

Systems Limitations Hamper Integration of Accessible Information Technology in Northwest U.S. K-12 Schools

Jennifer P. Wisdom¹, Nathan White², Kimberley Goldsmith³, Sarann Bielavitz⁴, Amy Rees⁵, Charles Davis⁶

¹Center for Health and Disability Policy, Oregon Health & Science University, Portland, OR, USA // Tel +1 503.494.2558 // wisdomj@ohsu.edu // Fax: 503.494.4981

²Carleton College, Northfield, MN, USA // Tel +1 507.646.7175 // nwhite@acs.carleton.edu

³MRC Biostatistics Unit, Institute of Public Health, University Forvie Site, Cambridge, UK // Tel +44 1223 330 389 // kim.goldsmith@mrc-bsu.cam.ac.uk

⁴Center for Health and Disability Policy, Oregon Health & Science University, Portland, OR, USA // Tel +1 503.494.2566 // bielavit@ohsu.edu

⁵Graduate School of Education and Counseling, Lewis & Clark College, Portland, OR, USA // Tel: +1 503.768.6074 // arees@lclark.edu

⁶Center on Community Accessibility, Oregon Health & Science University, Portland, OR, USA // Tel +1 800.949.4232 // davisc@ohsu.edu

ABSTRACT

Although federal U.S. regulations require schools to provide equal access to educational opportunities for all students, many technologies used in K-12 schools present accessibility barriers for students with disabilities. Interviews assessed knowledge of educational department staff, teachers, and parents of children in K-12 schools in the Pacific Northwest U.S. regarding accessible electronic and information technology, barriers to technology access, and the capacity of these school systems to address information technology (IT) accessibility issues. Results indicate staff and parents have some basic knowledge of IT accessibility issues, but significant barriers remain regarding appropriate implementation of accessible IT within Northwest K-12 schools. These schools continue to address information technology accessibility on a case-by-case basis, rather than making systemic improvements to the accessibility of technology for all students. Systemic barriers exist regarding system-wide policies of accessibility, a lack of funds for training and implementation, and lack of communication between educators, administrators, IT staff and parents. Recommendations for improving services are provided.

Keywords

Accessible information technology, Assistive technology, Needs assessment, Disability

Introduction

Accessible information technology helps make equal educational opportunities possible. While information technology has the potential for positively impacting all children in K-12 classrooms, for many students with disabilities the use of information technology is the vital link that enables them to participate fully in learning. Federal regulations require that schools make education accessible, which for many students involves the use of accessible information technology. The underutilization of technology in the classroom to *enhance* learning has been amply demonstrated (e.g., Cuban, 2001; Norris, Sullivan, Poirot & Soloway, 2003); the accessibility of technology in the classroom for students with disabilities has not been well-explored. In this paper, we describe findings from our regional needs assessment of K-12 educators and parents regarding their understanding of requirements related to accessible information technology, concerns related to accessibility for students with disabilities in their schools, and educators' and parents' perspectives on opportunities to improve access to information technology.

Accessible Information Technology and Assistive Technology

Accessible information technology includes computer hardware and software, computer operating systems; web applications; telephones and other forms of telecommunication; video equipment and multimedia products; and other devices used to transmit or manipulate electronic information. One characteristic of accessible information technology is that users can access information in more than one way; software that is compatible with assistive

technology devices, multimedia devices that present captioning for audio features and spoken directions for visual prompts, and Websites that can be navigated using keystrokes in addition to a mouse, are all examples of accessible information technology.

Accessible information technology is designed to meet the needs of a diverse user base, with and without disabilities, and differs from “assistive technology,” which describes products or devices used by an individual. An assistive technology device is “any item, piece of equipment, or system, whether acquired commercially, modified, or customized, that is commonly used to increase, maintain, or improve functional capabilities of individuals with disabilities” (Assistive Technology Act, 1998). Many assistive technology solutions are inexpensive and easy to implement. A student who has limited manual dexterity may find a trackball easier to use than a mouse. Students with learning disabilities may benefit from computer software that can read content out loud. The provision of appropriate assistive technology is an important component of an accessible information technology environment.

