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Assessing Accessibility: How Accessible are Online Courses for Students with Disabilities?

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Abstract

Delivering course material in a manner that is accessible to all students including those with disabilities is important in the online environment. This article presents an analysis focusing on the accessibility of six courses presented through the Webcourses platform. Six professors volunteered one course for analysis. The tool used for analyzing the courses was the WAVE tool bar. Analysis of course was completed individually, but results were reported across courses. Overall, results indicated 13 types of challenges and of these 5 were the most prevalent across courses. The author discusses a brief history of distance education, the tool used for analysis, challenges that were identified within course and offers suggestion of how to minimize those challenges. Within the methodology, screen shots of the WAVE tool bar are provided. Visual analysis of the frequency of the 13 challenges is provided. Implications of the WAVE tool are shared with future research directions.

Keywords: online learning, students with disabilities, accessibility, format challenges, format adaptations

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A student is enrolled in a prominently online masters levels degree that requires readings, discussion board postings and assignment submissions to be accessed and accomplished through the online environment. The student is registered with the university's disability services office and has had correspondence with the instructor about specific needs in order to be set up for success in the course. The instructor has made accommodations for immediate needs; however, challenges arise with course content that stem from an online learning platform perspective. The student notifies the instructor to see if there are alterative methods of accessing the necessary content. This scenario is not uncommon for online learning, but is especially pervasive for students with disabilities.

It is reported that as of 2012 an estimated 31% of individuals with disabilities have earned some type of college or associates degree (U.S. Disability Statisitics, 2013). Access to education for individuals with and without disabilities has been progressive. Starting with attending a physical school to attending through online connections. Approaches to learning have multiple modalities that can be used in isolation or combination. The two methods of learning often referenced are face-to-face and virtual learning with even a combination of the two, depending on the instructor's structuring of the course. For centuries, the primary means for sharing knowledge has been through face-to-face instruction. Distance learning has developed over time as providers evolved. The shaping of distance learning has its foundation in mail delivery, which transformed into radio broadcasts, television programs, and then various ways of computer-based learning (Casey, 2008). Twenty-first century distance learning requires the use of Internet where learning occurs both independently and cooperatively between instructors and students. According to Allen and Seaman (2013) 6.7 millions students in United States higher education institutions are enrolled in at least one online course. The National Education Policy Center (2014) reported that approximately 7.2% of those students have a disability (Molnar et al., 2014). Students with disabilities are continuing to choose online environments for their education because of the ease of access, self-paced nature, and control of the learner's environment (Coy, 2014). This is a significant change in the access to an education for individuals with disabilities from the early twentieth century when individuals with disabilities were only afforded an education where their families could directly provide one (Dickerson, 2012). With this change comes responsibility for both the learner and the instructor. As mentioned in the beginning vignette, students with disabilities may have approved accommodations but that does not guarantee a seamless transition into the online learning environment.

Learning and the Laws for Education

Education of all individuals, including those with a disability has a long history that stems from the 1800s; however, equal opportunity of education comes much later in 1975 with the Education of All Handicapped Children employed the right to free and appropriate public education (FAPE) for all children no matter the type or degree of disability (Reed, 1992). Many years later, the Individuals with Disabilities Education Act (IDEA, 2004) highlighted the concept of accommodation verses modification for students learning (U.S. Department of Education, 2006). Accommodations are student-led and modifications are teacher-led; however, both are initiated through letters defining educational needs written by medical professionals.

Online Learning and Individuals with Disabilities

With online learning on the rise, there are continuous concerns of its accessibility, particularly for participants with disabilities. It is the individual's prerogative to disclose a disability. In the online learning environment, it is difficult for the instructor to identify if any students have disabilities. Most institutions have a disabilities services department, but the student must take the initiative to activate services, which then are approved and professors are notified of needs pertaining to individual students (Hong, Ivy, Gonzalez, & Ehrensberger, 2007). Reaching out to professors on the student's behalf does not help lessen potential barriers within online course unless the student takes the initiative to introduce and identify themselves as a students within the class needing accommodations. Even then there is no guarantee that he or she will be successful in the course. The success of students with disabilities in an online environment centers on whether or not the student has accommodated access to course materials.

