

**UNIVERSITY OF EDUCATION, WINNEBA**



**INTERACTION BETWEEN DEAF AND DEAFBLIND STUDENTS AT  
DEMONSTRATION SCHOOL FOR THE DEAF, MAMPONG- AKUAPEM,  
GHANA**

**SETH KOJO ANTWI**

**MASTER OF PHILOSOPHY**

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**UNIVERSITY OF EDUCATION, WINNEBA**



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DEMONSTRATION SCHOOL FOR THE DEAF, MAMPONG- AKUAPEM,  
GHANA**



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fulfilment of the requirements for the award of the degree of  
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## DECLARATION

### Student's Declaration

I, Seth Kojo Antwi, hereby declare that this thesis is my own original work. Except for quotations and references from published sources, which have been clearly identified and appropriately acknowledged, no part of this work has been submitted previously, in whole or in part, for the award of any other degree elsewhere.

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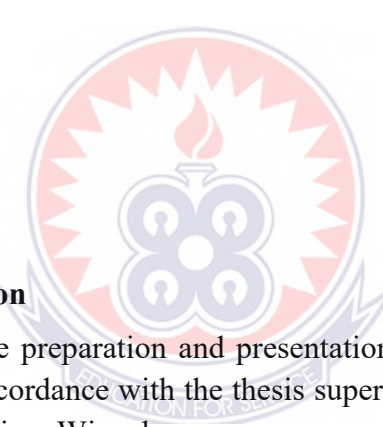
### Supervisor's Declaration

I hereby declare that the preparation and presentation of this work were carried out under supervision, in accordance with the thesis supervision guidelines established by the University of Education, Winneba.

Supervisor's Name: Dr. Adam Awini

Signature: .....

Date: .....



## **DEDICATION**

I dedicate this work to my family.



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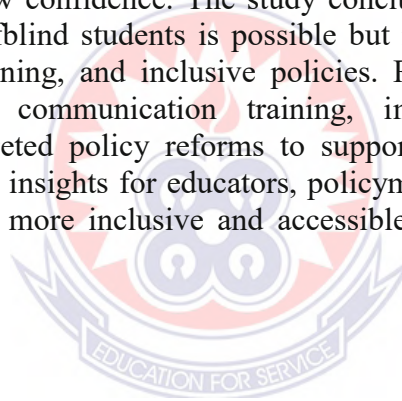
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## ABSTRACT

This study explored the interaction between deaf and deafblind students at the Demonstration School for the Deaf (DEMOMODEAF) in Mampong-Akuapem, Ghana. Despite growing efforts in inclusive education, little empirical research has examined how students with distinct sensory impairments engage with one another in shared learning environments. Using a qualitative phenomenological design within an interpretive paradigm, data were collected through semi-structured interviews with eight purposively selected participants (five deaf and three deafblind students). The study investigated three key areas: the nature of their interactions, the communication strategies employed, and the barriers they encounter. Findings revealed that while both groups demonstrated resilience and creativity in communication, significant challenges persisted. Communication methods included Ghanaian Sign Language (GHS), tactile signing, touch cues, and informal personalized systems. Interaction quality was often shaped by familiarity, environmental conditions, and individual communication skills. Peer-led adaptations and teacher support were identified as effective strategies, though access to assistive tools and formal training remained limited. Barriers included a lack of specialized communication skills, inadequate institutional resources, and social-psychological challenges such as fear of embarrassment and low confidence. The study concluded that successful interaction between deaf and deafblind students is possible but requires structured institutional support, enhanced training, and inclusive policies. Recommendations included the provision of tactile communication training, improved access to assistive technologies, and targeted policy reforms to support dual-sensory education. The findings offer valuable insights for educators, policymakers, and disability advocates committed to creating more inclusive and accessible learning environments for all students.



## CHAPTER ONE

### INTRODUCTION

#### 1.1 Background to the Study

Communication is a prerequisite of life for humans to achieve a meaningful life. Communication is an interaction between two or more people or a group in the society, organization. Without communication, interaction between humans, whether individually, group, or organization is unlikely to happen. As social beings, every human being cannot escape from the act of communication, that is the act of conveying and receiving messages from and to others (Tukimin et al., 2019). This communication action continues throughout the life process. The process takes place in a variety of physical, psychological, and social contexts. Communication becomes important because of the function that can be felt by the perpetrator of the communication. Through communication, people convey ideas on mind and feelings of conscience to others either directly or indirectly.

It is established that communication is a foundational aspect of human interaction, learning, and social integration. In educational settings, especially special education contexts, effective communication becomes more critical for academic success, emotional development, and peer relationships. For students with hearing or both hearing and vision impairments (deaf and deafblind) individuals communication challenges can be profound, affecting both learning outcomes and social inclusion.

Inclusive education and effective communication among students with different sensory disabilities, such as deafness and deafblindness, are increasingly gaining global attention (Masuku et al., 2024). Within specialized educational settings like the Demonstration School for the Deaf (DEMODEAF) in Mampong - Akuapem, students

who are deaf and those who are deafblind share academic and social spaces. While both groups have sensory impairments, the nature and extent of their communication needs and strategies differ significantly. Deaf students primarily rely on visual communication modes such as Ghanaian Sign Language (GHSL), while deafblind students may depend on tactile sign language or braille, depending on the degree of their impairment (Bruce et al., 2016). This coexistence presents both unique opportunities for peer learning and challenges in inclusive interaction.

Interaction between these two groups is a unique but often overlooked area of study. The complexity arises from the need for alternative or modified communication systems that bridge the gap between visual and tactile modalities. Deafblind students' limited access to visual and auditory information can restrict their communication and social participation in educational settings, contributing to feelings of isolation and exclusion (Pérez-Aguirre et al., 2024). The situation calls for intentional and informed communication strategies to facilitate inclusion and meaningful social interaction.

In the context of Ghana, limited resources, lack of trained personnel, and societal attitudes towards disability can further compound the challenges faced by deaf and deafblind individuals (Avoke, 2002). Although DEMODEAF has a reputation for providing quality education to students with hearing and visual impairments, there is a need to investigate how effectively it facilitates communication and interaction among its diverse student population.

Despite the growing recognition of inclusive education, little research has been conducted on the specific communication dynamics between deaf and deafblind students within Ghanaian schools. Understanding these dynamics is crucial for promoting inclusive practices, improving educational outcomes, and enhancing the psychosocial well-being of students.

Moreover, understanding how these students engage with one another, what strategies they use, what barriers they face, and what support systems exist would be essential for informing teaching practices, resource allocation, and policy development. This study aims to fill that gap by exploring the nature of interaction between deaf and deafblind students at Demonstration School for the Deaf, Mampong, Akuapem.

## **1.2 Statement of the Problem**

The Demonstration School for the Deaf (DEMODEAF), Mampong-Akuapem is one of the few specialised institutions in Ghana that provides education for both deaf and deafblind students. Despite its significance in Ghana's special and inclusive education landscape, there is limited empirical research on how deaf and deafblind students interact with one another within this school environment.

Several studies conducted in Ghana have examined aspects of communication and education for persons with hearing impairments, but these studies do not specifically address peer interaction between deaf and deafblind learners. For example, Obosu (2019) investigated *sign language acquisition among preschool children who are deaf* in Ghana, finding that schools for the deaf play a central role in facilitating language development through peer interactions and visual sign exposure (Obosu, 2019). Similarly, Asomaning's (2022) study on *communication strategies between young deaf children and their hearing caregivers* highlighted various interactional strategies in Ghanaian school and home contexts, underscoring the complexity of communicative exchange with deaf learners (Asomaning, 2022). Research on *parental involvement at Mampong Demonstration School for the Deaf* revealed parents' contributions to educational support but did not focus on learner-learner communication (Parental Involvement in the Education..., 2025). Additionally,

Dogbe and Anku (2024) explored the *prospects and challenges of educating a deafblind student in a Ghanaian university*, identifying barriers such as inadequate training for educators and communication challenges, but this work was conducted at the tertiary level and not in a basic school context (Dogbe & Anku, 2024).

Other Ghanaian studies have documented broader educational challenges. For instance, research on *academic challenges of students with hearing impairment in Ghana* highlighted institutional barriers to learning for deaf students (Academic Challenges of SHIs..., 2025), and studies on access to English language in Ghanaian schools for the deaf identified language acquisition difficulties that affect educational progress (Obosu, Opoku-Asare & Deku, 2024). While these studies contribute insights into educational and communicative challenges faced by learners with sensory impairments in Ghana, none specifically investigate the nature of interaction and communication between deaf and deafblind students within a shared school setting.

In the context of DEMODEAF, deaf students predominantly use Ghanaian Sign Language, whereas deafblind students depend on tactile communication such as tactile sign or hand-over-hand methods. These differences in communication modalities may present significant barriers to mutual understanding, social participation, and collaborative learning. Teachers, caregivers, and peers may lack the specialised training and adaptive strategies required to support effective interaction across sensory modalities.

Given this gap in Ghanaian research, there is a critical need to explore how deaf and deafblind students communicate and interact in inclusive school settings. Without such research, inclusive education in schools like DEMODEAF may continue to

overlook the specific interactional needs of deafblind learners, leading to their marginalisation and reduced participation in academic and social activities. This study is therefore justified on the basis of addressing a significant gap in current knowledge, with the potential to inform policy, training, and inclusive practices that enhance equitable communication and participation for all learners.

### **1.3 Objective of the Study**

The objectives of this study were to:

1. Describe the nature of interaction between deaf and deafblind students at DEMODEAF.
2. Investigate and analyze the communication strategies used when deaf students interact with deafblind students at DEMODEAF.
3. Explore the barriers to successful communication between deaf and deafblind students at DEMODEAF

### **1.4 Research Questions**

This study was guided by the following research questions:

1. How is the nature of interaction between deaf and deafblind students at DEMODEAF?
2. What communication strategies are used when deaf students interact with deafblind students at DEMODEAF?
3. What are the barriers to successful communication between deaf and deafblind students at DEMODEAF?

### **1.5 Significance of the Study**

This study is significant because it provides insights into how deaf and deafblind students interact and communicate within a school setting, offering practical guidance

for teachers and school administrators on facilitating effective peer interactions and inclusive classroom practices. It contributes to policy development by highlighting the need for curriculum adjustments, resource allocation, and specialized teacher training to support learners with dual sensory impairments. By exploring the communication strategies and barriers experienced by these students, the study promotes social inclusion, reduces the risk of isolation among deafblind learners, and enhances their psychosocial well-being. Furthermore, it fills a critical gap in Ghanaian research by focusing on peer-to-peer interaction in specialized schools, generating empirical evidence that can inform the design of support structures, mentoring programs, and interventions that foster equitable learning opportunities and participation for all students.

### **1.6 Delimitation**

The focus was limited to deaf and deafblind students currently enrolled at DEMODEAF. Among the deaf students, only those who had established friendships with deafblind peers and engaged in regular social interaction with them were selected for participation. The study was further delimited to students within a defined age range and specific educational levels at the school. Teachers, school administrators, parents, caregivers, and support staff were excluded from the study. The scope was restricted to peer interactions occurring within the school environment: interactions outside the school setting, such as those at home or in the community, were not examined. In addition, the study focused exclusively on patterns of communication and social interaction between deaf and deafblind students. It did not investigate academic performance, cognitive development, emotional or psychological outcomes, or the effectiveness of instructional strategies, assistive technologies, or intervention

programs. The study was also limited to the use of qualitative data collected during the study period.

### **1.7 Limitation**

The researcher encountered some challenges which are worth mentioning: most of the deaf and the deafblind students were not in school after reopening as at the time of this study, data collection from both parties (deaf and deafblind) students became a challenge. The researcher got them to participate after numerous visitations to the school from time to time in order to know about their availability status in school which was very costly.

### **1.8 Organization of the Study**

This thesis was organized into six chapters. Chapter one comprised the background to the study, statement of the problem, the purpose of the study, objectives of the study, research questions, significance of the study, delimitations and limitations of the study, operational definition of terms used in the study. Chapter two focused on the literature review considering the research objectives and the theoretical framework of the study. Chapter three dealt with the study methodology which were: philosophical underpinning research approach, research design, population, sample and sampling technique, an instrument used in data collection and analysis, and description, trustworthiness and ethical consideration. Chapter four presented and analyses the data collected, chapter five interpreted and discussed the various results gathered, whereas chapter six provided the summary, conclusions, recommendations of the study and suggestion for further studies.

## 1.9 Operational Definition of Terms

Communication:

The process through which thoughts, emotions, or information are conveyed using verbal, non-verbal, visual, or tactile means. In the context of this study, communication refers to the various methods used by deaf and deafblind students to interact and understand each other within the educational environment.

Deaf:

Individuals who have a profound or severe hearing loss that prevents them from processing auditory information with or without amplification. In this study, “deaf” refers to students who primarily rely on visual language modalities such as Ghanaian Sign Language (GHSL) for communication.

Deafblindness:

Students who have dual sensory impairment involving varying degrees of hearing and vision loss that significantly limits a person’s ability to access auditory and visual information. This condition results in complex communication and mobility needs.

Sign Language:

A complete and natural language using hand shapes, facial expressions, body movements, and gestures to convey meaning. In Ghana, this specifically refers to Ghanaian Sign Language (GHSL) as used by the deaf community.