Assistive technology improves the functional capacity of an individual, but its effectiveness can be limited when accessible information technology is not present. Screen reading software, for example, is assistive technology that can read electronic text out loud. On a Website built with accessibility in mind, the screen reader can access text descriptions of visual elements, and the user can choose to use the keyboard or the mouse to navigate. An inaccessible site may require the user to navigate with a mouse, and the navigational links may be images with no text description. The screen reader user, while provided with the necessary assistive technology, is still unable to use the inaccessible Website because he/she needs accurate text descriptions of navigational elements, and the ability to activate links using the keyboard.

Although most schools do provide assistive technology to some students, they are just beginning to address the accessibility of information technology environments system wide. Incorporating accessible information technology into schools is more complex than the provision of assistive technology for individuals, and involves coordination between administrators, school disability services, and information technology personnel. In order to understand schools’ information technology environments, we first review regulations that address accessible information technology.

Regulations Addressing Accessible Information Technology

U.S. regulations provide standards that prohibit discrimination against individuals with disabilities, require public schools to furnish appropriate aids and services to assist individuals with disabilities, and establish a structure for schools’ determination of appropriate aids. Section 508 of the Rehabilitation Act of 1973 (<http://www.section508.gov/index.cfm?FuseAction=Content&ID=12>), enforceable only for federal agencies, outlines specific standards for all types of information technology, including Websites, software, hardware, and telecommunications devices. The Americans with Disabilities Act (United States Equal Employment Opportunity Commission, 1990) prohibits state and local government entities from excluding people with disabilities from services or activities that are offered to people without disabilities. It also requires covered entities (including public schools) to furnish appropriate auxiliary aids and services where necessary to ensure effective communication with individuals with disabilities, unless doing so would result in undue burden or a fundamental alteration to the program or service (auxiliary aids can include audiotaped texts, materials in Braille or large print, captioning and other methods of making audio and visual media available to people with disabilities). The ADA has also been interpreted to include the Internet as a “place of public gathering” (United States Department of Justice, 2002), which means it is also covered.

Section 504 of the Rehabilitation Act of 1973 (<http://www.ed.gov/policy/rights/reg/ocr/edlite-34cfr104.html>) prohibits recipients of federal financial assistance from discriminating against people with disabilities; its coverage includes public K-12 schools. Public K-12 schools are further governed by the Individuals with Disabilities Education Act (<http://www.webaim.org/articles/laws/usa/idea.php>), which mandates a “free appropriate public education” for all students, regardless of disability status and requires the creation of an Individual Education Plan (IEP) for each student who requires accommodations for his or her disability. Specific assistive technology needs may be written into a student’s IEP.

Work outside the U.S. has also promoted accessible information technology. The European Union has adopted anti-discrimination statutes and the EuroAccessibility Consortium (founded in 2003) seeks to develop and promote standards for web accessibility (WebAIM, 2005). The United Kingdom has required organizations with Websites to make them disability-friendly since 1999, and in 2005 the British Standards Institution developed guidelines for good accessibility practice (Adams-Spink, 2005). Canada, Hong Kong, and Japan, among others, have also taken steps to improve their national efforts to promote accessibility (WebAIM, 2005). These efforts, however, focus primarily on web accessibility, and their implications for K-12 services are not clear.

All U.S. states have responded to federal regulations to create accessible information technology environments. Golden & Buck (2003) indicate states have taken a policy approach to institutionalizing accessibility, with 9 states having statutes, 2 with executive orders, and 20 with statewide policies requiring accessibility. Of the remaining states, 13 have statements supporting accessibility and guidelines or best practices, and 6 states have issued web accessibility standards or guidelines without accompanying policy.

