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Community College Journal of Research and Practice

ISSN: 1066-8926 (Print) 1521-0413 (Online) Journal homepage: https://www.tandfonline.com/loi/ucjc20

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To cite this article: Z. W. Taylor & Ibrahim Bicak (2019): Two-Year Institution and Community College Web Accessibility: Updating the Literature after the 2018 Section 508 Amendment, Community College Journal of Research and Practice, DOI: 10.1080/10668926.2019.1600604

To link to this article: https://doi.org/10.1080/10668926.2019.1600604

COMMUNITY COLLEGE JOURNAL OF RESEARCH AND PRACTICE
https://doi.org/10.1080/10668926.2019.1600604

Two-Year Institution and Community College Web Accessibility: Updating the Literature after the 2018 Section 508 Amendment

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ABSTRACT

On January 18th, 2018, the Americans with Disabilities Act (ADA) required all federal aid-receiving institutions of higher education (Title IV) to publish web accessible websites for people with disabilities. To be compliant with federal law, Title IV institutions must now adhere to Web Content Accessibility Guidelines (WCAG) 2.0 standards at the Level-A and Level-AA threshold. This study examined the web accessibility of a random sample of 325 two-year Title IV institutions in the United States and found all institutions had at least one Level-A error on their homepage, potentially violating new ADA guidelines. This study also found private, for-profit institutions published the least web accessible websites, while public institutions published the most web accessible websites. Implications for future research and practice are addressed.

Introduction

According to the most recent per the Integrated Postsecondary Education Data System (IPEDS), students with their disabilities documented by their institution comprised less than 3% of the overall student population at 79% of all institutions of higher education in the United States in fall 2016. In all, roughly 215,000 students with disabilities studied at two-year institutions in the United States in fall 2016, comprising less than 4% of nearly 6.5 million community college students in the United States (National Center for Education Statistics, 2018). As students with disabilities are often marginalized and under-supported during their transition from high school to postsecondary education (Brinckerhoff, 1996; Eckes & Ochoa, 2005; Garrison-Wade & Lehmann, 2009; Janiga & Costenbader, 2002; White et al., 2017), a large, longitudinal body of research has demonstrated that students with disabilities do not access higher education – at two- and four-year institutions – at the same level as their peers (Evans, Broido, Brown, & Wilke, 2017; Getzel, 2008; Getzel & Thoma, 2008; Hong, 2015; Madaus, Grigal, & Hughes, 2014).

For as influential and powerful as Internet technologies have become for informing student choice (Burdett, 2013; Daun-Barnett & Das, 2013; Dettling, Goodman, & Smith, 2018), researchers have criticized institutions of higher education for not producing web accessible materials for students with disabilities (Erickson et al., 2013; Hackett & Parmanto, 2005; Harper & DeWaters, 2008; Thompson, Burgstahler, & Comden, 2003; Thompson, Burgstahler, & Moore, 2010). This lack of web accessibility has contributed to students with disabilities being excluded from postsecondary education in the U.S. (Bradbard, Peters, & Caneva, 2010), including from community colleges (Erickson, Trerise, VanLooy, Lee, & Bruyère, 2009; Flowers, Bray, & Algozzine, 2011; Wisdom et al., 2006).

Subsequently, hundreds of people with disabilities have brought lawsuits against institutions of higher education (Carlson, 2018). These lawsuits have alleged that institutions of higher education have violated Section 508 of the Rehabilitation Act of 1973, which mandated that electronic and

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information technology used by the federal government, including federally-funded institutions of higher education, be accessible to all people with disabilities (LaGrow, 2017). In response, beginning on January 18, 2018, U.S. Government updated Section 508 requirements. These Section 508 requirements now hold all federally-supported U.S. institutions of higher education (Title IV institutions) to Level-A and Level-AA compliance according to Web Content Accessibility Guidelines (WCAG) 2.0 standards (United States Access Board, 2018).