Tactile Sign Language:

A mode of sign language adapted for deafblind individuals, where the receiver places their hands over the signer’s hands to perceive signs through touch. It enables communication in the absence of vision.

#### Braille:

A tactile reading and writing system used by individuals with visual impairments.

Braille characters consist of raised dots arranged in cells and are read by touch.

#### Touch Cues:

Specific physical prompts or gestures used to convey messages or guide actions, especially used with individuals who are deafblind. These cues are individualized and context-specific.

#### Hand-Over-Hand Signing:

A tactile communication method where a deafblind person places their hands over the hands of the signer to feel the signs being made. It is used when vision is severely impaired or absent.

#### Finger Braille:

A tactile method of communicating using Braille code by tapping specific patterns on another person's fingers, representing Braille dots as if the fingers are the six Braille keys.

#### Tadoma:

A tactile technique in which a deafblind person places their hand on the speaker's face (usually on the lips, jaw, and throat) to feel vibrations and movements during speech, aiding in lip-reading and speech comprehension.

#### Assistive Technology:

Devices or systems that aid individuals with disabilities to perform functions that might otherwise be difficult or impossible. In this study, it refers to tools like Braille slates, refreshable Braille displays, and communication boards that support deafblind communication.

**Inclusive Education:**

An educational approach that ensures students of all abilities learn together in mainstream classrooms and settings, with appropriate support and accommodation. In this context, it refers to integrating deaf and deafblind students within the same academic and social spaces.

**Peer-to-Peer Adaptation:**

Informal strategies developed by students to communicate with peers who have different sensory needs, such as tapping systems or personalized gestures developed between deaf and deafblind friends.

**Interpersonal Interaction:**

The way individuals communicate, relate, and engage with one another socially and emotionally. In this study, it emphasizes the relationships between deaf and deafblind students and the quality of their social engagement.

**Communication Barriers:**

Factors that hinder the effective exchange of information, including lack of common language, absence of trained interpreters, environmental noise, or lack of tactile communication skills.

**Social Inclusion:**

The process of improving the terms for individuals and groups to take part in society. Here, it refers to how well deafblind students are included in the social life and peer interactions within the school environment.

**Demonstration School for the Deaf (DEMOMODEAF):**

A specialized educational institution located in Mampong-Akuapem, Ghana, providing academic and vocational training for students with hearing and visual impairments, including those who are deafblind.

## **CHAPTER TWO**

### **LITERATURE REVIEW**

#### **2.0 Overview**

This chapter deals with the review of related literature obtained from books, journals, articles and from other websites. This chapter was reviewed on the following strands:

1. Nature of interaction between deaf and deafblind students.
2. Communication strategies used when deaf students interact with deafblind
3. Barriers to successful communication between deaf and deafblind students

#### **2.1 Nature of Interaction Between Deaf and Deafblind Students**

Hathazi, 2005: Hersh, 2013: Willoughby et al., 2018 defined Deafblindness as the combined loss of both the sense of vision and hearing that comes into various degrees, determining a unique profile of development, communication skills and learning difficulties. Communication is increasingly understood as an interactive and dynamic process in which participants exchange, interpret, and negotiate signals to co-construct shared meaning (Li, 2025). Effective communication, particularly among individuals with diverse sensory abilities, depends on multiple factors, including the modes of expression and reception (e.g., speech, sign language, or tactile signals), the intended meaning of the message, and the contextual characteristics of the interaction, such as the physical environment and the communicative skills of the partners (Pérez-Aguirre et al., 2024). These features highlight that communication is not merely the transmission of information from sender to receiver but a mutually constructed process that requires both intentionality and contextual awareness to be successful.

Deafblind people are both very varied in their communication requirements due to differences in the extent, type, and history of their sensory impairments: personal

characteristics and the skills they have been encouraged to develop and as varied as the general population on a wide range of characteristics, including interests. According to Hart (2006), individuals who are deafblind use a range of interpersonal communication methods adapted to their dual sensory loss. These include:

- Sign languages.
- Tactile sign languages:
- Deafblind manual alphabets: spelling using signs to represent the alphabet. There are two main approaches of the deafblind manual alphabets: The speaker signs the letter onto the listener's flat palm: the listener puts their hand over the speaker's vertical hand and feels the movements of their fingers. Both approaches are quicker than deafblind block alphabet.
- The deafblind block alphabet: drawing block capital letters onto the palm.
- Finger Braille: typing onto six fingers as a Braille keyboard.
- Tactile Braille: typing raised dots on paper.
- Tadoma: The deafblind person puts one hand on the speaker's chin, lips, or throat to feel their movements as they speak.

### **2.1.1 Sign language**

The development of sign language has a rich and complex history, which has evolved alongside the experiences of Deaf communities. The development of sign language reflects a long and intricate history that has evolved in close connection with the lived experiences of Deaf communities. Linguistic and historical scholarship indicates that visual-gestural communication has been present for centuries, with classical sources from ancient civilizations such as Greece and Rome acknowledging that deaf individuals communicated using gestures. Recent research emphasizes that these early observations demonstrate the longstanding human capacity for visual language, which

later developed into fully structured sign languages as Deaf communities formed and sustained shared systems of communication (Sandler & Lillo-Martin, 2006).

One significant milestone in the history of sign language was the establishment of the first formal School for the Deaf in the United States. In 1817, Thomas Hopkins Gallaudet and Laurent Clerc founded the American School for the Deaf in Hartford, Connecticut. Clerc, a Deaf teacher from France, brought French Sign Language (FSL) to the United States, where it merged with local sign languages, forming what is now known as American Sign Language (ASL) (Padden & Humphries, 2005). In Europe, similar developments occurred, leading to the establishment of School for the Deaf and the recognition of sign languages as legitimate languages of communication. British Sign Language (BSL), for example, evolved from the signing systems used by Deaf communities in the UK in the 19th century (Schein & Delk, 2013).

Similarly, in Ghana, the history of sign language in Ghana is deeply tied to the recognition and inclusion of people with hearing impairments in society. Prior to the establishment of formal education for the deaf, communication for those with hearing impairments in Ghana was largely informal, relying on home signs and gestures within families.

In Ghana, formal education for Deaf and hard-of-hearing students began in 1957 when Rev. Dr. Andrew J. Foster, a Deaf American educator, introduced structured schooling and sign-based instruction, founding the first organized school for the Deaf in Osu, Greater Accra, which later moved to Mampong (Amoako, 2019: Oppong & Fobi, 2019: Runnels & Akanlig-Pare, 2018). Prior to Foster's arrival, there were no formal educational programs for Deaf children, although village sign systems existed in some communities such as Adamorobe (Amoako, 2019). Foster's approach blended American Sign Language (ASL) with local signs and practices, and this educational

model laid the foundation for what later became known as Ghanaian Sign Language (GHS�), which continues to evolve within Deaf communities and educational contexts in Ghana (Oppong & Fobi, 2019; Amoako, 2019). Following the expansion of formal schooling and community organization, Deaf leaders formed groups that eventually led to the establishment of the Ghana National Association of the Deaf (GNAD) in 1968, a national body advocating for the rights, inclusion, and cultural identity of Deaf Ghanaians, as well as promoting the development and use of Ghanaian Sign Language (Ghana National Association of the Deaf, n.d.; Oppong & Fobi, 2019). By the 1970s, the use of Ghanaian Sign Language (GHS�) began to evolve as a more standardized form of communication for the deaf community.

In 2005, the Ghana National Sign Language Policy was introduced, further acknowledging GHS� as a key language for the deaf community, with the government recognizing its role in education and public communication (Ghana National Association of the Deaf, 2005). Since then, advocacy for the use of GHS� has grown, with initiatives aimed at raising awareness about the rights of deaf people and the importance of sign language in communication.

Sign language is a crucial method of communication used primarily by the Deaf community. It is a visual language that conveys meaning through hand gestures, facial expressions, and body movements, allowing individuals who are Deaf or hard of hearing to communicate effectively. Unlike spoken languages, sign languages have unique grammar and syntax, tailored to the visual-spatial nature of communication.

Sign language is a language that uses visual gestures and symbols rather than auditory sounds to communicate. It is not universal: each country or region tends to have its own distinct sign language, though there are some shared features across different sign languages. The primary mode of communication is through hand

shapes, movements, and placements, combined with facial expressions and body posture to convey grammatical and emotional nuances (Padden & Humphries, 2005). Sign languages have their own syntax and grammar, which makes them distinct from spoken languages.

For example, American Sign Language (ASL) is used predominantly in the United States and Canada, while British Sign Language (BSL) is used in the United Kingdom. These languages are independent of English or other spoken languages, meaning they have different linguistic structures and vocabulary, despite being used by people in the same geographical regions (Schein & Delk, 2013).

It uses a combination of handshapes, finger positions, and arm movements to convey phonological, morphological, and syntactic information (Liddell, 2003). Sign language also employs a range of non-manual markers, such as facial expressions and body language, to convey pragmatic and discourse information. Deaf-blind individuals use this language in their means to communicate with the deaf, where the deaf person receiving the message places their hands over the signer's hands to feel the signs, altogether it involves signing in order for both parties to understand (Hersh, 2013).

### **The Linguistic Status of Sign Language**

Sign languages are fully developed languages with their own grammar and syntax, not merely gestures or codes for spoken languages, and research demonstrates that they are complex, sophisticated linguistic systems (Padden & Humphries, 2005, p. 2).

For instance, sign languages have a unique grammar structure that is different from that of spoken languages. While spoken languages rely heavily on word order (e.g., subject-verb-object in English), sign languages often use visual-spatial relationships to convey meaning, with facial expressions, head movements, and the positioning of

hands and arms conveying crucial grammatical information (Napier, 2016). Additionally, sign languages have their own vocabulary and idiomatic expressions that are unique to the Deaf community. The use of iconic signs, where the handshapes represent something visually similar to the concept being communicated, is a notable feature of sign languages. However, many signs in sign languages are arbitrary and cannot be understood through visual resemblance alone, highlighting the linguistic complexity of these languages (Schein & Delk, 2013).

### **2.1.1.1 Significance of Sign Language**

#### **Cognitive and Educational Implications**

The cognitive development of deaf children is profoundly influenced by early exposure to sign language, which provides a robust foundation for acquiring complex cognitive abilities. Research consistently shows that children who have access to a fully accessible language from an early age develop critical cognitive skills such as working memory, executive functioning, and theory of mind more effectively than those without such access (Petitto et al., 2000; Morgan & Woll, 2002). Working memory—the ability to hold and manipulate information over short periods—is essential for problem-solving and learning, while executive functioning encompasses cognitive processes like attention control, cognitive flexibility, and inhibitory control, all of which are fundamental for academic and everyday functioning (Diamond, 2013). The theory of mind—the capacity to understand others' perspectives and intentions—is similarly enhanced by early language exposure, enabling better social cognition and interpersonal interactions (Morgan & Woll, 2002). The visual-spatial modality of sign language contributes to cognitive development by engaging brain regions involved in spatial reasoning and mental imagery, and experience with signing is associated with enhanced visuospatial skills and activation of related neural

areas (Secora & Emmorey, 2020, p. 449). This sensory modality requires deaf children to process and represent information through dynamic spatial configurations and movement, fostering mental flexibility and enhanced visual-spatial working memory (Emmorey et al., 2009). Neuroimaging studies support this, revealing that sign language users often show increased activity in right hemisphere areas related to spatial cognition, which can generalize to superior abilities in tasks involving spatial problem-solving and visualization (Bavelier et al., 2006). Educationally, the presence of sign language as a medium of instruction and communication is vital for deaf students' access to curriculum content and peer interaction. Deaf children who receive instruction in sign language typically achieve better academic outcomes compared to those who rely solely on oral methods or who experience delayed language acquisition (Mayberry & Lock, 2003). Language deprivation during critical periods of brain development can lead to long-term deficits in literacy, cognitive processing, and academic achievement (Hall et al., 2017). Bilingual education programs that incorporate both sign language and written/spoken language have shown particular promise in addressing these challenges by leveraging the strengths of each modality. These programs support literacy development by linking the visual language with the phonological and syntactic structures of written language, thereby improving reading comprehension and written expression (Marschark et al., 2002; Singleton & Crume, 2010).

For deafblind individuals, who face compounded sensory challenges, tactile signing and related tactile communication systems are indispensable for cognitive and educational engagement. Tactile sign language allows individuals to perceive linguistic input through touch, maintaining access to complex language structures necessary for learning (Hadley, 2006). The use of such tactile communication

facilitates social learning and cognitive stimulation, providing opportunities for interaction and exchange of ideas that are otherwise limited by sensory constraints (Hersh, 2003). Access to tactile communication methods fosters autonomy and inclusion within educational settings, enabling deafblind learners to participate actively in classroom activities, develop conceptual understanding, and build social connections (Hersh & Johnson, 2008). Technologies continue to enhance education for deaf and deafblind students. Tools such as refreshable Braille displays, tactile electronic communication devices, and video relay interpreting expand access to information and interaction, reinforcing the cognitive and educational benefits of sign language and tactile communication (Holcomb, 2012). In summary, early and consistent access to sign language whether visual or tactile plays a pivotal role in shaping the cognitive, social, and educational trajectories of deaf and deafblind individuals. Ensuring such access is critical to overcoming barriers posed by sensory impairments and promoting equity in educational opportunities and cognitive development.

