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EMPOWERING LITERACY THROUGH TOUCH: TEACHERS' ROLES IN ADVANCING BRAILLE LITERACY IN GHANA

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Abstract:
This study explored the roles, practices, and challenges of teachers in advancing Braille literacy among learners with visual impairments in the foremost schools for the blind in Ghana. Data were collected through focus group interviews and an observation schedule with teachers, particularly those specialising in language instruction. Findings revealed that teachers' roles in Braille literacy extend beyond direct instruction of Braille symbols to encompass pedagogy, resource management, technology mediation, emotional support, and advocacy, highlighting the multifaceted nature of their responsibilities. In setting up Braille literacy programmes, teachers reported that they considered the age of onset of the disability, employed task analyses to facilitate gradual learning, and assessed the nature of impairment to determine whether learners could engage with both Braille and print or only Braille. However, the study also identified significant challenges undermining Braille literacy instruction. These include shortage and irregular supply of Braille textbooks and learning materials, limited teacher preparation and professional development in Braille pedagogy, large class sizes that restricte individualised instruction, and systemic issues such as inconsistent implementation of inclusive-education policies, inadequate funding for special education, and weak inter-agency coordination. The study recommends the need for targeted professional training, improved resource provision, stronger policy implementation, and stakeholder collaboration to enhance Braille literacy and educational outcomes for learners with visual impairments in Ghana.

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1. Introduction

Literacy is universally recognised as the foundation of education and a key driver of personal, social, and national development. For individuals with visual impairments, literacy is achieved primarily through Braille, a tactile writing system that enables independent reading, writing, and access to information. In Ghana, Braille literacy holds particular significance because it does not only support academic achievement but also enhances social participation, employability, and overall quality of life for persons with visual disabilities. Without functional Braille literacy, students who are blind or partially sighted face limitations in accessing mainstream curricula, engaging in higher education, and competing favourably in the labour market (Dogbe, 2024; Khaliq *et al.*, 2023).

Braille remains the main medium of communication for persons who are blind. Ghana adopted the braille code, which is made up of six dots. Braille writing equipment includes Perkins braillers, slate and stylus. Perkins braillers are quite ideal for writing, but rather expensive. The slate and stylus, on the other hand, are a cheaper alternative. However, when using the slate and stylus, the learner writes from right to left, thus contradicting the left-right eye orientation. The learner turns the paper when it comes to reading what has been written. This makes the process rather slow. This is also cumbersome and more so, to young learners with visual impairment (Dogbe, 2024).

Teachers play a pivotal role in advancing Braille literacy, particularly within Ghana's specialised institutions such as the Akropong, Wa, and Wenchi Schools for the Blind. Their responsibilities extend beyond instruction to include curriculum adaptation, provision of tactile learning resources, and fostering of positive attitudes toward Braille among learners (Dogbe, 2024; Abu Shokhedim *et al.*, 2024). However, challenges such as inadequate teaching materials, limited training in Braille pedagogy, insufficient technological support, and large class sizes continue to impede effective Braille instruction (Ry-Kottoh *et al.*, 2022; Kana, 2025). These constraints, if unaddressed, threaten the development of literacy skills among learners with visual impairment, further entrenching educational inequalities (Khaliq *et al.*, 2023; WHO, 2022).

Globally inclusive education frameworks, including the United Nations Convention on the Rights of Persons with Disabilities (CRPD) and Ghana's Inclusive Education Policy (2015), emphasise the right of learners with disabilities to equitable and quality education. These commitments underscore the urgency of strengthening Braille literacy as an indispensable pathway to educational inclusion (Ametepee & Anastasiou, 2015). Teachers, therefore, are not only facilitators of knowledge but also advocates who bridge the gap between policy aspirations and classroom realities (Opoku *et al.*, 2017).

