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## Investigating Teaching Strategies to Braille Beginners in Special Pre-Primary Schools

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### ABSTRACT

This study investigated the teaching of learning readiness skills among braille beginners in special pre-primary schools in Tanzania. The study intended to investigate the learning readiness skills taught to braille beginners. This study adopted a qualitative phenomenography design for three selected special pre-primary schools through interviews, observations, and focus group discussions. The findings revealed that teaching strategies that teachers use to teach learning readiness skills to braille beginners include role plays, the use of songs, the use of real things, direct teaching, the use of extra teaching times, tactile exploration, and questioning. Apart from direct instructions, these strategies put the learner at the center. The study revealed further that a single class of braille beginners requires differentiated teaching strategies due to variabilities among the learners. Role plays, songs, questions, and answers improve listening and speaking skills, vocabulary building, and critical thinking. The study concludes that a particular teaching strategy enhances each learning readiness skill, i.e., the use of songs and role plays enhances listening and communication skills, and exploration of real things like small stones and sands enhances both gross and fine motor skills. The study recommends that the governments put in place centralized guidelines and curricula for braille beginners all over the country.

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## 1. INTRODUCTION

The teaching of learning readiness skills emerged in the 1800s when Louis Braille developed braille tactile communication as central to the literacy of blind and visually impaired persons (Singla, 2021). Since the world's creation, no system has been developed to allow blind people to read and write independently. In this study, braille beginners are the visually impaired learners who begin learning through the braille medium. Education for persons with visual impairment gained reasonable development globally due to international conventions and legal frameworks (Korir, 2015). These include the Convention on the Rights of the 1989 Child (CRC), the Convention on the Rights of Persons with Disabilities (CRPD) of 2006, the Education for All (EFA) framework of 1990, and the Dakar Frameworks of Actions of 2000, (Opie, 2018).

Countries colonized by the British used the Louis Braille format as a benchmark to develop the Standard English Braille (SEB), which contained braille literacy codes, braille science codes, mathematical codes, and computer codes. To make it simple and administratively easy to handle, the International Council on English Braille was formed in 1991 to combine all the codes in one format called Unified English Braille (UEB) (Argyropoulos & Martos, 2016). UEB has also simplified the converting of Braille into prints, prints into braille, and Braille into speech through different software like Job Access with Speech (JAWS) and Non-Visual Desktop Access (NVDA) (Kao & Mzimela, 2019).

A Braille beginner must be instructed on how to read and write in Braille format. A lack of access to visual cues such as gestures, facial expressions, and written materials impedes comprehension of non-verbal cues and contextual information. Dogbe (2020) asserts that Braille beginners need sensory training in the remaining senses of touch and hearing to help them acquire information. The most used methods to teach literacy are phonic, touch, and say, and combining the two (Dogbe, 2020). Teaching braille readiness skills should encompass a holistic approach that integrates tactile, visual, and auditory learning methods. Literature informs that engaging all sensory modalities can enhance learning for learners with visual impairments (Goodman, 2020). Group activities that promote collaboration and communication help braille beginners to learn from one another and build confidence since peer learning fosters a supportive environment that can alleviate anxiety related to learning braille (Peters, 2020).

Drilling plays a significant role in teaching braille readiness skills to beginners as it focuses on reinforcing skills through repeated practice, which is vital for developing proficiency and confidence in braille literacy. Consistent drilling helps reinforce tactile and motor skills necessary for reading and writing Braille. Repeated practice allows learners to internalize the braille alphabet and the positioning of braille dots, fostering automaticity in recognition (Kromer, 2018). Drilling patterns enhance memory consolidation, enabling braille beginners to recall braille patterns and signs more effectively; as they become more familiar with the tactile representations of letters and words, their anxiety decreases, leading to improved literacy competence (Chestnut & Asaro, 2019; Meyer & Davie, 2021).

Developing better memory, speaking, writing, and listening skills should be taught as a prerequisite for using braille code as they contribute significantly to overall literacy and communication abilities. Active listening through guided discussions, audiobooks, and verbal comprehension exercises can enhance comprehension and communication abilities (Kopeny, 2020). It is also commendable that braille beginners develop listening skills through activities such as following oral instructions, identifying sounds, and using audiobooks (Tobin & Hill, 2015).