### **2.1.2 Social Inclusion and Cultural Identity**

Sign language plays a central role in shaping and sustaining cultural identity within Deaf communities around the world. Rather than defining deafness solely as a medical impairment, many Deaf individuals view themselves as part of a distinct linguistic and cultural minority whose shared use of sign language fosters a sense of belonging, community cohesion, and cultural pride (International Journal of Research and Innovation in Social Science [IJRISS], 2025). This cultural perspective recognizes Deafness as a unique social identity rather than a medical condition, framing sign language as more than just a communication tool—it is a shared

heritage, a symbol of collective experience, and a marker of group membership (Bauman, 2008).

Research in Deaf linguistics and culture shows that when Deaf people use sign language in community settings such as schools or social networks, it becomes more than a communication tool that functions as a shared language and cultural practice that helps shape Deaf identity and provides participants with a strong sense of belonging to a collective Deaf community (Stander & McIlroy, 2024). Deaf cultural events, such as theatre performances, storytelling, and social gatherings, revolve around sign language, enabling community members to engage in shared practices that reinforce identity and social bonds. Moreover, these cultural activities nurture empowerment by affirming the community's linguistic rights and promoting positive self-concept (Ladd, 2003).

For deafblind individuals, social inclusion is often more complex due to dual sensory impairments that limit both auditory and visual access. However, tactile sign language adapts the expressive capacity of visual sign languages into a tactile modality, allowing deafblind people to maintain communication, social interaction, and cultural participation (Hadley, 2006). Tactile signing enables deafblind individuals to engage in conversations, access cultural information, and express personal identity, thereby fostering inclusion within both the Deaf and deafblind communities. Importantly, tactile sign language also acts as a social bridge, connecting deafblind individuals to broader networks of support and friendship, which counters the heightened risk of social isolation frequently experienced due to sensory loss (Monaghan, 2011).

The sociocultural importance of sign language has prompted governments and international organizations to formally recognize these languages, affirming their legitimacy and rights of users. Recognition often translates into legal protections,

educational policies, and accessibility mandates that promote the use of sign language in public life (Humphries et al., 2012). This legal acknowledgment enables greater access to public services, education, and employment opportunities and elevates the status of the Deaf community within society.

Globally, the recognition of sign languages—such as British Sign Language (BSL) in the UK, New Zealand Sign Language (NZSL), and American Sign Language (ASL)—reflects a growing appreciation of the linguistic diversity and cultural richness inherent in these languages (King & Parker, 2014). These developments contribute to dismantling societal stigma and discrimination by affirming the cultural and linguistic legitimacy of Deaf and deafblind communities. The United Nations Convention on the Rights of Persons with Disabilities (UNCRPD) further reinforces these commitments by explicitly recognizing the right of deaf persons to use sign language and access appropriate linguistic and cultural resources (United Nations, 2006). Nonetheless, despite these advances, challenges remain in achieving full social inclusion. Many deaf and deafblind individuals continue to face barriers related to inadequate interpreter services, limited access to education in sign language, and social prejudice (McKee, Schlehofer, & Thew, 2013). Advocacy efforts by Deaf organizations and disability rights groups remain essential to address these systemic barriers and promote policies that support linguistic and cultural rights.

In conclusion, sign language whether visual or tactile serves as a vital medium through which deaf and deafblind individuals forge social connections, assert cultural identity, and advocate for their rights. Its recognition as a legitimate language and cultural heritage is indispensable for fostering empowerment, inclusion, and equality within broader society.

### **2.1.3 Tadoma**

Tadoma is a tactile method of communication primarily used by individuals who are both deaf and blind. It is a form of tactile speechreading, where the deafblind individual places their hand on the face and neck of a speaker to feel the vibrations and movements associated with speech. The technique provides access to spoken language by enabling the receiver to perceive the articulatory features of speech such as lip movements, jaw motion, and vocal cord vibrations through touch.

The origins of Tadoma date back to the early 20th century in the United States. It was developed by educators and practitioners working with deafblind individuals, particularly at the Perkins School for the Blind. The name “Tadoma” itself is derived from the names of Tad and Omaha, two early students who successfully learned the method. According to Reed et al. (1990), Tadoma gained wider recognition in the 1960s and 1970s, as advocacy for the rights of the deafblind increased and the demand for alternative communication access methods became more urgent. As noted by Reed (1996), the method was initially developed to provide deafblind children with direct access to spoken language, particularly in environments where sign language or braille were not viable due to a combination of sensory limitations or the surrounding communication culture. It represented one of the few techniques allowing for real-time, face-to-face communication with hearing individuals without the need for interpretation or external tools.

### **2.2 Linguistic Structure and Function**

Tadoma is not a language in itself, but rather a tactile method of accessing spoken language, particularly English. However, its linguistic structure reflects an adaptation of auditory-visual phonological processing into the tactile modality. In this sense, it

shares properties with tactile sign languages, though it is fundamentally rooted in the reception of speech articulation rather than visual-manual signs.

The thumb typically rests lightly on the speaker's lips to perceive bilabial articulation (e.g., /p/, /b/, /m/). The fingers are spread across the jaw, cheek, and throat to monitor voicing, airflow, and tongue placement. The palm detects resonance and vocal fold vibration, contributing to the perception of voiced vs. voiceless consonants, as well as intonation patterns (Reed, 1996; Goldreich & Kanics, 2003).

In this way, Tadoma supports the understanding of phonological and prosodic aspects of speech through haptic perception, making it possible for some users to both comprehend and replicate speech sounds. Studies by Nielsen (2002) confirm that with extensive training, Research shows that individuals trained to use tactile speech perception methods can attain substantial levels of speech intelligibility and even develop syntactic and pragmatic skills in spoken language contexts. Contemporary studies of tactile phoneme communication systems—analogue to Tadoma—demonstrate that with structured training, users can discriminate phonemes via touch and generalize this learning to novel words, indicating meaningful acquisition of linguistic structure after extensive practice (Jung et al., 2024). Instruction in tactile communication typically emphasizes helping learners to:

- (i) detect and distinguish different speech sounds through tactile feedback
- (ii) associate specific tactile cues with phonemes and syllables
- (iii) approximate articulatory positions to produce intelligible speech
- (iv) participate in conversation using tactile reception paired with verbal output.

Instructional programs often incorporate repetitive, structured practice, beginning with simple phonemes and advancing to complex syntactic structures. According to

Collins & Petronio (2000), Tadoma instruction can also be supported by multisensory strategies, including residual hearing, braille literacy, and tactile sign to reinforce comprehension. Because Tadoma is so tactilely demanding and requires prolonged physical contact, it is typically used in close, familiar communication settings, such as with family members, educators, or interpreters. It may be less practical in public or group settings, which has contributed to its limited adoption relative to other methods such as tactile American Sign Language (TASL) or braille-based communication systems.

### **2.3 The Deafblind Block Alphabet (Spartan Alphabet)**

The Deafblind Block Alphabet emerged as part of a broader effort to develop accessible forms of communication for individuals who are both Deaf and blind. Over the years, various tactile alphabets have been developed to meet the needs of Deafblind individuals, who often face unique challenges in communication due to their dual sensory impairments.

One of the most well-known systems, the Spartan Alphabet, was developed in the mid-20th century, designed to facilitate communication in educational and social contexts. The Spartan Alphabet is often used alongside other forms of tactile communication, such as the Tadoma method, but its distinct feature is that it allows for the direct tactile identification of individual letters without the need for speech or sight (McKellar, 2017).

In contrast to other systems like Braille, which is a more complex tactile system relying on raised dots to represent letters, the Deafblind Block Alphabet uses more straightforward shapes that are felt by the fingers. This feature makes it more accessible for those who are just beginning to learn tactile communication or for individuals who may have limited tactile sensitivity (Tuttle & Jacobson, 2020).

The Deafblind Block Alphabet, also known as the Spartan Alphabet, is a tactile alphabet system used by individuals who are both Deaf and blind. It is designed to provide a method of communication that allows Deafblind individuals to read and write by touch, using the tactile sense to feel the shape of the letters. This method is especially useful for people who have both hearing and vision loss, as it enables them to access written language in a way that does not rely on sight or sound. The Deafblind Block Alphabet is a system of hand-based tactile symbols that represents the alphabet through simple, block-like shapes that are easy to distinguish through touch. The letters of the alphabet are formed by using the fingers to trace specific shapes on the palm or other parts of the hand. Each letter has a distinct configuration, making it possible for individuals to feel and identify the letters by touch, without the need for vision or hearing (McKellar, 2017). The *Block Alphabet* is a tactile communication system in which letters are designed with simple, geometric shapes that can be recognized by touch. One version, the *Spartan Alphabet*, was developed to be especially straightforward and accessible, particularly for individuals with limited literacy skills or no prior exposure to other tactile communication systems (Tuttle & Jacobson, 2020). These systems allow people who are deafblind or have minimal literacy experience to receive information in an immediate and easily understandable way.

The Deafblind Block Alphabet is designed to be simple and easy to learn, with each letter formed through specific shapes that can be traced on the hand. To use the system, a user places their hand or fingers in contact with a surface where the corresponding letters have been written, or they may receive letters one by one by someone else tracing the shapes on their palm.

For example:

- A is represented by a small, clockwise circular motion made with the index finger.
- B is formed by a small block shape with the finger moving from left to right across the palm.
- C uses a simple curve-like motion, mimicking the shape of the letter C.

Each letter's shape is designed to be distinct enough that the user can differentiate it by touch alone. This tactile approach allows the Deafblind individual to read the alphabet using their fingertips, providing access to written communication without relying on vision or sound.

### **2.3.1 Significance of the Deafblind Block Alphabet**

The Deafblind Block Alphabet is significant for a variety of reasons, particularly in terms of accessibility and inclusivity for individuals with both hearing and vision loss. Some of the key advantages include:

#### **i. Promoting Literacy**

For many Deafblind individuals, traditional literacy methods such as Braille or visual writing are not accessible. The Deafblind Block Alphabet provides a method that is simple to learn, allowing individuals to begin acquiring literacy skills at an early age. This is particularly important as literacy is essential for independent living, educational success, and social inclusion (Tuttle & Jacobson, 2020).

#### **ii. Facilitating Communication**

One of the primary benefits of the Deafblind Block Alphabet is its role in facilitating direct, tactile communication. By allowing individuals to feel the letters as they are traced on their hands, Deafblind individuals can participate in real-time communication with others, especially in situations where sign language or Braille

may not be practical or available. This method can be used in both one-on-one conversations and larger group settings, making it a versatile communication tool (McKellar, 2017).

- iii. Reducing Dependence on Others
- iv. The Deafblind Block Alphabet allows users to communicate without needing specialized interpreters or support services in certain situations. For example, individuals who use this system can communicate directly with family members, friends, or peers trained in the alphabet. This reduces reliance on interpreters or external assistance, giving the individual greater autonomy and confidence in navigating daily life (Tuttle & Jacobson, 2020).
- v. Easing Transition for New Users

The Spartan Alphabet is often considered easier to learn compared to other tactile systems like Braille. Because it relies on simple, easily distinguishable shapes, users can quickly start learning the alphabet and gain literacy skills. This can be especially beneficial for younger users or those new to tactile communication (McKellar, 2017).

While the Deafblind Block Alphabet has numerous advantages, there are also several challenges and limitations associated with its use. The following are some of the challenges associated with deafblind block alphabet:

- a. Limited Recognition

The primary challenge facing the Deafblind Block Alphabet is its limited recognition and adoption. Unlike Braille, which is widely accepted and standardized across many countries, the Deafblind Block Alphabet is not as commonly known or used. This lack of recognition can hinder its ability to serve as a universal system of communication for Deafblind individuals, especially when interacting with people who are unfamiliar with the system (Tuttle & Jacobson, 2020).

#### b. Physical Limitations

The effectiveness of the Deafblind Block Alphabet relies heavily on the tactile sensitivity of the user's hands and fingers. For individuals with limited hand dexterity or reduced tactile sensitivity, it may be difficult to distinguish certain shapes or letters. This limitation can hinder the system's accessibility for some individuals, particularly those with additional physical disabilities (McKellar, 2017).

#### c. Need for Trained Communication Partners

Although the Deafblind Block Alphabet allows for direct communication, it requires both parties to be trained in the system. A communication partner must be skilled in tracing the letters accurately and fluidly, and the Deafblind individual must be proficient in reading these tactile letters. This creates a dependency on others who are knowledgeable in the system, limiting spontaneous communication with individuals who may not be familiar with the method (Tuttle & Jacobson, 2020).

### **2.4 Finger braille**

Finger Braille refers to the method of reading and writing Braille using the fingers to feel the raised dots arranged on a surface. While traditional Braille is typically read by touch, Finger Braille is a method where the reader uses their fingers to identify Braille dots on surfaces, including paper, metal, or electronic displays (Blaze, 2015). Unlike visual Braille, which is printed on tactile surfaces, Finger Braille emphasizes tactile interaction between the fingers and the Braille characters.