Few projects have described the impact of state efforts to promote accessibility on the K-12 learning environment, but Kentucky and New Mexico provide useful examples. The Kentucky General Assembly passed the Kentucky Accessible Information Technology Act in 2000, requiring all state-supported institutions to have accessible information technology (Noble, 2005). The Kentucky Department of Education implemented a network that provided a Website with resources, clear guidelines for what schools need, and technical standards checklists for school district use in improving their services. They report significant increases in the use of accessible information technology, and stress in their findings the importance of considering accessibility as a technology issue, not an issue of special education or disability (Noble, 2005). In New Mexico, a team implemented both top-down (legislation, regulation, and policy) and bottom-up (district demonstration projects) approaches to increase knowledge and implementation of accessible information technology (Peterson, 2005).

The clear intention of federal and state regulations is to ensure that all students have equitable access to education and the opportunity to succeed; planning for accessible information technology helps ensure compliance with federal disability law and helps ensure student access to educational opportunities.

This needs assessment sought to answer the following research questions:

- What do educational staff and parents know about disability law, guidelines for accessible electronic and information technology, and how to access accessible technology in their school system?
- What barriers exist to full and appropriate implementation of technology access?
- What is the capacity of school systems to address IT accessibility issues and how can this capacity be improved?

Methods

The authors created a semi-structured interview that addresses areas of current knowledge, current uses and purposes of information technology at schools, and participant-identified gaps and training needs. The University's Institutional Review Board provided approval to conduct the study. Participants were required to verbally assent to the interview, and were assured their identities would not be discernible in any study reports.

Experienced research staff contacted potential participants in the Pacific Northwest (Alaska, Idaho, Oregon, and Washington) via telephone or email to invite them to participate in the individual phone interviews or in-person focus groups. Initial contacts for administrators, teachers, assistive technology specialists, parents, advocates, and representatives from agencies that provide technical assistance to K-12 schools came from the Northwest Americans with Disabilities Act and Information Technology Center (NW ADA & IT Center) and from school Websites. Sampling proceeded via a snowball method: the authors asked each interviewee about others who would have information, experience, or expertise in accessibility issues and/or equipment purchasing. Additional contacts came from potential participants who were contacted but declined to participate in the interview. We continued interviewing individuals in each state until we were no longer receiving new information. Washington and Oregon educational staff were interviewed in focus group format; all parent-advocates and other state educational staff were interviewed individually in person or over the phone. Individuals who were identified as potential interviewees but did not respond to phone calls were called a minimum of three times to attempt an interview.

Interviewers typed detailed notes during each interview and focus group. Interviews varied in length; most interviews lasted about 20 minutes. Interviews addressed the following topics: (a) accessible information technology; (b) legal requirements for accessible information technology (e.g., Section 508, IDEA); (c) availability of resources for information; (d) understanding of universal design; (e) instances of students' successful use and limitations regarding accessible information technology; (f) school or district capacity to address accessible information technology; (g) what changes respondents suggest to increase awareness and implementation of accessible information technology; and (h) the usefulness of training and what topics would be helpful to increase awareness and implementation of accessible information technology. Copies of the interview guide are available from the first author.

To analyze data, notes from interviews and focus groups were summarized and one document was created for each interview or focus group. Data analysts reviewed all materials and developed themes to address research questions. Results were refined through an iterative process. The research team took several steps to increase methodological rigor: (a) multiple staff participated in data collection and analysis to ensure multiple viewpoints and discussion of perceptions of data and (b) analysts sought consensus on coder agreement to ensure more accurate coding (Boyzatis, 1998).

Results

In this assessment of K-12 schools, 273 telephone calls and emails resulted in individual or focus group interviews with 36 individuals at K-12 schools, advocacy organizations, and technical assistance centers in Alaska, Idaho, Oregon, and Washington. We interviewed educational staff within each state's school system (e.g., state administrators, individual school staff) and contacted state consultants and parent-advocates as well (See Table 1). Input from participants revealed a wide range of knowledge about, and opinions of, accessible information technology in K-12 schools. Recommendations mentioned throughout the report are summarized in Table 2.

