

Connecting the Tactile Dots: A Decisive Literacy Skill For The Visually Challenged In The Information Age

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Abstract - Acquiring literacy is an empowering process that enables access to knowledge and information which builds opportunities for better life. The ability to read and write is regarded as birth right, whereas all persons must have literacy which prospers their social life to be a part of society. Globally, the process of learning and construction of messages is primarily dependent upon printed words. But braille literacy in education creates an environment that opens a world of possibilities for the visually challenged to develop them as a person in terms of knowledge and shape their behaviour in different situations. However, the visually challenged demands specific learned competencies in attaining knowledge which is the medium for communication. Braille brings the joy of reading and writing from alphabets to musical notations to express their thoughts. Therefore, Braille literacy in the digital age is still critical for individuals to have knowledge platforms in the transitional environment. This paper explores how braille plays a predominant role in accessing the information, to know the fundamental representation of letters and words, which improves reading and writing skills for the visually impaired. A qualitative approach is incorporated, and a total of five cases are explored to know an in-depth understanding of braille literacy skills in the digital age among the visually challenged. The study results show that braille provides the representation of letters in tactile dots, the conception of meanings and symbols which enable visually challenged to develop knowledge and potential to participate in the wider society.

Keyword - Communication, Reading, Writing, knowledge, Braille.

I. INTRODUCTION

In many of the early great civilizations, during the 16th century, blinds are illtreated (Cohen,1972), left to die, sold into galley slavery, lived as beggars (Omvg,2014), and treats as a symbol of the curse (Bjorn,1990). After then, in the 18th century, civilized societies in Europe began to operate Alms houses to take care of blinds, which gradually created the

acceptance of blind people. History indicates that, in many early societies, only the privileged classes are permitted to read and write, and written forms of language are primarily used for religious and commercial purposes (Guerrero,2017). However, the 18th century brought a change in attitude in understanding that blind or visually impaired people are capable and worthy of being educated (Rex et al., 1995). Moreover, the shift in perspective results in promising educational opportunities to become independent citizens who contributed to the welfare of the majority (Guerrero, 2017). The renaissance era emerged in the 19th century, Louis Braille found the braille writing system, which inspires the work of Charles Barbier's "night writing" code where it creates an efficient written communication system for blind individuals. Later, he developed and refined the design of raised dots, which has enlightened the lives of millions of people who are blind around the world in the nineteenth century. Considerably, even in the fast-paced world of technology, braille is an essential tool that cannot be substituted by any other means of access for promoting literacy and increases opportunities to be a part of the mainstream.

A. Braille

Today the world of technology offers numerous methods to learn and construct knowledge for the visually impaired. Still, only the Braille gives the conception of understanding the representation of letters and symbols through the sense of touch, which helps construct the letters in the memory. Braille is a tactile code that provides characters with simplified patterns of raised dots, whereas each cell consists of a two-by-three matrix of dots that encodes a character, punctuation marks, symbols that show letter groupings and sixty-four combinations are possible using one or more of these dots. (Munyi,2017). Also, it gives the awareness of different written conventions such as spelling, paragraphing, and footnotes. Subsequently, Braille is read by moving the hand from left to right along each line and the reading usually involves both hands, and the index fingers generally do the reading. Thus, braille contributes to reading, and



writing skills that allow interaction between the reader and the text, provide information about language construction, helps in learning the mechanics of punctuation and the spelling of familiar words and text formatting (Cylke, 2001). Also, Nadeem (2015) opines that braille literacy refers to skills one possesses to read and write in Braille, comprehend meanings of texts, and communicate with each other in a meaningful way. Moreover, the format of English braille is the same as in the standard English writing system, but each country uses a different standard size of braille dimension (Aranyanak, 2014).

II. REVIEW OF LITERATURE

A significant absence of visual experience causes a delay in motor, language, social, communication, and cognitive skills (Mosco et al.,2015). But the only braille can support the visually impaired to build the concept development and understanding of everything they want to communicate. Toussaint and Tiger (2010) opine that braille is a system that enables individuals to recognise each letter of the alphabet through touch, which is represented by a unique dot configuration (Millar, 1978). So, knowing braille gives them confidence in knowing the letters and symbols requisite for literacy skills. Before starting braille, persons with visual impairment receive tactile sensitivity training by gently touching various textures and eventually braille dots, whereas fingertips get practice in discriminating to get fine details. During their schooling, they learn the basics of braille skills that give scope for literacy and development; on the practical side, the strategies and techniques to learn to read in braille are technically hard (Brown, 2016). Besides, braille helps in knowing regressive hand movements, two-handed reading techniques, contractions, running fingers, body postures, skimming fingers, and tools for writing in braille.