Section 508 of the Americans with Disabilities Act adopted the WCAG as the official standard of web accessibility, setting accessibility conformance at three levels. Level-A is the minimum level of conformance and satisfies all Level-A success criteria defined by WCAG, such as ensuring all audio content is captioned for those hard of hearing (W3C, 2018b). Level-AA is the standard level of conformance and the threshold Title IV institutional websites must meet to be deemed web accessible and in compliance with ADA (United States Access Board, 2018). Level-AA success criteria encompasses all Level-A criteria, plus an additional level of conformance, such as color contrast minimums and using unique headings and labels to allow students to differentiate between webpages (W3C, 2018b). Finally, Level-AAA is the optimal level of conformance, including all Level-A and Level-AA success criteria (W3C, 2018b). Title IV institutions do not need to meet Level-AAA conformance, as "It is not recommended that Level AAA conformance be required as a general policy for entire sites because it is not possible to satisfy all Level AAA Success Criteria for some content" (W3C, 2018c, para. 11).

Ultimately, WCAG 2.0 requires websites to be perceivable, operable, understandable, and robust for people with disabilities, as these four categories encompass diverse elements of a webpage, such as audio, video, images, text, hyperlinks, buttons, toolbars, and menus (W3C, 2018b). As a result, an institution's website can be considered ADA and WCAG 2.0 compliant if a wide variety of assistive technologies are able to read the data in the website's markup language – typically HTML or hypertext markup language – and render the content intelligible to a person with a disability (W3C, 2018b). For instance, a person who is blind may require an assistive technology which can vocalize text and visual elements of a website, while a deaf person may require an assistive technology which can caption audial elements of a website.

Extant research has examined web accessibility at four-year (Bradbard et al., 2010; Hackett & Parmanto, 2005; Harper & DeWaters, 2008; Kelly, 2002) and two-year institutions (Erickson et al., 2009; Flowers et al., 2011; Wisdom et al., 2006). These studies have found that postsecondary websites are rarely compliant with WCAG standards. The most recent studies of two-year institutional web accessibility are the works of Flowers et al. (2011) and Erickson et al. (2013). Flowers et al. (2011) found only 58 of 253 (23%) community college home pages were accessible to people with disabilities, while Erickson et al. (2013) found less than 1% of webpages from 30 community college websites met Section 508 guidelines. Since the January 18, 2018 deadline, no research has updated previous work to learn if postsecondary websites – specifically, two-year institutional websites – comply with new Section 508 guidelines and the most recent WCAG 2.0 standards (W3C, 2018b). In addition, it is important to update previous studies related to web accessibility, as assistive technologies and web accessibility can frequently change and become more advanced (Kurt, 2018). Therefore, this study seeks to update and expand upon previous work by answering two critical research questions pertinent to community college students with disabilities:

(1) After the January 18, 2018 deadline, are two-year, Title IV-receiving institutional websites compliant with new Section 508 guidelines and WCAG 2.0 standards?
(2) If not, which WCAG 2.0 standards are most abundant?

Answering these questions will not only inform the scholarly community but also inform institutions as to whether their websites are compliant with federal law and accessible for a marginalized population in higher education, namely community college students with disabilities.

Literature review

Since the proliferation of the Internet, educational researchers have examined the web accessibility of postsecondary websites. Kelly's (2002) study of the web accessibility of United Kingdom (U.K.) university websites (n = 162) found only four U.K. universities were Level-AA compliant per WCAG 1.0 standards. Using the web-based Bobby™ accessibility tool, Kelly (2002) also asserted the primary source of web accessibility errors were made when images were missing alt element attributes, or text that specifies what should be rendered on a screen when the element cannot be rendered (i.e., screen reader technology reading text to a person who is blind). Similarly, in a longitudinal study from 1997 until 2002, Hackett and Parmanto (2005) evaluated archived institutional higher education webpages and found that as Internet technology advanced, institutional websites became increasingly inaccessible for people with disabilities.