Braille characters consist of six raised dots arranged in a 2x3 matrix. Each character can represent a letter, number, or punctuation mark. In Finger Braille, these characters are interpreted using one or more fingers in direct contact with the raised dots, allowing the reader to understand the text through touch.

### **2.4.1 History and Development of Finger Braille**

The development of Braille itself dates back to the early 19th century. Louis Braille, a French educator, developed the system in 1824 as a means for blind individuals to read and write. His initial system was based on military night writing, a code designed for soldiers to communicate in the dark (Grau & Sahu, 2019). Over time, Braille evolved into a universally recognized and highly adaptable system for blind and visually impaired people.

Finger Braille emerged as a variant of Braille, primarily used for individuals who have the tactile sensitivity necessary to distinguish the raised dots. Early advocates of Finger Braille emphasized its importance in helping blind individuals interact with their environment and access printed information, contributing significantly to education and social integration (Blaze, 2015). As technologies developed, Finger Braille continued to play a crucial role, adapting to modern tools such as electronic Braille displays and devices.

### **2.4.2 Significance of Finger Braille**

The significance of Finger Braille lies in its ability to provide independence and empowerment to individuals who are blind or visually impaired. By using Finger Braille, individuals gain access to written materials, which enhances their ability to participate in education, the workplace, and daily life. Some key aspects of its significance include:

- Education: Finger Braille is widely used in schools for blind students, providing them with a means to read textbooks, complete assignments, and interact with their peers. Braille literacy is an essential skill, as it enables students to pursue academic and professional goals independently (D'Andrea & O'Sullivan, 2017).

- **Independence and Autonomy:** One of the primary benefits of Finger Braille is the autonomy it provides. Blind individuals can use Finger Braille to access a wide range of documents, including letters, bills, newspapers, and more. This independence is a significant aspect of social integration, allowing individuals to navigate the world without reliance on others for reading tasks (Grau & Sahu, 2019).
- **Inclusion and Social Participation:** In a society that heavily relies on written communication, Finger Braille offers an avenue for inclusion. Through it, blind individuals can engage in both personal and professional communications. For example, in the workplace, employees with visual impairments can use Finger Braille to read and process written information, ensuring they are not excluded from key tasks (Blaze, 2015).

There are several types of Finger Braille systems, each tailored to specific needs or technologies. These include:

1. **Traditional Finger Braille:** This is the standard system in which the Braille reader uses their fingers to interpret the raised dots on paper or other tactile surfaces. It is the most widely used system and can be employed in a variety of environments, from personal reading to academic or professional settings (D'Andrea & O'Sullivan, 2017).
2. **Electronic Finger Braille:** As technology has advanced, electronic devices designed for the blind have incorporated Finger Braille. These devices often feature Braille displays that allow for dynamic reading and writing. The most common type of electronic Finger Braille system is the Braille e-reader or Braille notetaker, which has a small keyboard or tactile screen that can display text in Braille (Grau & Sahu, 2019).

3. Tactile Graphics with Finger Braille: Tactile graphics are often combined with Finger Braille to provide blind individuals with visual information in a tactile format. This can include maps, diagrams, charts, and even art, all accompanied by Finger Braille annotations to offer a complete sensory experience of the content (Blaze, 2015).

While Finger Braille offers numerous benefits, it also presents certain challenges, both in terms of usage and accessibility:

- Tactile Sensitivity: One of the primary challenges for users of Finger Braille is the need for tactile sensitivity. To effectively read Braille, individuals must have a certain level of fingertip sensitivity. Some individuals with conditions that impair sensation may struggle to distinguish the raised dots, making reading difficult or impossible (Grau & Sahu, 2019).
- Learning Curve: Finger Braille requires extensive training, both for beginners and those who are transitioning from other forms of Braille. The learning process can be time-consuming, especially for individuals who are not exposed to Braille at an early age (D'Andrea & O'Sullivan, 2017). Additionally, instructors must ensure that students are properly taught, as incorrect usage can lead to difficulties in reading and writing effectively.
- Access to Materials: Despite the significance of Finger Braille, access to Braille materials remains limited in many regions. While the development of Braille e-readers and digital devices has expanded access, printed Braille texts are still less widespread than traditional printed materials. Additionally, the cost of specialized Braille devices can be prohibitive for some individuals (Blaze, 2015).

- **Space and Portability:** Traditional Finger Braille requires physical surfaces such as paper or Braille books, which can be cumbersome to carry around in large quantities. Though electronic devices have addressed this issue, they are not yet universally available or affordable (D'Andrea & O'Sullivan, 2017).

## **2.5 Tactile Braille**

Another form of Braille used by deaf and deafblind individuals to communicate is the tactile Braille. Tactile Braille is a system of raised dots arranged in cells that allows individuals who are blind or visually impaired to read and write through touch. Developed in the 19th century, it remains one of the most significant tools for literacy and independence among the blind community. Despite advances in audio and digital technologies, tactile Braille continues to play a foundational role in education, employment, and personal autonomy for blind individuals. The tactile Braille system was invented by Louis Braille in 1824. Each Braille character, or "cell," consists of two columns and three rows of raised dots, allowing for 64 combinations, including the space (Wormsley & D'Andrea, 1997).

### **2.5.1 Structure and function of tactile braille**

Each Braille cell consists of six tactile dots, numbered 1 through 6: By altering the arrangement of these dots, users can represent letters, numbers, punctuation, and even complex mathematical and musical notations. Braille is not a language but rather a code that can be applied to many languages, including English, French, Arabic, Chinese, and others.

Tactile reading is done by lightly gliding the fingers, usually the index fingers, across lines of Braille cells embossed on paper or displayed electronically via refreshable Braille displays (Koenig & Holbrook, 2000).

## **2.5.2 Applications of tactile braille**

### **Education**

Tactile Braille is fundamental to literacy development among blind and visually impaired students. Unlike auditory tools such as screen readers, Braille enables users to perceive the structure and mechanics of written language including spelling, punctuation, grammar and syntax because it provides direct tactile access to text in a coded, tactile format. These skills are essential for achieving full literacy and academic competence (Long & Bjorg, 2025). For instance, blind students who rely solely on audio-based instruction often struggle with homophones, contractions, and complex sentence structures, which are more easily understood through reading and writing Braille (Koenig & Holbrook, 2000). Furthermore, Braille supports active engagement in classroom activities. Students who are Braille literate can take notes, complete written assignments, and participate in independent reading, just as their sighted peers do. According to research by Wormsley and D'Andrea (1997), early Braille instruction is linked to higher academic achievement and better preparation for post-secondary education. In short, Braille is not just a tool for communication: it is a medium of empowerment that fosters equal access to education.

### **Employment**

Braille literacy has a direct impact on employment outcomes for blind individuals. Studies have shown that blind adults who are proficient in Braille are significantly more likely to obtain and maintain gainful employment compared to those who are not Braille literate (National Federation of the Blind 2009). This is largely because Braille enables users to read complex information quickly, take notes efficiently, and manage tasks independently in professional environments.

For example, Braille notetakers and refreshable Braille displays allow users to access digital content, organize calendars, and write reports — essential functions in today’s knowledge-based economy. In sectors such as education, law, technology, and administration, the ability to read and produce written documents is critical, and tactile Braille remains an irreplaceable asset (Wiazowski, 2010).

### **Accessibility and Navigation**

Tactile Braille plays a crucial role in enhancing the navigability and accessibility of physical environments for blind and visually impaired individuals. Braille signage is commonly used in public buildings, hospitals, transportation systems, hotel rooms, and restrooms to identify rooms, provide instructions, and indicate floor levels on elevators (Bentzen & Myers, 1997). This form of tactile communication allows blind individuals to navigate independently without relying on assistance from others.

In addition to signage, Braille is used on consumer goods packaging — especially in industries such as pharmaceuticals and cosmetics — to ensure safe and informed use of products (L’Occitane, 2022). When integrated into accessible design, tactile Braille supports the principles of universal design, benefiting not only individuals who are blind but also those with temporary visual impairments or literacy challenges.

### **2.5.3 Challenges and modern developments in tactile braille**

#### **Challenges**

Despite the unquestionable benefits of tactile Braille for literacy, independence, and access, its use has experienced a notable decline in some regions, particularly in developed countries. This decline is closely linked to the widespread adoption of screen readers and audio-based technologies, which have made access to written information easier and faster for many visually impaired users (Millar, 2003).

Screen readers convert text into synthesized speech, enabling users to listen to digital content such as emails, websites, books, and documents. While these technologies provide immediate access, they often support passive consumption that does not always promote active engagement with the mechanics of written language. Recent research comparing Braille and audio modalities demonstrates that tactile literacy such as Braille remains a foundational medium for developing deep reading and writing proficiency, academic progression, and daily communication, whereas audio alone may not fully support the development of spelling, grammar and other core literacy skills (Sharma, 2025). Consequently, blind students who depend primarily on audio tools may face challenges in achieving comprehensive literacy, which can affect academic outcomes and broader life opportunities. Moreover, a decline in Braille literacy has been linked with reduced independence and fewer opportunities to participate fully in contexts where written communication is essential, underscoring the ongoing importance of tactile reading systems in education for individuals with visual impairments (Sharma, 2025).

### **Modern Developments**

Recognizing these challenges, technological advancements have focused on creating innovative solutions that integrate tactile Braille with digital accessibility. One of the most significant developments is the advent of refreshable Braille displays. These devices contain a series of small pins that dynamically rise and fall to form Braille characters, allowing users to read text from digital sources such as computers, smartphones, and tablets in real time (Wiazowski, 2010).

Refreshable Braille displays are highly portable and facilitate bidirectional communication, enabling users not only to read digital content but also to input text through Braille keyboards. This technology bridges the gap between traditional

Braille literacy and modern digital communication, providing access to emails, websites, social media, and educational resources instantly.

In addition to refreshable displays, portable Braille notetakers have gained popularity. These devices combine Braille input with digital storage and connectivity features, allowing users to take notes, organize schedules, and read e-books independently. Some models include speech output, offering a multimodal approach that caters to different learning preferences and environments (Wiazowski, 2010).

#### **2.5.4 Significance of tactile braille**

##### **Independence and Empowerment**

Tactile Braille is more than just a reading system: it is a cornerstone of personal independence and empowerment for individuals who are blind or visually impaired. By offering direct, hands-on access to written information, Braille enables users to interact with their environment, manage personal responsibilities, and engage in daily life without depending on others. This autonomy is essential for preserving one's self-reliance, privacy, and human dignity (National Federation of the Blind, 2009).

Braille allows individuals to independently label and organize household items such as food containers, cleaning products, and clothing, ensuring accurate identification and efficient use of everyday materials. One of the most significant contributions of Braille is in labeling and identifying personal items. The ability to independently identify items such as medication bottles, food containers, clothing, and money through Braille labeling reduces the risk of errors and enhances safety and efficiency in personal routines (NFB, 2020). For example, medication misidentification can lead to serious health consequences: the use of Braille labels ensures that individuals can correctly identify and administer medication without external assistance (Wiazowski, 2014).

The ability to independently study or work using Braille enhances a person's self-confidence and competence, reinforcing a sense of control over their own life.

Importantly, Braille also supports private communication. Individuals can maintain personal diaries, read sensitive correspondence, or write confidential notes — activities that would otherwise require the involvement of sighted assistants or technology, potentially compromising their privacy. In this way, Braille provides not just access, but ownership of one's personal and intellectual space.

In essence, Braille literacy enables blind individuals to live with dignity, autonomy, and equality. It reduces dependency on sighted assistance, supports lifelong learning, and fosters full engagement in social, educational, and professional life. As such, promoting Braille literacy is not only a matter of educational policy, but a fundamental issue of human rights and inclusion.

### **Cultural and Symbolic Importance of Tactile Braille**

In modern contexts, the presence of Braille in public spaces — such as on elevator panels, room numbers, transportation signage, and public restrooms — sends a powerful cultural message: that individuals with disabilities are valued, expected members of the public sphere. It affirms that the built environment should accommodate all people, reinforcing the principles of universal design and social integration (Lid, 2014).

In the digital age, Braille's symbolic value has only grown. The integration of Braille into emerging technologies — such as refreshable Braille displays, Braille smartwatches, and accessible e-readers — signals that technological innovation can and should be inclusive. This visibility within cutting-edge tech underscores the notion that access to digital information must be universal, further aligning with

global human rights frameworks like the UN Convention on the Rights of Persons with Disabilities (CRPD) (United Nations, 2006).

Braille also holds cultural significance within the blind community itself, serving as a medium of shared experience, empowerment, and identity. For many blind individuals, learning Braille is a rite of passage — a tangible link to a broader historical struggle for educational and civil rights. Advocacy organizations often highlight Braille as a symbol of pride, emphasizing its role in enabling independence and personal expression (National Federation of the Blind, 2009).

In sum, Braille's importance extends well beyond its function as a reading system. It serves as a cultural emblem of accessibility, equality, and respect for diversity, reminding society that inclusion must be both structural and symbolic. The continued presence and promotion of Braille reinforce the idea that equitable access to information — whether in physical or digital form — is a non-negotiable component of a truly inclusive world.

