Infogrip, Inc.

<http://www.infogrip.com>

- Magnifies computer screen allowing focus on work without straining to see 20 levels of magnification, from 105% to 200%
- Change the magnification level with a mouse wheel
- Full Screen Mode, which enlarges entire monitor screen to the magnification level selected

10) *TextHELP! ScreenReader by TexHelp Systems*

Infogrip, Inc.

<http://www.infogrip.com>

- Simple text to speech product
- Reads window menus, documents, emails or Internet pages
- Easy to use toolbar provides five features to select from

Augmentative Alternative Communication Devices

LightWRITER

1) ZYGO Industries, Inc.

<http://www.zygo-usa.com/lighwrts.htm>

- Portable text-to-speech communication aid
- Large, bright displays
- Easily seen by both the user and the listener(s)
- For users with autism, laryngectomies, C.P., head injury, ALS, etc.
- Now accessible through Morse code



2) *Dynawrite*

DynaVox Systems LLC

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

- Keyboard-based communication device
- Accessed using variety of selection methods and scanning configurations
- Documents created and stored on DynaWrite can be backed up to PC or Mac
- Function keys activate features common to all DynaVox devices
- Text-editing capabilities
- Personal reminders menu
- Integrated help menu
- Store thousands of Keyboard, single- and dual-switch scanning
- DECTalk™ with 10 synthesized voices
- VeriVox with 3 synthesized voices
- Digitized speech and sound available

3) *Pathfinder with Unity 128*

Prentke Romich Company

- <http://store.prentrom.com/cgi-bin/store/index.html>
- Powerful communications tool
- Static keyboard plus a color dynamic display
- Contains vocabulary (Unity 128), pictures, computer keyboard emulation and infrared controls
- Synthesized speech with memory capacity that holds thousands of words
- Range of age and gender appropriate voice options.
- Digitized speech option for adding fun sounds, songs or additional languages

4) *ChatBox and ChatBox-DX,*

Prentke Romich Company

<http://store.prentrom.com/cgi-bin/store/index.html>

Voice output communication devices

Combine use of meaningful pictorial images with the latest technology

For use by individuals experiencing cognitive and language limitations, brain disorders, cerebral palsy or conditions that result in temporary loss of speech.

ChatBox-DX for individuals with visual difficulty or very poor motor skills

Software

ClickIt

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

- Provides access to "point-and-click" software programs
- Add Hot Spots and scanning to popular software
- Users touch an overlay or a switch to activate selected areas on the screen

CameraMouse

Infogrip, Inc.

<http://www.infogrip.com>

- Hands free computer control
- Uses video camera to track body movements and convert movements to cursor movements on computer screen
- Built-in toolbar allows emulation of all mouse
- Non-intrusive
- Works with all standard software
- No wires, dots, infrared beams, or other head apparatuses needed for activation

PixWriter - Slater Software, Inc.

(Don Johnston Inc.)

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

Easy-to-use early writing intervention
Users write by selecting pictures and word buttons
Built-in speech provides immediate, lets teachers create talking documents

Tracker One

Madentec

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

- Head pointing device
- Tiny sensor tracks a reflective dot placed on forehead or glasses
- Operates from the USB port or compatible AAC device
- No battery packs or power adapters required

Tracker 2000

Madentec

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

- Move the cursor on the computer by moving head
- Sits on top of computer
- Tracks tiny reflective 'dot' on forehead or glasses
- Head movements converted into computer mouse movement

Writing Tools

Write Outloud

(Don Johnston Inc.)

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

- Easy to use word processor
- Gives immediate speech feedback as words, sentences and paragraphs are typed
- Extensive keyboard shortcuts

Braille 'n Speak

Freedom Scientific

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

Combines speech with a standard Perkins-style keyboard

- Weighs less than one pound
- Includes word processing with spell check
- Built-in speech synthesizer for input and editing directly into memory
- Information read back at the press of a single command.
- Input information in Grade 1 or Grade 2 Braille through six-key mode



Braille Blazer

Freedom Scientific

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

Compact and quiet

High-quality Braille on many sizes of Braille paper, plastic labels and index cards

Internal speech synthesizer for quick and simple configuration

Can be used with any PC or Freedom Scientific notetaker

Critical Thinking Tools

Inspiration - Visual Learning Tool

Inspiration Software, Inc.

