

Abstract

Purpose To review existing literature on distance library services for individuals with disabilities with a specific focus on Deaf and Hard of Hearing (D/HH) users and provide strategies for creating an online library that is accessible to this community.

Design/Methodology/Approach The authors reviewed articles covering distance library services for D/HH users, then identified specific parts of the Web Content Accessibility Guidelines (WCAG) 2.0 that are applicable to the D/HH community. Using the literature, strategies for developing and purchasing accessible electronic library resources are presented.

Findings While there is a breadth of literature focused on creating accessible resources for online libraries, there is a gap when it comes to D/HH users. Libraries can cater to this community by providing text-based alternatives for all library instructional materials and working closely with vendors to ensure that library databases are accessible.

Practical Implications The authors present strategies for creating and converting electronic resources and services that are accessible to D/HH users.

Originality/Value This paper fills a gap in literature by addressing fully online library services for users with disabilities with a particular focus on meeting the needs of D/HH users in a distance learning environment.

Introduction

Distance education courses are becoming increasingly popular among traditional brick and mortar colleges and universities, which is leading to a greater awareness of accessibility of online academic library resources such as websites, databases, and instructional materials. Libraries have always been champions of diversity, inclusion, and accessibility, perhaps more so than any other type of organization. As noted by Jaegar and Bertot (2015), "Libraries were often the first social or government institutions in many communities across the nation to recognize the humanity of people with disabilities and provide services to promote their rights and equality" (para. 2). In addition to the early guidelines laid out by ALA (2001) and IFLA (2005), continuous efforts have been made over the years (both nationally and by individual libraries) to make resources and services equally accessible to all users.

While there is a breadth of literature that focuses on the experience of users with disabilities in the setting of physical libraries, there is not as much information available on the provision of online library services to this unique population, particularly regarding the deaf and hard of hearing (D/HH) community, which accounts for over 360 million people worldwide (World Health Organization, 2017). This article will review existing literature on distance library services for D/HH individuals. The authors will provide practical strategies to create accessible online materials based on the Web Content Accessibility Guidelines (WCAG 2.0) and discuss one fully online library's efforts to incorporate accessible resources and services specifically catered to the D/HH community.

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Literature review

Distance library services for users with disabilities

When it comes to providing library services for users with disabilities, there is a wide range of literature devoted to the accessibility of physical libraries, libraries' compliance with disability laws (Blansett, 2008; Fulton, 2011), and most recently, library website accessibility (Schmetzke, 2001; Schmetzke and Comeaux, 2007; Jaegar, 2012). However, it is only in recent years that attention has been given to providing fully online library services for individuals with disabilities. In addition to the accessibility of websites, library professionals must ensure that electronic articles, eBooks, database platforms, and instructional materials (including videos, tutorials, and images) are accessible to users with various disabilities. As Farkas (2015) points out, "The growth of content management systems and tools like LibGuides have led to more distributed responsibility for the development and maintenance of library web content" (p. 54). In other words, there is a greater need for all library staff to be familiar with standard best practices for accessibility--not just those who work in systems or web design. Additionally, much of the recent literature regarding the accessibility of library resources is based heavily on WCAG 2.0, which suggest methods for implementing Section 508 of the 1973 Rehabilitation Act. There are many articles that provide a general overview of the guidelines and then present tips or checklists for creating accessible online library materials such as text documents, videos, images, and other types of learning objects (Vandenbark, 2010; Wray, 2013; Catalano, 2014; Billingham, 2014). Even though these articles serve as excellent guides for how to make online libraries accessible, there are fewer articles that address the nuances of providing services to specific user groups such as individuals with visual, auditory, or cognitive impairments.

Literature that focuses on providing online library services to users with specific disabilities is sparse and tends to cover visual impairments and print disabilities more so than any other type. In an analysis conducted by Hill (2013), it was found that 41 percent of library and information science articles that were written about disabilities focused on visual disabilities—the highest percentage out of any other type of disability including learning disabilities (17 percent), physical disabilities, and auditory disabilities (both 1 percent). Hill points out that libraries' emphasis on visual disabilities is not surprising considering that the majority of their content has always been text-based. Alternatively, Cervone (2013) explains that libraries probably gave more attention to visual impairment issues after the National Federation for the Blind filed a complaint against Pennsylvania State University for lack of accessible electronic resources (including the library catalog) in 2010. As libraries continue to decrease their print collections and provide more materials online, it is increasingly important to include all individuals with disabilities in the conversation, not just those with print disabilities.

