

IT Accessibility Law, Policy, and Implementation

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Information Technology Accessibility: The Problem Defined

Higher education institutions have long-standing ethical and legal obligations to provide programs and services to all qualified participants, including those with disabilities. Their legal obligation dates back to 1973, when Section 504 of the Rehabilitation Act made it unlawful to deny or exclude qualified individuals with disabilities from programs or activities receiving Federal financial assistance. Later, the Americans with Disabilities Act of 1990 reinforced this requirement by prohibiting disability-based discrimination in employment (Title I), programs and services provided by public entities (Title II), and places of public accommodation (Title III). The effects of these laws can be seen in curb

cuts, wheelchair ramps, and accessible entrances to buildings; as well as in the accommodations provided by disability services offices.

When these laws were passed, students could receive a college degree without ever using a computer, and the laws didn't explicitly address accessibility of information technology (IT). However, IT is ubiquitous in college and universities today, and much of it has been developed, purchased, and deployed with little or no consideration to whether doing so creates unlawful barriers for students with disabilities. Consequently the disparity between the quality of education offered non-disabled students and disabled students is increasing as a direct result of the vast proliferation of inaccessible technologies students with disabilities face.

Users of information technology in higher education are diverse, but designing and creating IT that is accessible is a solvable problem from a technical standpoint. All major operating systems have long had application programming interfaces (APIs) that enable programs to communicate effectively with assistive technologies. For websites and web-based applications, the World Wide Consortium's Web Content Accessibility Guidelines were first published in 1999 [1] and updated in 2008 [2]. These guidelines provide exhaustive details to help web developers to create accessible websites. For virtually all other IT, Section 508 of the Rehabilitation Act, as amended in 1998, required accessibility of electronic and information technology (E&IT) developed, procured, maintained, or used by the federal government; and E&IT accessibility standards were written to accompany this law. These standards effectively defined accessibility for six categories of E&IT: software applications and operating systems; web-based intranet and internet information and applications; telecommunications products; video and multimedia products; self contained, closed products; and desktop and portable computers [3].

By conforming to accessibility standards and utilizing accessibility APIs, it is technically feasible to create accessible websites, software, and other information technology; and some companies, as well as web developers and content authors at higher education institutions, are developing products and resources with accessibility in mind. However, the majority of IT products and resources used in higher education were not created with accessibility in mind, and do not

conform to accessibility standards. Consequently, students are excluded from participating fully in their education.

Frustrated, students with disabilities and advocacy organizations working on their behalf have turned to the law for help. In Fiscal Year 2008 (the most recent year for which data is available), 3,165 disability-related complaints against education institutions were filed with the U.S. Department of Education Office for Civil Rights (OCR) [4]. In 2009 the National Federation of the Blind (NFB) sued Arizona State University and filed OCR and U.S. Department of Justice (DOJ) complaints against five other institutions for their use of Amazon Kindle [5]. In November 2010 the NFB filed an OCR complaint against Penn State University for multiple violations, including an inaccessible library website, inaccessible departmental websites, an inaccessible learning management system, classroom technologies that are inaccessible to blind faculty members, and inaccessible financial services provided by a third party [6]. In March 2011 the NFB filed a DOJ complaint against Northwestern University and New York University over their use of Google Apps [7]. These efforts have resulted in positive change. The defendants in each case took action to resolve their IT accessibility problems, but as importantly, vendors at the center of these legal actions – most notably, Amazon and Google – began to take steps to improve the accessibility of their products. Motivated by these successes, students with disabilities and organizations like the NFB are likely to continue using the law to motivate higher education institutions to demand accessible products from vendors.

Meanwhile, students with disabilities continue to work diligently in pursuit of their higher education goals, despite incredible hardships placed on them by inaccessible IT. The following two case studies illustrate the types of challenges students with disabilities face.

Case Study #1: Student with a Visual Impairment

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As a visually impaired graduate student, the challenges I face seem to be multiplied by a factor of three over being an undergraduate student. Due to the

sheer volume of information that I am supposed to digest and assimilate each week, access to information technology and the information that is conveyed in this manner is tantamount to success. I have had to face the major obstacles of a multitude of software and hardware systems being either totally inaccessible or partly inaccessible by means of a screen reading program or by any tactile means. I routinely forgo using presentation packages such as PowerPoint for this reason. Getting my laptop to interface with the school systems is easy enough, but I can rarely do it by myself.

