Accessible Technology Can Help Colleges and Universities Remove Barriers to Education

by Diana Oblinger and Laura Ruby

Increasingly, the United States is becoming an information-based society whose citizens depend on computer technology for work, communication and education. More than two-thirds of all U.S. workers now use some kind of computing or Internet device in their jobs. At the same time, colleges and universities are integrating technology more fully into campus and community life, using personal computers and the Internet to provide course information, facilitate student interaction, deliver resources, post schedules, and provide information about an expanding array of services.

For more than 54 million Americans with disabilities—approximately 20 percent of the U.S. population—the extensive use of information technology (IT) can be either a blessing or a curse.

When properly designed to include the needs of people with disabilities—whether with built-in accessibility features like those in the Microsoft Windows XP operating system or with compatible add-on assistive technology such as text-to-speech screen readers—the personal computer is unequalled as a liberating device, opening doors to a world of information and providing unparalleled employment and educational opportunities regardless of physical and sensory capabilities. Conversely, when colleges and universities fail to design their Web sites for accessibility, or to ensure the technology they employ is accessible and compatible with leading assistive technology products, the proliferation of technology on campuses may actually create additional and needless barriers for students, faculty or staff with disabilities.

“Adaptive computer technology is creating the most level learning space in history for students with disabilities,” says Norman Coombs, Ph.D., professor emeritus at the Rochester Institute of Technology and CEO of EASI (Equal Access to Software and Information, http://www.rit.edu/~easi), a nonprofit organization that provides online technology training for people with disabilities and accessibility consulting services to schools, colleges and libraries.

“Today, almost every course in high school and college involves the use of a computer in some way,” Coombs continues. “Increasingly, if information and technology are not designed to be accessible to students with disabilities, then the students’ access to education rapidly moves backward.”

Education’s “return on investment,” although unmistakable, is often hard to measure. We do know, however, that there is a direct correlation between education, employment, and income. That’s true for people with disabilities, just as it is for others.

The 1990 Census showed that people with disabilities who had less than a high school diploma were employed at a rate of only 15.6 percent. For those with at least a high
school diploma, the employment rate nearly doubled to 30.2 percent. Those who had completed at least four years of college were employed at a rate of 50.3 percent.

By purchasing and deploying accessible and assistive technology to facilitate educational opportunities for students with disabilities, colleges and universities can significantly improve those employment figures. Yet, the benefits of accessible technology to individual students and faculty go far beyond job opportunities, empowering people to realize their full potential and improve their lives. Coombs, who is blind, uses his own experience as an example.

“I taught history for 20 years, but after I started using a computer my colleagues told me that I seemed like a different person, more poised and more confident,” Coombs says. “I’ve seen the same thing happen with my students who have disabilities. Accessible technology empowers people, and the independence they gain from it changes them, makes them better. Empowerment and transformation is the true purpose of education.”

Along with the benefits that accessible technology provides for individuals, it also enhances an institution’s ability to retain valued students and attract the most talented minds without regard for physical capabilities. Accessible technology increases personal productivity, enhances collaboration and communication among students and faculty—including those with disabilities—and helps colleges and universities accommodate individual learning styles and preferences. And accessible technology helps institutions achieve greater diversity. A campus should reflect society as a whole, which includes people with disabilities.

According to the National Center for Education Statistics Study on Postsecondary Students with Disabilities, roughly 6 percent of all college and university students have a disability, and those numbers are increasing as accessible technology creates greater access to education for people with disabilities. To address the needs of this population, colleges and universities nationwide are using a variety of policies and practices designed to help ensure equal access to education through the purchase, development, and use of accessible technology and Web design. Accessibility programs at the University of Washington, the University of Texas-Austin, University of Wisconsin at Madison, and Rio Salado College in Arizona illustrate some possibilities.

