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Voices from the Field

The Importance of Braille During a Pandemic and Beyond

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ABSTRACT

In March, 2020, the same month that the World Health Organization (WHO) declared COVID-19 a pandemic, people throughout the United States and across the globe were required to rapidly make major decisions that impacted every aspect of their lives, including, but not limited to, social interactions, healthcare, transportation, childcare, education, and employment. In order to make the most informed decisions, it was critical during this period that all individuals be provided equal access to emergency-related information. Availability of essential health-related information can be even more critical for individuals who are blind, and who are often already disadvantaged due to a lack of available access in both the physical and digital environment.

This paper will explore the value and importance that braille serves in the lives of individuals who are blind and are proficient braille users. A qualitative study related to braille access for individuals who are blind was conducted by Center for Inclusive Design and Innovation at Georgia Tech in September of 2020, with a specific focus on access to COVID-19 materials. The findings of this qualitative study will be

examined, with a specific focus on how braille continues to serve as an essential format when accessing critical content.

Keywords: blind, braille, accessibility, embossed, braille-ready

THE IMPORTANCE OF BRAILLE DURING A PANDEMIC AND BEYOND

Technology continues to play an ever-increasing role in leveling the playing field for individuals with disabilities, and provides access to critical information that many individuals without disabilities may take for granted. This is certainly the case for individuals who are blind. The accessibility features built into many of the most common devices used today, such as the macOS and Windows operating systems, smartphones, and tablets, all contribute to a greater number of options available to individuals who are blind. Powerful third-party screen reading programs such as Job Access with Speech (JAWS) are able to provide auditory access to much of the content available to sighted individuals.

Amidst the tremendous advancements that have been made in the area of assistive technology solutions for individuals who are blind, it is easy for individuals and organizations to underappreciate and overlook the continued value that braille offers. After all, the braille system was developed almost 200 years ago, long before any modern-day technology was available (Biography, 2015). Far from being obsolete, braille continues to be an essential means for individuals who are blind when accessing critical information.

Personal Statement

Throughout my career as a Vision Rehabilitation Therapist, Orientation & Mobility Specialist, and Assistive Technology Instructional Specialist, I have observed firsthand how the benefits of braille access can empower individuals who are blind. As a braille instructor, it was evident that the continued practice and dedication of learning braille would eventually provide a means for braille users to access and retain information in ways that speech output alone could not.

TARGET AUDIENCE AND RELEVANCE

This article may be of value to educators and healthcare providers, including, but not limited to, direct service providers to individuals who are blind, and any researchers and/or organizations disseminating information to individuals who may require braille as their preferred means of accessing content. The findings in this article related to COVID-19 materials was subject to IRB approval.

LITERATURE REVIEW

Publications and data related to the use of braille and its relevance to individuals who are blind for accessing, learning, and retaining information will be reviewed. Sources of information include the following:

- National organizations serving individuals who are blind and who have low vision
- Research examining brain activity, cognition, and retention with individuals who are blind and who access braille
- Data collected by Center for Inclusive Design and Innovation (CIDI) at Georgia Tech through a qualitative study related to the need for COVID-19 materials in braille format.

UNDERSTANDING THE CONTINUED RELEVANCE AND IMPORTANCE OF BRAILLE

The National Federation of the Blind (NFB) estimates that approximately 10% of individuals who are legally blind (a visual acuity of 20/100 or less in the better-seeing eye with best conventional correction, or a field of view of 20 degrees or less) are braille readers (National Federation of the Blind, 2009, March 26). In *Journal of Blindness Innovation and Research*, the authors point out that the employment rate among individuals who are legally blind or visually impaired in the United States is at 37% in accordance with the study referenced in the article. In the same article, the authors go on to state that “for individuals who read braille on a weekly basis and used a white cane, the likelihood of being employed and receiving higher earnings was higher than those who did not use these tools” (Bell et al., 2015).

Braille represents more than just another means of accessing content for individuals who are blind. From firsthand experience of teaching braille for several years, I have witnessed braille students increase their ability to access, process, and retain information in ways that auditory input offered by screen readers could not. This would appear to be especially relevant for braille users requiring access to critical health-related information during a pandemic.

In recent decades, there has appeared to be a notable shift with the use of braille by educational institutions and organizations, moving instead toward what may be considered a less expensive option of providing access to content for individuals who are blind. Braille is certainly not the only way in which individuals who are blind can access content. These additional methods include the use of e-books, audiobooks, and screen readers (software applications primarily used by individuals who are blind that convert digital content such as text, buttons, links, and images containing alternative text into synthesized speech).