Perspectives of Online Learning

The prevalence of online learning for students with disabilities has increased over the years due to its accessibility (Burdette, Greer, & Woods, 2013; Coy, 2014). Giving the learner flexibility to determine their location of study. A study was conducted by Burdette, Greer, and Woods (2012) to investigate what propels kindergarten through twelfth-grade online learning in the students' school district, participation of students with disabilities in online learning, and the access to a free and appropriate public education (FAPE) through online learning. Three major findings were yielded. First, it was found that online learning was driven by its affordability, flexibility, and quality of instructors. Second, students with disabilities reported having guidance through their online learning experience. Last, FAPE access in the least restrictive environment through online learning was evaluated and yielded that there were many issues related to accommodating students with disabilities to ensure sufficient access to the curriculum to succeed in the online environment (Burdette et al., 2013). The perspectives represented were mostly positive, but the negative aspects expressed can have a significant impact on success within the online learning environment.

Considerations to be Made When Teaching Online

By nature, the planning and delivering of instruction takes deliberation and action. When teaching online, this consideration is heightened due to the limited face-to-face interaction between instructor and student. For student with disabilities, their institution's disability services are an important tool to ensure access to course curriculum, but students must take the initiative to inform their professors of specific needs. WebAIM outlined online accessibility for all, including for those with disabilities, to be (a) the right thing to do, (b) smart to do, and (c) the law (WebAIM, 2014). This understanding has brought about different considerations when developing online courses. Professors need to be aware of the potential barriers to content accessibility that inhibit growth of knowledge and application of content.

As an instructor, there are many considerations for developing a course online in order for it to be accessible to all students, including those with disabilities (Greer, Rowland, & Smith, 2014). One method that can allow "all individuals equal opportunity to learn" is by using Universal Design for Learning (UDL) principles (Cast, 2014). When principles of UDL are

employed one concept is focus but is presented in many different ways, students present their knowledge gained in different ways, and there are different ways that student are engaged with the concept (Cast, 2013). Greer and colleagues (2014) even suggest having supplemental option available to all students. A variety of considerations go into developing an online course and presentation of course content needed to be accessible to all students (Rao & Tanners, 2011).

Students' Success with Online Learning

According to Burdette et al. (2013) from primary grades through high school, students with disabilities often depend on their parents and teachers to provide accommodations and modifications needed for academic success. Once students with disabilities move on to post-secondary education it is the students' responsibility to obtain documentation for accommodations relating to disability and activating those accommodations; however, not all students with disabilities realize this and struggle early in their college career (McCarthy, 2007).

The introduction of Common Core into K-12 public education has required the use of technology across content areas (Graham & Harris, 2013). Incorporating technology into all learning environments is also effective because of the technological literacy of the current generation of students (Carr & Prater, 2013). While the use of technology to enhance or even deliver education is common, its efficacy at producing learning outcomes is still debated in some settings (Bushweller, 2014).

The General Problem

Distance education has changed over time (Casey, 2008). Today, distance learning is understood as online or virtual learning, either partially or fully in this format. Virtual learning is increasing in its prevalence, especially within higher education, making the accessibility of this method of learning more important for students with disabilities (Allen & Seaman, 2013).

Research Questions

1. What possible challenges can be identified within online courses for students with disabilities, as measured by the online WAVE Assessment Tool?
2. What strategies can be implemented to make online courses more accessible for students with disabilities?

Challenges with the Nature of the Platform

There is a continued growth of online learning among university students with disabilities; however, with the many different platforms that are used to deliver the online instruction, accessibility across platforms is difficult to ensure. All modalities of learning present advantages and disadvantages. The platform that was analyzed in the current analysis for delivering online instruction was WebCourses. Before a detailed analysis using a specific tool was initiated, this researcher looked at the basics the program offered students. For instructional material delivery, the instructor can use text, links, video, and images just like a normal website. Students have the option to submit assignments as text submissions, pasted into a textbox within the program; attached as a file; or submitted as an audio or video submissions that meet the

assignment criteria. All options have to be enabled by the instructor when they create the assignment. Each submission option that is available to students is located on an assignment-specific submission screen with icons representing the different types of submissions available. The most common submissions were document uploads and occasional textbox entries. The following is analysis of six online courses and the challenges identified within each. Each class' instructor granted access to course materials for the purposes of this study. Upon explanation of findings, implementations of improvement are suggested.

