Preventing for Accessible E-Learning

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Abstract
The author of this paper discusses access challenges faced by students with disabilities in e-learning programs. She shares what lecturers need to know to deliver course instruction and materials that are accessible to potential students with disabilities as well as their need for professional development and ongoing support. The respective roles of lecturers, online learning designers, and the university administration is discussed and resources are shared. The author shares her experiences teaching an online course to teach educators how to create accessible online courses, including objectives, content and activities, delivery methods, and student feedback, as well as lessons learned that can benefit others who wish to offer similar training.

Introduction
Education programs world-wide continue to make increasing use of technology to deliver instruction. They promote e-learning (alternatively called distance learning, online learning, cyber learning, distance education) as a way for anyone to access any content from anywhere. The dramatic increase in the number of online students around the world has included those with disabilities (Kim-Rupnow, Dowrick, & Burke, 2001; Phillips, Terras, Swinney, & Schneweis, 2013). Their disabilities include blindness and other vision impairments, hearing impairments, mobility impairments, learning disabilities, and attention deficits. However, barriers to e-learning reported by students with disabilities persist. They include uncaptioned videos, disorganized websites, and course materials that cannot be read by screen readers or accessed without a mouse (Gladhart, 2010). Researchers in one study reported that almost half of students with disabilities who took online courses said that they “perceived their disability to have a negative impact on their ability to succeed in online courses” and almost 70 percent reported that they had not disclosed their disabilities to their online instructors (Roberts, Crittenden, & Crittenden, 2011).

The needs of students with disabilities are not often considered as online courses are being developed (Kim-Rupnow, Dowrick, & Burke, 2001; Kinash, Crichton, & Rupnow, 2004) and, when they considered, a reactive model of providing accommodations is usually applied (e.g., Barnard-Brak & Sulak, 2010). The accommodation-only approach often requires that a student self-identify a disability to a disability services office and then this office arranges for accommodations, that may include captions placed on videos for students who are deaf and documents reformatted into accessible formats for students who are blind or have learning disabilities. Although many online students with disabilities report that their requests for accommodations were met, sometimes this approach results in the student with a disability gaining access to course content at a later date than other students and being unable to participate in some online activities.

An alternative approach to providing access is to apply universal design (UD) principles when a course is being developed so that it will be accessible to a broad audience that includes students who are blind and using screen reader technology, who are deaf, whose first language is not the language in which the course is taught, who have varying levels of technology expertise,
and who have other diverse characteristics. UD is defined as “the design of products and environments to be usable by all people, to the greatest extent possible, without the need for adaptation or specialized design” (The Center for Universal Design, n.d., p. 1). Originally applied to architecture and commercial products, UD was later applied to technology, and then to instruction (Burgstahler, 2008). UD is consistent with an understanding of disability as a social construct much like those defined by gender, race, and ethnicity. The “social model” of disability and other integrated approaches within the field of disability studies (DePoy & Gibson, 2008; Gabel & Peters, 2010) consider variations in abilities a normal part of the human experience and suggest that more attention be devoted to proactively designing products and environments, including e-learning courses, that are welcoming and accessible to everyone.

Some course developers and instructors may feel a moral obligation to fully engage students with disabilities in their courses, but in many countries there is also a legal imperative to do so. Internationally, the United Nations has developed the Convention on the Rights of Persons with Disabilities to “promote, protect and ensure the full and equal enjoyment of all human rights and fundamental freedoms by all persons with disabilities, and to promote respect for their inherent dignity” (2006, Article 1).

Notable efforts have resulted in the development of accessibility policies, accessible online instruction, and related resources. In spite of exemplary efforts around the world, more than 80 percent of online learning faculty in one survey had not considered and less than 12 percent had only partially considered the needs of students with disabilities in developing their courses (Bissonnette, 2006). Few faculty report being aware of strategies to make their online courses accessible (Gladhart, 2010) and many say that they do not have the knowledge and support necessary to ensure access to students with disabilities (Roberts, Crittenden, & Crittenden, 2011).

