Making Distance Learning Courses Accessible to Students with Disabilities

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Abstract: This paper provides an overview of how and why online courses are made accessible for people with disabilities. As online learning becomes more popular and with legal mandates requiring accessibility, designers and instructors of courses should be aware of the possibilities for accommodating diverse needs. Four scenarios for accommodating students who are blind, deaf, have learning disabilities or mobility impairments are provided.

Introduction

Online learning is a popular way to provide post-secondary level instruction to students in a variety of situations and settings. It holds promise for "non-traditional students" such as adult learners who work full time and students who do not live close to a university campus and students. As online courses become an increasingly popular way to provide access to higher education, it is necessary for course developers to consider issues of "accessibility" of courses for people with disabilities. Both from a legal and ethical standpoint, it is important to consider how the medium of delivery and the materials used in online courses can be made accessible to all students. In this article, we describe some accommodations to consider for students with sight and hearing impairments, mobility challenges and learning disabilities. While it may not be realistic to make all facets of a course accessible to accommodate every functional challenge a student may have, it is useful for instructional designers to be aware of the tools readily available to them to approach "universal access."

Legal Mandates

Several laws ensure that people with disabilities have equal rights and access to education. The Individuals with Disabilities Education Act (IDEA) of 2004 applies to K-

12 education and mandates the consideration of assistive technologies for all students receiving special education services. Title II of the Americans with Disabilities Act (ADA) ensures equal access to information, including print and computer-based information for all Americans. Section 508 of the Rehabilitation Act of 1998 requires that all federal entities and states receiving funding under the Assistive Technology Act State Grant Program must provide students with disabilities access to electronic and information technology. The ADA and Section 508 are important legal mandates for institutions of higher education to take into account as course delivery and interaction is increasingly conducted through online technologies.

Assistive Technologies and Universal Design

Computers and other digital technologies offer several built-in software features that facilitate accessibility. These built in features can constitute "assistive technology." These features include the text-to-speech and accommodations for people with low vision such as built in magnification and contrast settings. Some assistive technologies are available for purchase, such as speech-to-text software which allows those who are unable to type a way to input data. Assistive technologies also include products or equipment specially purchased "that is used to increase, maintain, or improve functional capabilities of individuals with disabilities." Course developers should be aware of the array of tools an individual with a disability may need to use and create course content accordingly. For instance, Adobe Portable Document Format (PDF) files can be made accessibly or not. An accessible PDF file is one that has meta text along with the graphical representation of text, allowing computers to interpret it.

Weir (2005) provides a list of instructional strategies and course design elements that can facilitate online learning for students with disabilities. She includes not only the technical functions, but also best practices in instructional practice online. Researchers point out that developing online courses to meet the students with disabilities can be helpful for all students, addressing with diverse learning styles. Judd (2005) notes that universal design principles for online learning can take into account how content is presented and also the ways in which students are evaluated.

The DO-IT program of the University of Washington has been a leader in the field of accessible distance learning, publishing articles on policy and implementation of online courses that take into consideration the needs of students with disabilities (Burgstahler, Corrigan, & McCarter, 2004). They emphasize the importance of university-wide guidelines, established and published procedures and support for staff and designers of online courses.

Four Scenarios: Accommodations to Consider

In this section, we provide examples of a few accommodations that can be made with common elements of online courses. Using four scenarios, we define the challenges of students with particular disabilities and highlight some of the ways that accommodations can be made by instructors and designers of courses. These scenarios represent general

classifications of four disability categories and some common functional limitations that are associated with each. We do not intend to provide an exhaustive list of all accommodations that can be made for each type of disability, but rather just give a sample of accommodations to be aware of and to consider.

Our scenarios take place in a hypothetical online course, based on actual courses we have designed and delivered. This course is an Introduction to Special Education course, often taken by undergraduate students at a College of Education, who are gaining exposure to a variety of concepts in the field of education. Our hypothetical course is delivered through the university's course management system (CMS), called "Sakai". Sakai is an asynchronous environment, in which instructors can post resources and materials. Sakai has features such as a Discussion Board and Email features that allow students and instructors to communicate and interact with one another. The instructor posts materials that are primarily text-based, files that students can download.

In addition to the asynchronous component that Sakai provides, the course includes five synchronous "real time" meetings during the semester. These sessions are conducted through "Elluminate Live!" the college's synchronous web conferencing/collaboration environment. Through Elluminate students are able to communicate with each other via text and audio. The Elluminate environment includes a "whiteboard" on which presentations and documents can be shared. The instructor will ask students to take part in five synchronous meetings, during which they can have class discussions and present projects to each other, using the whiteboard feature.

For this course, the instructor will use text-based files that the students have to read. Students will also be expected to participate in "threaded discussions" on Sakai, where they read and respond to posts from the instructor and other students. In addition, the instructor posts some instructional videos for students to watch and audio podcasts. Students are expected to download the videos and watch them (using a computer) and download the podcasts and listen to them (using a computer or MP3 player).