The phonic teaching strategy requires the teacher to teach alphabets and numbers by naming and singing with learners about the braille dots, shapes, and sounds they make (Dogbe, 2020). The next step is to blend two, three, and four dots to form words. The phonic strategy uses the auditory-verbal technique by encouraging the braille beginner to rely on their listening and speaking capabilities to learn new concepts (Barlow & Rinaldi, 2020). Listening is the ability to attend to and distinguish environmental and speech sounds. Hearing and listening abilities include identifying the source of a sound, remembering or memorizing spoken words, identifying voice inflection, and picking up on rhythmic patterns. These abilities are critical to the development of expressive language and early literacy. Emelogu (2020) states that phonemic awareness increases letter or code-sound relationships and simplifies reading. Reading aloud helps the learner improve fluency as the teacher continually listens and corrects the learner after reading a few words, lines, or paragraphs.

Another strategy is touch and say, where the teacher allows the learners to touch an alphabet and say what it means. The learning readiness skills enable the learner to touch and learn Braille codes and alphabets. Laura *et al.* (2023) pointed out that for blind Braille beginners, the palm is the primary source of knowledge about their environment. Fine motor development skills include wrist and finger strengths, two-hand coordination, effective and discriminative touch, tactile perception, line tracking, hand position, and sensation (Laura *et al.*, 2023). Soft motor skills result from activities that strengthen the hand, palm, fingers, and coordination. Both teacher and Braille beginners should engage in activities such as sorting mixed things like sand and beans, holding things to learn three dimensions, punching and hole tracing, playing with sands, bead threading, filling containers, assembling bolts and nuts, playing musical instruments, tracking from left, right, top, bottom and its vice versa (Roe *et al.*, 2014).

Readiness skills are interventions that promote tactile awareness and enhance the tactile reading of blind learners. Learning readiness skills as an intervention intends to equip braille beginners with the ability to read and write in braille codes, name, and touch alphabets, read from right to left, use braille writing materials, sort things like beans and sand, differentiate sizes and shapes, sense, correct hand movements, and listening skills (Susanti & Rudiyaniti., 2020). Learning readiness skills lay the foundation for effective literacy development and overall academic success as they help learners transition into the complexities of learning Braille by promoting awareness, motivation, and the necessary cognitive and physical abilities required for literacy. Learning readiness skills, such as phonemic awareness, vocabulary recognition, and print motivation, are critical prerequisites for mastering Braille. Barlow and Rinaldi (2020) emphasize that establishing these foundational skills supports the transition from non-braille to braille literacy, enhancing students' ability to decode and comprehend written content. Learning readiness skills empower braille beginners to take an active role in their learning process as they develop skills to express their needs, engage in self-directed learning, and become more independent and effective learners (Smith, 2020). Learning readiness skills must be incorporated with meaningful literacy experiences by integrating pre-braille skills (tactual perceptions) with language literacy activities (i.e. use of stories and reading books) based on a whole language approach (Nelson & Bruce, 2019; Phutane *et al.*, 2022).

Global statistics show that more than 1 billion people live with different forms of disabilities. According to the World Health Organization (WHO), 253 million people (3.2%) of the world's population have different forms of visual impairments (WHO, 2018). In Tanzania, about 6,000,000 people have difficulties with vision, whether moderate, severe, or profound.

Also, there is a large number of pupils in primary schools who are blind and were once Braille beginners. It has 523 typical braille beginners in its special and inclusive pre-primary schools (Mangione et al., 2016; Epstein, 2002).

Education for braille beginners in Tanzania started in the 1950s when the Anglican Church established a Buigiri primary school in Dodoma to teach persons who were blind. The teachings were much of the religious concepts from the bible. Later on, they introduced general education to the blind persons enrolled in that school (Possi & Milinga, 2017). Furaha residential primary school for blind girls was established in Tabora in 1962 by a Swedish Free Mission and, later on, was made a coeducational school in 1964. On the other hand, the Lutheran church established the Irente School for the Blind in 1963 in Lushoto (Tungaraza, 2014). Irente, Buigiri, and Furaha schools still operate as special primary schools for the blind with pre-primary sections for the braille beginners.

Although learning readiness skills for braille beginners serve as the foundation for learning the core curriculum, they are embedded in the regular curriculum and syllabus. Braille beginners and their sighted peers in Tanzania undergo the same syllabus, exposing them to activities that build fine motor skills that promote pre-writing skills. Ng'wandu (2020) put forward that learning readiness skills include tactile discrimination, auditory discrimination, fine motor skills, and basic literacy concepts, all of which are vital for successful Braille literacy.