The most common, yet easiest problem to solve is getting access to accessible documents. Although the majority of what I have to read in school is now in .pdf formats, these formats are rarely accessible! Every professor in every semester has given me inaccessible "empty" documents to read. These documents are actually just scanned images of pages and there is no discernable text for my screen reading programs to read. This can be so easily rectified by utilizing the right process when converting or scanning and then converting documents.

The biggest obstacle is still software access. The example that had me perplexed for over a full year and caused much consternation was the use of the Endnote reference management software program. From the fall of 2010 to October of 2011, I could not get either Endnote version 4x or 5x to install on any computer that I had. Finally, after dealing with every person in the IT chain of command, I figured out what the problem actually was related to. When I was told that Endnote had been downloaded over 1,000 times in September and I was the only person to have any trouble getting it installed, I realized that the uniqueness of my computers was the problem. Since I am the only blind student out of over 20,000 in the entire student population that is primarily using screen reading software, I knew this was the problem! Three days later, I had it installed on my Desktop and laptop computers at home. If it had not been for my own personal knowledge about accessibility, I would have been passed on to the company that makes the software to determine what the problem actually was.

I am pursuing work in the area of Human Computer Interaction and have made it my goal to make statistical analytic programs such as SPSS and SAS accessible to screen reading programs. As a researcher, I need access to these tools or I literally have nothing to substantiate my work. Even allowing tools such as this

to be purchased and used when they are inaccessible actually puts me back to the time when blind people had a sighted person sitting next to them and telling them what was happening on the screen.

Case Study #2: Student with a Physical Disability

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I am a PhD student with spinal muscular atrophy (SMA) in the Department of Computer Science and Electrical Engineering at the University of Maryland, Baltimore County (UMBC). SMA is a progressive motor neuron disease resulting in spinal curvature and weakness and atrophy of respiratory and voluntary muscles. As a result of SMA, I have respiratory complications, limited mobility, and I am only able to move the index finger of my right hand. Despite my health conditions, I am a recipient of UMBC's NSF LSAMP Bridge to the Doctorate Fellowship, Ford Foundation Fellowship, and National Science Foundation and have maintained a 4.0 GPA throughout my undergraduate and graduate studies.

The transition from high school to college was one of the biggest challenges that I have faced in life in my first semester. In high school, I had an Individualized Education Plan (IEP) with the provision to be home-schooled for half-a-day and attend school to spend the rest of the day with the support of a personal assistant. In college, I did not realize there would be no IEP and it was completely my responsibility to request the necessary services and accommodations.

With the assistance of my mother, Mrs. Pushpa Krishnaswamy, I was able to go to campus and physically attend classes using a power wheelchair. My mother helped me to drive from home to campus, frequently reposition her by sitting with her in class, and assist with personal care needs on campus. Even after coming home, my mother still assisted me around the clock 24/7.

Due to my decline in health, I am currently unable to physically attend classes but thanks to the UMBC Student Support Services and my department I am able to continue my studies and classes via Skype from home. My advisor, Dr. Tim Oates, is also very supportive of my research in developing robotics to assist

people with disabilities and our research on "Real-Time Path Planning for a Robotic Arm" was recently accepted in the Proceedings of the 4th International Conference on Pervasive Technologies Related to Assistive Environments.

Dr. Renetta Tull, the Assistant Dean of the UMBC Graduate Student Development and the Director of PROMISE: Maryland's Alliance for Graduate Education and the Professoriate (AGEP), wrote the following blog article about me: <http://renettatull.wordpress.com/2011/01/04/grad-student-with-spinal-muscular-atrophy-excels-kavitas-story/>, January 4, 2011.

My assistive technology devices include a Logitech trackball mouse, SoftType virtual keyboard, and DragonDictate. Several challenges that I have faced accessing information technology in college include software and websites that are not compatible with DragonDictate and SoftType, textbooks that are not available in electronic format, and attending class remotely.