Thompson et al. (2003) provided an early audit of four-year U.S. institutional websites when they applied WCAG 1.0 standards to 102 public research university websites using a five-point accessibility scale employed by two human evaluators. In total, their work evaluated 1,103 different webpages on 102 different websites and found one evaluator to determine that 182 webpages were entirely web accessible, while another evaluator found 42 webpages to be entirely web accessible using the same scale. Thompson et al. (2003) asserted that human evaluators may differ in their perceptions of web accessibility, yet human judgement should be used in tandem with web accessibility software to provide a more accurate assessment of web accessibility.

Shortly after Thompson et al.'s (2003) foundational work, Wisdom et al. (2006) examined web accessibility knowledge of staff members at Oregon community colleges. Wisdom et al. (2006) found information technology (IT) professionals and disability/student services staff members were the most knowledgeable about disability laws including web accessibility guidelines, yet IT professionals and disability staff members rarely collaborated to ensure web accessibility. This finding led Wisdom et al. (2006) to encourage communication between IT and disability/student services departments to collaboratively publish web accessible websites. Closely related to web accessibility, other studies have examined web accessibility policies at land-grant universities (Bradbard et al., 2010) and community colleges (Erickson et al., 2009). Both studies found many institutions either did not have web accessibility policies, or these policies were weak or poorly distributed among practitioners working at the institution (Bradbard et al., 2010; Erickson et al., 2009).

Once WCAG 2.0 standards were updated and published in 2008, Harper and DeWaters (2008) found that one of 12 four-year U.S. institutions met Level-AAA standards, while four of the 12 institutions did not comply with Level-A, Level-AA, or Level-AAA standards. At the community college level, Erickson et al. (2009) found that although 90% of a sample of nearly 700 community colleges reported offering online courses, catalogs, and class schedules, only 50% of respondents reported their institution having written requirements for web accessibility. Examining institutional websites, Flowers et al. (2011) asserted that only 23% of a sample of 253 community college homepages were web accessible to people with disabilities. Using a different sample, Erickson et al. (2013) later found less than 1% of webpages from 30 community colleges met Section 508 guidelines.

Beyond community colleges, Thompson et al. (2010) performed a longitudinal, five-year study of 127 four-year U.S. institutions and asserted advances in web technology made it difficult for institutions to reach or maintain WCAG 2.0 compliance. The authors found a decline in keyboard accessibility across the sample, likely owed to technology advances, yet web accessibility training did help improve the web accessibility of institutional websites. However, near the end of their study, Thompson et al. (2010) reasoned that there was no significant difference in the web accessibility between institutions that had received training and those that had not.

Outside of the United States, related studies have found Turkish university websites (Kurt, 2017) and Israeli university websites (Nir & Rimmerman, 2018) to be not accessible for people with disabilities to varying degrees. In a cross-continent comparison, Lorca, De Andrés, and Martínez (2018) recently articulated the relationship between efforts to improve web content and efforts to

improve web accessibility. Therein, the researchers learned Anglo-Saxon institutions paid more attention to web accessibility while improving and adding web content, while Germanic institutions published higher quality web content. Meanwhile, Latin American institutions published both higher quality web content, while maintaining high levels of web accessibility (Lorca et al., 2018).

Ultimately, given the mutability of Internet technologies and web accessibility (Kurt, 2018; Thompson et al., 2010), this study updated and expanded upon extant research to learn whether prospective community college students with disabilities still face technology hurdles on their path to a postsecondary education in the form of inaccessible institutional websites.

Methods

The following sections will detail how the research team identified the population and sample, gathered data, analyzed data, and delimited the study so that the study could be completed in a timely, efficient manner.

Population and sample

To address this study's primary research questions of whether two-year institution websites are web accessible, we gathered institutional-level data from the Integrated Postsecondary Education Data System (IPEDS). The research team identified a sampling frame of all public and private nonprofit and for-profit two-year higher education institutions in the U.S. receiving Title IV funding. As the new Section 508 update requires all Title IV institutions to publish web accessible websites, the research team identified only Title IV two-year institutions in the U.S. In all, the research team narrowed the scope of the population to 2,088 two-year institutions receiving Title IV funds during the 2016–2017 academic year according to IPEDS.