Challenges and solutions related to the accessibility of online learning from the perspectives of students with disabilities, campus disability service providers, professors, and online learning professionals have been reported (Adams & Brown, 2006; Ball & McNaught, 2013; Case & Davidson, 2011; Fichten, et al., 2009; Gladhart, 2010; Keeler & Horney, 2007; Roberts, Crittenden, & Crittenden, 2011; Seale & Cooper, 2009). Many actions have been recommended to improve the accessibility of online learning. For example, ten Distance Learning Program Accessibility Indicators—that online learning programs can take to address accessibility issues relevant to students and potential students, distance learning designers, distance learning instructors, and distance learning program evaluators, developed through a project funded by the U.S. Department of Education, resulted from a review of the literature and engagement with distance learning administrators from multiple institutions (Burgstahler, 2012). For example, one recommendation is that programs that offer online learning should institute a system to monitor the accessibility of courses and, based on this evaluation, take actions to improve the accessibility of specific courses as well as update information and training given to potential students, actual students, course designers, and instructors. The results of this project as well as many others suggest that institutions commit to accessibility and offer a variety of training options and resources. As summarized by Fitchen et al. (2009, p. 253),

One means of addressing problems involving inaccessibility of websites and course management systems, of e-learning broadly, and of specific materials, such as course notes and audio and video clips is through training of professors. Many colleges and universities already offer training on how to integrate e-learning in teaching and on how to use specific e-learning tools. Developing a module, as a start, on how to make e-learning in teaching and integrating this into existing training would, at a minimum,
begin sensitizing faculty and staff on the issues. There are numerous online resources to act as a starting-point (e.g., EASI http://easi.cc/, DO-IT www.washington.edu/doit, and WebAIM www.webaim.org).

However, even institutions that commit to faculty training can face resistance; three-fourths of the respondents in one study cite “faculty resistance to teaching online courses” and three-fifths cite “lack of key resources (training instructors support personnel)” as key factors affecting online program expansion (The Campus Computing Project, 2010). A review of the literature suggests a need to develop and share the results of multiple approaches for the delivery of instruction on the accessible online learning to educators.

It has been recommended that more case studies be shared as a way to encourage the accessible design of online learning (Kim-Rupnow, Dowrick, & Burke, 2001). The author of this paper takes this approach in describing her experiences in developing and teaching an asynchronous online course designed to teach educators how to create online courses that are welcoming to, accessible to, and usable by all potential students. Lessons learned thus far may benefit others who wish to offer similar instruction.

**Accessibility and Compliance in Online Education, Rutgers University**

Rutgers University in the U.S. A. created a series of four courses designed for faculty who teach or who plan to teach online. Program leaders wanted to make the courses short in order to encourage faculty members to take the time to participate in them. Students in the courses are expected to engage in the course about two hours per week over a six week period. Individuals who complete all four courses earn an online teaching certificate. The first three courses in the series are *Fundamentals of Designing and Teaching Online Courses; Absorb, Do, Connect – Technologies to Present, Experience, and Collaborate; and Assessment for Online and Hybrid Courses*. The fourth course, *Accessibility and Compliance in Online Education*, is the focus of this paper:

This course introduces online learning educators to basic concepts, issues, approaches, strategies, beneficiaries, and resources with regard to the creation and delivery of online courses that are welcoming to, accessible to, and usable by all students, including those with disabilities.

**The instructor**

The author of this paper, Sheryl Burgstahler, founded and continues to direct the Disabilities, Opportunities, Internetworking, and Technology (DO-IT) Center and the Access Technology Center (ATC) at the University of Washington (UW) in Seattle. Both centers promote the development of accessible hardware, software, websites, multimedia, and online learning programs. An Affiliate Professor in the College of Education at the UW, Dr. Burgstahler has taught on-site and online and published articles, delivered presentations that focus on applications of UD in education and is the lead author and editor of the book *Universal Design in Higher Education: From Principles to Practice*. Although she works full-time at the UW, she teaches as an adjunct professor at Rutgers University.