Why WAVE?

WAVE is a free tool for evaluating the accessibility of webpages (WebAIM, 2001). The WAVE application was one of a few resources for evaluating the accessibility of websites, including online course material for students with disabilities (Hashey & Stahl, 2014). After reading Hashey and Stahl's summaries of different website evaluation tools, WAVE was selected by this researcher for its access to the tool, easy identification of challenges, and solutions to challenges detected. It was also viewed as a tool that online instructors would be open to using when building their course due to its identification of challenges. WAVE also provided solutions to the identified challenges, making it a more valuable resource. A website evaluation by WAVE gives the user a stoplight hierarchy of challenges detected on the website and then generates instructions on how to overcome each item seen as a potential challenge.

Methodology of Evaluation

Selection of Participants:
Select professors were emailed within the College of Education explaining about the purpose of the project and offering to analyze their course and provide them the feedback from the analysis. The professors interested had one of their courses analyzed (n=6).
Using WAVE to evaluate the accessibility of a website can be done in two ways:

1. Go to the website http://wave.webaim.org/ and then typing in a full web address
2. Downloading the WAVE tool bar to be used one at webpages

For the purpose of this analyze, the research chose to download the WAVE toolbar.
Step-by-step procedures followed for analysis of each course using the WAVE tool bar:

1. Go to the webpage for evaluation.
2. In the Wave tools, select the "Errors, Features, and Alerts." See Figure 1 for location within toolbar.

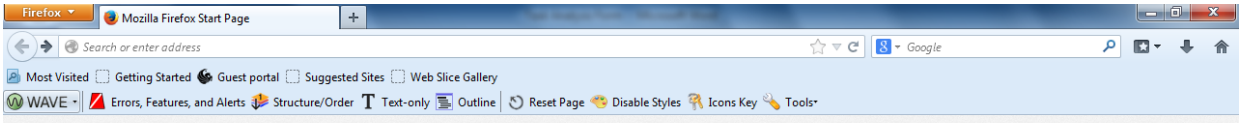

Figure 1. Location of "Errors, Features, and Alerts."

3. If WAVE detects errors, a yellow strip will appear under the tool bar that reads, "Uh oh, Wave has detected ___ accessibility errors!" See Figure 2 for location within toolbar.

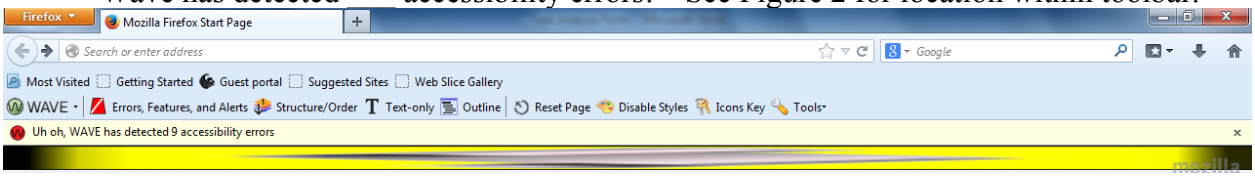

Figure 2. Location of "Uh oh, Wave has detected ___ accessibility errors!"

4. Once "Errors, Features, and Alerts" is run your page will look similar to Figure 3.

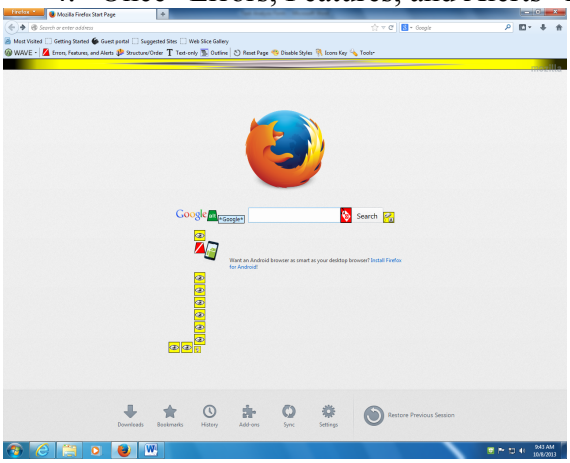

Figure 3. Example of WAVE results output.

