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Professionalising Skills in Teaching Braille Reading to Persons with Visual Impairment in Nigeria

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Abstract
Braille is a tactile method of reading and writing for persons with visual impairment. Therefore, this paper defines the term persons with visual disability. It enumerates and discusses the challenges of using Braille as a medium of communication to persons with visual and those without visual impairment. This paper pointed out and discussed the benefits of Braille to persons with visual impairment as well as some strategies for effective Braille reading. The procedures for increasing Braille reading speed and the professional skills for Braille reading were also enumerated and discussed. The paper recommended that the Government should provide assistive technology devices like Braille Sense and Braille Edge that will help people with visual impairment access the internet and online materials, and Braille teachers should emphasise spatial orientation training to learners with visual impairment to enhance learners' reading ability and speed.

Keywords: Braille Reading, Visual Impairment, Teacher Training, Inclusive Education, Special Needs Education

Introduction

Braille is a system of embossed writing meant for persons with visual impairment. Braille is the most popular tactile system of reading and writing for persons with visual impairment. Braille was named after its discoverer, Louis Braille, It uses a combination of six dots to form letters, numbers, symbols and punctuation marks (Perkins School for the Blind, 2023). Moreover, it is a method of writing for visually impaired persons and those with blindness, in which each letter is represented as a raised structure that can be read by touching using a finger. Braille writing can be done on special paper called Braille paper. The characters embossed on a Braille paper are read by passing fingers lightly over the Braille writing. Braille writing is based on six raised dots arranged in two columns of three rows. Braille may be written from right to left, using a slate and a stylus to press dots onto a Braille paper placed between hinged metal plates. When the Braille paper is turned over, the dots face up, and are read from left to right. The Perkins Braillers, Smart Perkins Braillers, Braille typewriters and electronic embossing machines are also used to form Braille writing (Merriam, 2023). These machines write from left to right on the Braille paper. There are two types of Braille writing, namely, contracted Braille and uncontracted Braille forms. In uncontracted Braille writing, every word is spelt out (Braille without contractions). While in contracted Braille writing, words are contracted and shortened, that is in "shorthand form". Moreover, in contracted Braille writing, words are abbreviated. For instance, "ch" is a shorter form of "child" and "l" is a shorter form of "like". The beginner Braille learners begin with learning uncontracted Braille writing before they learn the contracted form.

Professionalising skills in teaching Braille reading and writing to persons with visual impairment implies making the skills in teaching Braille become recognized to the degree that they meet alleged criteria. Furthermore, professionalising skills in teaching Braille means giving a higher standard of skills and competence to Braille reading. This could be achieved through giving professional training on Braille reading and writing to persons

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with visual impairment. Braillists should acquire professional skills that will increase the Braille reading and writing proficiency of persons with visual impairment.

Concept of Persons with Visual Impairment

Visual impairment refers to partial sightedness, low vision and other disorders of the eye, which prevent persons from normal use of the eye for academic and other purposes. However, Adebayo (2010) defines persons with visual impairment as persons having problem with their sense of seeing. They include those with low vision and partial sightedness. Adebayo further, highlighted that, the blind are persons with little or no sense of seeing or persons with profound visual loss to the extent that they cannot read or write ordinary print writing (that is small, medium or large writing) but use Braille as their method of communication. Persons with low vision refer to those persons who are certified as visually impaired because they have some residual vision that could be useful within a few inches. Their sight is very minimal for the performance of any schoolwork without special adaptations, such as low vision aids or magnifiers and assistance of eye specialists. The partially sighted are those persons whose sight is not severely impaired. They can read large prints or regular prints under special situations. Some of persons with partial sightedness suffer from refractive errors such as short sight and long sight. Dafwat and Dada (2013) also conceptualize persons with visual impairment as referring to persons with some amount of visual problems that could be remediated by either surgical operation or optical correction. All these forms of eye disorders can affect the academic performance of people with visual impairment, if there is no adequate and appropriate educational intervention.

