Using a Range of Braille Technologies to Access Adult Life

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Before 1971 the main production method for braille was by hand. This was either by using a Perkins Brailler - available 1951 - or the slate and stylus (Seymour-Ford, 2009). According to a document from The NFB the first technologies to produce braille were a braille embosser (1971), a refreshable braille display (1975) and then the first braille translation program (1976), (Van Jergen & Taylor, 2009). Production of new embossers and refreshable braille displays continued throughout the 1980s, and in 1991, the braille display, laid out as we know it today emerged, with the patent for cursor routing keys (Van Jergen & Taylor,, 2009) swiftly followed by products which would work with Windows computers.

From the year 2000, the development of braille displays, braille embossers and braille and qwerty notetakers continued apace, and, 20 years on, there are a large range of products which continue to develop and compete for business amongst the blind consumers around the world.

In 2020, the range of braille devices is just brilliant. Today, braille displays range from 14 cells to 80 cells. The common producers tend to make a range within that number, perhaps having a 40 cell and an 80 cell version. As technology diminishes in size however, so are braille displays. 40 cells have become 32 cells, which have become 20 cells and 14 cells. Braille note-takers seem to have 18 cells, 32 cells and 40 cells. A 40 cell braille display is useful in front of a computer but an 80 cell display is more essential if you require longer strings of text. The fewer cell braille displays and note-takers are far more portable. A recent innovation onto the market is the 9 line refreshable display which aims to provide as close an experience of reading a braille page as possible. Generally, refreshable braille displays present the reader with one line at a time and the reader must scroll with keys on the front or side of the device in order to refresh the braille and read the next line. Although we have become accustomed to reading refreshable braille in this way, there are braille readers who feel that refreshable braille is no substitute for reading braille on paper. Whilst paper provides page formatting such as numbers, paragraphing and line length; the single-line format of the display or note-taker mean this is not usually available unless you are able to switch on formatting markers which can hinder the reading speed. From the research I undertook prior to writing this paper, 6% of respondents commented that they preferred to read a whole page of braille rather than single lines, and one respondent said that they did not like having to constantly press a button to change to the next line. 14% of respondents preferred the portable nature of current braille devices. Electronic braille can also be expensive and this can prohibit the average blind adult from purchasing a display or note-taker if they do not have any disposable income (Russomanno, o’Modhrain, Gillespie, & Rodger, 2015). However, just as with the technology improving so refreshable braille products are becoming smaller, the materials with which they are being made are developing and thus cheaper. In the last year, braille products have been released to the market under £500. This can only be good for the average braille user, as it allows for greater access to braille products and greater use of braille in every day life for adults with VI.

In my research, I asked my target group if they owned a refreshable braille display or an electronic braille note-taker or both. 34% of the group own both a display and a note-taker; 60% own a braille note-taker and 64% own a braille display. Only 5 people (11%) responded that they do not own either a braille display or a note-taker. Of these five respondents, two have used a braille device in the past but cannot afford one currently. A further two manually braille documents out for use at work and all three read hard copy braille books. One limitation of my research was that I did not ask which brand braille devices the respondents owned, nor did I ask if they had used schemes to obtain their devices or whether they had funded them themselves. 64% of respondents to my research indicated that they use a braille display alongside their computer, and 66% confirmed that they use a braille device with their smartphone. This illustrates that with the amelioration of technology and the fact that there is a wider range available which can be used with a computer or a smartphone, people are now able to use braille electronically more regularly. Two respondents commented that with the development of braille technology, they realised just how often they used braille and for such a great range of activities, some suggesting that they now use it every day because it is more available (Merryfield, 2009). One respondent commented that as the quality of the electronic braille cells has improved, they would prefer to read electronic rather than hard copy braille.

As a child with a congenital vision impairment myself, I grew up with braille all around me. Any book I wanted to read, I could get in our extensive school library. Anything I wanted to write down, from phone numbers, letters and school work was all produced on any number of Perkins braillers that were around the boarding school. I well remember the noise of the several braille machines bashing away as we all did dictation or maths. When I was fifteen, I was introduced to my first braille notetaker. In the late 1990s and early 2000s, notetakers did seem to be preferred by technology professionals and TVIs as opposed to computer use (Bickford & Falco, 2012). I continued with a different braille notetaker as I did my A-Levels and then at university I was advised to invest my funding and knowledge into using computer technology. I was more comfortable with a braille note-taker so I used that in my lectures and a computer to write my essays in my room. As I progressed to the world of work, I continued to use both technologies and, now, fifteen years on, I am glad that I am able to use both: having a range of braille note-takers, braille displays and laptops available. As a TVI now myself, I feel that one of the most important aspects of my role is to provide as many access opportunities as possible to students to use a wide range of braille technology devices encouraging them to know what is available so that they can adequately navigate the challenges of assessments for university and work. Part of what children and young people need to develop is the skills of self-advocacy: being able to request specific technologies for themselves, depending on what they feel they need, and not be dictated to by cost or lack of knowledge of assessors (Roe, Rogers, Donaldson, Gordon & Meagre, 2014).