Distance library services for D/HH users

Of the literature that focuses on online library services for D/HH individuals, there are several articles that discuss the provision of virtual reference services using technologies such as teletypewriter (TTY) devices and instant messaging/chat services (Peters & Bell, 2006; Saar & Arthur-Okor, 2013). While library staff may have been implementing chat services to provide an additional option for all users to reach them, they were also (perhaps unknowingly) building a more accessible infrastructure for individuals with disabilities. However, even chat services do

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not provide a fully equitable experience for D/HH users, because “you are seeing and sending chunks of information rather than single words, so the conversation process is diminished” (Mates & Reed, 2011, p. 79). In other words, while chat services are an improvement to reference services in terms of accessibility, they do not allow for the real-time interactions that non-D/HH users experience.

However, one of the most common themes that arises in regard to providing services to this unique population is the idea of making library audiovisual materials accessible through the use of text alternatives such as transcripts or captions. Some authors have discussed the use of captions in the context of internally-created library instructional materials (Clossen, 2014; Parton, 2015; Clossen & Proce, 2017), while others have emphasized the importance of transcripts or captions regarding library collections or purchased content such as DVDs and streaming video databases (Riley, 2009; Oud, 2016). When it comes to developing instructional materials such as videos and tutorials, libraries are increasingly realizing the importance of providing captions. In one recent study, Clossen and Proce (2017) found that 77 percent of video tutorials from academic research libraries had some sort of captions. Many libraries also take advantage of YouTube’s automatic captioning feature whether their videos are ultimately hosted on YouTube or not. The problem with automatically-generated captions is their notorious inaccuracy, which can alter the meaning of content and decrease comprehension for individuals who rely solely on the text to learn material. (Parton, 2015; Oud, 2016; Clossen & Proce, 2017; Smith, Allman, & Crocker, 2017). For example, in another study, Parton (2015) found that for every minute of YouTube captions, there was an average of 7.7 phrases “that were unintelligible or altered the meaning of the message” (p. 12).

As more library resources are moved to a fully-online environment, one general theme that has emerged from the literature is that making materials accessible with the use of text alternatives benefits all library users, not just individuals with hearing impairments (Burgstahler, 2012; Wray, 2013; Clossen & Proce, 2017). In fact, one study showed that 75 percent of students who use audio captions said that they use them as a learning aid, whereas only 6 percent said they used them as a disability accommodation (Linder, 2016). On a similar note, Burgstahler (2012) explained that some people may find themselves in situations that mimic the experience of an individual with a disability, and that these people also benefit from accessibly-designed materials. “For example,” she writes, “a student who participates in a class late at night and prefers to turn off the sound capabilities of her computer to avoid waking up sleeping children, has created a situation similar to that experienced by people who are deaf” (p. 3). Furthermore, not all students with disabilities are known to ask for accommodations, so taking a proactive approach to accessibility is the best way to ensure that all users of the library have an equal learning experience (Catalano, 2014).

Due to the positive impacts that implementing accessibility guidelines have on all students’ learning, they are often discussed in conjunction with Universal Design for Learning (UDL), or the idea that using a wide variety of teaching methods can help cater to different learning styles. As Wray (2013) points out, “The great thing about accessibility is that all learners have a better experience when accessibility features are utilized in online instructional materials.” Likewise, as Zhong (2012) demonstrated, libraries that implement UDL practices are also likely to create a better learning experience for all students, including those with disabilities.