Table 1. Description of Respondents by Job Field and State

Job Field*	Alaska	Idaho	Oregon	Washington	Total
State level					
Special education	2				2
Information technology		1	1	1	3
ESD level					
Special education				1	1
District level					
Special education	1		2		3
Information technology		3			3
School level					
Principal	1				1
Teacher			2		2
Special education				1	1
Other					
Parent/Advocate	2	2	2	4	10
Technical assistance consultants	4	1	1	4	10
Total	10	7	8	11	36

*Note: We identify participants by job field only to ensure individuals with unique job titles cannot be identified.

Respondents report knowledge of school-related disability laws regarding accessibility and information technology

The most informed respondents tended to be those affiliated with university-based or non-profit groups acting as accessible IT consultants to the schools. Accordingly, they expressed confidence in their knowledge of laws regulating accessibility and information technology, specifically mentioning IDEA, ADA, Section 508, Section 255

of the Telecommunication Act, and the Rehabilitation Act/Section 504. Many respondents knew generally of legal guidelines and their obligations to students with disabilities—including providing assistive technology when necessary, providing the least-restrictive learning environment, and making school Webpages accessible if government funding is received—but did not know the specifics of the laws. Several respondents said they would turn to other school staff, including special education teachers at the school, district, or Educational Service District (ESD) level if an issue arose; a few respondents had access to attorneys or other experts in disability law who could provide training or answers to specific questions. Generally, staff with less knowledge indicated that they learn about laws when specific issues arise, rather than operating under an ongoing philosophy of accessibility. One respondent said he suspected that most schools were aware of the existence of such guidelines, but lacked the time and motivation to research and implement them.

Table 2. Opportunities to Address Accessible Information Technology

Issue	Recommendations	Implications
Low awareness among teachers of universal design and benefits of accessible information technology	ADA & IT Centers can provide training to teachers about accessible information technology and how to implement it into their classrooms. School psychologists can serve as training resources for teachers.	Teachers who wish to use technology in their classrooms can ensure it uses universal design and is accessible to all students.
Low awareness among parents of how accessible information technology may benefit their children	ADA & IT Centers can provide training to parents about accessible information technology and how to implement it into their classrooms. School psychologists can serve as training resources for parents.	Parents of children with disabilities can coordinate with teachers and school staff to ensure new technology is accessible to all students both in the classroom and at home.
Need for information regarding specific programs and recommendations for purchase	ADA & IT Centers can coordinate with district information technology, disability, and purchasing offices regarding recommendations for accessible technology purchases. School psychologists can serve as liaisons between ADA & IT Centers and schools.	Districts and schools have resources for consultation regarding programs, purchase recommendations, and student needs.
Challenge in keeping up with latest legal requirements	ADA & IT Centers can provide up-to-date information regarding school responsibilities for accessibility.	Districts and schools are aware of legal requirements and can plan accordingly.
Integration of disability, information technology, and purchasing services in educational districts	Districts can consult with ADA & IT Centers to integrate disability, information technology, and purchasing to ensure communication between the three departments about disability-related information technology issues.	Integrated services increase likelihood that accessibility and information technology processes are streamlined.
Limited funding and resources for implementing changes	Counter lack of school funding by securing grant funding for basic infrastructure improvements, with support of and coordination with school psychologists and ADA & IT Centers.	Districts and schools can consider larger-scale change to ensure they are meeting student needs and complying with federal regulations.

More respondents were familiar with the concept of universal design than with Section 508 standards and other guidelines. Nine respondents said that they were very familiar with the concept and recognized its application to Websites as well as for non-technological purposes.

Three respondents said they were only vaguely familiar with the idea of universal design, and another eight were not at all familiar with the concept.