There are primarily two ways in which braille is produced for content that requires larger volumes of braille beyond short notes or brief labels:

- **Embossed braille:** a physical document (typically pages of sturdy paper, but sometimes on a label, card, or specialty substrate) with text translated into the raised dot patterns of braille.
- **Refreshable braille display:** one of a wide range of portable output devices (typically used with a computer or mobile phone) that uses retractable pins to display a single line of braille (up to 80 characters, depending on the device) which can be read with the fingers as embossed braille. These often interface with commonly used screen readers such as JAWS, NVDA, and VoiceOver, thereby converting audio output into refreshable braille.

Both of the methods listed above rely on braille translation software, which translates electronic documents into braille code. From these files, a refreshable braille display can present tactile braille, or a braille embosser can produce a hard copy on braille paper.

When considering the role that braille continues to play within the landscape of so many technologies that are improving access for individuals with disabilities, there appears to be a tendency to couch the topic of braille and various technology solutions into a binary choice, where one takes precedence over the other. In fact, the relationship between braille and emerging technologies is more nuanced; very often, one will complement and support the other. As an equivalent example to illustrate this point, individuals who are able to access content visually would find it unacceptable if they were restricted to only having access to digital and web-based content. Conversely, if sighted individuals were limited only to information audibly such as radio stations, podcasts, and audiobooks, that would be equally unacceptable. Such restrictive thinking toward access for individuals who are blind, in other words, to presume that only one format for consuming content should be enough, appears to be a frequent occurrence. Limiting a braille user and/or a screen reader user to one format over another would significantly limit how, when, and where, they may need to access content in the most effective means possible. For individuals who are deaf-blind, braille is also one of the only formats in which they can access text-based information, since the auditory output of screen readers alone would not meet their needs.

There is also a misconception that auditory means of access to content for individuals who are blind serves as an equivalent substitute for braille. Accessing content in a linear, auditory fashion lacks the tactile reinforcement of sentence structure and spelling that braille offers, or the ability to quickly scan and review information in a non-linear way that is an option readily available to sighted individuals.

One benefit to embossed braille is that it can be displayed across an entire page. This allows a braille user to quickly scan and review a single line or paragraph, or skim through an entire page and its sections, similar to the way that a sighted person can quickly skim through a page. Embossed braille also provides access to braille readers who may not have a refreshable braille display and/or screen reading technology.

One of the benefits to refreshable braille displays is that they allow digital content to be translated into braille quickly. However, one of the most significant restrictions to refreshable braille displays is that they only display a single line of braille at a time. Although refreshable braille displays are becoming less expensive as their use expands, they may also be cost-prohibitive for some individuals. Whether braille is being embossed or accessed through a refreshable braille display, it is also worth noting that there is frequently a manual process required for an accurate translation of the braille conversion, especially if the source of the digital content itself was not created with accessibility in mind.

The various ways in which braille is produced, and the number of ways in which it is accessed, continue to evolve since it was first invented almost 200 years ago. However, its fundamental value and importance

as a tactile format for individuals who are blind continues to remain relevant today. To understand its continued relevance, it is helpful to understand how it differs from other means of access for individuals who are blind, such as audio format. As stated in “The Importance of Braille Literacy” press release, “Braille is not a code to be deciphered but it is a method of reading and writing that is equal in value to print for sighted people.” (The International Agency for the Prevention of Blindness, 2017).

QUALITATIVE STUDY OF COVID-19 RELATED CONTENT FOR BRAILLE USERS

CIDI conducted a qualitative study related to COVID-19 materials between September 10 and September 17, 2020, with a specific focus on individuals who are self-reported as being either legally blind or low vision, and who use braille on a consistent basis. The methods were reviewed by the Institutional Review Board (IRB) at Georgia Tech. Informed consent was acquired from the participants prior to beginning the study (Protocol H20315). All interviews were conducted remotely, partially due to geographic proximity, but also out of an abundance of caution during the COVID-19 pandemic. The WebEx platform was used to remotely interview all participants. Familiarity with the platform was provided to participants ahead of time to ensure a successful connection. The study carried out was a qualitative study that included six participants.

One of the goals of this assessment was to gather the needs and insights related to existing COVID-19 content, and to investigate the existing need for alternative format development for braille users. All the braille users recruited for this study met the following criteria:

1. 18 years and older
2. have blindness or low vision and use braille for reading
3. read in English
4. currently living in and present in the U.S.
5. have access to the internet, a computer, and their respective assistive technology solutions needed for remote testing.