The study by Nahar et al. (2015) revealed a need for more qualified teachers to teach braille beginners. The study further identified that many teachers teaching braille beginners are not professionals; they teach using their life experiences because they are blind and were once braille beginners. The study by Chen et al. (2012) pointed out that special education teachers in pre-primary schools teach braille skills to learners who are blind. However, every teacher uses personal initiatives to adapt the instructional strategies and materials to accomplish the general curriculum for braille beginners. Mile et al. (2018) revealed that few teachers use reasonable accommodation when teaching braille beginners using real-life objects to teach abstract concepts and step by step from concrete to abstract. Most fail to improvise and accommodate braille beginners due to large classes, insufficient instructional materials, and timetabling factors. Opini and Onditi (2016) state that the general curriculum frustrates teachers by adapting and modifying curriculum contents to enable braille beginners to participate in the learning process. The current study was, therefore, designed to investigate the teaching of learning readiness to braille beginners in special pre-primary schools in Tanzania.

## 2. METHODS

The philosophical assumption underpinning this study is interpretivism. It seeks to uncover the meanings and interpretations that people attach to their experiences and social interactions. The study was shaped by relativist ontology, subjectivist epistemology, naturalistic methodology, and balanced axiological stances as a basic aspect of the interpretivism paradigm. The interpretivism philosophical perspective agrees that every participant in the study is experiencing the existing realities individually (Goldkuhl, 2012). Different persons may have different understandings of a situation based on their experiences in a particular situation. Teachers, head teachers, and Braille beginners from different schools have different understandings and experiences in teaching learning readiness to braille beginners, and their views were honored and considered.

## 2.1. Research Approach

This study adopted a qualitative research approach as it was conducted in its naturalistic setting (schools). According to [Cowan and Allen \(2007\)](#), qualitative research aims to interpret and make sense of the complexities of human behavior and social contexts, highlighting the subjective meaning of participants' experiences. This study collected multiple views about teaching learning readiness among braille beginners from teachers, head teachers, and braille learners to uncover multiple perspectives. A qualitative technique is one in which the researcher frequently creates knowledge based mainly on the varied interpretations of personal experiences that are socially and historically created.

## 2.2. Research Design

This study adopted a phenomenography design. It aims to study people's experiences and understanding of teaching the learning readiness among braille beginners before they go for the core curriculum in primary schools in Tanzania. Phenomenography aims to map qualitatively different ways people understand various phenomena in the world around them. To capture the views and experiences on teaching learning readiness among braille beginners, teachers, heads of schools, and braille learners were engaged accordingly. Correctly identified phenomenography as an interpretative methodology that focuses on the participants' understanding and lived experiences of a particular event.

## 2.3. Study Location

This study was conducted in Dodoma, Tabora, and Iringa regions. The selected regions had specialized schools catering to visually impaired learners, including beginners learning Braille. This provides a concentrated sample of the targeted population, making it a prime location for collecting relevant data. Since Braille beginners are central to the study, the selected schools from these regions had readily available groups of learners in this category. This minimizes the time and effort required to identify suitable research participants. Meanwhile, the selected schools from these regions had experienced teachers, specialists' teachers, and administrators with insights into Braille beginners' teaching methodologies, offering a valuable source of qualitative data through interviews, observation, and focus group discussion.

## 2.4. Sampling Technique

A purposive sampling technique was adopted in the selection of special pre-primary schools. The guiding principle identified schools providing rich information about teaching learning readiness skills to braille beginners. Criteria for inclusion in each region were set that:

- (i) The school must accommodate braille beginners in separate classrooms
- (ii) It had at least four specialist teachers in visual impairments
- (iii) A school had at least seven years of operation to get former braille beginners
- (iv) A accommodate both boys and girls
- (v) The selected school was older than the rest.

Headteachers automatically participated in the study due to their leadership responsibilities and position in schools, assuming they had rich and precise information concerning the day-to-day teaching activities and availability of the instructional materials for the braille beginners before they embarked on the core curriculum. Teachers were sampled purposively. The criterion for inclusion was that selected teachers should be teaching the braille beginners:

- (i) The teacher must be teaching learning readiness skills to the braille beginners
- (ii) The teacher must have special training in inclusive education or is a blind teacher using experiences
- (iii) Must have taught braille beginners for at least four years. The process of selecting teachers from the accessible population to participate in the study was continued until saturation of the desired information was reached

The blind learners who are former braille beginners were involved in the study. The inclusion criterion is that they have mastered the learning readiness skills, are in the upper classes, and can answer questions. The snowball protocol was used to sample learners from upper primary schools to share their teaching readiness experiences among braille beginners. Data collection methods include; interviews, observations, and Focus Group Discussions (FDGs). This study employed thematic analysis for the data interviews and focus group discussions. A study by [Nowell et al. \(2017\)](#) discusses the application of thematic analysis in educational research, highlighting its effectiveness in exploring participants' experiences and perspectives. In the same vein, [Kearns and Morrow \(2022\)](#) utilized thematic analysis to explore the experiences of educators teaching Braille to young learners, identifying key themes such as the importance of individualized instruction and the role of collaboration. The ethical protocol was observed, and the interviews were conducted in special places within schools, which provided suitable privacy to secure the participants' anonymity. Secondly, participants' anonymity has been protected and maintained by replacing their names with pseudonyms. In most cases, the researcher assigned codes to identify the participants while presenting data.