As an English teacher, in the early years of my teaching career, I relied on braille. All the books I needed I had to order in hard copy braille and store in my flat. However, when I discovered a braille display and that I could attach it to my computer, the ability to directly read the work I was marking in braille-thus specifically read spelling and punctuation errors at speed-rather than using screen-reader software and using specific settings or having to read character by character in order to mark adequately. When braille displays and note-takers could be connected to a smartphone to access E-books, the amount I needed to carry around with me dramatically reduced. Nowadays, I am able to access everything I need for my teaching and everything I might want to do in my freetime via a braille note-taker or my smartphone and braille display.

Using smartphones, and E-book apps such as Kindle, Playbooks or IBooks, has increased access to books, newspapers and magazines for the VI community. Whereas, prior to the connection between smartphones and electronic braille, the main method for accessing books in braille was to read a hard copy posted from a national library service, now a much wider range of reading material is available. When I wanted to read the play script for “Harry Potter and The Cursed Child”, (Rowling, Thorne & Tiffany, 2017) I was simply able to download it and read using my braille note-taker. This is not to say that it wasn’t available on publication date from the RNIB, but I did not have to manage or transport several bulky volumes in order to read it when and where I wanted. I was just able to sit with my electronic braille device on my lap and read. This means I can read anywhere, on a train, in my lunch-break, in my bed. Although this is possible with hard copy braille, reading from a braille device is less cumbersome and easier to navigate. In my research, 81% of respondents agreed that they use braille to read books for pleasure. Of those asked, 70% read E-books in braille and 19% commented that this was because hard copy braille was “heavy” and “bulky” whereas, electronic braille is more “convenient”. Studying too has become much more accessible. Electronic braille devices can be used both to access internet webpages and virtual learning platforms and read articles and textbooks which are in electronic format. Apps can be downloaded to some braille note-takers or smartphones which can provide further access or internet search engines can be used to locate text copies of journal articles which can then be read with the display on the braille device. In particular, my research indicates that those who study subjects which require more reading such as English Literature and those who require comprehension or reading for meaning such as when studying languages, study using electronic braille devices. Those who are studying suggested that it is now much easier to get these materials electronically and then read them on a device than obtaining them in hard copy braille. 81% of respondents signalled that they had used electronic braille devices whilst studying. This may support my own experiences and my earlier assertion that braille devices are used as a matter of course throughout school studies and that perhaps braille users aim to continue this during their studies as they wish to continue with what they know, and use funding to obtain them.

Whilst the generally preferred medium for reading for people with vision impairments may be speech,, it is argued that this is a more passive form of reading than the use of braille and as such when reading for comprehension, or dealing with technical or specialist material, braille is superior (Russomanno, et al., 2015). This is supported in my research, as one respondent asserted that they use a “screen reader for efficiency and electronic braille for detail”.

Gone are the days when braille was just for reading books and writing notes, addresses and phone numbers. Braille for both children and adults is “useful” and “fun” (Merryfield, 2009). Those who still argue that braille is not of use now we have technology (Wunder, 2009), miss the point, technology has broadened out our access to life, not restricted it. One of my research respondents commented that they “rely on the braille screen input feature built-in to voice-over on IOS for almost all data entry”. This is not something I specifically queried as part of my research, but it is another form of braille entry if you wish to write in braille but you do not want to use a separate braille device. Making notes in braille no longer need to be written by hand with a slate and stylus or on a Perkins brailler: now they can be directly input into the smartphone using touchscreen braille or using a braille device attached via Bluetooth. 78% of those surveyed did confirm that they use braille still to make and read notes, phone numbers and addresses.

Using braille can be efficient and fast, and specifics which may sound odd in speech or may not be correctly iterated can be easily understood through quick perusal of the version in braille (Merryfield, 2009; Wunder, 2009). This seems particularly relevant in the current time as, with social media and email and text message communication, which are far more text-based than communication twenty years ago, braille aids with understanding and clarity (Merryfield, 2009).