Despite the recognised importance of Braille instruction as the primary medium that enables literacy, autonomy, and equal educational opportunities for individuals with visual impairment (World Blind Union, 2022), blind learners in Ghana continue to face

significant Braille literacy deficits. Teacher-centered barriers, including insufficient training in Braille pedagogies, limited access to tactile and assistive learning resources, and inadequate systemic support, undermine effective pedagogy and hinder Braille proficiency among students with visual impairment (Dogbe, 2024; Ry-Kottoh *et al.*, 2022). For instance, research reveals that Ghanaian teachers actively use differentiated instructional strategies to support learners with visual impairments; however, their success is constrained by limited resources, insufficient training, and a lack of systemic structures to sustain inclusive practices, especially regarding Braille and assistive technology integration (Opoku *et al.*, 2017; Kana, 2025).

Additionally, studies have documented the acute scarcity of Braille resources and functioning assistive devices such as Perkins Braillers, forcing learners with visual impairment to share or use slower alternatives like hand frames and styluses, thereby negatively impacting motivation and literacy outcomes (Dogbe, 2024). Moreover, Ghanaian teachers often lack formal training in Braille pedagogy and pre-reading skills necessary for laying a solid foundation before Braille instruction, leading to inefficient teaching practices and poor reading readiness (Abu Shokhedim *et al.*, 2024; Opoku *et al.*, 2017).

It is against this backdrop that examining the roles teachers play in advancing Braille literacy in Ghana is both timely and essential. The study provides insights into how teachers empower learners with visual impairment through touch-based literacy, the roles they play, how they learn to overcome challenges, and the extent to which their efforts align with national and global educational goals (UNESCO, 2020; CRPD, 2006). Indeed, this study contributes to understanding how literacy through Braille can be strengthened, ensuring that students with visual impairments are not left behind in Ghana's quest for inclusive and quality education.

Specifically, the study sought to answer the following research questions.

1) What roles do teachers play in advancing Braille literacy among learners with visual impairment in Ghana?
2) What are the steps teachers follow in setting up a braille literacy instruction for learners with visual impairment?
3) What challenges do teachers encounter in performing their roles in Braille literacy in Ghanaian schools for the blind?

2. Theoretical Framework

This study is underpinned by Koehler and Mishra's (2009) Theory of Technological, Pedagogical and Content Knowledge (TPACK). TPACK is built on Lee Shulman's construct of Pedagogical Content Knowledge (PCK). Koehler and Mishra (2009) articulate that there are three main components of teachers' knowledge of technology integration in the theory of TPACK. These components are content, pedagogy and technology. Content knowledge is knowledge of the subject matter that has to be taught or learnt in a particular grade (Mishra & Koehler, 2006; Shulman, 2022). In this study, it

was expected that the teachers would have knowledge of important concepts, skills and facts of literacy as a fundamental subject in the foundation phase, particularly emergent literacy skills.

The second component of TPACK is Pedagogical Knowledge (PK). Pedagogical Knowledge is a teacher's knowledge of teaching and learning methods, practices and processes that are used to construct knowledge (Ball *et al*., 2008; Mzimela 2012; Shulman, 2022). Teachers need to be knowledgeable of the diverse learning styles of learners in their classrooms, and they need to be able to design teaching strategies that enhance their teaching. The third component of this theory is the knowledge of technology. Technological knowledge is knowledge about 'standard technologies such as books, markers and whiteboards, and more advanced technologies such as the internet and digital video' (Koehler & Mishra, 2009). Teachers teaching students with visual impairment should be knowledgeable of the standard braille technologies for learners who are visually impaired, such as the braille stylus, slate, the Perkins brailler and advanced technologies such as the Mountbatten brailler, the Perkins Smart brailler and other braille note-taking devices.

Koehler and Mishra (2009) assert that the basis of effective teaching requires an understanding of the representation of concepts using technologies; pedagogical techniques that use technologies in constructive ways to teach content; knowledge of what makes concepts easy or difficult to learn and how that technology can help redress some of the problems that learners face; and knowledge of learners' prior knowledge. Thus, to use technology to support meaningful learning, teachers need additional knowledge of the content they are required to teach, the pedagogical methods that facilitate learners' learning and the specific ways in which technology can support those methods (Ertmer & Ottenbreit-Leftwich, 2010). This aligns with the study's aim to examine the roles teachers play in advancing Braille literacy in Ghana.