Challenges of using Braille as way of Communication

Braille as means of communication for persons with visual impairment it is associated with several challenges. A few among them according to Shubham (2022) include:

i. Time consuming, not all required materials are available on Braille, examination cannot be completed in a limited time without help of Braille.
ii. Studying subject like Mathematics, science, accountancy, and other subjects involving discount data is not easily manageable for every blind student, because they have to put a lot of efforts in understanding the lengthy concepts in performing all the calculations, visualizing graphs and figures, analyzing graphs and data etc.
iii. Lack of accessible materials is another challenge for the blind and Braille learners: Many books by various authors are not available in the PDF or other accessible formats for persons with visual impairment. Furthermore, people with visual disability find it very hard to access internet and online materials (Tamma et al., 2021).
iv. Writing examinations with the help of a scribe to persons with visual impairment becomes a very difficult task. Many a times, these scribes are not aware of the spellings, symbols, terminologies etc. of higher classes they end up reading the questions wrong and making mistakes in writing as well. This leads a blind to face lot of marks deductions and not able to achieve the desired scores in the examination.

Tammakad (2022) also identified other challenges of using Braille as a means of communication to include the following:

v. Reading speed is slower in Braille than in print reading
vi. Their slow writing speed is challenging accomplishing writing tasks. This situation is due to delay in motor skills development, which in turn influences the mechanical nature of handwriting using the Braille system.
vii. Poor spelling performance due to limited vocabularies is also a factor that affects communication of persons with visual impairment in Braille. These difficulties can result from disorder in spatial orientation, structure of letters or words, visual perception, as well as lack of visual memory. These affect Braille communication ability of persons with visual impairment.

Benefits of Braille Proficiency to Persons with Visual Impairment

Proficiency in Braille reading is of great benefits to persons with visual impairment, some of the benefits as suggested by Sight Scotland (2021) are:

- Braille proficiency is a key to independence for many persons with low vision, blindness and partial sightedness.
- Braille proficiency enables persons with blindness and partial sightedness to learn how to spell words, grammatical structures, use of punctuations and gain an understanding of how texts are formed.

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- The ability to read Braille out weighted listening to audio formats as reading aids comprehension and retention of information.
- Braille usage can enable persons with visual impairment develop their skills for self-expression in written form through typewriting.
- Because of the nature of Mathematics and science, persons with visual impairment need to learn Braille Mathematical and scientific notations.
- In Mathematics and science symbols, Braille has equivalents which make it easy for persons with visual impairment to access equations, complex problems, tables and chats.
- Persons with visual impairment who have Braille skills are more likely to be in employment than those who do not have.
- Electronic Braille note takers can be used to takedown notes whether in a lecture or meetings in the workplace.

Strategies for Effective Braille Reading

Reading is very important to people including those with visual impairment, because it helps them to have good comprehension, acquisition of information and knowledge. Adebiyi and Abilu (2009) pointed out some effective strategies of Braille reading as follows:

- Sitting posture: Braille readers should be trained to sit squarely at their desks in an erect position looking straightforward in a relaxed and comfortable posture. There should be a flat reading surface of the height blow the elbow level to allow free movement of the hands.
- Place of hands: The Braille fast readers are those that can use both hands independently and in conjunction with one another. Beginners should be trained to use both hands in Braille read. While reading Braille, the left hand should cover the half of the line while the right hand takes continue to the end of the line and the left hand rapidly sweep back to locate the next line of Braille. In some cases, there may be a dominant hand where one hand will be more sensitive to Braille than the other. The recessive hand must be used to accompany the dominant hand either to locate the beginning of a line or to mark the end of a line. A weak hand must be trained to be proactive. There is always a misconception that a person's dominant hand in reading Braille will be the hand that is mostly used in day-to-day, psychomotor activities. Normally, reading Braille is activated by stimuli fed through the fingers on Braille characters to the brain. Therefore, students should be allowed to train with the two hands and use them accordingly.
- Finger placement, hand movement and touching the Braille paper: These activities contribute immensely to a perfect Braille reading. Good Braille readers use both hands and move across lines with a smooth fluid motion. Moreover, good Braille readers use a light touch while reading Braille. Braille reader must develop new skills that can speed up his reading level. One important skill that could be helpful to Braille readers is their ability to create smooth and even pressures when running their fingers along the Braille writing (Adebiyi & Abilu, 2009).

Perkins School for the Blind (2024) suggested that before children learn to read Braille there are steps that can make them get ready, which involved i) giving the children lots of access to Braille everywhere ii) providing lots of practice to develop fine motor or hand skills iii) encouraging children to sort, match and categorize items iv) encourage children to be practicing telling stories and sequencing events, v) help children to understand position, direction and spatial orientation, vi) encouraging children to practice counting, vii) provide opportunities to increase tactile discrimination, viii) create experience stories, ix) encouraging children to " scribble" on the Braille writer and x) encourage children to read Braille book every day.