After the research team established this population, we randomly selected a sample size of 325 institutions by using the random number generation function in Microsoft Excel. A sample size of 325 reflects a 95% confidence level to prove strong enough for quantitative analysis in subsequent studies or meta-analysis of this study. Furthermore, Flowers et al. (2011) examined a sample of 253 community college homepages. The research team wanted to expand and update this work, thus requiring a larger sample size. An overview of the sample in this study can be found in Table 1 below.

Data collection and analysis

To collect website accessibility data, the research team gathered institutional hyperlinks or URLs to each institution's homepage. Once the research team located these URLs, the team employed Tenon™ accessibility software, a robust freeware program capable of running 99 total tests of web accessibility at the Level-A, Level-AA, and Level-AAA standards (Tenon LLC, 2018). However, any Level-AAA errors discovered in this study were removed from the analysis, as Title IV institutions are not required to meet Level-AAA conformance. In addition, Tenon™ allows practitioners to download a .csv report detailing which accessibility errors are most prevalent and the HTML location at which to remedy to error. Recent comparisons of web accessibility software have found Tenon™ to be a reliable, accurate, and efficient web accessibility tool (Ismail, Kuppusamy, & Nengroo, 2017; Timbi-Sisalima, Amor, Otón, Hilera, & Aguado-Delgado, 2018); thus, the research team employed Tenon™.

Table 1. Sectors of institutions (n = 325).

Sector	Number of institutions (% of sample)
Public	185 (57%)
Private	140 (43%)
For-profit	116 (36%)
Non-profit	24 (7%)

Once the research team gathered web accessibility data, the team merged institutional IPEDS variables with Tenon's™ error reports to analyze the data by institution type and error type. This merge allowed the research team to understand what the most frequent error types were, and which institutions were responsible for the least web accessible and most web accessible websites. As a result, Tables 2 and 3 in the findings section of this study clearly explain the overall sample mean, median, high, low, and standard deviation of errors, as well as descriptive statistics of errors by institution type. In addition, the research team analyzed the merged dataset and created Table 3 to clearly display the most frequent error types across all four strands of WCAG 2.0 web accessibility: perceivable, operable, understandable, and robust web elements (W3C, 2018b).

Delimitations

The research team delimited this study in three ways: by sample size, web accessibility evaluation tool, and webpage.

First, the research team delimited this study to 325 two-year, Title IV-receiving U.S. institutions of higher education in order to complete the study and report its findings in a timely, efficient manner, given the mutability of Internet and web accessibility technologies. The research team acknowledges the web accessibility work performed by other researchers choosing to focus on different institution types,

Table 2. Descriptive statistics of web accessibility errors (n = 22,523*) of homepages/ landing pages for two-year institutions of higher education (n = 325), by institution type.

Institution type	Web accessibility errors
All institutions (*n* = 325)	
Mean	69**
Median	41
High	1065
Low	1
Standard deviation	112
Public (*n* = 185)	
Mean	59
Median	36
High	430
Low	1
Standard deviation	68
Private, For-profit (*n* = 116)	
Mean	87**
Median	44
High	1065
Low	2
Standard deviation	166
Private, Non-profit (*n* = 24)	
Mean	60
Median	52
High	145
Low	2
Standard deviation	44

* This study found 70 Level AAA, 1.4.8 errors; however, these errors were removed from our analysis, as ADA guidelines only require Level-A and Level-AA web accessibility compliance.

**In the private, for-profit sample, there were three outliers (1000 or more errors). After removing these outliers from the analysis, private, for-profit mean was lowered to 62 errors per page and overall mean was lowered to 60 errors per page.

Table 3. Descriptive statistics of web accessibility errors (n = 22,523*) of homepages/landing pages for two-year institutions of higher education (n = 325), by error type.