Despite gaps in their knowledge, respondents indicated that they had access to the information they needed about disability laws. They obtained information in a variety of ways, including by attending annual special education conferences or department of education trainings; receiving training from qualified organizations; receiving information from district administrators or consulting attorneys; and looking up information on the Internet. One focus group participant said that disability laws were well covered in pre-service teacher training, but that teachers often do not receive updates following the beginning of their tenure in the district and may therefore be relying on outdated information. Interviewees also were able to identify resources for obtaining accessible equipment and software. Many respondents were either readily aware of resources for obtaining accessible materials or knew of ways to find such resources: they turned to equipment or software lending libraries, or directly to companies that manufacture equipment. They also reported attending conferences on the subject; reading about resources; subscribing to listservs; consulting with organizations and associations that provide information about disabilities or technology (e.g., associations for the blind, the Organization for Education Technology Consortium, Washington's Disabilities, Opportunities, Internetworking, and Technology (DO-IT) Center, the Special Education Technology Center, and the NW ADA & IT Center); or consulting the Internet (e.g., <http://www.ClosingTheGap.com>, <http://www.section508.gov>). Other respondents looked to their school systems for guidance, including consulting with information technology staff.

Respondents who were well informed were sometimes less optimistic about the efforts of their colleagues to obtain information about accessible technology. Special education staff and a teacher indicated separately that staff often do not even know enough about accessible technology to know whether they need it. If a teacher or administrator did not already have a working relationship with a resource center, he or she might not know to seek out that help. Some respondents were less aware of how to obtain accessible materials; such responsibility was often perceived to fall outside their scope of work.

Numerous barriers hamper implementation of accessible information technology

When asked about specific instances of K-12 students being unable to access appropriate information technology, many respondents merged the concepts of accessible IT and assistive technology. Respondents recounted many occasions when an inability to access information could have been remedied with an assistive device. Sometimes, a school owned a particular device and limited the amount of time or the setting in which its use was allowed; other times, the need for a device was not recognized at all.

Education system respondents also recognized problems with system-wide accessibility. In some cases, existing technology did not meet the needs of students with disabilities. Examples include: (a) students unable to access Websites because the sites were not properly coded for users with disabilities; (b) struggling readers, who had problems accessing information on computers because of screen layout; and (c) students with sensory disabilities who had trouble accessing educational software and Websites. In some cases, existing technology was underutilized or not used at all; for example, (a) students with disabilities had been given assignments on paper when word processing software or calculators could have been suitable alternatives; (b) students with disabilities had access to computers in a special education classroom, but not when they were in their regular or mainstream classrooms; and (c) technology for a reading intervention program was available at a school, but was not available to a student with a disability who wanted to study from home.

One education system respondent reported that most school districts have technology specialists, but the specialists often do not have experience with access issues and do not know much about policies around accessibility. Another observed that part of the problem was teachers' perceptions of technology. Some teachers reportedly were concerned that other students would be jealous of their classmates' use of computers during class. Another respondent cited teachers' difficulties in modifying curricula to make them accessible, and in obtaining equipment to access computerized curricula. She said that teachers are not always aware of technology options that would benefit their students, and are not always aware that they should have assistive or accessible technology available.

Many educational system respondents were not aware of any specific incidences of students unable to access information because of a disability; or they knew of such cases, but their schools had either successfully acted to resolve the issue, or a solution was in progress.

Parent-advocate respondents also reported specific challenges communicating with schools about technology accessibility. Respondents indicated concern that educators were not trained in ADA issues, and that the educators did not know whom to consult when questions arose. Parent-advocate respondents described teachers and other school staff who were reluctant to learn new software programs, afraid of breaking assistive technology equipment, unable to assist students with equipment, or distrustful of advocacy agencies offering information and training. Parent-advocate respondents reported frustration with wait lists for local disability law advocacy centers and with school districts that were “backed up” with ADA-related litigation. Some parents said they gave up on an expensive litigation process to purchase equipment and software themselves.

School systems have limited capacity to address IT accessibility issues

A primary barrier identified by respondents across states was that of communication and cooperation across levels of school system governance and across disciplines. For example, a respondent indicated that her state updated its technology plan five years ago and implemented policies regarding accessibility, but the policies “haven’t trickled down to the field yet.” There were also barriers regarding the logistics of technology purchasing. Bidding and ordering processes may take months, which can be difficult for a student waiting for accommodations. General software purchasing procedures in some districts required a review of system compatibility but not accessibility; ensuring accessibility was reviewed before purchasing could save districts and staff time and effort. Another concern regarded the funding systems. For example, correspondence courses (which include online instruction) in one state do not qualify to receive special education funding, so money from other programs must fund special education accommodations for those courses.