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Accessible distance services and resources for D/HH users

Developing electronic resources

The ultimate guide to follow to ensure that an online resource is accessible is WCAG 2.0 published by World Wide Web Consortium (W3C) in 2008. W3C repeats the sentiment that not only does using their recommendations make content more accessible to users with disabilities such as D/HH users, but it provides a better experience to all users regardless of disability (2008). This idea that all users have a better experience when people design resources in an accessible manner is applied to all accessibility guidelines, not just those specific to the D/HH community. However, there are specific WCAG 2.0 guidelines that have D/HH users in mind are:

- *Guideline 1.2 Time-based Media: Provide alternatives for time-based media*, which addresses nine specific subjects covering topics such as captioning, audio description, and sign language.
- *Guideline 1.4 Distinguishable: Make it easier for users to see and hear content including separating foreground from background*, which addresses providing a method in which to control the volume of audio and having low or no background audio.

First and foremost, all video and audio should have a text alternative such as a transcript or captions--preferably captions as they synchronize with their accompanying media (W3C, 2008). It is important to note that the amount of effort it takes to create captions and add them to a library video or tutorial varies greatly depending on the type of software being used. Fortunately, many of the common products used by academic libraries such as Adobe Captivate, Camtasia, and newer versions of Articulate Storyline now have built-in captioning editors. With these robust (and arguably expensive) products, adding captions to a video is as simple as copying and pasting sections of a text transcript into a caption editor and adjusting the caption durations as needed. This step of the captioning process can be simplified by scripting videos before recording. Additionally, there are third party companies, such as 3Play Media, that libraries can take advantage of to create captions for their resources.

Some libraries may not have the funds to purchase video tutorial software with built-in caption editors, nor may they be able to afford third party captioning services. Luckily, there are free tools that library staff can utilize to create captioned videos. One of the most popular free methods for adding captions to videos is YouTube's captioning function, which allows users to manually create captions with a built-in caption editor, upload a pre-written transcript to make captions, or simply use the automatic captioning feature, which uses Google's automatic speech recognition (ASR) technology to generate captions for English language videos. However, as Clossen and Proce noted in their study of academic library tutorials, "Incorrect closed captions universally [result] from YouTube automatic captioning" (p. 814). Fortunately, YouTube has made it easy to review the automatic captions and edit them manually with the site's built-in caption editor. Therefore, if libraries are relying on automatic captioning, staff must factor in time for editing so that D/HH users have an equitable video viewing experience. "Without editing," notes Parton, "the auto-captions would not appear to meet the Office for Civil Rights criteria for communication that is as effective for people with disability as for those without" (2015, p. 15).

There are numerous other free software programs that can be used to create captions both online and offline such as Amara, Magpie, and Subtitle Workshop. While these programs may not have the convenience of Google's ASR technology, they allow for easy upload of

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transcripts that can be synced to appropriate times in the video, which ultimately become captions. It should also be noted that most captioning editors (and even some free screencasting programs such as Screencast-O-Matic) allow users to create and import caption files from scratch. Caption files can be created using any plain text editor such as Notepad and are typically saved as one of several caption files types such as .SRT, .SUB, or .VTT. While this method for creating captions may soon be obsolete and is not as streamlined as it is in a more expensive software, it still provides an additional option to implement accessibility. Library staff should not be discouraged from captioning just because some methods require more time and effort.

Best practices from WCAG 2.0 should be kept in mind when creating captions. All necessary content from a video should still be visible when captions are turned on by the user, because it creates a separate accessibility issue when captions block essential video content. Also, captions should include audio descriptions when appropriate to describe essential audio cues like the ringing of a timer. Next, captions should be as accurate as possible in regard to the audio content, including their synchronization to the audio (W3C, 2008). Finally, Clossen and Proces highlight that closed captions (CC) are preferred to open captions as they allow the user to turn the captions on and off manually (on the other hand, open captions are part of the video itself and are displayed by default), which makes them “arguably, the most accessible” (2017, p. 809). For more information about best practices for captioning such as recommended font style and placement of captions, staff can refer to the Described and Captioned Media Program’s *Captioning Key* guidelines at www.captioningkey.org.

It is important to note that poor captioning practices can result in potentially serious legal ramifications. In 2015, both MIT and Harvard were sued for lacking captions in their online courses and podcasts (Lewin, 2015). More recently, the University of California Berkeley withdrew all online lecture content after the Department of Justice pointed out that the videos (which were hosted on YouTube) had inaccurate, incomplete, and automatically-generated captions (Larimer, 2017).