### 3. RESULTS AND DISCUSSION

The study aimed to examine the learning readiness skills of braille beginners in pre-primary schools. Interviews, focus group discussions, and observations revealed the six strategies teachers adopt in teaching learning readiness skills to braille beginners in pre-primary schools. The strategies include role plays, the use of songs, the use of real things, direct teaching, the use of extra teaching times, tactile exploration, and questioning.

Headteachers were interviewed on the teaching strategies teachers use to teach learning readiness skills to braille beginners, and one of them stated that:

*"Teachers use more collaborative strategies to engage braille beginners in learning. The strategies used include teaching by touching various objects, especially real objects, to enhance tactile perception and differentiate between objects. Since visually impaired learners learn slowly, teachers spend extra time explaining slowly until they understand. Sometimes, teachers introduce games and role plays to help visually impaired learners improve memory retention, build vocabulary, and enhance listening and verbal expression skills. For a new topic or concept, teachers directly teach new concepts and then use questions and answers to engage in the learning process (transcription of an interview with one head teacher, HTM)."*

Another participant stated that:

*"Teachers use strategies that engage braille beginners in the learning process. They mostly use real objects from the nearby environment, allowing learners to explore them by smelling and touching them. They teach the new concepts directly to familiarize learners with the general understanding. Direct teaching is possible and appropriate when teachers teach new concepts in bits under scaffolding protocol. The goodness of scaffolding is that the teacher uses the learners' prior knowledge about a particular concept. They also use songs, storytelling, and role plays to improve their listening and speaking capabilities (transcription of the interview with one head teacher, HTF)."*



The quotes above align with Social Cultural Theory (SCT) because the learner is at the center of whatever strategy. For instance, braille beginners can explore real things to strengthen fine and gross motor skills and build vocabulary. Similarly, it resonates the Vygotsky's assumptions that prior knowledge is a factor when learning new concepts. Role play and songs use language to communicate information, and language tied to the material culture provides vocabulary and concepts for learning (Guanoluisa *et al.*, 2022; Akpan *et al.*, 2020). It also rhymes with the assumptions made by Day *et al.* (2008) in his Emergent Braille Literacy Model that teaching strategies that strengthen speaking and listening improve braille literacy (Wiazowski, 2014). Exposing braille beginners to real things (realia) reflects the idea by Jannok and Suppasetsee (2020) that teaching strategies involving hands-on activities enhance learning readiness skills.

Similarly, role-play allows learners to explore realistic situations by interacting with others in a managed way and developing communication skills (Islam & Islam, 2012). The findings that teachers use direct instruction are in line with Rosenblum *et al.* (2018), which is suitable for braille beginners as it is provided in a scaffolding perspective step by step. Learners can quickly master the intended knowledge and skills.

Teachers who are the main curriculum implementation agents in the classroom level were also interviewed, and one participant responded that:

*"There are many teaching strategies; some you learn from colleges, but others you are forced to use real context. It is obvious that in my class with seven braille beginners, I have seven different classes because they are all blind but have different learning needs. The first strategy is to use natural things so that he/she can touch and explore. The second is role plays and songs to strengthen listening and vocabulary-building skills, and the third one is to teach orientation and mobility skills to enhance the positioning and movement of braille beginners from one corner of the class to another (transcription of an interview with one teacher, BT2)."*

The interview response from teacher BT2 specifically revealed that each braille beginner in a class has different learning needs. This understanding calls for the adoption of mixed teaching strategies in one class. Using natural things enhances communication skills because material culture provides the vocabulary for learning (Guanoluisa *et al.*, 2022).