Communication across disciplines was also a concern. Many individuals described a lack of communication between information technology staff, special education staff, and teachers. One state was described as having a division between “educational technology” and “special education technology.” One respondent said special education classrooms end up with “funky technology” because of lack of input from educational technology staff during purchasing. Most teachers interviewed reported challenges determining how to address a student’s request for accommodations with information technology, and that it was difficult to communicate with both disability/special education staff and information technology staff. An information technology staff member said accessibility issues are sometimes not addressed because teachers feel overloaded with their responsibilities and lack the time and personnel support to give the issues proper attention. She said, “If a student needs something for a disability, it is unique and requires brainstorming and planning [to integrate that into a classroom]...it takes time and people.”

Rural schooling environments also provided a unique challenge. In Alaska, for example, there is great variability among districts’ ability to address accessibility issues. Some rural respondents noted a problem with staff turnover. Rural, remote schools often have less plentiful resources than do urban ones; however, rural schools, including some only accessible by plane or boat, may be more technologically accessible because technology is generally necessary to interact with the rest of the state and world.

Finally, many educational systems staff indicated that due to a gap between what the schools should provide, and available time and funding, accessible information technology is often provided on an as-needed basis rather than on a programmatic basis. Respondents reported they knew some schools were not complying with disability laws because they did not have the money to do so. One consultant reported that schools in his state tend to have antiquated technology that did not support Internet access, and some schools were reportedly still using Apple II computers. Other schools have had to manage two different operating platforms—PCs and Macs—with technology support for only one. One district was sharing a T1 line among all its schools, compromising students’ access to the Internet. They noted a lack of funds for training, even for programs identified as priorities, such as special education.

Training on accessible information technology strongly supported

Respondents indicated that education and training could empower teachers to control how technology is used in their classrooms. Several respondents said that in some districts network technology, not teachers, dictates curricula. Better-informed teachers could have more input into the selection of accessible equipment and software. Teachers

must also know how to communicate with network technicians who may want to limit software choices to better manage a district's network.

Teachers and staff who are not already “tech savvy” may need basic technical training; one respondent noted that teachers are at different levels of readiness to add technology to their teaching plan. Using technology sometimes requires more time and a different way of teaching, which may push many outside of their “comfort zone.”

Systems reorganization and information sharing key to effort

When asked for suggestions to improve schools' provision of accessible information technology for students with disabilities, respondents most commonly responded with system-level suggestions. Some respondents suggested continual attention to and improvement of existing policies and procedures regarding accessible information technology. Respondents suggested addressing state standards for IEPs to ensure accessible information technology is addressed in a meaningful way during the assessment process, or lobbying for improvements to, and enforcement of, state policies on information technology. One respondent noted that schools will soon need to address principles of accessible technology regarding wireless networks, handheld devices, and other new technologies, and expressed concerns about educational systems' ability to anticipate new technology and respond in a timely manner. Other organizational suggestions included addressing purchasing processes to decrease the amount of time it takes to obtain accessible technology, and improving procedures for assessing compatibility of accessible IT with existing standard technology.

Respondents were also interested in sharing information among schools and between schools and parents, especially information regarding successful methods of making information technology accessible. Respondents wanted information from technical assistance centers, specifically requesting a list of available resources including regional and state-specific resources for teachers, administrators, and purchasers to call with questions. Some parents were frustrated with a lack of basic information from their children's schools. One parent-advocate said that she was not getting any information from her child's school and that she had to put her child's needs on their agenda. Other respondents wanted to see joint meetings of technology staff and teachers to discuss curricula and how accessible technology can support learning objectives.