Ideally, a transcript should be made available in addition to CC. Transcripts are useful to users beyond the D/HH community because users can review them (read, highlight, take notes, etc.) at whatever pace they prefer. Transcripts should be templated for consistency, and they should incorporate other accessibility standards such as spelling out abbreviations, including links via meaningful language, and legible color contrast. While these standards are not covered in this article, they can be researched further by consulting WCAG 2.0.

Purchasing/Subscribing to electronic resources

A database that provides accurate text alternatives to audio or video can be considered accessible to D/HH users. This is a key factor when considering working with a new streaming media vendor. Librarians involved in electronic collection development should be familiar with the Voluntary Product Accessibility Template (VPAT), which vendors provide to explain how accessible their product is to users with disabilities. VPATs are aligned with the requirements of Section 508, so they help librarians insure that they are purchasing or subscribing to resources that will be accessible to all of their users (General Services Administration, n.d.). However, as North Carolina State University details, it can be difficult to compare VPATs for similar products because vendors take varying amounts of responsibility when filling them out, so a product that on the surface appears to have more issues may be the better choice (VPATS, n.d.).

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Furthermore, DeLancey (2015) points out that “[s]imply acquiring the VPAT can be a challenge unto itself,” because vendors’ customer service representatives are often not familiar with where to find it (p. 105).

Kanopy is an example of a vendor offering a streaming media service that has user-friendly accessibility services and documentation. They have a public Accessibility Statement, which includes a link to their VPAT. In their Accessibility Statement, they confirm that their media player is accessible to users with auditory disabilities (Kanopy, 2015). Furthermore, while not all of their videos already contain CC, they have a streamlined process for requesting that captions be added to a film (Kanopy, n.d.). However, not all vendors make accessibility a priority, which is why it is important to review a vendor’s VPAT and to ask questions if it looks like something is missing.

Copyright anxiety is an issue that holds some vendors and library staff back when considering captioning videos. To allay concerns, the majority of items needing captions will be internally-created audiovisual materials owned by the library or library’s institution, and the remaining titles are most likely okay to caption under fair use. According to Reid, captioning something not already captioned should weigh in favor of fair use since it is being used for an educational purpose, the text is only a fraction of the work, and there is no captioned version available, so the copyright holder cannot lose money as there is no comparable version (2015). Overall, Reid suggests that copyright concerns should not become a barrier to accessibility, but reiterates that it is essential to consult with your institutions legal counsel on what they consider an acceptable amount of risk to take on (2015).

Distance Reference Services

Distance reference services typically include email, phone, chat, and a plethora of other ways to reach librarians via the internet (e.g. social media). By default, electronic methods for contacting library staff will be more accessible to D/HH patrons than face-to-face services. Government supported TTY services are also available to make phone interactions accessible to D/HH users (Federal Communications Commission, 2017). However, in 2016 the Federal Communications Commission (FCC) began phasing out TTY as the recommended method of interaction for D/HH people in favor of Real Time Text (RTT) (2017).

RTT has come into favor over TTY because of its superior technological capabilities and accessibility. For example, TTY has “60 words per-minute speed limitation and functional challenges...on IP networks” (‘FCC Proposes’, 2016, p. 33), whereas users of RTT have their words transmitted instantly without ever having to hit a “Send” button. This makes RTT interactions more similar to conversations between people that are using sign language or are not D/HH. As of December 2017, all major wireless carriers were to comply with RTT protocols, so most cell phones should have RTT available, which means that any reference questions answered via cell phone can be responded to using RTT (‘FCC Proposes’, 2016). If library staff are using a chat service, they may also be able to turn on RTT to create an additional layer of accessibility. However, not all chat service providers have this functionality. For example, Springshare’s popular LibChat service does not have an RTT option (Springshare, 2018).

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Practical Recommendations

While the authors work for a full service online library, all librarians, regardless of setting, should design resources and services with accessibility for all users in mind. Specific recommendations to meet the needs of the D/HH community in the distance environment include captioning all library videos (or including a transcript if captioning is not possible), using accessible media players, providing electronic reference options, and conducting staff trainings on accessibility.