**Design, objectives and content**

Course design was informed by the results of three research studies that, together, suggest that accessibility training for e-learning personnel should include content related to access challenges for people with disabilities, legislative requirements, accessibility guidelines/standards, design techniques, and resources and be tailored to the needs of program administrators, course
designers, and instructors (Burgstahler, 2007). The instructor applies the Quality Matters (QM) Rubric of eight benchmarks for high quality online courses. Developed by an international collaboration, the Rubric’s eight standards and related benchmarks apply to course overview and introduction, learning objectives, assessment and measurement, instructional materials, course activities and learner interaction, course technology, learner support, and accessibility and usability (Quality Matters, n.d.).

The students in the course are told about the QM Rubric and how the course focuses on standard number eight, accessibility and usability, as well as the integration of accessibility issues within the other seven standards. By the end of the course, it is expected that students will be able to state the definition, describe the principles and processes, and give examples of UD applied in educational settings; describe ways that students in online courses represent a diverse group; share some of the experiences, challenges, and perspectives of people with disabilities and reflect on how they might impact participation in online learning; describe how individuals with different types of disabilities use technology; discuss international views on the civil rights of people with disabilities and related legislation; compare guidelines and standards most relevant to online instruction; describe accessible design issues and approaches; and design an online lesson that applies UD principles.

The syllabus includes a description of the target audience, the technical level of the course, the time required to complete the course, and resources for getting help with the content or the eCollege LMS. The instructor also tells them that a link to content will be marked “[OPTIONAL]” when it points to a good resource that is not required to meet course objectives; requires technical expertise or time beyond what is expected of students; and/or is inaccessible to some potential students (e.g., an uncaptioned video). Assignments described include participating in discussions, contributing items to a combined list of useful resources, and developing an accessible online lesson or completing an alternative project. They are also told how to request disability-related accommodations through disability support services and asked to share with me any features of the course that are inaccessible to them.

The instructor strives to make the course itself a model of UD, ensuring access to a broad audience, including students whose first language is not English, are blind and using screen reader technology, are deaf, have learning or attention challenges, have low technical skills, live in different time zones, and have a variety of busy schedules. All content and activities are offered asynchronously. Course expectations are clearly presented; all videos are captioned; all PDF files are designed to be accessible to individuals using screen readers; all lessons are presented in a consistent layout and on an uncluttered page and background; unnecessary jargon is avoided and all technical terms are defined; all images are described in a text-based format; extraneous facts are not included with critical content; although due dates are given for posting messages and completing assignments; when students are asked to link to an online resource, they are given a clear expectation regarding exploration of the resource (e.g., ‘browse for ten minutes,’ ‘read thoroughly’); and students are given options for their final project so that they can make the experience practical for them. Students are encouraged to ask for extra time when needed and are allowed to turn in their final project one week after the course end date.
Formative evaluation

Although the course is still in a formative phase of development, student feedback suggests that those who completed the course learned useful content and plan to apply what they learned. Responses include

- “I really learned a lot. I had honestly never been aware, nor given much thought to accessibility and accommodations for students with disabilities;”
- “I think infusing this content and procedures into my [past] courses would have provided a more meaningful experience for all of my students;”
- “… my consciousness/awareness has been well-raised. I’ll need to review some of the material as I wish that I had more time to pore over the pages and links. (I have notes.);”
- “The experience I’ve had in your course has opened up a new dimension of teaching for me. I’ve downloaded many of the resources you provided for future reference and use;”
- “Going forward, I’m working on making online courses accessible to learners with psychiatric disabilities (increasing engagement, focus, navigation elements, etc.);
- “…I learned a lot about issues of accessibility and how to include accessible materials in a course,” and
- “… now I feel more confident to start working on my own to develop more accessible courses.”

No feedback is available from individuals who considered taking the course but did not enroll, enrolled in the course but withdrew before the course began, or enrolled in and began to engage in the course but did not complete the course.