3. Teachers' Roles in Braille Literacy

Research evidence indicates that teachers' role, both in Braille code mastery and literacy pedagogy, strongly influences students with visual impairment learning trajectories (McCall, 2022; Toussaint & Tiger, 2010). In Ghana and other low-resource contexts, teachers' roles are even more critical because they must often compensate for shortages of materials and limited institutional support (Ry-Kottoh *et al.*, 2022). Where teachers are proficient in uncontracted and contracted Braille and are trained in evidence-based literacy strategies, learners demonstrate higher proficiency in vocabulary and comprehension (Abu Shokhedim *et al.*, 2024; Koenig & Holbrook, 2000). Conversely, when teachers lack adequate preservice or in-service preparation, students often achieve basic decoding skills but fall behind in fluency and comprehension. Recent evaluations of teacher training programmes suggest that systematic coaching and continuous professional development significantly enhance teachers' confidence and instructional fidelity (Abu Shokhedim *et al.*, 2024; OCALI, 2020).

Teachers' role is also shaped by resource availability and access to assistive technologies. In many of the blind schools across Ghana, shortages of Braille textbooks, broken Perkins braillers, and limited tactile graphics are reported as significant barriers (Ry-Kottoh *et al.*, 2022). Such constraints often force teachers to improvise, narrowing the scope of literacy instruction. In contrast, the integration of tactile and digital technologies, including Braille learning software and audio-tactile tools, has been shown to increase learner engagement and provide opportunities for independent practice when guided by skilled teachers (Hoskin *et al.*, 2024). However, researchers stress that the presence of technology alone is insufficient; teachers require training in how to integrate these tools effectively into daily literacy instruction (Hoskin *et al.*, 2024; Kana, 2025).

4. Setting up Braille Literacy Instruction

Braille is a system that enables individuals with visual impairment to read and write through touch. Each letter of the English alphabet is represented by a unique dot configuration represented by the presence or absence of six dots, each approximately 1mm in diameter, within a matrix of two columns and three rows, with 1.5mm between the midpoints of each adjacent dot. These small patterns differ only by the presence or absence of dots, making braille alphabet learning difficult (Millar, 2020).

Braille reading constitutes a highly specific and active tactile process, in which fingers, arms, and even elbows are involved (Millar, 2020). It seems that appropriate hand movements for reading braille depend on (a) brain asymmetry, (b) the sensitivity of each finger, and (c) training received at an early stage of learning (Lorimer, 2012). A hypothesis suggests that the necessary level of tactile sensitivity for braille reading is already achieved during the beginning stages of reading and no further improvement in tactile spatial resolution occurs (Veispak *et al.*, 2013). Braille reading presupposes effective tactile spatial acuity, so that the reader will be able to identify the relative spatial position of the braille dots and eventually acquire the maximal amount of information from each braille character (Vakali & Evans, 2014).

One of the earliest skills for braille literacy development is the ability to name individual characters correctly. Difficulty in this basic skill impedes learning more complex braille-reading skills, such as producing and combining letter sounds (Hampshire, 2022). These combined phonics skills are a key component of reading acquisition (National Institute of Child Health and Human Development, 2000). Despite the need for braille letter naming as a precursor for braille reading, limited research exists on effective methods for teaching this skill, and it is rarely included in commercially available braille curricula.

5. Challenges of Teaching Braille Literacy

Teaching Braille literacy presents multiple challenges that hinder effective instruction, particularly in low-resource settings. One of the most persistent challenges is the shortage

of Braille instructional materials and assistive devices. Empirical studies in Ghana and other Sub-Saharan African countries have shown that limited access to Braille textbooks, malfunctioning Perkins braillers, and scarcity of tactile graphics reduce the ability of teachers to provide comprehensive literacy instruction (Ry-Kottoh *et al.*, 2022; Kana, 2025). Such shortages do not only affect the breadth of instruction but also lead to teacher improvisation, which may compromise literacy outcomes. Also, research demonstrates that many teachers who work with students with visual impairments lack adequate preservice training in Braille or do not receive continuous professional development to update their skills (Abu Shokhedim *et al.*, 2024; McCall, 2022). This gap often results in instruction that emphasises rote code recognition rather than fostering reading fluency, vocabulary, and comprehension. As a result, majority of students with visual impairment may achieve basic decoding skills but continue to lag in higher-order literacy development (Toussaint & Tiger, 2010).

