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Title: Provision of braille reading and learning material in South Africa: A balance between technology and Braille Adding Value and Creating a Love of Reading

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### ABSTRACT

This paper will:

* Outline the changes in the landscape of providing information in braille.
* Explore the changes in trends of braille usage, with particular reference to hard-copy and electronic braille, hard-copy documents and braille versus speech to text;
* Outline the changing needs of braille readers;
* Explore ways to add value to the braille reading experience for those disadvantaged and advantaged by accessibility to technology;
* Outline challenges faced around the teaching of braille and technology; and attempt to address issues of creating a love of reading by adding value to the provision of information in braille and increase the number of readers and maintain the balance between the use of braille and technology to those technologically advanced, and those disadvantaged on the African continent.
* Where there is a lack of resources, and highlight the importance of the braille hard-copy in deep rural areas where often the promise of greater opportunities purported by technology merely remains a beckoning mirage in a Sub Saharan desert where the gap between those with access to technology and those to whom technology remains inaccessible continues to widen.
* It is in this context that this paper will explore the provision of information in the alternative format of braille and make recommendations around provision of information and reading material to braille users.
* In addressing the provision of information in braille this paper will explore aspects of quality, the purpose of the document and emphasize the importance of braille usage alongside technology, and the importance of maintaining a balance between the two at school level and in libraries to ensure that braille reading members of libraries continue to enjoy access to information in a meaningful and user friendly way.

INTRODUCTION

In South Africa, the number of braille users seems to be on the decline as braille seems merely used in functional reading, with teachers at numerous schools for the blind in South Africa reporting a change in the needs and user trends of braille readers.

These changes may not be due to the braille code alone, or the availability of technology with its own underlying challenges, but due to numerous challenges relating to problems with infrastructure, economy, the teaching of braille and assurance of quality.

In a survey conducted among braille readers, in Ghana, Kenya, and South Africa there is evidence of changes in braille trends and needs of braille readers. These changes are in all likelihood caused by affordability and accessibility. (Survey braille user trends November 2015 Alden P)

FINDINGS

Despite changes in braille user trends, learners and adults from Ghana, South Africa and Kenya, who learnt braille from an early age, taught by knowledgeable competent teachers, state that the braille book is still necessary and that an electronic braille device can only be a part of the reading experience if it were more affordable.

Circulated as widely as possible, and with its focus on participants over a large age range, the survey focused on those with braille as part of their occupation, as well as those who are employed outside of the blindness and braille sector. These braille users were taught by teachers with a sound knowledge of teaching blind learners and with a sound knowledge of the braille code. These braille users were taught braille in more than one language; These learners have become successful contributing members of society and have gone on to master skills relating to the use of assistive technology such as braille devices and smart phones.

These braille users state that they still require both braille in hard-copy and in cases where computers and assistive technology are available, material in electronic format

They point out that it is unlikely that the use of text to speech and the electronic braille files will replace the use of the braille hard-copy. There are numerous reasons for this.

Firstly, braille users found that braille includes them on all levels as it allowed them to participate with others in many daily living activities.

These braille users were aware of other braille products such as playing cards, music books braille measuring tape and the like and could benefit from such products in daily living.

Braille readers experienced the need to have access to braille hard-copy as they preferred the personal quality of a book and interaction with the text.

They found that in accordance with their experience, it contributed to communication skills and spelling.

However, despite a strong preference for the braille hard-copy document, especially for functional purposes, the importance of portable braille devices (braille displays and note-takers were highlighted, the latter often remaining inaccessible to the majority due to price.

All braille using respondents in the survey indicated that there is a place for braille and technology to exist side by side. However, that in cases where both were available, they were used for different reading purposes with readers having the benefits of hard-copy and electronic text.

Though participants of the survey ranged from older users to younger users, the need for the hard-copy braille document such as books, knitting patterns and documents in meetings was emphasized, while a call was made for thinner braille books with more pleasing covers in all responses.

Readers found that short documents not comparative in nature could, in cases where technology was available be read on computer with text to speech facilities.