### **Cognitive Development**

Neuroimaging research provides strong support for the cognitive advantages of Braille literacy by highlighting the brain's remarkable adaptability during tactile reading. Studies have found that blind individuals who read Braille exhibit heightened activity in the occipital cortex, an area normally responsible for visual processing. This reorganization, referred to as cross-modal neuroplasticity, illustrates the brain's capacity to repurpose visual regions to support nonvisual sensory functions following the loss of sight (Sadato et al., 2002).

In blind individuals, the recruitment of the visual cortex during Braille reading exemplifies the adaptive capacity of the brain and highlights the neural efficiency of tactile literacy (Burton et al., 2002).

Furthermore, this cross-modal engagement is not limited to passive tactile perception but extends to higher-order linguistic and cognitive processing. Studies indicate that proficient Braille readers exhibit activation patterns in the visual cortex similar to those of sighted individuals reading printed text, suggesting that Braille reading supports the development of sophisticated language networks in the brain (Reich et al., 2011). These findings reinforce the argument that Braille literacy is not only a tool for communication but also a vital contributor to cognitive development and brain organization in blind individuals

## **2.6 Deafblind Manual Alphabets**

Deafblind manual alphabets are tactile communication systems used by individuals who are both deaf and blind. Unlike standard manual alphabets used in sign language, which involve visual cues, deafblind manual alphabets are based on touch. In these systems, each letter or symbol is represented by specific hand configurations or finger placements that can be felt by the recipient (Miller, 2018). These systems allow for one-to-one communication between deafblind individuals and others, providing an alternative to spoken or written communication.

The development of tactile alphabets emerged alongside efforts to find ways for people with both sensory impairments to communicate effectively. Early attempts at communication between deafblind individuals and others were primitive, relying on gestures and touch-based methods. The first notable advancement was the creation of the manual alphabet for individuals with dual sensory loss in the 19th century. One of the earliest systems was developed by Thomas Hopkins Gallaudet and Laurent Clerc for the deaf community, which later evolved to be used with tactile adjustments for those who were also blind (Patterson & Stam, 2016). As awareness of deafblindness expanded, more specialized tactile communication methods were developed. One

such approach is the hand-over-hand technique, in which the communicator places their hand over that of a deafblind person to guide the formation of letters through the manual alphabet. Another commonly used method is the block alphabet, also known as American tactile sign language, where letters are conveyed by tracing or positioning the fingers on the palm or back of the hand (Vanderheiden & Killeen, 2019).

### **2.6.1 Types of Deafblind Manual Alphabets**

There are several variations of deafblind manual alphabets, depending on the region and the needs of the individual. Some of the key types include:

- **American Manual Alphabet (AMAL):** One of the most widely recognized manual alphabet systems, AMAL represents each letter with distinct hand shapes and finger configurations. It is commonly used in the United States and parts of Canada, and tactile adaptations are available to help individuals with reduced tactile sensitivity distinguish the letters (Miller, 2018).
- **British Manual Alphabet:** Mainly used in the United Kingdom, this system uses slightly different finger placements from the American Manual Alphabet and is often combined with British Sign Language. Its tactile form enables communication through touch rather than sight (Patterson & Stam, 2016).
- **Tactile Fingerspelling:** This method conveys letters through touch, often using a hand-over-hand technique where the recipient feels the spelling movements. It is especially effective for individuals with profound vision loss who rely on touch for communication (Vanderheiden & Killeen, 2019).
- **Block Alphabet:** A tactile system in which letters are traced on the palm or back of the hand, making it suitable for people who cannot interpret visual gestures or prefer tactile communication (Miller, 2018).

- Deafblind manual alphabets play a critical role in the autonomy and social integration of individuals with dual sensory loss. These systems facilitate daily interactions, ranging from casual conversations to more complex exchanges, such as in education or professional settings. Without these systems, the deafblind community would face significant barriers to communication, which could lead to social isolation and exclusion (Patterson & Stam, 2016).

The tactile manual alphabet system provides an inclusive means of communication for people with both vision and hearing impairments, offering independence in educational, social, and vocational settings. For example, it allows students in specialized schools to communicate with their peers and teachers, helping to foster inclusivity and equal educational opportunities (Vanderheiden & Killeen, 2019). Similarly, in the workplace, these communication systems allow for effective collaboration and problem-solving among deafblind individuals and their colleagues, supporting both productivity and social interaction.

Moreover, the use of manual alphabets is crucial in maintaining a person's identity and connection with their community. For many deafblind individuals, tactile sign language is not just a communication tool but also a cultural expression, allowing them to connect with other deafblind people, share experiences, and express themselves freely (Miller, 2018).

### **2.6.2 Challenges and limitations of deafblind manual alphabets**

While deafblind manual alphabets are invaluable, there are challenges in their use. One significant challenge is the need for consistent tactile sensitivity from both the communicator and the recipient. Some individuals with severe vision and hearing impairments may have limited tactile sensitivity, making it difficult for them to

recognize letter configurations or hand positions (Vanderheiden & Killeen, 2019). To overcome this, specialized training is often required to ensure both parties can effectively communicate.

Another challenge is the varying use of manual alphabets across regions and communities. While some deafblind individuals may be familiar with one system, others may use a different variant, leading to potential communication barriers between individuals from different geographical areas or linguistic backgrounds (Patterson & Stam, 2016).

## **2.7 Tactile Sign Language**

Within the field of sign language linguistics, an emerging area of interest is the sign language forms used by people who are both Deaf and blind. (Willoughby et al., 2018) One of the key benefits of tactile sign language is its ability to provide deafblind individuals with a means of expressing themselves and interacting with others. By using tactile sign language, individuals are able to communicate their thoughts, feelings, and needs with those around them, fostering a sense of connection and understanding.

In a study conducted by Gormley, et al. (2018), researchers found that individuals who were taught tactile sign language demonstrated improvements in communication skills, social interaction, and overall quality of life. This highlights the importance of providing individuals with access to tactile sign language as a means of enhancing their ability to communicate effectively.

Furthermore, tactile sign language has been shown to be a valuable tool in educational settings, allowing deafblind students to access information and participate in classroom activities (Willoughby et al., 2018). By incorporating tactile sign language

into the curriculum, educators can ensure that all students have equal opportunities to learn and engage with their peers.

Overall, tactile sign language is a vital form of communication for individuals who are deafblind, providing them with the means to express themselves, interact with others, and participate in various aspects of daily life (Edwards & Brentari, 2020). It is essential that resources and support are made available to ensure that individuals have access to tactile sign language and can fully benefit from its use (National Center on Deaf-Blindness, n.d.).

In very simple terms, a deafblind signer will follow a conversation by placing one or both hands on top of the hands of someone who is signing (Willoughby et al., 2018). However, as this chapter will explore, the move from a visual to tactile mode of perception necessitates a number of adaptations in the way a message is communicated. Whether these changes lead to minor modifications of the existing visual sign language, the emergence of a new language specifically designed for tactile production and reception, or something in between arguably differs depending on both the individual deafblind signer and the communities in which they are embedded (Edwards & Brentari, 2020; Willoughby et al., 2018).

This entry provides an overview of the distinctive pragmatic strategies employed by deafblind signers across the globe, including both linguistic and non-linguistic approaches, as well as adaptations that range from highly conventionalized to more personalized or idiosyncratic forms (Willoughby et al., 2018). Our goal in taking a broad-sweeping view in this chapter is to give an overview of the different ways in which deafblind people respond to the challenge of communication with limited or no access to the visual or auditory channel, and to consider what insights this might give about pragmatics in human communication more generally. The choice of terms to

describe these ways of signing is potentially problematic, as calling something a tactile sign language might seem to be making claims that the variety has diverged markedly from the parent sign language or has been specifically optimized for tactile delivery (Willoughby et al., 2018).

## **2.8 Communication Strategies Used When Deaf Students Interact with Deafblind**

The interaction between deaf students and deafblind individuals presents unique challenges and necessitates the use of specialized communication strategies. Deafblindness, which is a combination of both visual and hearing impairments, significantly impacts the way individuals communicate, and the interaction strategies must be adapted accordingly (Bruce et al., 2020). This discussion highlights key communication strategies and methods used and the importance of individualized approaches (Miles, 2003).

### **Tactile Communication**

Tactile communication is one of the most commonly used strategies in interactions between deaf students and deafblind individuals. Given that deafblind individuals often have little to no sight or hearing, tactile forms of communication become essential. One such form is Tactile American Sign Language (TASL). TASL is a variant of American Sign Language (ASL), where signs are made by touching the hands of the individual and guiding them through the sign. This technique allows the deafblind person to feel the sign language and comprehend the message being conveyed (Willoughby et al., 2018).

Additionally, hand-over-hand signing is another common tactile communication method. The person providing the communication will place their hands over the hands of the deafblind individual, guiding their movements to form signs. This can be

particularly useful when the deafblind person has some residual vision or hearing (Hersh, 2016). This method allows for a more hands-on approach and can be crucial when dealing with more complex communication needs.

### **Braille**

Braille is another significant communication strategy, especially for deafblind individuals who have retained some tactile abilities and are more reliant on their sense of touch. Braille allows for reading and writing through tactile symbols and is often used alongside other methods, such as sign language or spoken language, depending on the individual's abilities and preferences (Tadié, 2020). For deaf students communicating with deafblind peers, the use of Braille can ensure that written communication is accessible.

For example, when written notes or materials are exchanged, Braille can be utilized to allow the deafblind individual to read the text independently. Additionally, deafblind individuals can use Braille display devices, which provide real-time tactile feedback to allow communication in a modern, electronic format (Miller, 2018). These devices can be crucial when exchanging information or during instructional settings, making the interaction more fluid.

### **Use of Technology and Assistive Devices**

Advancements in technology have significantly impacted the communication strategies between deaf students and deafblind individuals. One prominent example is screen reader technology that converts text on a screen into audio or tactile feedback. These devices can be helpful for individuals with both hearing and visual impairments, as they provide access to information that would otherwise be inaccessible.

Tactile input devices, such as the Braille Note or Braille displays, can be connected to computers or smartphones, allowing deafblind individuals to communicate through text-based formats. For instance, a deafblind person may use a Braille display in conjunction with speech-to-text software to transcribe spoken language into Braille, which they can then read (Miller, 2018). Similarly, video relay services (VRS) with sign language interpreters can be adapted to provide a visual relay in a tactile form, where an interpreter signs and the message is relayed via tactile sign language for the deafblind individual.

### **Object Communication**

Object communication involves using tangible objects to represent specific concepts or items, and it can be especially beneficial for those with minimal cognitive or sensory abilities. For example, a person might associate a particular object, such as a small ball, with a specific activity or person. This strategy is often used in conjunction with other tactile or gestural communication methods to support interaction (Parker & Prater, 2013). Object communication can be an intuitive way to express ideas, particularly when other forms of communication are too complex or difficult for the individual.

### **Communication through Gestures and Facial Expressions**

While facial expressions are an important aspect of visual communication for deaf individuals, they become less accessible for deafblind individuals who cannot rely on sight. However, some deafblind individuals may still have residual vision, allowing them to perceive large, exaggerated facial expressions or hand gestures. Therefore, it is important for deaf students to adapt their gestures and signs to be more tactile and exaggerated for better comprehension (Hersh, 2016). For example, using a wide range

of tactile gestures or touching the face of the individual to convey expressions may help facilitate better communication.

### **Social and Environmental Considerations**

Understanding the social dynamics and environmental context is crucial in fostering effective communication between deaf students and deafblind individuals. It is important for educators and peers to be aware of the unique needs of the deafblind individual and tailor their communication methods to ensure both comfort and clarity. This includes adjusting the physical space to minimize distractions, ensuring adequate lighting for those with residual vision, and maintaining a stable and quiet environment to ensure successful tactile communication (Deafblind UK, 2020; National Center on Deafblindness, 1995).

Additionally, providing consistent training and education to both deaf students and their teachers on communication strategies and techniques can foster inclusivity and mutual respect. Peer education programs, where deaf students learn to communicate effectively with deafblind peers, can enhance both the social and academic integration of deafblind students in educational settings (Tadié, 2020).

### **Collaborative Approaches**

Collaboration with support staff, such as interveners, is another essential strategy for fostering communication between deaf students and deafblind individuals. An intervener is trained to assist individuals with both vision and hearing loss, offering support in daily activities and communication. By working with an intervener, deaf students can learn techniques for effective interaction with their deafblind peers, ensuring both parties can participate in social and educational activities more fully (Miller, 2018).

### *Conclusion*

The communication strategies used when deaf students interact with deafblind individuals are multifaceted and require a high level of flexibility, creativity, and adaptability (Parker & Nelson 2016). Tactile communication methods, Braille, technology, object communication, and appropriate gestures are all vital strategies for ensuring effective interaction. Moreover, the role of educators and support staff in providing individualized support, training, and creating inclusive environments is crucial for facilitating meaningful communication. Continued research and development of accessible communication tools and methods will further improve the quality of interactions for both deaf students and deafblind individuals, ensuring a more inclusive society for all (Miles et al., 2011).