**University of Washington**

The University of Washington (UW) was one of the first universities to develop an adaptive technology lab—now called the Access Technology Lab—which houses a collection of adaptive technology that students, faculty and staff can test drive. The UW accessibility program, which includes many different on-campus services as well as the DO-IT outreach program, is unusual because it is so far-reaching and comprehensive.

“Along with that central resource, we also have a distributed model, because we really want adaptive technology to be out in the various departments’ computer labs,” says Sheryl Burgstahler, Ph.D., director of both the Access Technology Lab and the DO-IT
program. “We work with departments on a consulting basis to help them obtain the necessary hardware and software if they have students with disabilities in their departments.

“It used to be that if someone needed adaptive technology, we would supply that technology, and that was the end of the story,” she says. “Now, with so many resources available electronically, and often only available electronically, we’ve put much greater effort into helping departments and other groups on campus make their resources accessible.” According to Burgstahler, the counsel her group provides to various departments may involve everything from procurement advice as they buy new software to consultation on the design of accessible Web sites.

DO-IT is primarily an outreach program that extends far beyond the borders of the university campus. For example, DO-IT (Disabilities, Opportunities, Internetworking and Technology, www.washington.edu/doit) currently has a grant from the National Science Foundation to improve access to science, engineering, math and technology in colleges, universities and K-12 schools in a four-state region – Alaska, Washington, Oregon and Idaho. It also co-sponsors the National Center on Accessible Information Technology (AccessIT), which is funded by the National Institute on Disability and Rehabilitation Research of the U.S. Department of Education and promotes the use of accessible technology in educational entities nationwide. The goals of DO-IT's programs are to foster the success of people with disabilities in college and careers.

“At every turn, we look for ways that we can use technology to meet those goals,” Burgstahler says. “For example, we have a very strong mentoring community, where we have adults with disabilities mentoring kids with disabilities—and it’s all on the Internet.”

University of Wisconsin at Madison

The University of Wisconsin at Madison (UW-M) was one of the first universities in the country to develop an accessibility policy in regard to information technology, let alone a compliance timeline for legacy resources (such as Web content that was already posted when the accessibility policy took effect) and support to help people achieve compliance.

Those efforts have paid off in the form of some innovative programs. For example, UW-M has deployed computer kiosks at key locations throughout the campus, providing convenient access to the Web and email. Several accessibility features are enabled on the kiosk computers for users with disabilities, including full keyboard access, adjustable keyboard settings, and adjustable font sizes, styles and colors.

Computer labs at UW-M recently installed Kurzweil 3000 network server software, which provides reading, writing and test-taking solutions for people with learning disabilities. The dual highlighting feature allows students to highlight a sentence and have each word read aloud at the same time, which increases both auditory and visual comprehension. To increase the student's learning potential even further, the software
also includes powerful decoding tools such as dictionaries and synonyms to provide alternate word choices, writing tools such as an audible spell checker and word predictor, and study skills tools that allow students to highlight main ideas, add annotations, extract outlines or word lists, or create voice notes.

“In the past, adaptive equipment in the campus computer labs focused on people with visible disabilities such as mobility, vision and hearing impairments,” says Alice Anderson, coordinator, Technology Accessibility Program, Division of Information Technology. “By addressing the hidden disabilities, such as learning disabilities, the university is able to serve a group of people that often falls through the cracks.” In a 2002 study by the National Center for the Study of Postsecondary Educational Support, 31 percent of the participants with Specific Learning Disabilities indicated that their disability was first identified at the post-secondary level.

**Rio Salado College**

Rio Salado College is community college that offers a variety of non-traditional educational programs for working adults. Half of its 40,000 students are enrolled in distance learning courses. Known today as "the college without walls," in 1996 Rio Salado became the first Arizona college to launch Internet courses, and now offers 275 courses online. The college also provides a broad range of online student services, such as registration, tutoring, academic advising, library services and counseling.

“We support our students where they are,” says Carol Scarafiotti, dean of instruction at Rio Salado. “Part of that support involves providing course content that is accessible by people with disabilities.”