Errors, by type, all institutions	# of errors
Perceivable	
Level-A, 1.1.1, Non-text content	2289
Level-A, 1.3.1, Information and relationships	4187
Level-A, 1.3.2, Meaningful sequence	142
Level-AA, 1.4.5, Images of text	2
Operable	
Level-A, 2.1.1, Keyboard	3668
Level-A, 2.3.1, Three flashes or below threshold	4
Level-A, 2.4.1, Bypass blocks	418
Level-A, 2.4.2, Page titled	7
Level-A, 2.4.3, Focus order	321
Level-A, 2.4.4, Link purpose (in context)	6443
Level-AA, 2.4.6, Headings and labels	425
Understandable	
Level-A, 3.1.1, Language of page	59
Robust	
Level-A, 4.1.1, Parsing	1936
Level-A, 4.1.2, Name, role, value	2622

*This study found 70 Level AAA, 1.4.8 errors; however, these errors were removed from our analysis, as ADA guidelines only require Level-A and Level-AA web accessibility compliance.

such as land-grant universities (Bradbard et al., 2010), Turkish universities (Kurt, 2017), and regional U.S. institutions (Thompson et al., 2010). However, since the work of Flowers et al. (2011) and Erickson et al. (2013), no research has examined the web accessibility of two-year U.S. institutions. In addition, this study's sample of 325 institutions is the largest study of two-year institutional websites to date, rendering this study an important and updated contribution to the literature.

Second, the research team delimited this study by using Tenon™ instead of using multiple web accessibility technologies or a combination of software and human input (Thompson et al., 2003). The decision to use Tenon™ was informed by extant research demonstrating Tenon's™ quality (Ismail et al., 2017; Timbi-Sisalima et al., 2018), and practitioner-focused research asserting that Tenon's™ technology is user-friendly for two-year institutional professionals who are unfamiliar with web design, coding, or web accessibility (Taylor, 2018).

Finally, similar to other studies, this study only examines the homepage or landing page of each institution in the sample, following the logic that if a student with a disability cannot navigate past the homepage, they may be unlikely to navigate through the rest of the website. This study focused on homepages, as many other studies have done the same and made important contributions to the research community (Flowers et al., 2011; Hackett & Parmanto, 2005; Harper & DeWaters, 2008; Kelly, 2002; Kurt, 2017).

Acknowledging these delimitations, future research should continue to examine the web accessibility of all types of educational institutions, including those in the K-12 pipeline. In addition, future studies could use different web accessibility technologies or a combination of software and human input akin to Thompson et al.'s (2003) work. Finally, beyond homepages, future research could address multi-level websites and multiple webpages to learn how web accessibility may improve or worsen as a student navigates deeper into a website. These suggestions for future research could inform practitioners working with students with disabilities to provide a more accessible website for prospective and current educational stakeholders, including students, faculty, staff, and their support networks.

Findings

Table 2 indicates that across 325 institutions, a total of 22,523 Level-A and Level AA errors were detected on institutional homepages. Across all institutions, the average homepage included 69 errors, while one institution published a homepage with only one Level-A error. In addition, public

institutions (n = 185) published the most web accessible websites, with a mean of 59 errors per homepage. Private, for-profit institutions (n = 116) published the least web accessible websites, with a mean of 60 errors per landing page. Outliers in the study, three private, for-profit institutions published homepages with over 1,000 Level-A and Level-AA errors. As mentioned in the note below Table 2, after removing these errors, the overall sample mean was lowered to 60 errors per page, and the private, for-profit mean was lowered to 62 errors per page. Inversely, the most web accessible homepage in this study's sample was Southern Union State Community College (public), publishing a homepage with one Level-A error.

Table 3 indicates the most frequent errors were Level-A, including 3,668 keyboard-related errors, echoing previous research that found keyboard-related errors were often due to advances in technology that were not reflected on institutional websites (Thompson et al., 2010). According to WCAG 2.0 guidelines, Level-A 2.1.1 keyboard standards require, "All functionality of the content is operable through a keyboard interface without requiring specific timings for individual keystrokes, except where the underlying function requires input that depends on the path of the user's movement and not just the endpoints" (W3C, 2018a, para. 26). For example, in HTML, a programmer can add an attribute called an event handler to a HTML element, such as a hyperlink, image, button, or menu. However, in some types of Level-A 2.1.1 errors, an element may be missing an attribute – such as an event handler – causing a keyboard-focused assistive technology to parse over the element, thus failing to read it. This finding indicates students with disabilities who use assistive technologies relying on keyboard navigation may face an unfair disadvantage when attempting to access information on two-year institutional websites.