Repeat steps 1-4 for each webpage being evaluated.

To improve accessibility, it is necessary to be in the instructor view of the course. Based off of the screen that appears after Step 4 the colors of the icons mean:

Red: The page content contains "Errors" that are barriers for the majority of users.

Yellow: The page content contains "Alerts" that may have missing components.

Green: The page contents contains "Features" that provide accessibility for users.

Results

Figure 4 below shows all 13 challenge areas that were identified across the six courses that were evaluated. Within those 13, five were identified, by frequency of occurrence, as the top priority to be addressed through giving and methods of improving them. One of the five challenges, incompatible with screen readers, was addressed within the research as a concern that needs to take priority among the four others. The visual analysis below may lend confusion because of the verbiage that is used; however, this language matches the accessibility tool. In addition to identifying the challenges on each webpage viewed, WebAIM also supplied a list of direct actions that could be taken to improve the challenge. This will be explained more in the data analysis section of this report.

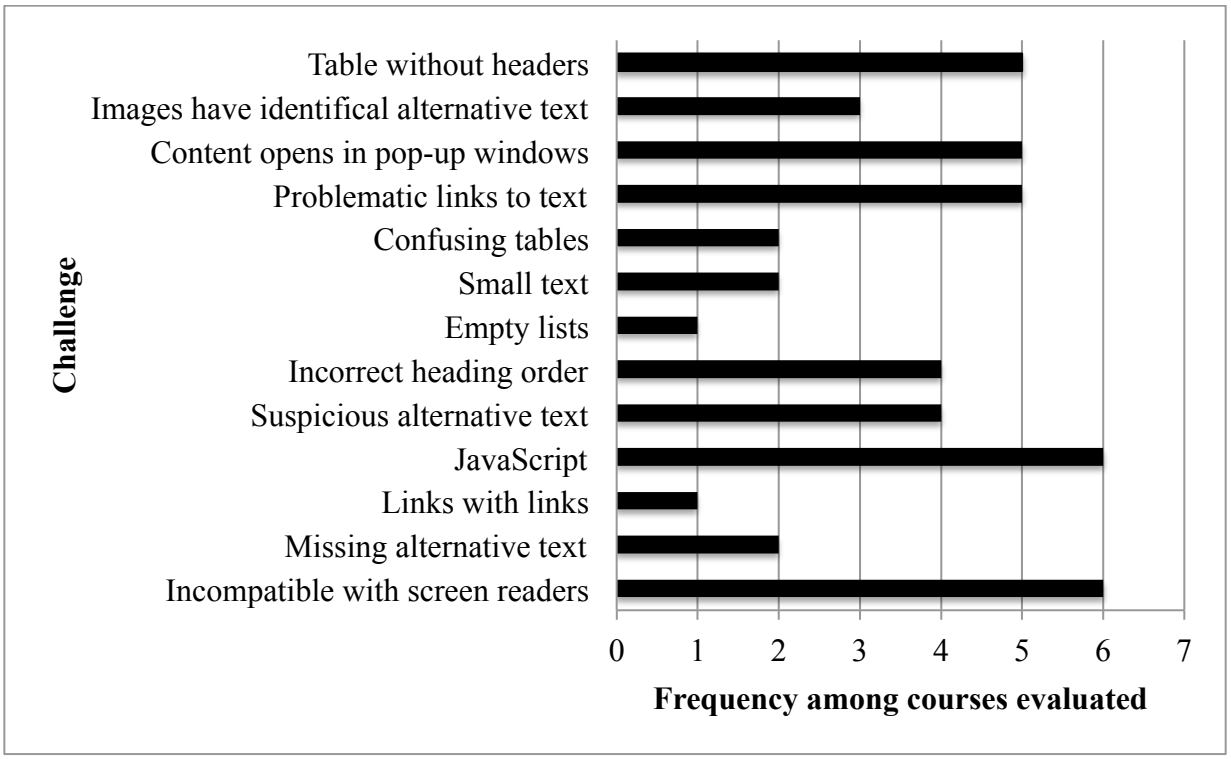

Figure 4. Overview of finding after analysis of courses using WAVE

Analysis of the Data

Each course was evaluated and a maximum of ten challenges and their corresponding solutions were identified using the application. The WAVE program highlighted all challenges and provided suggestions for improvement. The above figure represents thirteen collective challenges that were evident. Not all were challenges in every course evaluated. The following analysis will discuss the top five challenges represented across evaluations in order of prevalence.