In talking about the ways in which deafblind people use and adapt sign languages, it is important to be clear about several points from the outset. Because deafblindness is a low incidence condition severely impact a person's ability to communicate with other people including deaf friends. Many experience social isolation and may have limited experience using tactile sign languages with other deafblind or deaf people (Hersh, 2013). In visual sign languages a great deal of syntactic and pragmatic information is conveyed via non manual channels. The signed language pragmatics entry includes numerous examples of how features such as head nods and tilts, eyebrow movement and pursed lips are used to modify the meaning of the manually signed utterance – for example, to express degree of certainty or to turn statements into polar questions. These non-manual features are also frequently used to provide back-channeling responses, while eye-gaze plays an important role in regulating turn-taking in visual signing as it does in spoken language interactions as it helps to guess what the deafblind person is trying to communicate. While some tactile sign language users

may have enough residual sight to perceive occasional non-manual features visually, the majority will not (Herman & Morgan, 2010). A question thus becomes if and how tactile sign language users adapt the parent visual sign language or draw on different interactional cues to recover information that the parent visual sign language encodes through non-manuals. A further challenge in describing tactile sign languages is that a fulsome pragmatic discussion needs to account not only for the ways in which the language encodes linguistic information, but also for the ways in which deafblind signers might re-inscribe or otherwise access relevant interactional information that participants normally perceive through the visual or aural channels (such as who is in the room, whether their conversation partner is listening attentively, who is making a bid for the floor). One option, of course, is to use linguistic means to make such points explicitly.

Since deafblind people do not have visual access to their surrounding environment, there is a potential need to develop new conventions to convey this information quickly and succinctly. Social haptic communication is the name given to a range of communicative symbols and practices used to convey environmental information to deafblind people in a way outside of standard tactile signing. For example, by drawing the outline of a room on the back of a deafblind person in order to convey the location of doors, tables, etc. or where different people are sitting. Social-haptics as a distinct method has its origins in a collaboration between deaf and deafblind man (Willoughby et al., 2018). Growing from a range of hand taps and squeezes used to convey feedback into a wide range of conventionalized signs that can be articulated on the deaf person's arms or back to indicate things such as the emotional states of the deaf person (laughter, crying), directions (door, forwards). Haptics is commonly used to augment tactile signing in Scandinavia, and has been somewhat codified through

the publication of a dictionary of 103 haptic signs by the Danish Association of the Deafblind (Willoughby et al., 2018). Haptics has spread beyond Scandinavia through the Danish dictionary, translations of the Scandinavian materials and workshops held throughout Europe and the world. Part of the perceived usefulness of social-haptic symbols is that they can be delivered simultaneously with more formal signed information. For example, (Hersh, 2013) show how a deafblind woman chairing a meeting could receive haptic information about who was making bids for the floor once her turn concluded while she herself was signing. Likewise, information such as whom the chair was allocating the turn to next could be conveyed back to the deaf person through haptics without needing to break into the stream of dialogue. Haptic signs can also be used in crowded situations or other contexts where there is not the space or time to assume a normal tactile signing posture for example, to quickly inform a deafblind person about what food or drink options are on offer at a function. Another study conducted by (Youssef et al., 2022) said more about how technology could help the smooth communication between deaf and deafblind individual. A social robot can be defined as a robot designed to operate and interact with humans, in contexts similar to human–human interaction contexts. Knowing that several types of machines and robots can interact with humans in different ways and modalities, a question emerges on what differentiates a social robot from a robot that is not social. In recent scholarship, multiple definitions of social robots have been proposed, reflecting varying perspectives among researchers about what characteristics and capabilities qualify a robot as –social.” These definitions differ in emphasis on aspects such as autonomy, interaction with humans, communication norms, and embodiment, indicating that there is no single consensus on the concept of a social robot in the literature (Rubio-Tinoco et al., 2022). This also arises because there is no agreement

on the definition of robots, regardless of their social qualification. The question of defining social robots has been addressed in where scientific and popular definitions of social robots have been examined. Drawing on previous definitions and research in the field of social robotics, it can be argued that social robots are capable of providing services and employing a variety of communication methods when interacting with humans. They can be envisioned in diverse settings, including industrial, educational, commercial, and domestic environments, integrating into everyday human life. Social robotics has emerged as a rapidly growing area of study, driven by advances in techniques that enable computer systems to efficiently process and interpret data from sources such as audio, visual inputs, and natural language. Additionally, social robots can convey information to humans through multiple channels, including speech, gestures, and facial expressions. Progress in machine learning and pattern recognition has further enhanced their ability to exhibit realistic social behaviors, allowing them to participate actively in both text-based and voice-based conversations. In spoken conversations, speakers intricately coordinate their turns, minimizing gaps and overlap by managing a flow of multimodal information. It has been suggested that turn-taking is universal cross linguistically. In conversations in sign languages, which are described as visual-gestural languages, turns are produced with the hands, body, and face, and perceived visually (see signed language pragmatics entry for further details).

In contrast, deafblind people who have no access to auditory and visual resources require modified resources through tactile and kinetic inputs to initiate, sustain, and terminate their social encounters. Studies on tactile signed interaction find the importance of contact and hand position in accomplishing turn-taking. For example, following the work (Engleman et al., 1999), who employed the signaling approach,

found that the major turn yielding signal their participants used was returning their hands to rest position, but that turn yielding was also accomplished by a more general decrease in signing speed and the indexing of addressee at the end of a turn, with a held question. Turn-claiming was accomplished by an increase in size and quantity of head-nodding, switching to palm, moving out of rest position, shifting posture, and interrupting and repeating the first few signs. The latter strategy was found to be a particularly effective way of initiating turn change in their data. Employing the signal-based approach, (Willoughby et al., 2018) explores turn-taking in tactile Swedish Sign Language. The preference for signing in dialogue position creates a unique turn taking environment in this language, since it allows both parties to talk without the need to change hand positions. (Willoughby et al., 2018) further explained that the changes in hand height or levels and position in signing space are used to regulate turn-taking in tactile Swedish Sign Language interactions. At rest level the hands are in the lap or otherwise disengaged from signing – what is commonly referred to as the home position in other sign language studies. The default height for hands engaged in conversation is called the turn level,


With (Willoughby et al., 2018) stating that, hands are raised somewhat from this position in order to indicate hesitation and lowered somewhat (but not returned to rest) to signal turn change. She further suggests that hands move on the horizontal plane to indicate turns at talk – with whoever has the floor bringing their hands into signing space directly in front of their body and indicating that they are giving up the floor by moving back into a shared signing space between the two interlocutors. (Langer, 2008) also notes that hesitation in tactile Norwegian Sign Language can be indicated by raising the height at which signs are produced, but other features of turn zones and levels have not been attested in tactile sign languages that make use of

other hand configurations for reception. In recent years, researchers working with visual sign languages have become increasingly interested in the role of micro-pauses and sign lengthening as resources for managing turn-taking (Hersh, 2013; Willoughby et al., 2018)). This is likely an important resource for turn-taking in tactile sign languages, though it is yet to be the subject of sustained research.

## **2.9 Barriers to Successful Communication between Deaf and Deafblind Students**

Successful communication between Deaf and Deafblind students is crucial for fostering an inclusive, supportive, and effective educational environment. However, various barriers can hinder their ability to interact meaningfully with each other.

According to Cawthon and Wurtzel (2017), the following are some of the factors that can hinder the successful communication between deaf and deafblind students.

- 
- a) Differences in Communication Systems
  - b) Sensory and Physical Limitations
  - c) Cultural and Linguistic Differences
  - d) Limited Exposure to Interpreters or Support Systems
  - e) Inadequate Educational Resources and Training
  - f) Social Isolation and Stigma

### **Differences in Communication Systems**

Communication is essential for human interaction, learning, and overall personal development. For individuals who are Deaf or Deafblind, communication methods differ significantly due to the nature of their sensory impairments. Deaf individuals rely on visual communication, primarily through sign language, while Deafblind individuals use tactile communication methods due to their loss of both vision and hearing. The differences between these communication systems create substantial

barriers to effective interaction and communication between Deaf and Deafblind individuals.

The communication systems used by Deaf and Deafblind individuals are inherently distinct because of the sensory impairments these individuals experience, therefore deaf students mainly use visual communication to convey information.

### **Visual Communication in Deaf Individuals**

Deaf individuals predominantly use visual cues for communication, which are naturally suited to their visual capabilities. Sign language uses a complex system of hand shapes, movements, and facial expressions to convey meaning. ASL, for example, is a rich language that allows speakers to express ideas, emotions, and concepts through visual signs (Padden & Humphries, 2005). The visual nature of this communication system is effective for those who can see clearly and read the signs, but it becomes inaccessible for Deafblind individuals who lack the ability to see these signs. Deaf individuals are trained to recognize visual cues, and many also use additional forms of communication, such as lip reading or written language, to enhance their ability to engage in various contexts (Marschark et al., 2014). However, these modes are not viable for those with combined hearing and vision loss, as they do not have access to the visual or auditory aspects of communication. Deaf individuals typically use visual sign language, which is a fully developed language with its own grammar, syntax, and vocabulary. American Sign Language (ASL) and British Sign Language (BSL) are the most common examples of this visual form of communication (Padden & Humphries, 2005). Deaf individuals rely on their sense of sight to perceive and interpret these visual cues, which include hand movements, facial expressions, and body positioning.

In contrast, Deafblind individuals face a more complex challenge, as they experience both hearing and vision loss. This dual sensory impairment limits their ability to use visual communication methods: hence tactile communication methods are employed.

#### Tactile Communication in Deafblind Individuals.

Deafblind individuals, on the other hand, rely on tactile communication, a system that conveys information through touch. Tactile sign language is often used by Deafblind individuals, where signs are formed on the hands or bodies of the individual to allow them to feel the signs. Additionally, tactile fingerspelling involves the Deafblind person feeling each letter of the alphabet spelled out on their hand, and Braille is often used for reading and writing (D'Andrea et al., 2018). These tactile systems require a direct physical connection between the signer and the Deafblind individual, making communication less spontaneous and slower compared to visual sign language. The need for tactile communication limits the speed and flow of interaction, as the sign language movements must be felt rather than seen. This significant difference in the sensory modality required for communication presents a major barrier when Deaf and Deafblind individuals attempt to communicate with each other. Deafblind individuals often use tactile communication systems, such as tactile sign language, tactile fingerspelling, or Braille, which rely on touch to convey meaning. In tactile sign language, for instance, the Deafblind person feels the signs made by their communication partner, typically by holding the hands of the signer. This system allows the Deafblind individual to understand signs through touch, rather than through sight (D'Andrea et al., 2018).

## **Consequences of the Differences in Communication Systems**

- Limited Interaction Opportunities

One of the most profound impacts of these differences in communication systems is the limited interaction between Deaf and Deafblind individuals. The inability to share a common communication method severely restricts the social and educational opportunities available to both groups. For example, while Deaf individuals can engage in spontaneous conversations using visual sign language, Deafblind individuals must rely on tactile systems, which are slower and require more focused attention. Consequently, Deafblind individuals may be excluded from casual social interactions or group activities within the Deaf community, where visual sign language is predominantly used (Marschark & Knoors, 2012).

- Miscommunication and Lack of Understanding

When Deaf and Deafblind individuals attempt to interact, there is a heightened risk of miscommunication due to the differences in their communication systems. A Deaf individual may use sign language or fingerspelling in an attempt to communicate with a Deafblind person, assuming that the Deafblind individual can follow the signs. However, unless the Deafblind person is skilled in tactile sign language or is familiar with the specific mode of communication being used, this interaction will likely result in confusion or misinterpretation (Marschark et al., 2014).

On the other hand, Deafblind individuals might attempt to use tactile signs with the assumption that Deaf individuals can perceive them, but Deaf individuals may not be trained to understand tactile communication. This leads to misunderstandings and frustration on both sides. The lack of a common language or modality further contributes to a sense of alienation and inhibits the development of meaningful relationships (Padden & Humphries, 2005).

## **Sensory and Physical Limitations**

Communication is vital for interaction, learning, and overall human connection. However, for Deaf and Deafblind students, sensory and physical limitations can present significant barriers to effective communication. While Deaf students experience hearing loss and rely on visual forms of communication, Deafblind students face both hearing and vision impairments, which compound the challenges to communication, thus sensory and physical limitations becomes a major barrier to successful communication.

Sensory limitations refer to impairments in the ability to perceive stimuli through sight or hearing. For Deaf students, hearing loss prevents the reception of auditory signals, which necessitates the use of visual or tactile communication methods. These methods typically include sign language, lip reading, and written language (Padden & Humphries, 2005). In contrast, Deafblind students experience both hearing and vision loss, which significantly complicates their ability to communicate using conventional methods. Deafblind individuals often rely on tactile systems, such as tactile sign language, tactile fingerspelling, or Braille, to receive and express messages (D'Andrea et al., 2018).

Physical limitations refer to any condition that impairs physical movement or the ability to interact with the environment in a typical manner. These limitations can exacerbate sensory impairments, making communication even more challenging. For example, a Deafblind individual may experience restricted mobility or have difficulty with motor coordination, which can further hinder the ability to engage in tactile communication (Marschark & Knoors, 2012).

The nature of sensory and physical barriers of deaf and deafblind students are distinct. Deaf students use visual mode as a means to communicate which is different from deafblind individuals.