A. Recognition of letters

Braille encodes the letters' position and structure and depends on the sensory system's characteristics to receive the information (Cognitivia,2019). Braille contributes to the primary stages that imply the recognition of letter positions in a word from the cells, which is essential for learning and comprehending meanings. Through touch, the raised dots give the direction to feel how the letters are represented, whereas it gives the abstract about the letters to learn further. Moreover, it helps to form the basis of language for communication and offers the advantage of knowing how letters and words are pronounced and spelled in language and also how to think in a language (International Language Services, 2019). Furthermore, the report states that by understanding the written alphabet, the visually impaired are better able to learn that there are knowing the difference between the sounds and letters which encourages them to read, write and speak fluently in a language.

B. Recognition of Symbols and signs

Numbers, shapes, sizes, signs, and symbols predominantly exist in part of life, but bringing those experiences to the visually challenged is highly challenging. Yet, braille makes it happen effectively with a more enriching experience (Annie,2020). Braille encodes mathematical signs, scientific notation, and symbols linearly using standard six-dot braille cells, whereas it offers easy access without needing to learn a new script. Most importantly, braille decodes signs and symbols which are graphical presentations that help the visually impaired understand the world, enhance communication, voice opinions, and convey recognizable meanings shared by societies (Annie, 2020).

C. Punctuation

Punctuation is essential, is used to convey and clarify the meanings of written language (Jones,2020), change the pace of reading, and offers sentence complexity and variety (Youg,2015). Braille helps in decoding the punctuation to indicate the pauses, and the emphasis on specific ideas is expressed in the text. Particularly in writing, it helps to strengthen arguments made in text (Enago,2021) as well as a wrongly used punctuation can change the meaning of a sentence. Moreover, it isn't easy to make them understand through auditory, and certain things like punctuation have to be decoded only through tactile for better conception.

D. Objective of the study

To understand the importance of braille literacy skills among the visually impaired.

To identify the effects of braille in learning alphabets, symbols and punctuation among visually impaired.

III. RESEARCH METHODOLOGY

The study adopts a qualitative case study approach to know the details of braille and the representations of letters and symbols, which is essential for reading and writing. Therefore, purposive sampling technique is incorporated; in particular, critical case sampling is used to collect the samples that are most likely to give the vital information from a small number of cases which means samples who experience the braille literacy skills. The study focused on the congenital blind, which contains both male and female teenagers who lost their sight by birth, as there is no perception of light can be sensed by their eyes. A total of three cases were examined using in-depth interviews to get the comprehensive source of information and followed an unstructured format with open-ended questions to explore the importance of braille in the information age. Eventually, primary data is collected using two schedules, wherein first focus on the demographic variables like age, gender, educational qualification, place, school, districts. The second schedule focuses on braille learning, the representation of letters and symbols, understanding braille contraction, and the signification of braille in the information age. Moreover, secondary data collects information from journals, articles, archives, newspapers, reports, and books.

The below table show the demographic variables of the respondents

S.no	a	b	c	d	e	f
1	R1	17	Male	11 th grade	Coimbatore	Grade 2
2	R2	14	Male	9 th grade	Trichy	Grade 2
3	R3	15	Female	9 th grade	Chennai	Grade 2

a-Respondents, b- Age, c-Gender, d- Grade, e-Place, f- grades in braille

A. Case #1

Sriram, a 17year old blind teenager, lost his eyesight due to a genetic disorder, although his parents encouraged him to fulfil his desire. For which he moved to the city to have his schooling but could not find any special education nearby. Being an active child and grasps everything expeditious, his parents decided to give him the right way of learning, which resulted in excellent academic performance. His mother was worried about joining him in a residential government school as he had to manage everything on this own without anyone's help. Still, he was strong and accepted the reality. Indeed, which created a change to learn braille with proper notations, gave him the confidence to excel in all the subjects and was able to read the news in daily prayer. In particular, he learnt letters, symbols, signs, punctuations through touch, to enhance strong memory to recall and read efficiently. Sriram fulfilled his dream of becoming a newsreader by being the world's first news anchor with a visual disability. Thus, braille gave him a valuable skill to establish him as a newsreader. He found problems in pausing the sentences, punctuations, and modulations, but he learned gradually and gave his best.