Library staff should closely examine VPATs for all software to ensure that it is accessible. However, VPATs can be difficult to interpret, and accessibility issues may exist with a software that are not evident until it is tested. For example, the authors' institution purchased a software that was unable to create CC or an accessible HTML5 output, so when an upgraded version with these features was released, they purchased it. Now, the library team is making a concerted effort to retroactively add captions to all videos and tutorials created within the previous version of the software, even though they already include transcripts. Library teams may decide to have both transcripts and CC, because students have shared that they like having the ability to print out transcripts and review the content at their leisure. Another recommendation for multimedia software is to ensure that the player allows for flexibility in how it is viewed. The authors enacted this by creating a template that all staff use when developing multimedia. This template has many built-in accessibility features including a "transcript" button, audio controls, and a "play" button that prevents the media from playing without user initiation.

Because not all vendors make accessibility a priority, it is important for librarians to work closely with database vendors to ensure that their streaming media is accessible. For example, when the authors were reviewing their library's streaming video collection, they encountered a vendor who did not provide CC for all of their videos. An instructor that wished to use such a film within a course notified the librarians of the issue, who passed it along to the vendor. The vendor was unable to take any action because they did not have rights to the script, and therefore, they could not supply captions without obtaining permission from the copyright holder. Unfortunately, they were never able to obtain the rights to the script, so they would not supply CC for the film. Subsequently, the title was removed from the course.

Implementing multiple means of electronic reference such as email and chat are crucial to providing accessible services for the D/HH community. As previously mentioned, RTT is the most accessible form of electronic communication that is currently available, primarily on mobile devices. If a library decides to add texting to their suite of electronic references services, staff will need to familiarize themselves with how to use RTT. As an added precaution, libraries may also want to provide a fax number so that users can fax their questions to the library. While faxing is no longer a popular mode of communication with the ease at which the internet can be accessed, it may still serve as a useful tool in extenuating circumstances.

Finally, knowledge-sharing about accessibility within the library team is essential. It is recommended to have a document of accessibility best practices available for the team so they can refer to it anytime they are creating or reviewing an electronic resource for the library's website. Additionally, library staff should have trainings where accessibility is taught in-depth.

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Implications for Future Research

While libraries have always been known for providing inclusive services, there are gaps in the literature when it comes to providing distance services for individuals with specific disabilities. This calls for additional awareness in regard to ensuring resources are accessible to unique user groups. The impending release of WCAG 2.1 may bring renewed attention to this important topic. These updated guidelines are slated to include new features such as, “new success criteria, definitions to support them, guidelines to organize the additions, and...additions to the conformance section” (W3C, 2018).

While there is a handful of literature that focuses on library services in the context of a particular disability, it has typically been visual impairments at the forefront of the conversation. However, as more services are provided online and the use of multimedia materials increases, it will be necessary to explore library accessibility for individuals with other disabilities such as auditory, cognitive, and motor impairments. Targeted case studies reviewing the implementation of accessibility best practices for these unique populations would be valuable contributions to the literature. Libraries are doing their best to comply with accessibility guidelines, but diverse user needs make compliance a moving and potentially unattainable mark.

Conclusion

As distance education librarians for a completely online library, work is continually done to provide electronic resources and services that are accessible to all people, including the D/HH community. D/HH students often do not self-identify to disability services unless they find they need accommodations, so it may appear that this user group is much smaller than it is in reality. In addition to students, a percentage of faculty, staff, and other users of a library will be D/HH. Proactive steps should be taken by all libraries to ensure that no D/HH user has to request that something be made accessible retroactively. While libraries are implementing transcripts and CC to make videos and tutorials more accessible, many of them are also using YouTube’s auto-caption feature. If libraries choose this method, staff must factor in time to edit the captions to ensure their accuracy. In addition to working with vendors to provide accessible streaming media, staff should make CC and transcripts available for all internally-created materials and implement user-controlled audio and video play. Accessible reference services such as email, chat, and/or RTT should be in place, and all library employees should be educated on how to provide excellent customer service to all users including the D/HH community.

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