### **Visual Communication for the deaf**

For Deaf students, communication primarily occurs through visual methods, especially sign language, which relies on hand shapes, facial expressions, and spatial positioning to convey meaning (Padden & Humphries, 2005). However, Deaf students are not limited to sign language alone. Many also rely on lip reading, written communication, and, to some extent, auditory cues, such as vibrations or assistive listening devices, to communicate with the hearing world (Marschark et al., 2014). Despite these strategies, Deaf students' ability to communicate effectively in certain environments is limited by their lack of hearing.

The visual nature of communication for Deaf students also means that they rely heavily on the presence of light and clear visual cues. In dimly lit environments or in settings where others are not proficient in sign language, communication becomes much more difficult. Furthermore, those with additional physical impairments, such as limited mobility or poor motor control, may find it harder to express themselves visually (Padden & Humphries, 2005). In this way, both sensory and physical limitations combine to create a challenge for Deaf students in establishing effective communication.

### **Dual sensory impairment deafblind students**

Deafblind students face the added difficulty of both hearing and vision impairments, which creates a more complex barrier to communication. Deafblindness can occur in various degrees, from partial hearing and vision loss to total loss of both senses. For

communication, Deafblind students often rely on tactile communication methods. Tactile sign language, where the Deafblind person feels the signs formed in their hands, and tactile fingerspelling, where letters are spelled out on the hand, are among the primary ways Deafblind individuals communicate (D'Andrea et al., 2018).

However, the dual sensory impairment makes it significantly harder for Deafblind individuals to engage with their peers in a typical educational or social setting. The absence of both visual and auditory cues means that they cannot participate in conversations that occur through visual sign language or oral speech. In contrast to Deaf individuals who can communicate visually, Deafblind individuals must rely on touch, which can be slow and labor-intensive. This leads to slower communication, which limits the pace of interactions and increases the likelihood of misunderstandings (Marschark et al., 2014).

### **Physical Limitations: Movement and Interaction Constraints**

In addition to sensory impairments, physical limitations can further hinder communication for both Deaf and Deafblind students. For Deaf students, physical limitations, such as limited motor control or mobility, may make it difficult to engage in sign language or other forms of communication. If a Deaf student has difficulty with fine motor skills, they may struggle to perform the precise hand shapes required for sign language, which can reduce their ability to communicate effectively. Similarly, physical conditions affecting mobility may limit their ability to attend group discussions or interact with peers in face-to-face communication situations (Marschark & Knoors, 2012).

For Deafblind students, physical limitations often go hand-in-hand with the challenges posed by sensory impairments. Deafblind individuals may have difficulty with motor coordination, making it harder for them to produce signs or interpret

tactile communication. For example, if a Deafblind student has limited dexterity or hand function, they may struggle to feel signs clearly or to communicate their thoughts through tactile systems (D'Andrea et al., 2018). Additionally, physical limitations such as difficulty with posture or hand placement can interfere with tactile communication, making it even more difficult for Deafblind students to establish effective communication with others.

Sensory and physical barriers faced by deaf and deafblind individuals in communicating often have some effects on their lives. One of these effects is social isolation and limited interaction. The sensory and physical limitations experienced by Deaf and Deafblind students can lead to social isolation. For Deaf students, limited access to auditory communication often results in difficulty interacting with hearing peers, leading to feelings of exclusion. While Deaf students may be able to communicate with other Deaf individuals through sign language, they may struggle to establish connections with hearing individuals, who may not be fluent in sign language (Padden & Humphries, 2005). In addition, physical limitations, such as the inability to move freely or engage in certain activities, may prevent Deaf students from participating in social events or group activities, further contributing to isolation. For Deafblind students, the challenges are even more pronounced, as their ability to communicate is restricted by both sensory and physical limitations. They cannot rely on visual cues or auditory signals, and the need for tactile communication means that interactions are much slower and more deliberate. This slower pace of communication can make it harder for Deafblind individuals to form connections with peers, both within the Deaf community and with others outside of it. As a result, they may experience greater social isolation, particularly if peers are unfamiliar with tactile communication systems (Marschark & Knoors, 2012).

## **Cultural and Linguistic Differences**

Communication plays an essential role in the development of social, academic, and personal skills. For Deaf and Deafblind students, who experience sensory impairments, the modes of communication they rely on are often deeply rooted in their cultural and linguistic backgrounds. These differences create substantial barriers when Deaf and Deafblind students attempt to communicate with each other. The interplay between cultural identity, language, and communication strategies can present significant challenges for both groups, particularly in environments where effective interaction is necessary for academic success, social integration, and personal growth.

### **2.10 Cultural and Linguistic Differences in the Deaf and Deafblind Communities**

#### **Cultural Identity of Deaf Individuals**

Deaf culture is a unique and rich cultural identity that has developed among individuals who are Deaf and use sign language as their primary mode of communication. It is distinct from hearing culture, with its own social norms, traditions, and values. The Deaf community shares a collective cultural experience rooted in visual and non-verbal communication, where sign language serves not only as a means of communication but also as an essential element of cultural expression (Padden & Humphries, 2005). Sign language, such as American Sign Language (ASL) or British Sign Language (BSL), is not a mere system of gestures: it is a fully developed language with its own grammar, syntax, and lexicon, fundamentally different from spoken languages.

Deaf individuals often identify strongly with their Deaf community and culture. They participate in activities such as Deaf clubs, social gatherings, and cultural events that celebrate their unique heritage and foster solidarity among members. This cultural

pride and shared language help Deaf individuals maintain a sense of identity and belonging in a world that often marginalizes them (Lane, 1992).

### **Cultural Identity of Deafblind Individuals**

The cultural identity of Deafblind individuals is less defined than that of the Deaf community, as they belong to a group that experiences a combination of both hearing and vision impairments. Deafblindness can result from a variety of causes, including congenital or acquired conditions, and individuals who are Deafblind may have differing experiences with communication, depending on the degree of their impairments and their personal history. While some Deafblind individuals are also part of the Deaf community and use tactile versions of sign language or fingerspelling, others may not identify with Deaf culture due to their additional visual impairment.

Moreover, some Deafblind individuals may identify more closely with the blind community or with individuals who have other disabilities, rather than with the Deaf community. The lack of a unified cultural identity can make communication more difficult, as Deafblind students may not always share the same experiences, norms, or language with their Deaf peers (Marschark & Knoors, 2012).

### **Linguistic Differences**

#### **Sign Language versus Tactile Communication**

Language is a central element of both Deaf and Deafblind cultures, but the linguistic systems that Deaf and Deafblind individuals rely on are different, leading to significant barriers when these groups attempt to communicate with each other. Deaf individuals predominantly use sign language, a fully developed language that uses hand shapes, facial expressions, and body movements to convey meaning. American

Sign Language (ASL) and other forms of sign language (e.g., British Sign Language, BSL) are widely used among Deaf individuals and are distinct from spoken languages, making them an essential component of Deaf culture (Padden & Humphries, 2005).

In contrast, Deafblind individuals rely on tactile communication methods, such as tactile sign language or tactile fingerspelling. In these systems, a Deafblind person feels the signs or letters that are formed by their communication partner on their hands or body, rather than seeing them. Tactile sign language allows for communication through touch, while tactile fingerspelling involves spelling out words by touching the Deafblind person's hand. These tactile systems are slower and less visually expressive than sign language, which can make communication more labor-intensive and challenging (D'Andrea et al., 2018).

Thus, Deaf and Deafblind students often lack a shared language system, leading to confusion and frustration. Deaf individuals who are not familiar with tactile communication may struggle to understand a Deafblind person's signs, while Deafblind individuals may find it difficult to follow fast-paced sign language conversations used by Deaf individuals.

## **2.11 The Impact of Cultural and Linguistic Differences on Communication**

### **Limited Interaction and Social Isolation**

One of the most significant effects of cultural and linguistic differences is social isolation. Deaf students, who are deeply embedded in Deaf culture, often find it difficult to relate to individuals who are not fluent in sign language or familiar with Deaf cultural norms. In the case of Deafblind students, this cultural divide becomes even more pronounced, as Deafblind individuals may not share the same cultural background or experiences. For instance, a Deafblind individual may use tactile sign

language or fingerspelling, but their Deaf peers may not be proficient in these communication methods, making it difficult for them to interact socially (Marschark & Knoors, 2012).

The lack of a common cultural understanding exacerbates feelings of isolation for Deafblind individuals, who may struggle to integrate into the Deaf community. Additionally, Deafblind individuals who identify more with the blind community or with other disabilities might not feel comfortable within the Deaf community, which could further limit their social interactions and engagement (D'Andrea et al., 2018). The resulting communication gaps and isolation hinder the development of friendships, academic collaboration, and other forms of social engagement.

### **Barriers to Effective Education**

In educational settings, cultural and linguistic differences present significant challenges. Deaf students are accustomed to visual learning, with the use of sign language interpreters, visual aids, and written materials to access the curriculum. Deafblind students, on the other hand, require specialized education strategies, such as tactile sign language, Braille, or adaptive technology, to facilitate learning. The differences in communication methods and learning styles create barriers to inclusive education, as teachers and peers may lack the skills or resources to bridge these gaps (Marschark et al., 2014).

Additionally, Deafblind students may struggle to participate in group activities or collaborative projects with Deaf peers, as their slower, tactile communication methods cannot keep up with the pace of visual sign language. This creates a challenge in both formal and informal educational environments, where communication and collaboration are essential for academic success (D'Andrea et al., 2018).

## **Misunderstanding and Confusion**

Cultural and linguistic differences between Deaf and Deafblind students can lead to misunderstandings and confusion, particularly when communication relies on sign language and tactile systems. For instance, a Deafblind student may attempt to communicate using tactile sign language, but a Deaf student may not recognize the signs or understand the syntax of the tactile system. Conversely, a Deaf student may use visual sign language, which a Deafblind student cannot access due to their lack of vision. Such misunderstandings can result in frustration and difficulty in establishing meaningful communication (Marschark & Knoors, 2012).

The challenge of miscommunication is further compounded when Deafblind students have additional physical limitations, making it even harder to communicate in a classroom setting where time and resources are often limited. Without proper support or training in tactile communication, both groups may fail to understand one another, exacerbating the communication gap.

### **2.12 Theoretical framework**

Communication Accommodation Theory (CAT), initially proposed by Howard Giles in 1973, states that all living beings communicate although the way of communication is different. The theory further explains that communication happens through sound, speech, visible changes in body movements gestures or in the best possible way make others aware of their thoughts, feeling problems s happiness or any other information. This theory seeks to explain how individuals adjust their communication styles to accommodate the communication needs of others in various social interactions. The theory posits that people modify their speech, language, and non-verbal cues to either converge with or diverge from their conversational partners. In the case of deafblind and deaf students, vision and speech are a major problem for their interaction.

Applying the theory to deafblind and deaf communicator it means that they have to create different ways interpret, send message and draw conclusions on their own. According to (Jensema, 1979), communication systems for deafblind students are unique as the individual themselves. Due to their uniqueness, communication between deafblind and any other communicator needs to pass through a certain process for a smooth interaction. The literature revealed further that, there are some systems of communication that deaf and deafblind should adopt to overcome the barriers for successful communication. This means that although deaf and deafblind students are special in the way they communicate, but when you adopt the right strategies there would be an effective communication and thorough understanding.

In the context of communication between deaf and deafblind students, CAT provides a valuable framework to understand how students, educators, and peers modify their communication strategies based on the varying abilities and communication needs of individuals within this group. Given the complex communication dynamics that exist between deaf and deafblind students, the theory can help explain how communication accommodations are made, how challenges are overcome, and how social integration occurs. In summary communication is tailored to suit the needs of the participants.

Convergence occurs when individuals adapt their communication style to become more similar to that of their interlocutors, often to foster social integration and understanding. On the other hand, divergence happens when individuals emphasize their differences, which may reflect social distancing, power dynamics, or identity preservation (Giles, 1973).

### **2.12.1 Implication of CAT to the Communication of Deaf and Deafblind Students**

#### Convergence in Communication

In the context of the School for the Deaf in Mampong, Ghana, convergence in communication refers to the adaptation of communication methods by both deaf and deafblind students, their peers, and teachers to ensure effective interaction. Deaf students, who rely on sign language as a primary communication method, may adapt their communication strategies to include tactile signing for their deafblind peers, thus aligning their communication to accommodate the specific needs of their deafblind counterparts. Similarly, deafblind students, who typically use tactile sign language or braille, may adjust their communication techniques to match the capabilities and preferences of deaf students who may be more familiar with visual sign language or gestures. This convergence in communication strategies is critical in creating an inclusive educational environment where both deaf and deafblind students can engage meaningfully with one another. It also fosters social inclusion, as the modification of communication strategies demonstrates a mutual effort to understand and accommodate the needs of others. The use of tactile sign language, for instance, represents a convergence of modalities that ensures that deafblind students can understand and be understood by their peers.

Example: In Mampong, it may be common for a deaf student to adjust their communication style by incorporating tactile signing when interacting with a deafblind student, creating a shared communication space where both students are comfortable and engaged.