Barriers to change may limit efforts

Many respondents cited lack of funding as a barrier to addressing accessibility issues. One respondent was adamant that schools in his state do not have the funding they need for teacher training or alternative programs. Another respondent expressed frustration that choosing to spend money on technology could result in larger class sizes. And, although it was usually possible for schools to get the technology to address the needs of individual students with disabilities, the quality of access for entire schools could still be substandard. One respondent noted that limited funds can make schools inflexible in their choices—taking a one-size-fits-all approach to software, regardless of disability, or buying software that does not interface correctly with existing platforms.

Not all respondents saw a need for change. One respondent said that he would not want to “spend much time, energy, and resources to address something that is not broken.” Another response was that when an issue arises for an individual student, then an Individual Education Plan (IEP) is the correct way to address the problem, rather than revising the whole system. A few respondents felt that their districts were already well-connected and networked.

Incentives to change may support efforts

Money was commonly cited as a motivator for school districts to adopt a more accessibility-focused perspective. With so many schools experiencing budget cuts, administrators are often unable to send teachers to trainings unless expenses are paid by another source. One respondent worked for an organization that had received funding from the National Science Foundation. They in turn distributed mini-grants of \$4,000 to schools for them to buy equipment and software that help create a “more inclusive environment in areas of science and math, and engineering.” Such a program provides equipment that schools may find difficult to provide otherwise. Another respondent suggested

school administrators may be persuaded to improve and enforce existing policies if technical assistance centers emphasize the business case that providing accessible information technology may reduce costs of individual aid services for students; implementing technology that observes the principles of universal design could also prevent costly changes later.

Legal pressure and the need to meet federal standards, such as the No Child Left Behind Act, were also cited as motivators. One respondent pointed out that providing better learning opportunities to all students would lead to making progress toward meeting assessment standards. An accessible technology specialist believed legal pressure would be the most effective motivator. He said, “It comes down to lawsuits, unfortunately. If a district is facing a lawsuit, they act quickly.” Another respondent’s point of view was that the whole issue needs to be approached as a “problem solving exercise” rather than with any punitive measures, acknowledging the challenges of the state, and the fact that the problem is systemic and will take a long time to resolve.

Discussion

This study was designed to assess knowledge about federal requirements for accessible IT, barriers to implementation, and school capacity to provide these services. We found general knowledge about requirements to provide service, and variable knowledge about how to implement specific accommodations for students. We also identified a significant lack of system-level organization to address accessible information technology. Current barriers present in schools include difficult communication between teachers, information technology staff, other school staff, and parents and a lack of understanding about how to implement specific accommodations. Systemic barriers include: communication within school systems and across disciplines about accessible information technology; difficulty navigating purchasing and logistical procedures to obtain needed accommodations; unique challenges for rural environments; and a lack of funding.

General awareness of accessible information technology

The commonality among the states was lack of knowledge of the issue of accessible information technology among staff. Although there were many respondents with expertise in disability laws, universal design, and assistive technology, few people had considered the broader view of information technology accessibility, and teachers were cited as having insufficient training and knowledge of information technology to adequately determine appropriate uses of technology for students who would benefit from it. Even in cases where participants were guided to think beyond assistive technology devices, it was difficult to get answers that took into account a whole system of hardware, software, operating systems, and purchasing decisions. This may reflect a disconnect that exists among departments; if special education staff are not in close communication with information technology staff, then special education staff may not realize the technological options available to them, and IT staff may not be aware of the need to consider accessibility in all the choices they make in purchasing and installing programs. These findings are similar to those reported by Noble (2005), who indicated that stakeholders in the Kentucky Accessible Information Technology in Schools Project viewed accessible information technology as a disability issue, rather than a systems information technology issue. In these findings, the best-informed respondents tended to be outside of the school systems, specifically those working for technical assistance or advocacy organizations.

Issues and barriers to improving technology access

The most important barriers to improving technology access we identified are a lack of systemic focus, prioritization, and organization regarding accessible technology in K-12 schools. Respondents throughout the region identified a number of issues related to this lack of system integration. They indicated that limited money and teacher time was a barrier. Budget cuts have reduced money for training and equipment. School administrators may face challenges justifying funds for equipment or software perceived to benefit a very small number of students. Teachers have limited time for training, and they may not see accessible technology as a priority.