Findings in Table 3 also suggest Level-A 2.4.4 errors related to the purpose of links embedded on webpages are abundant on two-year institutional websites. In total, this study found 6,443 of these types of errors. Errors related to the purpose of links often mean that alt element text or another form of metadata is missing from a webpage element, rendering that element difficult or impossible to understand depending on the type of assistive technology the person is using. For instance, one institution added alt element text to every hyperlink on their website, but these hyperlinks were simply titled "link." In all, there were five Level-A 2.4.4 errors on this particular institution's homepage because all of their hyperlinks contained generic alt element text that did not adequately describe the hyperlink and concisely inform the Internet user about where the hyperlink will take them. This lack of metadata renders it impossible for an assistive technology to discern where a hyperlink may lead. Subsequently, an Internet user may be searching for admissions criteria but may be compelled to click on every hyperlink on this institution's homepage because none of the hyperlinks were accurately or adequately described.

Similarly, Level-A 1.1.1 errors (2,289 in total) and 1.3.1 errors (4,187 in total) are related to the description and detail of non-text content and other webpage elements. Here, many of these errors may be owed to an image not containing text to describe it or a fillable form that is not described. For instance, one institution's embedded search tool was missing metadata to describe its function. For a user to input information, such as "apply for financial aid" and for the internal search engine to find the financial aid webpage included on that institution's website. Typically, in HTML, an embedded search tool can be considered a form element, or, an HTML element that can be filled with information by the Internet user. As a Level-A 1.1.1 error, this form element (the search tool) was missing an HTML label, alerting the Internet user as to what types of information could be entered in the field (the blank space) of the form element (the search tool). Here, an Internet user may be unable to find the content they need and want to perform a search on the institutional website, but the assistive technology would be unable to tell the Internet user what type of information could be entered in the search tool. These errors may render websites inaccessible, as students who are blind or have low vision may need text to be read to them in order to understand an image or form element on the screen.

Similarly, to inadequate and uninformative text included in hyperlink metadata, many Level-A 1.1.1 errors in this study pertained to images with no metadata or uninformative metadata. For example, one institution embedded 11 different images on their homepage, with each image having its own file name. In

HTML, an image's file name is part of the language, as HTML code will include the digital location of the file being used on the website. For this particular institution, all 11 images had different file names but the same alt text. Here, an Internet user with a vision impairment could hover their mouse all 11 images on the homepage and be unable to discern what each image was and where its hyperlink – if applicable – directed them. Alternatively, an Internet user with a hearing impairment and unfamiliar with postsecondary education may be unfamiliar about an image's contents. In this instance, the assistive technology would display the same caption – the same alt text – over 11 all images – potentially confusing the student as to what was included in each image. Here, students who are deaf or hard of hearing may need images and video to include text descriptions in order to better understand the multimedia content on the webpage, and these text descriptions should be unique, accurate, and understandable.

Finally, this study finds the robustness of two-year institutional websites to be problematic, as this study found 1,936 Level-A 4.1.1 and 2,622 Level-A 4.1.2 robust errors. For example, one institution's homepage included 162 Level-A 4.1.1 errors pertinent to parsing, or the way assistive technologies can read HTML and convey it to users. The main problem with this homepage was that each HTML element contained the same "id" attribute, or, a unique value of an HTML element. Within HTML documents, each HTML element should have a unique "id" attribute in order for a wide range of assistive technologies to parse the elements and distinguish each element from one another. However, nearly every HTML element on this particular institution's homepage had the same "id" attribute, rendering it difficult for multiple assistive technologies to parse the HTML and discern different elements. Level-A 4.1.1 errors fall under the category of WCAG robust standards (W3C, 2018b), ensuring that webpages can be accessed by a wide range of diversity assistive technologies, given that students possess a wide range of diverse disabilities. This study suggests many two-year websites are simply not robust enough to be accessed by a wide range of assistive technologies, as robust errors comprised over 4,000 total errors in this study.