Communication with friends is a further activity where the use of braille to access it is increasing. 47% of those questioned during my research confirmed that they use braille regularly when accessing social media sites such as Facebook and Twitter. Equally, using electronic braille devices to read and write text messages and emails is also popular although only 7% of respondents particularly mentioned this. My research did not delve into the reasons for communication being conducted using electronic braille, but it could be argued that privacy may be one. Although people with VI use speech to access their smartphones and computers, and they may have this speech set to a very increased rate, using braille to read and write text messages, emails and social media posts may be more private as no one else nearby needs to hear the speech. Additionally, when in a busy environment, dictation of messages and posts, which might be the preferred method of communication through the smartphone may be challenging because of background noise, and as such, using braille is an obvious solution. Two respondents specifically mentioned this as a reason why they use braille with their smartphone. Using electronic braille in this instance can also allow messages and posts to be proof-read before submission, and may prevent common errors which one might find with dictation. Whether a person chooses to use braille or speech may depend on whether they are posting quickly or whether they are writing a more professional email. One downside with using braille with social media however, may be the length of posts and thus the speed at which they can be read – or skipped past if desired. This is because emojis and hashtags may slow down braille reading. In research conducted in Norway in 2012, 80% of those surveyed used social media and 28% of those were braille users – although the research does not specifically state if they used braille to manage social media and being research which is nearly ten years old, this may give the statistics less value (Fuglerud, Tjostheim, Gunnarsson, & Tollefsen). It is likely now though, with braille displays becoming more portable and note-takers able to download social media apps, that using social media in braille is likely to be more common.

Further activity which my research identified as being popular using electronic braille related to socialising and doing activities with family (see Appendix 1). Four respondents asserted that they use electronic braille to participate in musical events. All these respondents are active members of choirs in their local areas and use electronic braille to read or learn the songs which are emailed to them for use during the sessions. It isn’t yet possible to read braille music using electronic braille: notation must still be read in hard copy, but song lyrics can be typed or scanned by the choir leaders and emailed as they are printed out for the membership. This ensures that the VI participants are able to join in right from the first session, rather than having to wait to order it in braille or braille it out manually using a Perkins brailler. One research participant also commented that they use their electronic braille device to learn chords and notes from the internet for songs on their string instruments. This access to electronic braille devices allows the VI community to take part in musical performances and be part of the associated social events. Just like with social media, where access allows peer support and socialising, (Fuglerud, et al. 2012), braille provides the ability here to improve physical social networking and reduce social isolation and loneliness. For the family too, the access to braille devices is also beneficial. Using braille devices to read recipes for family cooking and being able to access books on braille devices to read with children mean that a blind parent can use technology to spend time with and have fun with their children. One parent also asserted during my research that it was really nice being able to use braille to help their child complete their homework. Here, electronic braille devices seem to allow a much wider access to family activities which may have been more difficult before their use became regular.

In order that adults can maximise their use of this surfeit of braille technology and utilise it daily for such a wide range of activities, it is essential therefore that TVIs teach braille throughout education and should continue to provide the high quality teaching currently available to children and young people with VI (Douglas, McCall, & McLinden, 2011). It is further important that TVIs use braille technology when teaching. According to Douglas et al. (2011) the use of technology does not hinder the development or progress in braille reading and writing. Thus teaching braille using a range of electronic and smart devices will allow the children to realise the accessibility and convenience of braille which will be available to them as an adult. In order for braille to continue to be used by adult blind readers, positive promotion of braille and braille technology is crucial (Roe et al. 2014). Whilst research illustrates that both VI children and adults find the use of electronic braille devices easy to manage and quick to learn, TVIs may not keep up with the progress of braille technology because it forms such a small part of their case-load and as such they may find the introduction of such technologies more of a challenge (Bickford and Falco, 2012). It is essential therefore, that in order to promote braille technology to children and young people TVIs must keep abreast of their developments. Furthermore, as they directly work more with adults, it is important that national and local sight loss charities introduce and promote the use of braille technology as part of their technology offering. This may allow those who have lost their sight later, but who are still able to learn braille, the opportunity to utilise electronic braille for the range of activities explored here.

Words: 3072.

Appendix 1.

Range of braille activities using electronic braille devices by adults surveyed.

* Social media
* Emailing
* Text messaging
* Creative writing
* Learning music or lyrics
* Reading magazines
* Reading E-Books
* Doing calculations
* Reading books with and to children
* Helping children with homework
* Internet research and web browsing
* Studying
* Online shopping
* Making notes
* Reading prompts for presentations
* Revising for exams
* Computer programming
* Reading information for work
* Cooking
* Reading restaurant menus
* Navigation using GPS apps
* Using calendars and reminders
* Proof-reading documents
* Reading utility bills
* Reading the bible
* Learning languages
* Filling in forms
* Scanning and reading documents

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