The common solution to educational issues or problems is often to increase teacher training. While in theory this appears to be a logical solution, expecting teachers to meet all facets of student educational need is not reasonable.

The greatest change could occur by dealing with the larger cultural and political issues, including addressing the need for accessible information technology for all students. The general public and the legislators who represent them tend to place a focus on numbers of teachers as a benchmark in educational funding while viewing the need for support services as “non-essential.” Legislative lobbying and public education and advocacy for appropriate funding for IT support services is the core of creating larger systems change (Cunningham, Young & Senge, 1999). While lobbying efforts are underway, however, some training can be conducted with the aid of ADA & IT Technical Assistance Centers, organized by the ADA National Technical Assistance Program (<http://www.adata.org/>).

In addition, at the school level it may be helpful to identify current personnel who can bridge the communication gap between educators and IT services and assist in implementing systems change. Peterson (2005) and Noble (2005) report strong leadership as a key aspect for implementing accessible information technology change. For students with disabilities, school psychologists may be able to fulfill this role. Current training standards for school psychologists include a focus on consultation skills and multidisciplinary collaboration, and they have responsibility for providing services to larger numbers of students than the typical classroom teacher does. School psychologists are knowledgeable about IDEA and Section 504, are involved in initial eligibility determinations for special education, and could flag the need for computer accessibility at that time while providing a systems perspective to administrators and education leaders. While school psychologists frequently have high caseloads and their roles and functions vary from district to district, training school psychologists may provide the most economical and effective way to reach administrators, teachers, and students regarding accessible information technology. It would be especially helpful to identify school psychologists who are particularly interested in technology to take the lead in addressing education regarding accessible technology and consult with information technology staff and administrators to improve system organization.

Limitations of this study

There are several limitations to this study. The authors present information from a sampling of schools and districts in each state collected via a snowball sampling method; they did not randomly sample participants or interview representatives from every school. Further, the scope of the project limited contacts per state. There could be within-state differences that were not directly assessed. The authors believe they have obtained a sample that can provide valuable insights regarding the knowledge of and needs of K-12 schools. The information in this study is entirely self-reported; while self-report is not necessarily the best method to obtain complete and accurate information, for this needs assessment it is an ideal way to determine the breadth and depth of knowledge of interviewees.

Further research

System change will require more information before substantial improvements can be realized. Key to implementing improvements is further justification of a need for them; a cost-benefit analysis and financial evaluation would be useful in determining the extent to which funding is allocated to accessible information technology and the potential improvement among students if these efforts were more widespread. In public educational environments where funds are limited, an evaluation can include how best to balance district limitations with student needs. Individual schools and districts may benefit from conducting their own local needs assessments to determine specific training needs in accessibility and information technology. Additional topics worth researching include accessibility of relatively new technologies, the role of online/distance learning in reaching students with disabilities, and an examination of “model” schools and districts that have made accessible information technology a priority and a reality. Further, differences between urban, suburban, and rural educational environments can be elucidated in an effort to tailor implementation efforts to districts’ needs.

Conclusions

The results of this needs assessment indicate that many stakeholders in the Pacific Northwest K-12 school systems are aware of the need for accessible information technology for their students, and are also aware of significant systemic and organizational shortcomings in being able to implement the desired technology. Current challenges include (a) limited funding, staff time, and emphasis on accessible information technology; (b) limited understanding

of legal requirements for accessible information technology and limited expertise in applying requirements for appropriate accommodations; and (c) lack of awareness of a need for a system-wide focus on implementing accommodations, most noticeable in the communication divide between information technology and disability/special education staff. Individual schools also face unique challenges, including locations in rural areas and high staff turnover. The recommendations described in this report give interested parties many directions for helping K-12 schools in their quest to provide the best and most accessible services to their students and community.

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