“There is only one version of every course at Rio Salado,” Scarafiotti explains. “We have a centralized course development process, and we make sure accessibility is built in while courses are being developed.” Rio Salado uses Bobby, a program that tests the accessibility of Web pages, as courses are being developed to ensure that all of its course offerings are fully accessible.

Rio Salado doesn’t know how many people with disabilities are enrolled in its distance learning courses because the college only becomes aware of a student’s disability if he or she asks for assistance.

“So far this year 85 students have requested assistance because of some type of disability,” Scarafiotti says. “This is a low number considering that the flexibility of e-learning should be appealing to students with disabilities. However, we believe that many students with disabilities actually enroll in our e-learning courses but do not request assistance.” Scarafiotti explains that many college students with disabilities already have the assistive technology and other equipment they need to complete courses from home without additional help from the college.
When students do need help, Rio Salado is ready. Whether a student who is blind needs a screen reader or a student with agoraphobia needs a proctor to visit his or her home to oversee a final exam, Rio Salado lives up to its commitment to support its students where they are.

**University of Texas at Austin**

At the University of Texas at Austin (UT-A), John Slatin, Ph.D., runs the Accessibility Institute, which is dedicated to making the Web more usable for everyone. Slatin looks at his university’s world-class resources—such as its incomparable Latin American collection—and imagines what it would be like to have them all online and fully accessible to everyone, from scholars to school children—including people with disabilities.

“There are about 4 million people with disabilities in Texas, out of a population of 22 million,” says Slatin, who is recognized nationally as a leader in accessibility issues. “About 500,000 are kids in school. The resources of this university, and every university, should be available to them wherever they are. It shouldn’t matter if they have a disability.”

Slatin’s vision is more than a dream, however. He is actually working with the university to make it happen, but the technical challenges are daunting. Finding a way to translate images and artifacts into rich experiences for people with vision disabilities, for example, can be extremely difficult. Slatin, who is blind, understands that challenge well.

Another accessibility issue that Slatin wants to overcome is the one that assumes all people with disabilities have the assistive technology they need and can carry it around with them wherever they go.

“I would like to see point-of-need delivery for assistive technology and accessibility features,” he says. “When a person logged on to a network with an established user name and password, his preferences—including any assistive technology he might need—would automatically download to that machine.”

**Good Design is Accessible Design**

According to Slatin, everyone should support accessibility as a matter of self-interest, and people without disabilities should keep in mind the widespread benefits that accessibility inevitably creates. “Good design is accessible design,” Slatin says. “Making the Web accessible allows people with disabilities to participate as equals in the university community and in the world beyond campus, but it also improves the user experience for people who don’t have disabilities.”

Coombs agrees, comparing the broader benefits of accessible Web design to what happened when curb cuts were introduced on American sidewalks. “Curb cuts were made to assist people in wheelchairs, but they brought immediate benefits to people riding
bicycles, pushing baby carriages, etc.,” he says. “Accessible Web design is the equivalent of electronic curb cuts. Everybody benefits.”

The U.S. Department of Education Office of Civil Rights has compared the task of providing access to information through the use of accessible and assistive technology to society’s previous challenge of using ramps, elevators and other architectural changes to make buildings accessible to people with disabilities. Federal laws mandate equal access to education for people with disabilities, but they often fail to provide practical information to help college and university administrators achieve that goal.

For example, while Section 504 of the 1973 Rehabilitation Act mandates that students with disabilities receive equal opportunity for a full education, and Title II of the Americans with Disabilities Act (ADA) of 1990 requires that communications for people with disabilities be equal to those for others, neither law provides clear guidelines to help colleges and universities address and take advantage of the information technology. Refinement and further definition depends on case law, which often creates multiple interpretations.

“Courts and colleges look at things differently—especially when it comes to budgets,” Coombs says. College budgets are often fragmented, divided into small portions, which can leave administrators and department heads feeling as though there simply isn’t enough money to afford accessible technology or to implement accessible Web design.