The term “blindness” referred to in this study is more in alignment with legal blindness, as opposed to denoting an absence of any sight. The definitions of “low vision” can differ considerably, depending on the organization and potential funding services and standards of service. For the purposes of this study, low vision was defined as the inability to read regular-size print effectively with the use of corrective lenses, which may result in the need, and use, of braille by an individual. Beyond a particular individual’s visual acuities and overall functional vision, the goal of this study was to collect feedback from individuals who use braille as one of their primary means of accessing content.

A concerted effort was made to include participants from a variety of geographic areas in the United States, and with varying backgrounds and experiences. The backgrounds included students, teachers, administrators, and librarians. CIDI’s recruitment outreach included several statewide and national organizations that employed and/or served individuals proficient in braille. CIDI also extended recruitment

efforts to its individual consumers who were braille users. Participants for this study included representation from the following states: Georgia, Texas, Maryland, and the District of Columbia. The ages of participants ranged from 25 through 74. A summary of questions and feedback collected from participants included the following:

- assistive technology used for accessing the internet and computer
- suggestions for COVID-19 materials in order to improve their accessibility
- whether or not participants would benefit from, and use, embossed (printed) braille for COVID-19 related materials if it was made available
- alternative accessible formats to consider with COVID-19 related materials.

USE OF ASSISTIVE TECHNOLOGY

All participants owned computers (laptop or desktop) and smartphones. The participants stated that they used both their computers and smartphones to access the internet. All six participants were iPhone users, and used the built-in screen reader, VoiceOver, on a regular basis. All participants also had access to refreshable braille displays. All participants used the JAWS screen reader software to access the internet and their computers. Three participants stated that they occasionally used the NVDA screen reader software. These findings in and of themselves are not especially surprising. According to a WebAIM survey from May through June of 2021, 84.8% of screen reader users rely on either JAWS (53.7%) or NVDA (30.7%). All of the participants in the qualitative study also reported using the VoiceOver built-in screen reader available in the iOS operating system.

The Use of Embossed Braille for COVID-Related Materials

All six participants reported having access to a refreshable braille display. Especially noteworthy is the fact that all of the participants stated that they would use embossed braille versions of COVID-19 related materials if this was made available to them. It was expected that there would be a need for embossed braille among some of the participants. However, the unanimous consent for this expressed need by all six participants to have access to braille-embossed COVID-19 related materials suggests that the need for braille was even greater than originally anticipated. This unanimously expressed need for embossed braille was even more telling, considering that they all had access to a refreshable braille display and screen reading technology. Two participants in particular stated that understanding and retention is improved for them when utilizing embossed braille. One participant also stated that it is faster to read a printed braille version of the material than to use a screen reader. The fact that a refreshable braille display only conveys one line of digital braille at a time, and is also dependent on a power source, appears to further influence the value and importance of embossed braille for participants. For instance, one participant specifically mentioned the convenience of embossed braille without having to rely on additional technologies while accessing it.

Additional Formats Specified by Participants

Some of the participants also expressed that the need for COVID-19 related materials be made available in accessible PDF and Word formats. These additional formats would also allow easier overall access

and a cleaner conversion to embossed braille when used by those with access to a braille embosser (device that converts digital text into embossed braille). One participant emphasized that they may be reproducing COVID-19 materials on an embosser for other braille users, and doing so would not be possible without accessible source files such as Word or PDF.

CONCLUSION

The feedback received from participants through the qualitative study emphasizes the continued value and importance of braille for braille readers, especially when accessing critical information such as COVID-19 resources during a pandemic. Although the sample size of six in this qualitative study was relatively small, a great deal of valuable data was gleaned from such a sample size.

Technology has undoubtedly had a major impact in leveling the playing field for individuals with disabilities. However, this does not negate the significance and importance that braille continues to have in the lives of people who are blind and low vision. Assistive technology solutions such as screen readers and refreshable braille displays that work in conjunction with one another should be viewed as supplementing, not replacing, braille. Providing critical information such as COVID-19 resources in embossed braille during a pandemic, along with additional alternative formats leveraged by various assistive technology solutions, is essential. The availability of content in braille format further empowers braille users to effectively access critical information in order to make the necessary decisions for themselves and their loved ones, a process that individuals without disabilities may easily take for granted.

DECLARATIONS

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