Discussion and implications

After analyzing 325 two-year institution websites, data in this study suggest that no one website was entirely Level-A and Level-AA compliant. As a result, not a single two-year institution website entirely satisfied the new Section 508 guidelines. Building upon the previous work of Flowers et al. (2011) and Erickson et al. (2013), a number of themes emerge pertinent to web accessibility, advances in technology, and students with disabilities' equal access to higher education.

First, this study found keyboard-related errors were problematic, echoing prior research (Thompson et al., 2010). Subsequently, students with disabilities who rely on assistive technologies including keyboard usage may be unfairly disadvantaged when accessing postsecondary websites. Expanding on prior research, this study found robustness to be a critical area of emphasis from which community college websites could improve, as over 4,000 Level-A and Level-AA errors fell underneath the robust WCAG 2.0 standard. Given the variability of error amount from website to website, our data suggest students with disabilities may experience varying levels of web accessibility when navigating community college websites. For example, 30 institutions in this study had 10 or fewer errors on their homepage. In these instances, students with disabilities accessing these websites may not struggle to access these institutions' content. Inversely, 55 institutions in this study had 100 or more error on their homepage. Ultimately, this study suggests aspiring community college students with disabilities may experience vastly different experiences when navigating institutional websites depending on the student's disability, their assistive technology, and which institutions they are exploring.

In addition – although this study does not examine institutional websites over time – this study's data suggests web accessibility continues to be an elusive goal. For two decades or longer, extant research has asserted postsecondary websites are often not accessible to people with disabilities (Flowers et al., 2011; Hackett & Parmanto, 2005; Harper & DeWaters, 2008; Kelly, 2002; Kurt, 2017). This study continues this narrative. However, one common hurdle facing all institutions of higher education is the nature of an ever-changing technology landscape, especially Internet technologies.

Twenty years ago, uploading a 10-minute video to the Internet could take hours. Now, it takes minutes, if not seconds. For institutions of higher education to be truly web accessible for all people, institutions must find ways to keep up with technology (Kurt, 2017; Thompson et al., 2010). If not, a student with a disability may be able to access an institution of higher education, but without technology and accessibility maintenance, the same student may find themselves struggling to access digital content only one or two years into their postsecondary career. Here, the topic of web accessibility should enter discussions of student persistence and retention, as assistive technologies may play a much larger role in students with disabilities' persistence and retention.

Finally, understanding that institutions of higher education are frequently targets of lawsuits and others forms of litigation for failing to comply with ADA laws (Carlson, 2018), all members of institutions should explore web accessibility. As technology has allowed for voluminous amounts of data to be uploaded onto a website in short time, both faculty and staff members should be aware of how this ease of technology must be counterbalanced by an eye toward web accessibility. Akin to the foundational work of Erickson et al. (2009) and Thompson et al. (2010), institutions should alert their employees and greater campus community to the issue of web accessibility and their campus web accessibility policies. Subsequently, institutions should work to distribute the responsibility of web accessibility across multiple units to better serve students with disabilities (Wisdom et al., 2006). If this responsibility cannot be shared, web accessibility will likely continue to be problematic for both institutions and students alike, perpetuating the underrepresentation of students with disabilities at community colleges (National Center for Education Statistics, 2018).

Ultimately, this study, along with decades of extant research, demonstrates that publishing web accessible websites is difficult for community colleges (Erickson et al., 2013; Flowers et al., 2011) and other types of institutions (Bradbard et al., 2010; Hackett & Parmanto, 2005; Harper & DeWaters, 2008; Kelly, 2002; Kurt, 2017; Lorca et al., 2018; Nir & Rimmerman, 2018; Thompson et al., 2003; Wisdom et al., 2006). However, if researchers and practitioners can prioritize web accessibility – even though technology will continue to evolve – perhaps students with disabilities will access higher education to a greater degree, rendering the U.S. higher education landscape a more tech-savvy and inclusive one.

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