First of all, the labor of installing software by inserting CDs can be very challenging for individuals with motor disabilities. IT leaders may consider providing software installation programs via a URL link. Additionally, the installation dialog windows, many websites, and software often don't support the use of DragonDictate and SoftType. The fields of input on websites and software applications are not recognized because the designers did not create compatible features. IT leaders may encourage websites and software developers to use the Dragon NaturallySpeaking software developer kit (SDK) to add speech recognition capabilities to command and control functionality and follow accessibility standards on websites and software. With respect to DragonDictate and SoftType, a common issue is that the word predictions are not context specific. For example, students studying Java in Computer Science courses encounter the problem of typing programming code because these applications do not understand the syntax and logical structure of Java programs. Students have to type on the virtual keyboard or verbally spell character by character using DragonDictate or SoftType to code a Java program. Often, there is a cognitive workload on the end user to add Java code keywords. IT leaders may motivate AAC developers to include a dictionary of context specific words related to the individual's field of study in their applications.

For class work, reading from a book is always difficult because turning pages is hard for people with physical disabilities. Most importantly, the lack of textbooks that are not available in electronic format put the students with the disabilities at risk to keep up to pace with the rest of the class. As to alleviate this problem, students often have student support services to scan the book electronically but this is an unnecessary cost for the college to hire somebody just for scanning a book. IT leaders in higher education can help to address this problem by suggesting all books to be available on electronic format.

Lectures are also not available in audio-video format, making it difficult for the student to study because note takers often miss out on writing down important information. Even through attending classes remotely, there are a few challenges. Current web conferencing technologies, such as, Skype and GoogleTalk, do not let the students view the presentation slides on the professor's computer and notes written on the board simultaneously. Internet connectivity is also often lost during class even with broadband connection on campus and at the student's home. There is no way to transcribe the notes written on the board in the video of the web conferencing technology to a word-processing document. IT leaders in higher education may help find more suitable web conferencing technologies for virtual classes.

Students with disabilities do not always feel comfortable talking with their peers and professors about their disability. Likewise, there is an intricate difficulty for others to usually ask students with disabilities about their challenges. Campuses should encourage disability awareness to help ease conversation and better understanding of obstacles faced by individuals with disabilities. For example, to promote disability awareness on campus, I founded and led UMBC's first organization for students with disabilities, the Society of Inspiring Individuals with Abilities (SISIA). In that organization, I guided seminars to develop self-advocacy skills and required members to fulfill a monthly service project, such as a food drive for a homeless shelter, for community involvement. Campuses should provide more opportunities for students with disabilities to learn about various assistive technologies that may help them be a successful scholar. There should be an organization on every campus to represent students with disabilities and a forum to discuss the concerns related to disability issues.

Instructors can make the classroom more inclusive for students with disabilities by offering an option for online classes with virtual attendance, providing notes in electronic format, and selecting textbooks that are available in electronic format for the class curriculum. To instigate the development of new and better assistive technologies, students in computer science and engineering should be encouraged to focus in this area for their research. When new assistive technologies are under development, the designers should keep in mind that people are unique so there should be flexibility for customization to suit the different functional challenges and preferences of users. It is important to understand the different characteristics of individuals with physical disabilities. For example, individuals that have hand dexterity and speech may control a combination of two interaction methods with mouse control and speech recognition.

Campuses can improve life for students with disabilities by establishing a program for personal care assistance to help students become more independent and experience the same lifestyle of college student without a disability. In fact, the Disabled Students' Residence Program at University of California, Berkeley offers students with disabilities support with personal care assistance with many activities of daily living and a golf-cart for intra-campus travel (<http://dsrp.berkeley.edu/>).

Successful technological and scientific development still requires further advances in research. The policy changes also in academia are necessary to improve the quality of life for people with disabilities and to create an inclusive environment for all. The implementation of the proposed suggestions will significantly nurture the development of assistive technologies and techniques for providing accommodations to fulfill course requirements and to translate ambitions into reality through equality for educational opportunities. By supporting students with disabilities to reach their maximum potential, they can successfully begin their careers and contribute to society, potentially in profoundly meaningful ways to make a difference in the world.