“It’s a matter of priorities,” Coombs says. “Any budget decision takes money from something else. I know of one university a few years ago that hired a human reader for two years to assist a student who was working on a master’s degree instead of purchasing a screen reader application, even though the screen reader would have been far less expensive. The reasoning was that there was no money in the university’s equipment budget, but plenty of money in the reader budget.”

Courts have ruled that colleges and universities should not approach accessibility as an ad hoc issue, responding on a student-by-student basis. Rather, most case law on this subject has declared the need for comprehensive policies to address accessibility issues and keep post-secondary institutions in compliance with Section 504 of the Rehabilitation Act and the ADA.

**Procurement Policies**

The 1998 amendment to Section 508 of the Rehabilitation Act requires the federal government to make the data and information provided by electronic and information technology accessible to employees and the general public. Section 508 now offers accessibility standards for a multitude of technologies, including Web technology, software, hardware, telecommunications and portable devices, and establishes procurement preferences for technologies that meet those standards.
Although Section 508 doesn’t apply directly to colleges and universities, it offers a useful model for institutions that want to establish procurement policies that provide maximum accessibility to technology and information. Some, like the University of Texas-Austin and the University of Wisconsin at Madison have chosen to incorporate Section 508 in their accessibility policies along with other guidelines such as those published by the World Wide Web Consortium (W3C). Others, such as Temple University in Pennsylvania and several California State University campuses, have adopted policies with guidelines similar to Section 508 regulations.

“Section 508 gives us standards and policies that are being used by a very large group, the U.S. government, the largest procurer of technology in the world,” Burgstahler says. “So we look to those standards, and we apply them as guidelines for technology on our campus, and we also point people to the World Wide Web Consortium standards. We want people to embrace accessibility, not just look at a list of standards and say, ‘yes, we complied.’ But if we can get people to at least meet those minimum standards, then we’ve gone a long way toward achieving our goal.”

Some of the procurement processes and infrastructure that have been put in place jointly by government and industry to help federal agencies comply with Section 508 regulations may provide valuable tools for higher education as well. For example, industry now publishes the accessibility features of their products in standard templates, called Voluntary Product Accessibility Templates (VPATs), which makes it easy for a university to evaluate the accessibility of a mainstream IT product prior to procurement.

Meanwhile, other work is taking place at the federal level to enhance accessibility. Pending reauthorization of the Higher Education Act (HEA) and other federal legislation offers new opportunities to strengthen educational opportunities for people with disabilities and to bridge the gaps that are sometimes created between laws that are meant to be complementary.

For example, the transition from high school to college can be especially difficult for students with disabilities. During their K-12 years, some students with disabilities are used to having individualized education plans, mandated by the Individuals with Disabilities Education Act (IDEA) and written each year by a multidisciplinary team of people who interact with the students and their teachers, parents and rehabilitation professionals to ensure that their specific needs are met, including their need for assistive technology and other accommodations. When those students leave the K-12 system and go to college, they suddenly lose that support system and often don’t know how to request an accommodation at their college or university.

If colleges and universities succeed in using accessible technology to create equal access to education on their campuses, then such problems may be solved without additional legislation or government intervention.

Importance of Collaboration
According to Coombs and others, one of the biggest challenges to achieving universal compliance with accessibility standards on college campuses is that so much Web content is produced by faculty and is outside the control of college administrators.

Slatin, Burgstahler and Anderson all say part of the solution to that problem is to foster collaboration among people from many different groups around the campus, so that solutions are group directed and voluntary. For example, Burgstahler says the UW started a user group on campus of people who develop Web sites and Web content. Members of the group support each other in making their Web resources accessible to people with disabilities. The UW also has an accessibility committee, which includes members with disabilities, that meets regularly to talk about accessibility issues on campus and with electronic resources and to make recommendations to the administration.

According to Anderson, because of the collaborative work done by the Web Accessibility Committee at UW-M over the past two years, “an inclusive e-culture is developing” on campus. Coombs sees that as one of the important benefits of this kind of collaboration.