The integration of technology into Braille literacy instruction has also emerged as both an opportunity and a challenge. While studies highlight the potential of tactile technologies, digital embossers, and audio-tactile hybrid tools to enhance literacy outcomes, teachers frequently report difficulty in accessing or maintaining these devices (Hoskin *et al.*, 2024). Furthermore, even when these devices are available, inadequate training in their pedagogical application limits their effectiveness in improving students with visual impairment's independent reading and writing (Kana, 2025). Additionally, large class sizes, insufficient specialist teachers, and a lack of institutional support contribute to reduced individualised instruction and monitoring of progress (Ry-Kottoh *et al.*, 2022).

6. Methodology

The study employed qualitative research approach, which is grounded in the interpretivist paradigm. Qualitative research involves an interaction between the researcher and the researched in a socio-cultural/naturalistic context of participants of a study (Kusi, 2012). In qualitative research, Creswell (2018) suggests that participants are expected to give detailed rather than general information on the features of the specific phenomenon under investigation. Qualitative research approach considers collecting information from participants in order to understand a phenomenon under study from the perspectives of those involved in the research (Ary *et al.*, 2010). Therefore, qualitative narrative was used in this study, in order to have a detailed account of teachers' roles in advancing Braille Literacy in Akropong, Wa and Wenchi Schools for the Blind in Ghana.

6.1 Research Design

The study employed case study design (Yin, 2014) because the study sought to understand the unique roles teachers play in advancing Braille Literacy in Akropong, Wa and Wenchi Schools for the Blind. This design offered the researchers the opportunity to

delve deeper into the roles teachers play in these Schools for the Blind in teaching braille reading (Maare, 2007).

6.2 Population and Sample

The target population of the study comprised all the teachers in Akropong, Wa and Wenchi Schools for the Blind. These schools were chosen because they are the foremost schools for the blind in Ghana. The total population of teachers in these schools were seventy-seven (n=77), comprising 30, 25 and 22 teachers from the Akropong, Wa and Wenchi Schools for the Blind, respectively. The sample size of twenty-eight (n=28) participants, which was made up 12 teachers from Akropong, 9 teachers from Wa, and 7 teachers from Wenchi Schools for the Blind, was purposively selected. Purposive sampling technique was used in selecting these teachers because the study focused on teachers who teach braille reading or languages (English or Ghanaian Languages) in these schools. Since the researchers wanted to ascertain the teachers' roles in advancing braille literacy, these teachers served as the best option to provide authentic information. So, with the help of the administrators of the schools, the list of teachers who handle braille reading and the languages was made available to the researchers.

6.3 Data Collection Instrument

The instruments that were used for the study were a semi-structured interview guide and an observation checklist. The semi-structured interview guide was generally open-ended questions that elicited the views of teachers on the roles they play in braille literacy. The interview questions were prepared based on the three (3) research questions that guided the study. The semi-structured interview guide was used to collect data because it offered the interviewees the opportunity to express their views and experiences freely, and also gave the interviewer the freedom to direct the questions in the guide to seek clarifications. It again allowed for further and deeper probing of issues from participants (Avoke, 2005; Yin, 2014).

The researchers also employed a structured and non-participant observation technique to triangulate the responses from the interview. The focus of the observation was to ascertain the teachers' roles in advancing braille literacy programme, the order in which teachers follow in teaching the braille alphabet, and the challenges they face. The structured observation schedule helped the researchers to minimise observer bias in that the data collected were not predetermined (Gerrish & Lacey, 2010). The researchers therefore saw live roles and steps teachers follow in teaching braille reading skills, thus the issue of trustworthiness beset observation (Cohen *et al.*, 2004).