The survey also highlighted the role of braille as communication tool for the deafblind. It must be borne in mind that to many deafblind persons the hard-copy braille and braille display and note-taker in rare cases where it can be purchased, is important for gathering information as highlighted by one deafblind respondent in the survey, for whom listening to files with text to speech would prove impossible.

Having made the point that there is a place for both braille and technology to assist braille users for different reading purposes, users cited that the more prolific use of technology in Africa remains a challenge.

 It must be pointed out that despite the promise of greater opportunity through access to technology, it is unaffordable, and remains merely a mirage in a desert where the gap between rich and poor increases daily due to economic and political instability, with a few having access to basic commodities such as electricity and water. With few even employed, being able to afford a fluctuating price of assistive braille devices and even computers and smart phones, made available to the few in the workplace as part of reasonable accommodation; the latter only in few instances.

 In light of the above challenges as cited by respondents in the survey, braille devices remains prohibitive, making it difficult to access technology to read electronic braille files.

In light of the scenario as outlined above, it is recommended that electronic devices such as braille displays and note takers become more affordable to allow for greater access in South Africa, as on the remainder of the African continent. The efforts to develop braille note-takers and displays of a more affordable nature is gratifying and must continue if users on the African continent are to take full advantage of portable braille through devices such as smart phones, tablets smaller braille displays and the like. This suggestion to be addressed in later paragraphs of this paper.

Despite the increase in technology, relating mainly to cell phones, the electronic text to speech file could not replace braille for the reason that merely listening to a text to speech rendition of a file, document or in some cases of leisure reading, the book cannot be replaced by the benefit of reading braille, personal contact with the words. Another reader said that he has greater interaction with the text. A respondent in Ghana explained that it was personal interaction with the document.

COMPLEX CHALLENGES

In order to provide access to information, braille in hard-copy and by way of assistive braille devices, we would need to address numerous complex challenges as outlined below.

* Firstly, to be addressed is the shortage of braille teachers knowledgeable in teaching the young blind child braille. This is imperative as braille a tool of literacy will lead to the acquisition of other skills such as music and the use of computers and other skills relating to daily living.

LAYING THE FOUNDATION

Despite the fact that listening to stories read by a much loved relative, or on CD and television, plays an important part in learning to read, it should be borne in mind that listening alone is not reading. As listening is merely one component of a good reading program to develop memory auditory and language skills.

“Although listening will be extremely important for the child, it is not a substitute for learning to read and write in print or braille.  Listening will be a valuable supplement to reading, but will not replace it”.

(Chapter ten growing into literacy Alan J Koenig)

For this reason it remains important to create a foundation of literacy by means of teaching the young blind child to read braille, as without braille and subsequently literacy the blind child cannot develop other skills such as the use of computers.

The words of a grade 12 learner at a school for the blind in South Africa succinctly outlines the relevance of braille in the lives of many, emphasizing interaction with the text. “Not having examinations in braille is a huge disadvantage. When I have my question paper in braille, I can read a question again and again until I can properly understand it,” (anonymous Grade 12 learner, Khanyisa School for the Blind, Eastern Cape. LEFT IN THE DARK Failure to Provide Access to Quality Education to Blind and Partially Sighted Learners in South Africa a SECTION27 report T (Fish-Hodgson) (S Khumalo 2015)

* Teachers at the majority of schools for the blind in South Africa do not know: who should learn braille and in very few cases know to: pay attention to hands, teach fine motor skills, concepts concerning braille, seating, the historical background of braille, braille writing, using the Perkins brailler, using the slate and stylus. (TIPS FOR TEACHING BRAILLE READING AND WRITING Marshall H 2016)
* The shortage of teachers knowledgeable of the braille code presents a further serious challenge so that in many cases at schools for the blind learners monitor the work of their class mates as teachers do not know braille codes.
* Teachers also do not know the use of the braille translation software, so that learners do not always receive learning material and lessons on time. In numerous cases at schools I have visited, the braille translation is left to a sighted person often the secretary or a person with rather limited knowledge of braille. The reason is that the belief of “pressing a button and text morphs into braille”, remains prevalent and this is due to ignorance of the work around braille production.
* Teachers also have a limited knowledge of technology and so whatever the learner is taught is at best limited.