“It is increasingly clear that, instead of issuing directives, schools need to form loose teams of all the stakeholders to discuss issues, gain awareness, and develop the desire to voluntarily establish policies that promote accessibility,” he says. “The sense of community that comes from a team tackling a task and working together spills over into a spirit of cooperation and community with untold benefits.”

**Plan of Action**

For educational institutions that want to initiate or strengthen their accessibility programs, additional help is available through DO-IT and EASI, Microsoft and other industry leaders, federal and state governments, and other sources. For example, the U.S. Department of Education provides links to resources about accessibility and universal design ([http://www.ed.gov/about/offices/list/ovae/pi/AdultEd/disaccess.html](http://www.ed.gov/about/offices/list/ovae/pi/AdultEd/disaccess.html)), and Microsoft’s Accessibility and Education Web sites ([www.microsoft.com/enable](http://www.microsoft.com/enable) and [www.microsoft.com/education/?ID=accessible](http://www.microsoft.com/education/?ID=accessible)) provide in-depth information to help institutions of higher education integrate accessible technology into their programs. In addition, the Microsoft sites provide:

- Case studies to show what other institutions are doing with accessible technology ([http://www.microsoft.com/enable/casestudy/default.aspx](http://www.microsoft.com/enable/casestudy/default.aspx))
- Information on assistive technology manufactured by other companies ([http://www.microsoft.com/enable/at/default.aspx](http://www.microsoft.com/enable/at/default.aspx))
- Step-by-step tutorials to explain how students, faculty and staff can take advantage of accessibility features in Microsoft Windows XP and other Microsoft software ([http://www.microsoft.com/enable/training/default.aspx](http://www.microsoft.com/enable/training/default.aspx))

In a book titled, “Accessible Technology in Today’s Business,” Microsoft outlines a comprehensive five-step process to help organizations develop and execute a strategic accessible technology plan, as well as ideas on how to measure progress and sustain the
plan over time (see http://www.microsoft.com/enable/business/plan.aspx). Briefly, the five-step process includes:

- **Step 1: Define the Accessible Technology Strategy** – Identify a vision and objectives that set the groundwork for the next steps; determine how accessible technology fits with the organization's competitive strategies, objectives, and measures of success.
- **Step 2: Identify Requirements** – Develop a comprehensive set of requirements by scoping the accessibility needs of the organization and evaluating the current technology being used.
- **Step 3: Design, Develop, and Purchase Technology** – The standard operating system and office productivity software used by the organization is the foundation for accessible and assistive technology. Therefore, it is critical that the operating system and office productivity software be accessible. Products that allow employees to customize the system to their preferences should be selected as well as those products that address the requirements outlined in the needs assessment in Step 2.
- **Step 4: Implement and Train** – Once the accessible technology is in place, including new technology, the technology is rolled out to the organization. This step also involves increasing awareness among employees about the availability of accessible technology and training employees on how to use the accessibility features.
- **Step 5: Maintain Technology and Continue Learning** – In the last step, awareness of the accessible technology vision of the organization is increased, employees are supported in their use of technology, and success and opportunities for improvement are evaluated.

Clearly, many colleges and universities have already begun to implement new policies and processes to ensure the purchase, development, and use of accessible technology and Web design on their campuses. To meet the challenge of providing equal access to education, information and communications, however, many more must follow.

In addition, it is not enough for accessibility to be relegated to the campus disabled student services office. To achieve genuine progress in this area, there must be a strong commitment at the highest levels of the university, and among the faculty and staff. In particular, there is a great opportunity for constructive partnerships between chief business officers and chief information officers to advance institutional initiatives, such as diversity and enhanced accessibility.

Resources now exist to make that easier than ever before. Revising design, training and procurement processes and practices is one way to strengthen campus diversity and accessibility. Instead of such opportunities remaining ad hoc (department-by-department or student-by-student), new processes can create a foundation that will move the entire university toward greater accessibility.
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