6.4 Pre-testing of the Instrument

The interview guide and observation checklist were pre-tested on 8 teachers who teach at the Blind Unit of the Cape Coast School for the Deaf. The researchers chose this pre-test population because the school is similar to the target population. The pre-test detected ambiguities and repetitions of some items, and items that carried the same

meaning. Through the responses in the pre-test, corrections and modifications were made so as to improve the internal consistency of the instruments (Alumode, 2011; Vanderstoep & Johnston, 2009).

6.5 Trustworthiness

When validating a qualitative instrument, the trustworthiness procedure is the most recommended one. Its elements include credibility, transferability, dependability and confirmability. In ensuring the credibility of the findings of this study, the researchers developed early familiarity with the school by visiting the participants on two occasions to have a casual interaction with them. The researchers, with the help of the experts' guidance, developed an observation grid/checklist. This enabled the researchers to collect relatively similar data (Bell & Silverman, 2018), as the purpose of developing an observational schedule is to minimise or possibly eliminate the variations that will arise from the database on individual perceptions of events and situations. The researchers again employed questioning during the group interactions in order to compare the responses of the participants to the same question. Lastly, on the issue of credibility, the researchers cross-checked the transcript of the verbal responses to ensure that the verbatim response was presented.

Secondly, the researchers ensured confirmability of the data by engaging multiple participants in the study, thus constituting three different schools to triangulate the responses of the participants. The researchers then provided verbatim statements in the analyses to confirm the data. The researchers personally carried out the data collection, data transcription, thematic coding and analyses of the results.

In terms of the transferability of the findings, although it is not possible to generalise the findings of the study beyond the sample, it is transferable to contexts that share similar characteristics with the study context (Kusi, 2012). In line with the assertion of Kusi (2012), the study involved the three premier special schools for the blind in Ghana. The respondents were teachers who teach either braille or languages. The schools were used as a natural setting for the interview with the teachers.

Finally, in ensuring the dependability of the data results, Shenton (2004) stressed that there is a close tie between credibility and reliability, arguing that a demonstration of credibility ensures dependability. The researchers, therefore, achieved dependability by engaging the teachers in focus group interviews whilst also using the observation checklist to observe the teachers during instructional hours to ensure triangulation. Hence, a repetition of the same study may give a similar result.

6.6 Data Collection

The researchers engaged the teachers in focus group interviews. The focus group interview involved four to seven interviewees in each group. The interview was unstructured and generally open-ended questions, which were intended to elicit views and opinions from the participants, and were conducted in a serene environment devoid of external disruptions (Creswell, 2009). The participants were given the opportunity to

express their views and experiences without undue pressure on them. The interview was tape-recorded with the permission of the participants and transcribed for analysis. Before analysis of the data, the researchers scheduled another meeting with the focus groups and the transcripts were presented to the participants to confirm that the transcripts actually represented the views and experiences they shared.

Also, a structured and non-participant observation schedule was used by the researchers to observe the roles the teachers play in advancing braille literacy, and this took place during instructional hours of either braille reading or language classes, where a lesson lasted for approximately two hours. This allowed the researchers to identify events/behaviours that they looked out for (Kusi, 2012). The researchers again employed the services of close associates to witness the same events. This is in line with Denscombe (2017) who states that the aim of an observation checklist is to provide a framework for observation which all observers use and which enable them to be alert to the same activities and look out for the same things; record data systematically and thoroughly and produce data which are consistent between observers, with two or more researchers who witness same event recording the same data. The disadvantage of this method is that 'unexpected' behaviours or events are often neglected or overlooked by the observers (Kusi, 2012).

6.7 Data Analysis

Data from the interview were analysed first, followed by the data from the observation for each research question. The interview data were analysed using the narrative themes from the data recorded and transcribed. Transcripts of the interview were given codes as Group 1, Group 2 and Group 3 for identification purposes (Fraenkel & Wallen, 2009). Group 1 were teachers from Akropong School for the Blind, Group 2 were teachers from Wa School for the Blind, and Group 3 were teachers from Wenchi School for the Blind. In order to identify the themes that emerged from the data during the interview, the researchers further coded the data using colours (Creswell, 2012). This gave the researchers the opportunity for the categories and patterns emerging from the data to be decided in advance, and this facilitated the interpretation of smaller units. Verbatim expressions of the teachers were used in reporting the data, where necessary and the thematic contents were then formulated based on the research questions and the data gathered.