What our teachers are exposed to (blind and sighted), is the future of our learners. This was brought home to me clearly on a school visit when teaching a teacher to use tactile illustrations. The blind teacher did herself not know what an elephant looked like.

The lack of knowledge of teaching blind children braille has a negative impact on their ability to develop skills such as playing music, impacts on children learning to use computers, go on to become technologically able, and use assistive devices and applications for braille on devices such a smart phones, iPhones, braille note-taking devices and the like.

The situation as outlined affects the number of literate blind children and adults deleteriously.

* A further consideration is the role of the teacher in mentoring the blind child as a braille reader. The attitude of the teacher towards braille plays an important role in the child mastering braille

(The negative attitude of many teachers at schools for the blind in South Africa to learning the braille code and teaching it to learners at schools in South Africa is also a contributing factor to learners not mastering braille. Teachers often state that braille is difficult to learn.

Subsequently the following activities to foster a positive attitude to braille and reading are taking place only at a few schools for the blind in South Africa, but the majorities of teachers do not have the necessary knowledge and therefore have a negative attitude towards braille.

The labeling of the child’s surrounding with grade 2 braille, perhaps including desk, book shelves, books, brailler, etc., guiding the child and reading the label to him/her; provision of good braille reading models; demonstrations how braille is read, by placing the child's hands under yours as you move both hands down a page: a matter addressed during school visits of the Braille Consultant of SALB to schools.

Discussions with the child about where braille may be used in daily living; Stories read to the child books containing print and braille, with the child following along even if braille is not decoded. The dictation of a few short sentences by the child describing an experience that is important to him, with the sentences Brailled and read back by the child.

The Brailling of songs, commercials, nursery rhymes remembered by the child; Make first braille books interesting to touch by way of different shaped pages, round, triangle tree-aped, animal-shaped so that the child has a clue what the book is about; with an interesting tactile cover with fabric, scraps of material; interesting by covering it with fabrics, small objects, string designs, (tactile art projects of book covers)

Braille printed items that sighted children in a mainstream school may like to examine; such as calendars, lunch menus, special program agendas, and notes to parents.

Teachers should also teach the child how to locate stories through the use of the table of contents and to locate page numbers. (Chapter ten growing into literacy Alan J Koenig)

* Parents cannot afford to keep their child in school, and could certainly not afford computers, with braille devices even further out of reach due to the rand dollar fluctuation. In light of the aforementioned it must be considered that there are a significant number of blind and visually impaired learners who do not even attend school.

In a SECTION 27 interview suggest that reasons for non-attendance at schools for visually impaired children may include various factors such as parents’ fears for their children’s safety; distance between parents’ homes and schools; continuing societal stigma about people with disabilities shared by some parents; costs related to enrolment in schools including school fees, hostel fees and transport fees; parents’ needs for children to contribute financially to the household; a lack of knowledge of the existence of special schools. (report: Section 27 Left in the Dark Fish-Hodgson T 2015)

* Furthermore, the knowledge and skill to teach basic computer literacy to learners at school level also remains a challenge in a country like South Africa, where a system where there is a shortage of braille periods, but also no period for the teaching of computer technology in the greater number of 22 schools for the blind set aside in the curriculum.
* many schools either do not have working computers, appropriate software which enables blind learners to use them or educators who are trained to teach learners how to use this software. Not only is the price of braille computers, smart phones braille displays and note takers daunting and out of reach of most in South Africa and on the African continent, but also the ability to maintain and replace such devices.
* Often there is no formal post, that is to say, dedicated teachers of adaptive skills for the blind child such as braille, mobility and computers, the librarian and the braille instructor and other support staff such as occupational therapists and the mobility instructor.

In the case where computers, braille embossers, document readers, braille translation software need upgrading or maintenance, teachers at schools are also not able to engage with vendors, as seen in South Africa. A difficulty often caused by financial constraints caused by various circumstances relating to management and funding.