Procedures for Increasing Braille Reading Speed

One important thing that can increase Braille reading speed and efficiency of persons with visual impairment is reading Braille as frequently as possible. American Foundation for the Blind (2021) identified ways of increasing Braille reading speed as follows:

i. Keeping Braille nearby: Persons with visual impairment should form the habit of reading something that is easy and convenient. They should keep Braille book near their chair, keep a Braille magazine near their bed at night. They should carry along with them some Braille materials while embarking on a long car or bus journey.

ii. Start with reading shorter items: Reading short materials can be very motivating to persons with visual impairment. They should find a magazine that interest them or they can read song, lyrics, recipes, or poems to increase their reading speed.

iii. Repeated Braille reading: This can be helpful to persons with visual impairment if they read a short document over and over. The content will become more familiar to persons with visual impairment through repeated reading process and can help them to focus more on other reading mechanics.

iv. Reading Braille with a friend: If a person with visual impairment reading with another person, it will help them to enjoy the reading condition. Both of them will appreciate the content of what is being read and thereby increasing their reading confidence.

v. Read with an audio book: If a person with visual impairment has no friend to read with, he/she can get the same book in both Braille and audio form and can read the Braille book while playing the audio book.

vi. A person with visual impairment should record himself: A visually impaired person can record himself while reading and then listen to the recorded materials. In this way, he will become more aware of where his Braille reading might be improved (Adebiyi & Abilu, 2009).

vii. Using two hands to read Braille: A person with visual impairment can move his hands smoothly across each line of Braille without pressing down on the dots.

viii. Using Braille Display: An electronic Braille display offers some unique opportunities to Braille readers to increase their Braille reading speed and efficiency. The Braille display can be used with a computer or smart phones.

Teachers' Roles in Teaching Braille Professional Skills

Braille teachers have many roles to play in teaching Braille professional skills to Braille learners. Danlami (2021) suggested the following as roles that teachers play in teaching Braille. They are:

a. Braille teachers should help the blind to realize that Braille is a natural medium of writing just like print. Learners with visual impairment should not be told that Braille is either difficult or easy, but emphasis should be placed on the advantages in reading.
b. Braille teachers should lead a child to identify each symbol including letter signs, group signs and contractions as well as shapes. Letters symbol should not be introduced as a reverse or opposite of another as this may inhibit learning and speed of recognition.
c. The teacher should teach a letter or code as a whole shape in early stages of learning to read or write Braille. The teacher should avoid the use of dot numbers while teaching.
d. The teacher should encourage beginners to learn new signs with the combination of their dots, memorize the relative position of the dots and practice with it until mastery is achieved.
e. Teachers should not expect beginners to concentrate on a reading tasks for a long time as may be expected from those reading print.
f. The teacher should discourage the use of large-size dots.

Professional Skills for Braille Reading

Braille reading is done with two fingers these involves the two index fingers only. But other fingers are used in recognizing Braille characters. Moreover, some Braille readers believe that using three or four fingers in Braille reading is helpful to persons with visual impairment. Persons with visual impairment and other Braille readers need to develop Specific skills for the readiness of Braille reading. In considering any child's readiness to read Braille, the professional skills required to be developed according to Hall (2005) are as follows:

a) Motor development: It is of great importance to persons with visual impairment the development of gross motor movements, but for the Braille reading, this category of persons needs to develop fine motor skills such as wrist flexibility or finger dexterity, two handed coordination, light finger touch, tactile perception, tracking a line and position of hands.
b) Two handed coordination: A person with or without visual impairment should be trained on how to coordinate his/her two hands together to enable him/her read Braille very well. A person with visual impairment must be trained on how to use his left and right hands for activities such as bead threading, stacking, peg boards, filling containers and posting boxes. A child with visual impairment should be trained on the three different types of hand coordination that is fine motor skills (coordinated movement of small muscles), gross motor skills (coordinated movement of large muscles or groups of muscles) and hand-eye skills (the ability of the visual system to coordinate visual information).