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

Grades 6-Adult

Strengthens critical thinking, comprehension, and writing across the curriculum

Diagramming and outlining environments

Kidspiration -

Inspiration Software, Inc.

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

Grades K-5

Brainstorm ideas with pictures and words

Organize and categorize information visually

Create stories and descriptions using visual tools

Explore new ideas with thought webs and visual mapping

Other Devices

- Closed captioning
- Pencil grips
- Raised line paper
- Talking calculators
- Tape recorders

Resources for Information and Assistance

Local Resources and Information

Alabama Statewide Technology Access and Response Project System for
Alabamians with Disabilities (STAR)

<http://www.rehab.state.al.us/star/>

800-STAR-656

Birmingham Alliance for Technology Access Center

email: dankess@mindspring.net
205-251-2223

TASC- Technology Assistance for Special Consumers
<http://tasc.ataccess.org/main.html>
256-532-5996

UAB Civitan International Research Center's Sparks Clinic
<http://www.circ.uab.edu/>
800-822-2472

National Resources and Information

AbilityHub - Assistive Technology Solutions
<http://www.abilityhub.com/>

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

Alliance for Technology Access (ATA)
<http://www.ataccess.org/>
415-455-4575

American Printing House for the Blind
www.aph.org/
502-895-2405

Barrier Free Education - Tools for Learning
<http://barrier-free.arch.gatech.edu>

Center for Applied Special Technology (CAST)
www.cast.org/
781- 245-2212

Closing the Gap - Computer Technology in Special Education and Rehabilitation
www.closingthegap.com/
612-248-3294

Computing OutLoud
<http://www.out-loud.com/>

Council for Exceptional Children
<http://www.cec.sped.org/dv/>
703-620-3660

Equal Access to Software and Information (EASI)

<http://www.rit.edu/%7Eeasi/>

Family Guide to Assistive Technology

<http://www.pluk.org/AT1.html>

Infinitec Inc. - Infinite Potential through Assistive Technology

<http://www.infinitec.org/>

LD Resources

<http://www.ldresources.com>

(NCDDR) National Center for the Dissemination of Disability Research

<http://www.ncddr.org/>

National Center to Improve Practice in Special Education Through Technology,
Media and Materials (NCIP)

<http://www2.edc.org/NCIP/>

National Rehabilitative Information Center for Independence - NARIC Databases:
Assistive technology/devices

<http://www.naric.com/search/t15.html>

Project ASSIST (All Students in Supported Inquiry-Based Science with
Technology: <http://www.edc.org/FSC/ASSIST/>

Project LITT - Literacy Instruction Through Technology

<http://edtechfm.sdsu.edu/SPED/ProjectLITT/LITTinfo.html>

Rehabilitation Engineering and Assistive Technology Society of North America
(RESNA)

www.resna.org/

703-524-6686

Tech Act Programs by State

<http://www.abledata.com/abledata.cfm?pageid=113573&top=16050&ksectionid=19326>

American Institutes for Research - U.S. Office of Special Education Programs

<http://www.air.org/topics/default.aspx>

Technology for the Blind

<http://www.nfb.org/tech.htm>

TRACE Center
<http://www.trace.wisc.edu/>
301-589-3786

Untangling the Web - Assistive Technology Resources (not specifically
computer-related)
<http://www.icdi.wvu.edu/others.htm#g10>

References

- Council for Exceptional Children. (1991). *National institute on comprehensive system of personnel development collaboration -- Strategic planning*. Reston, VA: Author.
- Deloney, P. & Tompkins, R. (1995). Empowering rural students with disabilities through assistive technology. *SEDL-SEEDS, No. TES-10*. Retrieved May 21, 2003 from <http://www.sedl.org/rural/seeds/assistivetech/welcome.html>