B. Case #2

Sabari, a 14-year-old, congenital blind, is studying 9th grade in an integrated school in Trichy. As he is the third child in the family, his parents happily expected him even though being visual disabled. As his parents had experienced before since their elderly daughter were also blind, they exposed him to textures, shapes, sizes, sounds, which created curiosity in learning and becomes extraordinary in acquiring knowledge in braille. Also, braille contractions are introduced from the inception along with sound and letter associations, which made him complete grade 1 and grade 2 effortlessly, contributing tremendous writing and reading skills. Using tactile dots, he able to learn mathematics, signs, symbols, and structures. Braille code makes mathematical work written in any language easily translated and communicated by hand, wherein braille calculators, braille geometry, worksheets make it possible to read mathematics. Braille gave them an aspiration to learn everything they want to know which helped in expressing.

C. Case# 3

Ahalya is a 15-year-old teenage girl studying 9th grade in a special school (residential) in Chennai. When she was identified as blind, her mother nurtured being a single parent as a breadwinner of the family. However, she decided to put her in a special school to train in academic and non-academic, which offered an expanded core curriculum with braille and specialized equipment and train in orientation, mobility skills, occupational and physical therapies. When she started as a beginner learned all the techniques in braille, such as tactile discrimination, hand positions, and postures which contributes an effective way of learning braille. Also, feels that braille is the only medium that helps sense the representation of letters, symbols, and signs, and doesn't find it hard to learn braille codes; instead, it creates motivation to learn further. Moreover, she flourishes in both uncontract (Grade 1) and contraction (Grade 2) braille format develops the reading and writing skills through tactile dots, which helps her build rapport with her peers and improve her social and communication skills. Eventually, Braille is her first choice of learning even though when has exposed to new media technologies.

IV. RESULT AND DISCUSSION

The result indicates that braille gives the opportunity to read, write, decode the symbols and signs and helps in recognise punctuations. Significantly, braille engages the learner's senses to intensify the language development, sound discrimination, tactual discrimination, and concept development. Since its invention, braille codes have been developed for many languages, covering a range of subject areas such as mathematics, music, computing, science, chess, and knitting patterns (Munyi,2017). As it is a primary tool for literacy available to visually impaired people, braille is also incorporated into products such as clocks, watches and timers, games, and maps. No other medium can convey the core elements of literacy such as spelling, punctuation, grammar, and syntax necessary for writing and complete comprehension when reading. However, literacy is a crucial factor in determining success in life, inclusive employment. Also, Ndung'u (2011) argues that braille will always be more than a literacy medium for persons with visual impairment, which seeks to represent competence, independence, and equality.

The study shows that braille generates the habit of reading and writing, whereas good reading skills help visually impaired learn sounds of letters and words, which reflects in knowing to spell and expanding the vocabulary. Also, braille reading helps enhance comprehension and analytical abilities wherein it helps to improve imagination and stimulates the memory centres of the mind (Harappa,2020). It is similar to the study conducted by Davis (2021) reveals that braille reading helps to know how words are used in different contexts, can give a better understanding of the word usage, helps recall information, and stabilize emotions. Certainly, braille reading helps discover new things in the world and

educate according to their interest (Keyser,2021). Reading is a gateway to learn everything that also assists in writing skills. Indeed, ‘well-read’ individuals are often regarded as wise in society, so braille gives access to the source of information and knowledge that brings collective wisdom to understand the people and the world (Harappa,2020).

The study reveals that braille helps learn the representation of letters and symbols and enables signs and punctuations. Punctuation is also an important tool to make the written text logical and readable, and even a tiny comma can significantly change the sentence's meaning. So, braille helps understand the necessity of punctuation to show how the sentence is constructed whereas sentences are the building blocks that offer the complete sense. Overall, the tactile dots teach the structure of letters, words, symbols, signs, punctuations, which is the fundamental requisite for literacy skills.

V. CONCLUSION

In the past few decades, braille literacy has been declined dramatically and now at a critically low level worldwide. Also, teachers lack access to current materials for visually impaired beginners, which negatively impacts braille learning. But braille is the only source that provides the primary knowledge of literacy skills. Moreover, pre- braille skills must be included in the curriculum before starting their school education; it will encourage them to learn effectively. Yet, despite all this, braille will remain relevant even with vast other technologies approached for information access (Vision Australia, July 2011). Recent surveys have also shown that braille readership has significantly declined among the visually impaired. But only the braille gives the construction of knowledge to excel in text structures, fluent in the languages, develop reading and writing skills, improves communication skills which is a prerequisite for socialization.

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