In using two hands while Braille reading, there are four hand movement patterns which are left hand marks (the left hand waits at the beginning of the Braille line while the right hand read the Braille line), parallel (both left and right hands should remain together as they read the Braille line), split (both the

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two hands read Braille together until nearing the end of the line, the left hand drops down to the next Braille line and waits for the right hand) and scissors (the two hands read Braille independently of each other). Moreover, the child must always be encouraged to use both left and right hands together for all activities (Adebiyi & Abilu, 2009).

c) Light finger touch: The child with visual impairment should be trained on how to move counters on a surface just by touching them very lightly. The child should also be taught how to place counters on the Braille graph paper and make up a game to see how many counters he/she can find without moving them outside the square. Train the child on how lightly Braille dots can be touched.

d) Position of hands: During Braille reading, the readers will use both left and right hands to read Braille. The left hand reads the first half of Braille line, and then the right hand takes over and reads the remaining half line of Braille writing, while the left hand goes back and locates the beginning of the next line of Braille, and begins to read it as soon as the previous line of Braille is finished.

e) Wrist flexibility/Finger dexterity: The development of wrist flexibility or finger dexterity in children involves a lot of activities such as recognition of three-dimensional objects using both hands, matching of objects to differentiate between 'same', 'different'. 'large', 'small', etc; sorting activities (that is sorting according to size, shapes, positions and kinship). Others include stalking activities, bead stringing, collecting various jars and screw tops (let the child with visual impairment sort small objects with his fingers), (the child makes a pattern of holes with a punch, then traces them with his fingers), pinching clothes pegs to the side of a tin (this encourages the child to use both hands to find the side of the tin), teach the child to use cassette recorder while taking lecture (this help to develop manual dexterity of the child) and encourage the child to play with plasticize, this helps strengthen the hands of the child. Furthermore, to help in manipulating children with stiff fingers encourage them to practice using their fingers on keyboard instruments (Hall, 2005).

f) Tracking a line: This involves teaching the child with or without visual impairment how to move fingers horizontally across a line of Braille text and identifying when a line ends so that the Braille readers can reset their fingers on the subsequent line (Mindy, 2014). Furthermore, it is of great importance to train the children on correct finger and hand use during Braille instruction. Different students will use different types of hand movement patterns to read Braille. The most efficient pattern is to use a scissor type pattern, moving both hands together (Adebiyi & Abilu, 2009).

g) Tactile Perception: The teacher should teach the child tracking pattern. This is because the child needs to develop the skills of recognizing and discriminating shapes using the pad of his fingertips. This is a unique skill that the child should be carefully prepared for it. The best way to help the child learn tactile discrimination is to start with large objects and move to smaller ones. For example, students with or without visual impairment might use the following sequence to learn Braille, using large three-dimensional forms such as a ball, large and small pieces such as a puzzle, medium-size sharps with raised areas, small shapes with raised lines, and Braille letters (John, 2024).

h) Refreshable Braille Display: This is an assistive technology device. It is a single row of Braille cells ranging from 18 -180 Braille cells. Each Braille cell consists of six to eight plastic pins, which are raised and represent the Braille dots configurations of a Braille cell and connect to computers or tablets using USB cable or Bluetooth. The device contains navigations keys such as forward, backward, upward and downward. When reading on a refreshable Braille displays students can only see one line of text at time. Therefore, the skills that are required for using a refreshable Braille displays are different from the skills that are required for embossed Braille pages. Furthermore, the students will be train how to read it with one hand instead of reading with two hands, as they would when reading embossed Braille pages. When readings on refreshable Braille displays, the hand movement method that are used are different from the hand movement methods used to read embossed Braille pages. This is because students will need to use their thumbs to operate the navigation keys to scroll through the next page. In addition, students who use Braille as means of communication, must learn numerous commands to efficiently use refreshable Braille displays (Paths to Literacy, 2024)

Conclusion

To professionalize skills in teaching Braille reading to people with visual impairment and other Braille readers, some important skills must be developed by these categories of people. The skills needed to be developed for

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professional Braille reading include motor development skill, two handed coordination, light finger touch, position of hand, finger dexterity and tracking a line. Others are development of tactile perception and the use of refreshable display.

Recommendations

The paper proffered the following recommendations:

1. Government should provide adequate materials on Braille that will help people with visual impairment complete their examinations in a limited time.
2. Government should also provide software that will help people with visual impairment study subjects like Mathematics, Science, accountancy and other subjects that involve calculations.
3. Government should provide assistive technology devices like Braille sense and Braille edge that will help people with visual impairment access internet and online materials.
4. Braille teachers should emphasize on spatial orientation to learners with visual impairment. This will enhance learners' reading ability.
5. Government should provide adequate training on Braille to enable teachers to teach the subject effectively to all levels.

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