Policy-level Solutions and Strategies

There are many stories in higher education of individual faculty members, academic departments, and IT staff members who have worked with individual

students to help them to succeed. However, these are isolated success stories. The greater problem of inaccessible IT cannot be addressed in isolation. The problem needs to be addressed more systemically, through careful planning and institutional policy.

Ending denial may be the first step. Institutions must acknowledge that they are inaccessible, since no higher education institution can claim otherwise. Even institutions that have made significant progress toward making their IT accessible still have websites, PDF documents, online forms, videos, academic and administrative software, and classroom technologies with major accessibility problems that will prevent students and employees with disabilities from accessing programs, services, and resources. Some institutions may argue that acknowledging problems increases risk. However, institutions arguably face much greater risk by denying obvious problems and doing nothing to remedy them. By acknowledging that accessibility is a problem, institutions can then take ownership of the problem, and begin the process of identifying and implementing solutions. Steps in this process include identifying and documenting the specific problems, then developing an action plan to address them, clearly identifying responsible parties and deadlines.

Cornell University and the California State University system provide two examples of institutions that have taken steps to implement web and IT accessibility policies. The successes and challenges these institutions have faced provide learning experiences for other institutions that are early in the planning process.

Cornell University

In the spring of 2005, the Executive Policy Review Group approved an impact statement for University IT Policy 5.11, Web Accessibility. This policy, with exceptions, would require implementation of Section 508 standards for all official university web pages. As part of this effort, the university conducted a Web Accessibility Economic Impact Study [8] that considered the types of issues that typically needed to be fixed to make a site accessible, and estimated the number of hours of a person's time that would be needed to fix these issues. Results were reported in four categories of sites (basic HTML sites, CommonSpot sites, multimedia sites, and moderately interactive sites with search functions or databases) by size of site.

In the fall of 2009 the Executive Policy Review Group failed to approve this policy. A primary reason for their not approving the policy was that Cornell Information Technologies provided assurances that compliance with Section 508 standards would be included in new university-wide IT standards. As these standards go through various stages of development, the university's existing Disability Access Strategic Plan would act as a support to ensure accessibility is addressed. The Disability Access Strategic Plan is an annually updated plan that was initiated in 2007 to serve as the university's roadmap for disability access. [9] [10]. Each academic year the plan identifies the previous year's accomplishments and establishes goals and objectives for the coming year in six priority areas (physical accessibility of the campus, employment, emergency preparedness and evacuation, educational programs and services, communication, and technology).

With or without a specific accessibility policy, Cornell is approaching its commitment to accessibility by developing a practice of shared responsibility for evaluating, monitoring, and planning the delivery of an accessible learning environment. The goal is to make significant progress each year, revise the plan to include the progress made in the previous year, and set goals for the upcoming year. Key to the success of this effort is leadership and on-going education. Toward the latter, Cornell has developed a Web Accessibility Primer that provides extensive detail in a number of areas, from basic web accessibility principles to more focused topics such as CSS, JavaScript, plug-ins, CommonSpot and Blackboard. [11]

Still, the promise that the Disability Access Strategic Plan and ongoing training efforts would significantly reduce or eliminate web and/or IT barriers has not been realized, and Cornell has recently renewed its attention to this matter, asking questions of how the goal of IT accessibility will be achieved and whether a formal policy might in fact play a role in achieving that goal.

California State University

California State University (CSU) has a system-wide policy focused on continuously maturing the capabilities of the CSU to successfully respond to the educational needs of all students. The CSU policy statement on accessibility was articulated in Executive Order 926, The California State University Policy on Disability Support and Accommodations [12]. Implementation of this policy was

guided by the Accessibility Technology Initiative (ATI) [13], which was outlined in Coded Memo AA-2007-04 issued in 2007, and revised in Coded Memo AA-2010-13 [14]. The CSU approach to addressing IT accessibility is one of shared governance. The Chancellor's Office provides leadership, support, and monitoring; but otherwise responsibility for implementation is distributed across and within campuses. An ATI Leadership Council, campus executive sponsors, campus higher administrations (presidents, provosts, CIO's, and vice presidents), academic and faculty senates, centers for faculty development, disability support services, and vice presidents of student affairs all have explicit roles and authorities defined within the policy.