Accommodations for a student who is blind

Mathew is a blind student who has several functional limitations that will affect his ability to fully avail of the technologies used in the class. Mathew is unable to see a computer screen and therefore cannot read text or printable materials. He is also unable to see graphics that relay key content and navigation information within Sakai and Elluminate Live! Examples of images he will miss are; icons, videos, & collaborative whiteboards during Elluminate sessions.

Mathew uses specialized software and hardware to help him access information on the computer. He has screen reading software that converts computer text to audio or braille enabling him to listen or read the text. Mathew has a refreshable braille display attached to his keyboard that allows him to read, with his fingers, all the text converted to braille. This software does not read images, however, so instructors and instructional designers

need to design the course and instructions accordingly. One such option is to provide text descriptions of all images and video placed in the online course environment.

Mathew will also need accommodations for the instructional videos used in class. The instructor should be ready to provide descriptive audio of the visual information on the videos. The university's Disabled Student Services (DSS) office could direct the instructor to organizations that can produce descriptive audio. Another more likely accommodation would be to provide Mathew with an aide to watch the video with him and describe what is happening.

Accommodations for a student who is deaf

Marlee is Deaf and has been since birth. Her first language is American Sign Language (ASL). Marlee's functional limitations do not limit her access to most of the course since she can interact with the text-based information in Sakai. However, since the course includes a few multimedia elements, such as instructional video, podcasts, and synchronous meetings over Elluminate live which include audio, we need to consider that Marlee is unable to hear the audio in these course elements.

There are technologies that can help her access the audio content. To enable Marlee to access pre-recorded multimedia portions of the courses elements such as the videos can be captioned. If the instructor produces the podcasts herself, it is good practice to read off of a script; that script can be posted as the text alternative of the podcast. If the instructor is using a commercially-produced podcast, the DSS office of the university will be able to assist by hiring an organization or individual to transcribe the podcast.
Since Marlee is fluent in ASL, there are two ways to make the Elluminate sessions accessible for her. One way is to use two-way video conferencing between Marlee and an interpreter, who signs the audio from the Elluminate session. The second way is to enable the closed captioning feature included in Elluminate and to employ a real-time captioner.

Accommodations for a student with learning disabilities

Albert has a learning disability (LD), a label that is being seen more often in university environments as students with LD go from secondary school to college. Albert's particular learning difficulties are associated with written language. He has difficulty reading and understanding large blocks of text in print or on screen. Albert is also easily overwhelmed when there is too much information on a page.

Albert knows how to use text-to-speech software to assist him in reading. Using text-to-speech, he can highlight specific text and have the computer read it back to him. Hearing the text out loud while reading helps him comprehend the material better. The course instructor can post reading materials in formats that are accessible to text-to-speech software. (Word documents and accessible PDF files can be accessed by text-to-speech software.)

The instructor or instructional designer of an online course should also be aware of webpage design when creating a course. A well-designed webpage should have white space and text in a proportion that is uncluttered. For students with learning disabilities such as Albert's, the way text appears on a page can affect their ability to read with ease.

Accommodations for a student with impaired mobility

Our final scenario is Steven, a student who has limited mobility. Steven has little use of his arms and legs. It is very difficult for him to turn pages of books, use a mouse or a standard keyboard. Steven's voice is also affected so it is very soft and hard to understand.

To access information and communicate, Steven employs a variety of technologies. Voice recognition software, which converts speech into text on a computer screen, is a common software program used by individuals with mobility impairments. However, Steven's voice is not strong enough to use voice recognition software. Steven relies primarily on alternatives to the standard mouse and keyboard that are adapted for him to use. As with Albert effective use of white space in a course will aid Steven by giving him bigger targets to click on. Electronic versions of reading materials will enable Steven to read off of the computer screen elevating his need to turn or manipulate pages.

Conclusion

Developing an accessible online course is important for a number of reasons. Legally, it is required for universities to make their coursed accessible to all students taking them. As educators, it is good practice to incorporate universal design principals to limit the need for additional accommodations.

The four scenarios illustrated some challenges that students might have in an online course and the technology-related accommodation that can address them. In some situations what works for one individual is counterproductive for another. However, some of the strategies described are useful for students with various learning needs. For example, audio captioning allows students who do not have hearing impairments to acquire the information with two modalities, reading and listening.

While these strategies can be used for many disability categories and even aid students without disabilities, accommodations can be difficult or expensive to produce. The campuses DSS office can be a good resource; their purpose is to help provide appropriate accommodations to students who register with them as having a disability. A course does not need to be designed for all possible disability types and functional limitations; that is not always feasible. However, courses should be designed for the intended audience, taking into account some basic principles of universal design.

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