With the observation component, the researchers engaged two other observers who were close associates to observe the phenomenon under study. An inter-observer agreement was determined by calculating the percentage of agreement between the researchers and other observers. For instance, an option of a statement that received two (66.6%) or all three (100%) choices from the other observer was considered to have occurred, as against a statement that had one (33.4%) choice of another option.

6.8 Ethical Considerations

To ensure ethically sound research, the study was ethically approved, and the participants were not obliged to partake in the study. As a result, written informed consent forms were obtained from participants, and permission to tape record the interview sessions was also sought. Additionally, confidentiality and anonymity were ensured in this study. Given this, participants' real names were not used in this study, but pseudonyms were. Lastly, the day and time of the data collection were agreed upon between the researchers and the participants.

7. Presentation of Results

The interview data were coded and subjected to thematic analyses, and consequently, the themes and sub-themes were used in the analysis of the main variables of the research questions. However, observation data were analysed based on an inter-observer agreement, which was determined by calculating the percentage of agreement between the researchers and the other observers.

Theme 1: Teachers' Role in Advancing Braille Literacy

To provide answers to this research question, the data collected from the focus group interview were used. The evidence from the data suggests that teachers' roles in advancing Braille literacy extend well beyond direct instruction of Braille symbols. Their roles are multifaceted, combining pedagogy, resource management, technology mediation, emotional support, and advocacy. In practice, these roles overlap.

For instance, a teacher said:

> *"As for me, to be able to help learners progress from alphabet recognition to fluent Braille reading, I introduce tactile readiness activities, scaffold symbol recognition, and gradually integrate contractions, vocabulary, and comprehension strategies."*

Another teacher said:

> *"Given shortages of Braille textbooks and readers in my school, I often improvise by transcribing print materials, creating tactile aids, or reusing limited resources across classes."*

Again, a teacher said:

> *"I continuously serve as mediator between my learners and their usage of assistive devices such as Perkins Braillers, embossers, and screen readers to supplement classroom practice and extend learners' independent reading."*

In addition, a teacher said:

"I try to sustain my learners' learning by increasing motivation and boosting their confidence level. These encouragements, high expectations, and inclusive classroom practices help foster persistence, which is critical in the labour-intensive process of learning Braille."

Furthermore, a teacher said:

"I often serve as an advocate for my learners by trying to bridge the gaps between school leadership, resource centers, and NGOs. I lobby for Braille materials, advocate for curriculum adaptations, and liaise with parents to ensure learners receive both institutional and community support."

Theme 2: Steps in Setting Up a Braille Literacy Instruction

For research question two, the participants who were teachers of languages were interviewed to describe the steps they employ in setting up a braille literacy instruction. From the responses, it was noted that teachers considered the age of onset of the disability, they also employ a lot of task analyses so that learners would learn in bits in order to grasp the concept, and finally, they consider the nature of the impairment to ascertain if the students can interact with both braille and print or only braille.

For instance, a teacher said:

"Okay, what I know is that it depends upon the child's ability, maybe he or she was in school and because of the problem, he stays in the house for a while, now because he doesn't know anything, you need to let him know how the braille came about."

Another teacher added:

"I engage the learners in the finger dexterity activities because you cannot help them to read and write without training their fingers, so the first one, you help them to know; you give them a lot of materials to train their fingers. The finger dexterity activities require a lot of materials, which are not available to them. The fine and the gross motor skills allow them to be able to read and write, and apart from that, I help them to know the sitting position and how to sit before you read."

Again, a teacher added:

"If the learner has a low vision problem, then he or she has to be given a different thing altogether; however, when the learner is not partially sighted, this is what you have to do, you have to go according to the braille only."