Managing Institutional Improvements: The CSU Accessible Technology Initiative places emphasis on collaboration and sharing across all 23 campuses that comprise the system. Stakeholders develop a shared understanding and prioritization of the accessibility services that enable campus to students with disabilities to achieve their educational goals. Stakeholders also share their expertise, unique experiences, and how-to stories, all of which are critical for success. The CSU accessibility strategy shifted from our initial use of systemwide deadlines to meet compliance requirements to a focus on supporting campuses continuously improving their capabilities to reliably, promptly, and effectively meet the accessibility needs of their students, staff, faculty, and campus community members. This approach is based on the Capability Maturity Model Integration [15] and encourages campuses to assess their current capabilities and priorities to best determine where institutional efforts and available resources should be directed and then tailor their accessibility implementation to the specific needs of their campus community. Institutions submit ongoing reports of their status level of their capabilities (e.g. not started, initiated, defined, established, managed, and optimizing) on each of the defined goals, and this information is shared across campuses so institutions can compare their status with those of their peers. Through our shared governance processes, we developed an annual assessment methodology which includes a rubric for campuses to assess their current capabilities across the 3 major areas of web accessibility, instructional materials, and procurement, with multiple indicators/metrics within these major areas. This annual and systematic accessibility assessment process enables the CSU to recognize where there are exemplary practices that need to be shared and scaled and where there are

significant gaps in our campuses capabilities to reliably, promptly, and effectively provide educational services for our campus members with disabilities. The CSU openly shares these methodology, rubrics, and metrics [16]. The leadership and projects from Center for Persons with Disabilities & WebAIM, Utah State University, a source of information and support for the technical staff and web developers as they attend to web accessibility, has been very important. The Project GOALS (Gaining Online Accessible Learning through Self-study) [17] strategy, led by Cyndi Rowland, provided a framework for the CSU developing its accessibility assessment strategy that was well aligned with our emerging institutional polices, culture, and practices for continuously maturing the capabilities of the CSU to plan and respond to the educational needs of all our students.

Managing Vendor Improvements: IT accessibility is dependent to a large extent on accessibility of vendors' products and an important area of focus within the CSU's strategy is procurement. ATI accessibility requirements for procurement were revised to focus on technology products with the highest impact, rather than those within specific product categories or whose purchase met specific, prescriptive thresholds (e.g. dollar limits). Accessibility requirements are integrated into requests for proposals (RFP's) and master enabling agreements (MEA's). Performance requirements for accessibility are defined as well as the evaluation methodologies that vendors need to use to demonstrate the accessibility of their products. Products are tested within user-centered scenarios, both internally and by third party evaluators such as American Federation for the Blind and Tech For All consultants. If vendors' products fail to meet accessibility requirements, the CSU accessibility staff will work with the vendors to provide concrete guidance on improving the accessibility of their products and services as well as advice on including accessibility within their ongoing product development processes. We then provide opportunities for vendors to re-compete for CSU business. CSU has worked collaboratively with major vendors (e.g. Blackboard, and CourseSmart) to help them close accessibility gaps, develop and provide equally effective alternative access plans when gaps exist, and support communications that highlight accessible solutions.

The CSU is committed to leveraging our size to target critical institutional goals including achieving cost efficiencies – whether through coordinated procurement activities or the operation of shared services – and working with vendors to

improve the accessibility level of products used by the CSU system and other postsecondary institutions throughout the country.

Conclusion

Accessibility is required by federal law, and in some cases state law as well. More importantly, every person makes a difference, and some people are being denied access to a quality postsecondary education due in part to inaccessible technologies. Some higher education institutions are taking significant positive steps to address their IT accessibility problems through policy, planning, and procurement practices that require accessibility and create a market for accessible products. All higher education institutions can do much more. The digital revolution is occurring and if we do not make accessibility a requirement now, we will enable the institutionalization of another “digital divide” and another “achievement gap” for people with disabilities.

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