One problem the instructor encountered is potential teaching materials that were not available in an accessible format. These included videos without captions, inaccessible PDF files, and inaccessibly designed websites. Although content choices were limited by this situation, an adequate number of accessible products were located for the course. Keeping a natural flow to the course and discussions was a challenge the instructor anticipated, but did not materialize. For example, in an early offering one student needed to work ahead in the coursework because of an upcoming conflict and another asked to take extra time to complete her work. Discussions were impacted, but the instructor managed to work back and work ahead to comment on posts that were earlier or later than scheduled and the discussions were not seriously diminished. She continues to make small changes to the organization, content, and activities from one offering to the next based on engagement with and observations of the students. For example, when it
became apparent that some of my discussion questions were not clear, she revised them. Her biggest challenge is to offer meaningful content and engagement within such a short course and her greatest concern continues to be whether participants will meet their own commitments to apply what they have learned as they develop or update their online courses.

**Lessons Learned and Recommendations for Future Research and Practice**

Ongoing formative review and corresponding adjustments will ensure that the course described in this paper will continue to improve. A comprehensive summative evaluation of the course is recommended. The instructor also recommends that useful input for future development of the course could be obtained through a survey or interviews of past students to see if they implemented what they learned and of individuals who dropped out of a course to learn why they did so. Regardless of current limitations, the instructor of the courses have reflections to share that might benefit others as they develop similar courses. Many of the lessons she has learned thus far are consistent with challenges and recommendations reported in the literature.

Like others, the instructor learned that offering a course asynchronously offers flexibility regarding the work schedules of potential students. Her experiences also reinforce the importance of tailoring the content, length, and delivery methods to the audience. Her experiences suggest that program administrators consider offering two courses. Since a short course like that at Rutgers may be able to increase awareness, point to resources, and attract a larger audience, but a longer one can offer valuable hands-on training but may attract a smaller group, it might be good to offer an overview course and a follow-up hands-on course with the first course as a prerequisite. A third course the instructor identified is one that is designed specifically for software engineers and developers where content such as the design of accessible learning management systems could be addressed. The instructor also recommends that, when providing hands-on instruction, it is best if it is closely related to how students perceive that they will apply the content. When delivering technical content instructors should be sure to give adequate background and how-to instructions, keeping in mind that students will likely have a range of levels of knowledge and comfort with technology, and offer individual assistance to students, particularly with technical content. Even if students do not have hands-on opportunities to apply technical skills within the course, they should be given references to technical details that they can refer to at a later date. When pointing students to web resources, instructors should make their expectations clear (e.g., “read thoroughly,” “browse for ten minutes”).

It is recommended that course developers make their courses models of UD. Instructors should point out accessibility decisions that they made in developing the course as examples of how students might design their own courses. Course developers should anticipate the characteristics of a diverse audience of potential students with respect to age, ability, disability, culture, race, ethnicity, first language, and technical knowledge as a course is being developed. Content should be made accessible to a broad audience by employing UD techniques (e.g., making PDF files accessible, captioning videos) and instructors should be prepared to make additional accommodations if some aspects of a course are not accessible. Instructors should integrate flexible practices throughout courses. For example, they can build in a variety of options for projects, be flexible regarding deadlines.

**Conclusion**

As increasing numbers of learning opportunities are delivered online and governments around the world enact legislation to ensure equal access for people with disabilities, there is an urgent need for online course designers, content providers, and instructors to design and
deliver courses that are welcoming to, accessible to, and usable by all potential students, including those with disabilities. However, educators report little knowledge of how to ensure that their courses are accessible. Asynchronous online learning has the potential to help fill this gap in knowledge for busy professionals who benefit from the flexibility of this mode of instruction. The course described in this paper and the lessons learned by its instructor may be helpful to others who wish to develop courses on this topic. As reported in the literature, there is also a need for formal research that documents the experiences of students with disabilities in online learning, identifies accessibility challenges and solutions, determines how online learning designers and content developers can best be supported in creating courses that are accessible to all learners, assesses the long-term impact of professional development, and explores other strategies to address this complex problem. Everyone can play a role in the exciting journey toward a more inclusive world.

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