The result is often computer laboratories at schools in a state of disorder, computers not functioning, braille translation programs without licenses, or in some cases only demo versions of software, and braille embossers without licenses or standing dormant for years due to poor condition or lack of knowledge on maintenance and support, even break down in communication with vendors of such assistive technology.

It will be observed that the scenario as outlined above affects the meaningful use of technology and therefore braille devices deleteriously.

Even in cases where basic computers are taught at schools, the inaccessibility of technology outside of the school does not facilitate practice in cases where computers are taught, so that it becomes a case of what you don’t use you lose.

* Therefore a further consideration is that in most cases learners have never owned a computer and will therefore not be exposed to the use of technology, making the optimal use of computers with braille devices an unlikelihood as there is no opportunity to become technologically able and go on to master what is sometimes, rather complicated technology.
* Consideration should be given to the fact that only a small percentage of blind people are gainfully employed, so that technology remains out of reach of the greater majority)
* There is according to Professor Alemna little evidence that library services for the blind on the African continent are improving (Professor Alemna) Ghana, as libraries on the African continent may as of yet not be ready to respond in terms of accessible information for the blind, as we bear in mind that 54 African countries with 53 National Library Services are in place, with only 2 libraries for the blind active in:

Egypt, Kenya, Nigeria, Tanzania and South Africa. These Libraries are Egypt: Taha Hussein Library (Library of Alexandria) South Africa: South African Library for the Blind. As testimony to this is the fact that only 5 libraries for the blind are in place on the African continent, with only two libraries well structured and provide structured services to the blind on the African continent. (Establishing an African Network of Library and Related organisations serving Blind and Visually Impaired People Presentation (F. Hendrikz Director of the South African Library for the Blind DAC/IFLA Pre-Conference Meeting of African Ministers of Culture Cape Town 14 August 2015)

**An African Network of libraries or related organisations servicing blind and visually impaired people is urgently needed.**

In South Africa, despite the service of the National Library (The South African Library for the Blind), There is a further difficulty, that of no dedicated or permanently appointed librarian at schools forming a link for children with reading and linking young prospective members to the national library for the blind, a problem the South African Library for the Blind hopes to address in outreach programs to schools by way of promotion and support to schools in order to facilitate the creation of structured libraries and strengthening collections for children at schools.

In light of the above challenges as outlined it may be observed that the braille hard-copy, book, strategic document, crossword puzzle, magazine will retain its relevance.

(Alden P Survey on braille trends November 2015)

A POSITIVE IMPACT ON BRAILLE READING TRENDS

Despite an increase in the use of technology, relating mainly to the use of cellular phones, braille still remains important as a tool of literacy and communication. For this reason we need to promote the sound teaching and use of braille and subsequently promote the activity of reading.

As stated in previous paragraphs, our question may not merely need to address the lack of interest in the hard-copy braille file as the urgent need to ensure that teachers are equipped to teach our young blind learners braille and guide them to literacy; a similar case can be made for the print reading child.

The fostering of a positive attitude towards braille and the book will be imperative. The young and older braille beginner will need a great deal of support: teachers with insight and knowledge about braille, such as a braille teacher or braille instructor

Perhaps a community volunteer or an older braille reading student. Whichever, the following activities are suggested for encouraging a positive attitude toward beginning braille instruction:

Once braille is taught and learners are literate, we may ask a further question, how to revive a deep love of reading among the young blind pre-school child, as they grow into literacy and young adults, a situation similar among print readers where the desire for reading as an activity seems to be dominated by devices such as Kindle and the use of the hard-copy seems on the decline.

It needs to be exciting to read braille, perhaps consideration should be given to initiatives such as a “children’s reading corner”, braille clubs and mentorships to assist in creating a positive attitude to reading as a fun activity and of course, we need to consider that blind children wish to read what their friends and siblings read.

To many braille readers the older and younger reader alike, technology is merely an extra tool, in some cases a substitute for the braille hard-copy, a supplementary medium of “reading”, if we call listening reading.