Former braille beginners who benefitted from the adopted teaching strategies were interviewed, and participants had to report as follows:

*"We used the out-of-classroom environments to learn things by role-playing and reflecting on the plays. We also used songs and natural things to learn about the shapes of letters and numbers in braille format. The teacher guided us in using counters for subtractions and additions in mathematics. To assess our understanding, the teacher used to ask us oral questions about what we had just learned, and in case we failed to produce the correct answers, he kept correcting us until we understood the concept very well (Transcription of FGD with participants from school F)."*

The FGD findings from the participants from school F indicate that teachers use oral questions. Oral questions improve listening and speaking skills, vocabulary building, and critical thinking as they enhance reflections and organization of the learned concepts (Pammu & Jubhari, 2021).

All the strategies resonated with findings from the reviewed literature. For instance, Novi and Anwari (2020), stated that reciprocal teaching enhances scaffolding and teaching bits by bits. The findings resonate with the literature that the teacher of braille beginners needs to teach first the process of activities to strengthen fingers, followed by using of simple instruments like slate and stylus, Perkins braille machines, and later on the process of writing

and reading the braille and facilitates teaching through scaffolding protocol (Vygotsky, 1978). Islam and Islam (2012) pointed out that a role-play teaching strategy is relevant for Braille beginners because it allows learners to explore realistic situations by interacting with others in a managed way initiate interactions with their peers and increase their response behaviors. Direct instruction strategy allows the teacher to explain the concept to learners using a step-by-step method, where the teacher provides different learning activities that allow the learners to practice individually or as a group until the concept or skill is mastered (Louw, 2015).

The study observed further that direct instruction provides a clear, step-by-step process for mastering braille and preventing confusion and frustration. It also allows teachers to address individual learners' needs and learning paces, adapting strategies based on progress. Interaction with natural objects enhances abilities and skills to touch, hear, smell, and see these experiences will help them understand new concepts, develop their language, and motivate them to explore their environment, leading to motor development (Morrison et al., 2020). Kamei-Hannan and Lawson (2012) pointed out that extra time allowance is crucial for braille beginners to complete their work, process visual information, and complete their written assignments because learners with blindness need much time to integrate information coming from hearing.

The study aimed to explore the teaching strategies teachers use to teach braille beginners in Tanzania's special pre-primary schools. The interest in conducting this study was informed by the fact that although the teaching of braille beginners in pre-primary schools in Tanzania continues, there is no specific curriculum to teach this group of learners. Most teachers teaching braille beginners in pre-primary schools seem to be concerned about the centralization of curriculum to the extent of suggesting a specific curriculum for the braille beginners. The findings revealed several strategies teachers adopt in teaching learning readiness skills to braille beginners in pre-primary schools. These include role plays, the use of songs, the use of real things, direct teaching, the use of extra teaching times, tactile exploration, and questioning. The study revealed that a single class of braille beginners requires differentiated teaching strategies due to variabilities among the learners. It was also revealed that role plays, songs, questions, and answers improve listening and speaking skills, vocabulary building, and critical thinking. Similarly, using tactile materials like maize, bean seeds, small stones, and sands improves tactile skills. Purposive walking within and outside classrooms enhances orientation and mobility skills. The study revealed that much as the teaching of braille beginners continues in schools, teachers have opinions that, the lack of a specific curriculum for the braille beginners poses confusion to teachers because the planning of teaching activities is not guided and differs across teachers teaching pre-primary classes across the country. The study found further those teachers face challenges when teaching because braille beginners have communication problems; most braille beginners are only conversant with their mother tongues, and few lack languages entirely because they were denied their right to play with their peers and locked and a large number of them have more than one disability.

#### 4. CONCLUSION

Based on the study findings, the following conclusions are drawn. Firstly, the curriculum used to teach braille beginners in pre-primary schools confuses teachers, and this makes teaching strategies differ greatly among teachers. Secondly, the study concludes that much as teachers use syllabuses for sighted learners to teach those braille beginners in pre-primary schools, teachers have been using role plays, the use of songs, the use of real things, direct



teaching, the use of extra teaching times, tactile exploration, and questioning as the main teaching strategies. The study concludes that denying blind children the ability to play with their sighted peers makes them miss language for communication, mainly spoken Swahili and interactions with others. Thirdly, the study concludes that a particular teaching strategy enhances each learning readiness skill. Teachers use songs and role plays to enhance listening and communication skills, and exploration of tactile materials like small stones and sands enhances both gross and fine motor skills.

Fourth, the study concludes that teaching braille beginners in pre-primary schools requires competent and motivated teachers, specific curricula for braille beginners, reasonable accommodation in terms of instructional times, and relevant assistive devices.

## 5. AUTHORS' NOTE

The authors declare that there is no conflict of interest regarding the publication of this article. The authors confirmed that the paper was free of plagiarism.

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