Incompatible with screen readers: Content cannot be read my screen readers
Use of JavaScript: To use this in its default function individuals need to be able to use a mouse.
Content opens in pop-up windows: When the link associated with the content is clicked, a new window opens with the content.
Problematic links to text: The links to texts are similar to other links with or around text
Tables without headers: Tables that are visibly present but lack headers for organization

Implications for improvement

Instructors are to be aware of the basic struggles students with disabilities may have when interacting with instructional material and know what tools the online platform has to offer to minimize such challenges. This is awareness of potential challenges is not equal but more important in teaching online than in face-to-face due to the limited direct interaction with the students (Hashey & Stahl, 2014). Knowing the challenges that are presented to students with disabilities and being flexible with accommodating student through a multitude of ways that are acceptable to the professor is key for success in online learning for students with disabilities.

Table 1 provides adaptation solutions for all challenges that were identified in the results. The titles "Challenges" and "Adaption" are descriptors that the researcher chose. The actual challenges are in the language directly taken from the WebAIM site once "Icon Key" is clicked. The adaptions are paraphrases of what WebAIM provides.

Table 1. Identified challenges and suggested adaptations

Challenge	Adaptation
Content not compatible for screen readers	Plainly display all content if it is to be seen by the user
Problematic links to text	Reword the links so descriptions can be independent of the rest of the text
Content opens in pop-up windows	Make the link open in the same window that listed in or tell user that it will open in a different window
Images have identical alternative text	Make sure images have their own distinct text describing them
A tab index is used	Ensure that all labels and tabs read in local order
JavaScript is present	Make sure the user has a mouse or other hardware to access JavaScript
A table without headers is present	Make sure that the table is intended to be a layout table and remove all headers
Repetitive missing alternative text	Be sure the alternative text is not repeated
Links contain various other links within them	Reword the links so descriptions can be independent of the rest of the text
Suspicious alternative text	Make sure all alternative text accurate description of the image it is describing
Incorrect order of headings	The first heading label in a document needs to be h1 and heading levels should not be skipped
Empty lists	Lists should be used for informational purposes
Very small text	Small text is difficult for some user. Use font sizes that allow text to scale
Confusing table layouts	Be sure that the table is actually a layout table
Table headers are present	Make sure that what is being used as a header is really a header for the table
Links set to open in new window	Make the link open in the same window that listed in or tell user that it will open in a different window

Note. Adapted from WAVE Icon Key (2010). *WebAIM, Inc.* Retrieved from chrome://wavetoolbar/content/icons.htm

Future Research

Future research could include surveying this student population in an effort to evaluate their perceptions and struggles when using Webcourses to access their course curriculum.

WebAIM provides testimonials of accessing online course content however it is not specific to a certain campus wide used platform.

Types of accessibility certifications

There are two different types of accessibility certifications. The first, 508 compliant, is the minimal compliance needed for a website to be deemed accessible for individuals with disabilities. This level of compliance originates from Section 508 of the Rehabilitation Act (1998) mandating that "all technology used, developed, and purchased by federal agencies be it accessible to people with disabilities" (Smith & Basham, 2014, p. 130). The more sophisticated level, W3C, is harder to obtain and requires rigorous checks that result in a certificate of accessibility if they meet all required standards outlined (W3C, 2015). These are two well-known types of accessibility certification for online resources used by everyone including those with disabilities ranging from a minimal to maximum compliance capacities.

Conclusion

This article has discussed the development, application, and future implications of the access to online learning for students with disabilities. Evaluation identified usage challenges that could be present for students with disabilities and provided solutions for lessening these barriers to online content. Within the educational field, the phrase "all students can learn" is believed to be true especially among the professionals who do everything they can to increase their students' learning potential. It is difficult to know the barriers to potential, especially in an online learning environment, unless they are brought to our attention. This research is the result of the evaluation of one online learning platform, Webcourses, being evaluated using the WAVE application; however, it opens minds up to the accessibility issue further and provides recommendation to improve access to online learning content for all students. The increase in online accessibility broadens the avenues through which learning can continue.

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