Theme 3: Challenges Teachers encounter in Braille literacy

Research question three sought to unravel the challenges that teachers face as they perform their roles in braille literacy. Evidences from the data gathered established that issues such as shortage and irregular supply of Braille textbooks and reading materials; limited teacher preparation and professional development in Braille pedagogy; large class sizes and limited time for individualised instruction; and inconsistent implementation of inclusive-education policies, limited funding for special education school, and poor coordination among responsible ministries and agencies are the major challenges teachers face as they perform their roles in braille literacy.

For example, a teacher said:

"I find the shortage and irregular supply of Braille textbooks and reading materials to be my biggest challenge. My school often lacks adequate graded readers, curricular texts, and supplementary materials, which limits opportunities for guided practice, distributed reading, and vocabulary development. I frequently struggle to provide consistent and progressive braille literacy because of unreliable access to texts."

A teacher also added:

"I see poor teacher preparation and lack of clear-cut professional development in Braille pedagogy as an impediment. We, teachers who teach learners with visual impairment in the Schools for the Blind in Ghana, have little preservice training specific to Braille and often receive limited follow-up coaching."

Again, a teacher added:

"I face large class sizes and limited time for individualised instruction in my school, which is problematic in Braille literacy because tactile learning requires close monitoring and feedback. Teacher-to-student ratios in my school is high, and this makes it uneasy to provide frequent, individualised feedback to learners."

Furthermore, a teacher added:

"I find emotional and motivational challenges in sustaining my role in braille literacy. Many a time, I feel isolated in my efforts to advance Braille literacy because of low recognition, motivation, incentives, or adequate support structures. These emotional and motivational setbacks impact both my morale and the quality of literacy instruction I provide."

8. Discussion of Findings

The main aim of this study was to examine the roles teachers play in advancing Braille literacy in Ghana. The research questions considered were the roles teachers play in braille literacy advancement, the steps in setting up braille literacy and the changes teachers face in performing their roles in braille literacy. The results revealed that the roles teachers play in advancing braille literacy are multifaceted; thus, teachers combine pedagogy, manage resources, act as technology mediators, academic and emotional counsellors, and policy advocates. According to Abdulai (2021) and Wormsley and D'Andrea (2018), teachers use structured tactile readiness activities, scaffolded symbol recognition, and gradual integration of contractions, vocabulary, and comprehension strategies to build literacy competence. In fact, without such intentional sequencing, many learners plateau at the stage of simple decoding without reaching comprehension or grade-level fluency. Teachers also contribute to Braille literacy by adapting and improvising resources to counter chronic shortages of Braille materials. In Ghana, for instance, studies revealed that many schools receive limited or irregular supplies of Braille textbooks and readers (Ry-Kottoh *et al.*, 2022).

Hoskin *et al.* (2024), on the other hand, emphasise that when teachers are trained to integrate technology pedagogically, learners with visual impairment benefit from individualised practice, timely feedback, and increased independence in reading. This suggests that teachers' competence directly shapes whether technology becomes a transformative tool or remains an unused resource. Likewise, teachers' academic, motivational and emotional support strongly influences learners' persistence in mastering Braille. Swanwick and Clarke (2023) posit that teacher encouragement, high expectations, and inclusive classroom practices provide learners with visual impairment with the confidence to persevere in their learning of braille. Furthermore, research suggests that teachers act as advocates and policy mediators on behalf of learners with visual impairment (Ry-Kottoh *et al.*, 2022). This highlights the broader, systemic impact of teachers beyond their classroom duties.