THE FUTURE OF BRAILLE

Whether braille book, magazine, crossword puzzle, knitting pattern, strategic document, grammar book, hard-copy or electronic braille file, braille users wish that all producers and service providers pay close attention to the intended purpose of the document to ensure efficient braille reading and as achieved by the Unified Braille Code, enhance the braille reading experience by way of greater portability, thinner documents, even those of comparative nature and functional nature in hard-copy braille;

Such documents to be provided in smaller, thinner documents with more pleasing covers: by way of example: consideration for the thickness of braille volumes in the case of leisure reading; and of course greater ease of packing the document safely ensuring durability: lasting quality of dots and of course greater durability of the hard-copy contributing to cost-effective book production.

So what can we do to ensure that learners continue to enjoy braille and technology? Ensure literate blind adults, and, create a love of reading the book again?

Below follows numerous recommendations to ensure that quality braille continues to create a love of reading, a culture of readers who can use braille and technology side by side having the best of both worlds.

The vibrant voice of braille users can be heard clearly technology will not be a viable replacement for braille on the African continent, a continent with numerous logistic challenges, such as shortage of electricity, shortage of knowledgeable teachers and equipment, and others outlined above.

There will always be room for both braille and technology but that the hard-copy is vital especially in functional documents requiring comparison. This is even the case where many read braille electronically. Participants cite some of the following reasons relating to functionality:

* Listening is not reading; The ability to compare documents; The importance to see how a word is spelt;
* A tool of communication: Braille as medium for the deafblind;
* Tool to facilitate inclusion by way of participation: braille as medium for a blind mother to read to her seeing children;

Braille readers also agree that for braille to be used merely with technology, that is electronically, braille devices such as note takers, braille devices would need to become more cost effective in order to become accessible to

TRAINING IMPLEMENTATION MONITORING AND SUPPORT

We need sound training programs in place for teachers to learn to teach the blind child;

* It is necessary to continue efforts to establish strong training programs on braille codes;
* There is an urgent need for implementable policy around the teaching of braille, implementation program that can be enforced in order to:
* Provide training for teachers teaching children who are blind; It must be ensured that training courses address braille literacy among teachers, can teach young learners braille correctly, teaching good pre-braille skills, correct tracking, tactile discrimination, foster positive reading and braille reading attitude, and all such relevant aspects of reading braille. This often a huge challenge in the 22 schools for the blind in South Africa.
* An enforced braille policy, to ensure that it is mandatory that teachers teaching the blind child to know braille;
* A plan to monitor the progress of teachers and to measure impact and efficacy.
* Improve teacher attitudes towards braille and ensure that teachers do fun activities with the young blind child as mentioned in previous paragraphs to foster a positive attitude toward braille and reading.
* Support taking the form of refresher courses by way of workshops or perhaps, in cases where the necessary infrastructure exists, online braille classes are in place, or accredited satellite groups able to present refresher training in deep rural areas, to ensure that teachers remain up to date on changes in the braille code;
* As part of support to schools there is an urgent need that Government considers the return of support staff such as librarians to schools for the blind;

If our children are to become readers we need to support school librarians, teach children to use the library from a young age, and ensure that structured library services are available to the blind on the African continent.

Cultivate in our young learners a hunger for literacy by exposing them to braille from as early an age as possible, ensure that young members have a strong link with braille and the library in their region from as early an age as possible.

This to be achieved through strengthened contact with the national library, and participation in braille reading promotion activities such as reading role models, mentors, storytelling and book clubs.

That all librarians at school and other such as national libraries engage with collection development to ensure relevant collections to the African continent, while adhering to the urgent cry of those children who love books and reading.

In collection development the aspect of inclusion by way of reading braille it must be considered that blind children want to read what their friends are reading in their mother tongue. Some of the above activities are planned in a pilot project promoting braille at the South African Library for the Blind. Activities may include story telling corners, reading clubs and competitions on who has read the most books per year, also a possible readers award.

Taking the library to members: The South African Library for the blind has 148 mini-libraries in 5 provinces. The project extended these mini libraries are to expose readers to braille and technology and make library services available to braille, audio/technology and tactile picture book readers. Training is ongoing and should be if we are to ensure the use of libraries, braille and technology.

We would need to give serious and in-depth consideration to the remark: “I want to read what my friends are reading. This means that all throughout Africa must ensure the fast tracking of ratification of the Marrakesh treaty, and build relationships with publishers, as done at SALB to ensure access to information. Producing material that seeing readers are reading and reducing turnaround time where possible.

In South Africa the download of titles of the TIGAR project attempts to address availability of titles, however, continued engagement with publishers will be needed and for all countries to ratify the Marrakesh treaty.

The above are all mammoth tasks which we will in all likelihood not achieve today, tomorrow, or perhaps not in the next year or two to come, however Rome was not built in one day and we need to start somewhere.

THE FUTURE FACE OF BRAILLE

To ensure that braille users have access to quality braille, of a user friendly nature, producers need to ensure that documents are quality and remain user friendly and portable. The latter to be achieved by children’s books remaining small and not overwhelming.

In cases of craft and recipe books: considering aspects such as the cover, binding and page, the amount of pages per volume, to ensure a book not as bulky and more portable. Braille books should be pleasing to read.

The quality of braille paper must, where possible be considered so that braille is read with efficiency.

The functionality of braille needs to change in that braille needs to where at all possible, become as portable as would be allowed, and by way of continued innovation: the thinner hard-copy book, creation of smaller cheaper braille devices which can perhaps be solar powered, or at least an increased battery life to circumvent the difficulties relating to readily available electricity in Africa and of course greater affordability so that braille applications may be utilized on Smartphone so that braille may become more portable as users read with equally portable braille displays and can take advantage of their libraries wherever they may be, a functionality similar to Bard Mobile.

To assist braille users with taking advantage of assistive braille devices and technology and portable braille, a young braille using vendor of assistive technology also recommends:

Economic limitations: Despite a marked increase in technology sales, relating primarily to cellular phones and in fewer cases, assistive devices such as braille displays, such technology still remains inaccessible to many.

The minority of South Africans who are blind can purchase assistive technology such as braille note takers, however, in some cases those that are reconditioned.

To make assistive technology more accessible it is recommended that:

* Awareness be increased;
* Braille devices become more accessible and more affordable;

* Training and support around technology becomes available to those disadvantaged;
* Braille cannot be replaced by technology, an entry-level and accessible training environment needs to be created and effective training provided to enable all to access assistive technology in a meaningful way;
* Consideration should be given to the individual and technology must not be forced upon users, but must meet individual needs;

CONCLUSION

Africa, like others needs to continue to bear in mind the words of Michael C Mellor

“None of the impassioned arguments in the United States, no government subsidy, no piece of equipment, no accumulations of thousands of pages of Line Type or New York Point, not one of these matters could overcome the demonstrable fact that Louis Braille's reading and writing system had the best fit with how the fingers and brain cooperate to decode dots representing print letters. We have the benefit of hindsight, and must be careful not to be too critical of those who had not learned this lesson a century ago. It was an unprecedented lesson and was therefore not easy to learn.” Making a Point: The Crusade for a Universal Embossed Code in the United States (C. Michael Mellor; 2nd International Conference on "The History of the Blind and the Blind in History," Paris, France, June 22-24, 1998)

The same point can be made for a balance of braille hard-copy, electronic braille and text to speech. We need to continue to consider the functionality of information in hard-copy braille on the African continent so that information does not merely remain available to a few, such as for those in rural areas remain a mirage in a sub Saharan desert of impoverishment and illiteracy.

Research indicates the importance of reading information in hard-copy. In light of this we need to learn a similar lesson about the value of braille and maintain a fine balance with the use of braille, hard-copy or portable device and text to speech technology and place a full stop at the end of the sentence of illiteracy and inaccessible information.

Thank you

SOURCES

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LEFT IN THE DARK

Failure to Provide Access to Quality Education to Blind and Partially Sighted Learners in South Africa A SECTION27 report T (Fish-Hodgson) (S Khumalo 2015)