The study also established that teachers consider the age of the onset of the disability, employ a lot of task analyses and consider the nature of the impairment when it comes to setting up braille literacy programme. According to Swanwick & Clarke (2023), setting up Braille literacy begins with preparing learners through tactile readiness and orientation activities. They suggest that before learners with visual impairment can effectively recognise Braille symbols, they must develop fine motor skills, tactile sensitivity, and finger dexterity. Once tactile readiness is established, instruction moves to introducing the uncontracted Braille alphabet in a structured, sequential manner, ensuring that learners master letter recognition and discrimination before progressing to contractions or advanced literacy tasks. Millar (2020) asserts that braille reading constitutes a highly specific and active tactile process, in which fingers, arms, and even elbows are involved. Lorimer (2012) states that appropriate hand movements for reading braille depend on (a) brain asymmetry, (b) the sensitivity of each finger, and (c) training

received at an early stage of learning. Again, Vakali and Evans (2014) emphasise that braille reading presupposes effective tactile spatial acuity, so that the reader will be able to identify the relative spatial position of the braille dots and eventually acquire the maximal amount of information from each braille character. Indeed, teachers' constant feedback, progress monitoring, and scaffolding are critical throughout this process to address learners' errors, anticipate challenges, and support learners in moving from alphabet recognition toward fluent, comprehension-based Braille literacy (Hoskin *et al.*, 2024).

In this study, it was again found that that challenges teachers face as they perform their roles in braille literacy include shortage and irregular supply of Braille textbooks and reading materials; limited teacher preparation and professional development in Braille pedagogy; large class sizes and limited time for individualised instruction; and inconsistent implementation of inclusive-education policies, limited funding for special education school, and poor coordination among responsible ministries and agencies. According to Ry-Kottoh *et al.* (2022), teachers in Ghanaian schools for the blind often lack adequate graded readers, curricular texts, and supplementary materials, which limits opportunities for guided practice, distributed reading, and vocabulary development. They stress that this scarcity forces teachers to improvise by manually transcribing print texts or recycling outdated Braille books, often resulting in gaps in students' exposure to age-appropriate literacy materials. Research also points to the fact that many teachers who teach learners with visual impairment in Ghana have little preservice training specific to Braille and often receive limited follow-up coaching (Abdulai, 2021; Opoku, 2020). This, indeed, undermines the fidelity to structured teaching practices such as sequencing from uncontracted to contracted Braille. Again, teachers face large class sizes and limited time for individualised instruction, which are particularly problematic in Braille literacy, where tactile learning requires close monitoring and feedback (Swanwick & Clarke, 2023). This leads to uneven literacy progress, with some learners advancing quickly while others lag due to insufficient support. Abdulai (2021), in addition, reports that teachers of learners with visual impairment sometimes feel isolated in their efforts to advance Braille literacy because of a lack of proper recognition, incentives, or adequate support structures. These emotional challenges impact both teacher morale and the quality of literacy instruction provided.

8. Conclusions

This study sheds light on empowering literacy through touch with critical emphasis on teachers' roles in advancing braille literacy in Ghana. From the findings, it can be concluded that teachers' roles in advancing Braille literacy among learners with visual impairments in Ghana are multi-layered and indispensable. Their contributions are central to bridging the gap between Braille alphabet knowledge and fluent comprehension. Also, it can be concluded that in setting up Braille literacy programmes, teachers adopt a learner-centered approach by breaking down complex literacy skills into

manageable steps, which enhances learners' ability to gradually grasp and internalise Braille reading and writing. Again, the study concludes that teachers encounter substantial challenges that constrain their effectiveness as they perform their roles in advancing braille literacy. These constraints limit their ability to deliver high-quality, sustained Braille literacy instruction and thereby slow learners' progress from alphabet recognition to fluency.

8.1 Recommendations

Based on the findings of this study, it is recommended that teacher preparation and professional development should be prioritised. In addition, continuous in-service training, mentoring, and coaching should be institutionalised to keep teachers updated on effective instructional methods, including sequencing instruction, tactile readiness, error diagnosis, and fluency-building strategies. Also, the Ministry of Education and the Ghana Education Service must guarantee a consistent and equitable supply of Braille textbooks, readers, and tactile materials across schools. Establishing regional Braille resource centers and repair hubs would further support teachers by ensuring steady access to teaching materials and technical assistance. Furthermore, urgent steps should be taken to recruit and deploy more trained teachers of learners with visual impairment to help reduce teacher-to-student ratios in the schools for the blind. This would allow teachers to devote more time and resources to individualised instruction.

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The authors declare no conflicts of interest.

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