#### Divergence in Communication

Divergence occurs when individuals maintain distinct communication styles that highlight differences between them, and in this context, it can refer to instances where

the communication methods of deaf students and deafblind students remain separate. For example, deaf students who use sign language may diverge from deafblind students who rely on tactile methods or braille, as these methods may be incomprehensible to deaf students if they do not make efforts to adjust. In these cases, divergence could result from a lack of knowledge or training, or simply from the necessity of keeping communication styles distinct for clarity. This form of divergence may present challenges in terms of accessibility and inclusion. If communication methods are not adapted or converged, it can lead to misunderstandings, isolation, or exclusion. However, divergence can also serve to preserve the identity and independence of each group (deaf and deafblind), especially when different methods are needed for effective communication.

Example: A deaf student who is unfamiliar with tactile signing might not be able to effectively communicate with a deafblind student, resulting in a divergence of communication methods that may lead to frustration or a sense of exclusion.

### **Role of Teachers and Interpreters in Accommodation**

Teachers and support staff at the School for the Deaf in Mampong play a pivotal role in facilitating convergence and minimizing divergence by mediating communication between deaf and deafblind students. Teachers may act as bridges to ensure that both groups of students can communicate effectively. They may assist deaf students in learning tactile sign language and ensure that deafblind students receive appropriate support in the form of braille materials, tactile signing interpreters, or personalized accommodations. The presence of trained interpreters also enhances communication between deaf and deafblind students, as interpreters can adjust their methods based on the specific needs of each student.

According to (Communication Accommodation Theory (CAT) teachers who adopt convergent communication strategies (such as using clear sign language or tactile methods) demonstrate their willingness to understand and integrate the communication needs of deaf and deafblind students. When teachers make efforts to adjust their communication styles, they not only enhance mutual understanding but also encourage the same behavior in students (Reis & Sprecher, 2011).

Example: A teacher in the School for the Deaf in Mampong might use a combination of visual cues and tactile sign language to communicate with deaf and deafblind students, ensuring that both groups can understand the lesson content.

Identity and Social Interaction: Communication Accommodation Theory also touches on the importance of social identity in shaping communication behavior. Deaf and deafblind students often develop a strong sense of identity within their respective groups, and communication plays a crucial role in the formation of these identities. Deaf students may identify with the deaf community and culture, while deafblind students may develop a unique identity as individuals with dual sensory impairments. These identities influence how they interact with others and how they adapt their communication strategies.

In the School for the Deaf in Mampong, deaf students may converge on their communication strategies with their peers who share similar sensory experiences. However, when interacting with deafblind students, they may diverge their communication style to accommodate the distinct needs of the deafblind peers. This adaptation in communication fosters respect for the unique identity of each group, while simultaneously facilitating social inclusion.

Example: The development of a shared identity among deaf and deafblind students in Mampong might encourage them to use tactile sign language as a means of

convergence, reinforcing their collective desire for inclusive interaction despite their differences.

### **Conclusion**

The Communication Accommodation Theory offers a valuable framework for understanding the dynamics of communication between deaf and deafblind students at the School for the Deaf in Mampong, Ghana. By focusing on the processes of convergence and divergence, CAT highlights the communication adaptations that students and support staff make to enhance mutual understanding and social inclusion. The theory underscores the importance of adjusting communication strategies based on the needs of others and the role of educators and interpreters in fostering inclusive communication practices.

However, challenges such as limited resources and insufficient training for both students and staff must be addressed to ensure more effective communication between deaf and deafblind students. Overall, the study can contribute to the development of more inclusive educational practices and policies that recognize the unique communication needs of these students.

## CHAPTER THREE

### METHODOLOGY

#### 3.0 Introduction

This chapter presents the methodology for the study on the dynamics of interaction between deafblind and deaf students at demonstration school for the Deaf Mampong - Auapem (DEMOMODEAF). It is a qualitative study which adopted phenomenology design. This chapter discusses research paradigm underpinning the study, research approach, design and profile of the study area, population, sample size, and sampling techniques, instruments for data collection, data analysis, ethical considerations and summary of the study.

#### 3.1 Research paradigm

A paradigm is a set of assumptions about how the issue of concern to researcher should be studied (Kusi et al., 2014). There are many research paradigms, each of which has an epistemological foundation. The most common paradigms identified in research literature are however, positivist, interpretive/constructivist (Henn & Ottomanelli, 2006) and critical paradigm (Kusi, 2012).

This study is situated within the interpretive paradigm, which is appropriate for research aimed at understanding how individuals construct meaning from their lived experiences. The interpretive paradigm, also known as constructivism, emphasizes the subjective nature of reality, proposing that knowledge is socially constructed and best understood through the perspectives of those who experience it (Creswell & Poth, 2018; Schwandt, 2000).

In the context of this study, the interpretive paradigm enables an exploration of how deaf and deafblind students at DEMOMODEAF understand, experience, and navigate their interactions and communication strategies within an inclusive school

environment. In practice, this paradigm supports the use of qualitative research methods, including semi-structured interviews and observations. These tools allow the researcher to gather rich, descriptive data that reflects the perspectives and voices of deaf and deafblind students. They also allow for flexibility and responsiveness to participant's communication needs, which is essential when working with individuals who use diverse and adaptive methods of interaction.

Furthermore, interpretivism acknowledges the importance of context in shaping understanding. In the context of DEMODEAF, the school's inclusive practices and cultural norms influence how students interact and communicate. An interpretivist approach allows these factors to be accounted for in the analysis, ensuring that findings are grounded in the real-life experiences of those directly involved. The paradigm supports an inquiry into how meanings are formed through interaction, how they vary across contexts, and how they are influenced by students' unique sensory and communicative experiences.

### **3.2 Research approach**

A qualitative approach provides a comprehensive summary of experience gained in a specific event of participants (Leavy, 2017). This study adopts a qualitative research approach to explore the nature of interaction, communication strategies, and barriers between deaf and deafblind students at DEMODEAF, Akuapem. Qualitative research is appropriate for this study because it is concerned with understanding how people interpret, construct, and give meaning to their experiences in real-world contexts (Creswell & Poth, 2018; Merriam & Tisdell, 2016).

Researchers use this approach to explore vigorously investigate and learn about social phenomenon: to build a clear understanding and hands on experience about some

events of social life (Leavy, 2014). The aim is to gain deep, context-rich insights into how students with different sensory disabilities engage with one another in an inclusive educational environment.

Qualitative research is particularly useful when the goal is to explore complex human experiences and social interactions that cannot be easily quantified. In this study, the focus is not on measuring how often communication occurs between deaf and deafblind students, but rather on understanding how it occurs, what it means, and what challenges and strategies are involved in these interactions.

This approach is well-suited to investigating:

The lived experiences of students as they navigate interactions with peers who have different sensory abilities. The subjective meanings students assign to communication strategies and social engagement as well as the barriers that affect inclusive interaction from the perspectives of those directly involved.

Qualitative research allows for flexibility and depth, which are essential for engaging with a diverse population such as deaf and deafblind students, where communication modes and experiences vary widely (Patton, 2015). It also enables the researcher to be responsive to participants and choosing a communication preference whether through sign language, tactile methods or guided interviews, thereby promoting inclusivity and ethical engagement.

### **3.3 Research Design**

The researcher employed a Phenomenology design for the study. Phenomenology emphasizes investigation of the way individuals construct their lives and make meaning of their experiences (Cridland et al, 2014; Vagle, 2014). Therefore, the term phenomenology is a research design for mapping the qualitatively different ways in which people experience, conceptualise, perceive, and understand various aspects of

phenomena in the world around them (Shahadat, 2014). Phenomenology is a descriptive, open, flexible and responsive method which allows researchers to deeply and thoughtfully settle into and sit with the phenomenon under investigation (Vagle, 2014). A person's lived experience is a philosophical construct that describes meaning with no personal preconceptions and bias (Vagle, 2014).

According to Creswell, (2018) the descriptive nature of a phenomenology design gives a wider meaning to the lived experiences under study as the core of phenomenological research with the assumption to know about the phenomena under study through consciousness. This design is used to study phenomena in its natural state where people have no or little knowledge about it (Donalek, 2004). Creswell, (2018) reported that in phenomenological research, respondents describe their experiences as they perceive them. The phenomenological design was selected for the study because it enabled me to understand the how Deaf and Deafblind at DEMODEAF communicate and the barriers they have in relationships to their curricula and co-curricular activities. I chose the phenomenological design because it allowed me to declare and state my values, biases, and beliefs toward the objectives while separating and eliminating the biases and personal opinions in order to understand the dynamics of communication between Deaf and Deafblind students (Moustakas, 1994). I chose the phenomenological design because it enabled me to collect data from individuals who have experienced the phenomenon in order to develop complete description of their experiences (Poth, 2018). Their subjective experience stories could be obtained through interviews, discussions and Observations to enable researchers understand and describe the lived experience inductively or deductively.

### 3.4 Profile of the Study Area

Deaf education which eventually ended up being Demonstration School for the Deaf, Mampong started at Osu in Accra in 1957 by an American called Andrew Foster, a Reverend Minister. He tried to establish the school at Osu in Accra without success. In January 1959, he moved the school from Osu to Mampong Akwapem. The school was named Ghana Mission School for the deaf at that time. In 1965, the specialist Teacher training college was established to train teachers who were interested in teaching the deaf children. As part of the training programme for the teachers to practice what they learn, the Demonstration school for the Deaf was established in 1967 to provide that opportunity for the teaches to practice what they learned. The school (DEMOMODEAF) started with 39 students in that year. The school was under specialist training college until 1992, when they were moved to merge with university of education, Winneba and Demonstration school for the deaf became autonomous. The school has five (5) departments. These are KG department, primary department, junior high school department, vocational department and Deafblind department. The current students' population is 531.

The school is set to bring up students in a learning environment that is characterized by academic excellence, core positive values like honesty, discipline and commitment that will make them productive members of the society.

A total of 104 staff members are available in the school. The teaching staff is 56 and 48 non- staff. The minimum qualification for the teaching staff is –A” level certificate and masters being the highest among the teaching staff. On the other hand, the qualifications for the non-teaching staff are BECE, middle school certificate and the highest being a degree holder. They have a total of 27 teachers with special education background out of the 56 teachers.

### **3.5 Population**

The population for the study consisted of 8 participants at Demonstration School for the Deaf, Mampong-Akuapem. In accordance with (Giorgi, 2017) sample of a qualitative study are purposively made based on their possession of certain characteristics and knowledge that are of much relevance to the topic under study.

### **3.6 Sample Size**

The sample for this study consists of eight (8) participants, comprising three (3) deafblind students and five (5) Deaf students, all of whom are peers and friends of the deafblind students. Of the total participants, six (6) are female and two (2) are male, with ages ranging from 15 to 20 years. The participants are enrolled in Basic 6, Basic 7, and Basic 8, with an average age of 18 years.

The participants present varying degrees and onset of hearing loss, as well as combined hearing and visual impairments in the case of the deafblind students. Hearing levels were confirmed through pure-tone audiometry (audiograms), while visual impairment was confirmed using standard visual acuity assessments.

#### **Deaf Students**

The five (5) Deaf students included in the study exhibit different degrees and onset of hearing loss, as confirmed by pure-tone audiometry:

Deaf Student 1 and Deaf Student 2 are post-lingual Deaf, having acquired hearing loss later in life due to illness. Their audiograms indicate hearing thresholds of 71 dB HL, which places them within the severe degree of hearing loss, according to standard audiological classification.

Deaf Student 3, Deaf Student 4, and Deaf Student 5 demonstrate profound hearing loss, with audiometric thresholds measuring 120 dB HL or greater across tested

frequencies. This degree of loss is classified as profound hearing loss, indicating little to no functional hearing even for very loud sounds.

All Deaf participants are enrolled in Basic 7 and Basic 8 and have well-developed sign language skills, which supported effective communication during the data collection process.

#### Deafblind Students

The three (3) deafblind students included in the study have dual sensory impairments, with both hearing and vision loss confirmed through standardized assessments:

Deafblind Student 1 presents a severe to profound degree of hearing loss, with audiogram thresholds ranging from 71 dB HL to above 120 dB HL across tested frequencies, as measured by pure-tone audiometry. Visual assessment classifies the student as profoundly blind, with a visual acuity of 20/400 or worse.

Deafblind Student 2 demonstrates profound hearing loss, with audiometric thresholds of 120 dB HL and above, confirming a profound degree of auditory impairment. Visual acuity testing similarly classifies this student as profoundly blind (20/400 or worse).

Deafblind Student 3 has a severe to profound hearing loss, with pure-tone audiometry results showing thresholds between 71 dB HL and 120 dB HL. Visual acuity assessment confirms profound blindness, consistent with a visual acuity of 20/400 or worse.

The decision to select a small sample size of 8 participants stems from the qualitative nature of the study, which aims to gather in-depth insights into the experiences, challenges, and educational needs of a specific group of students. Qualitative studies often focus on smaller sample sizes to allow for detailed, rich data collection and analysis (Creswell & Poth, 2017).

The small sample size is also practical, as students with both severe sensory impairments (deaf and deafblind) represent a narrow, specialized population. Including four students allows for an in-depth exploration of their individual challenges and experiences in a controlled setting, without the need for a large sample that might be difficult to access.

### **03.7 Sampling Technique**

This study employed a mixed sampling approach, specifically using criterion purposive sampling for the selection of deaf students and total population sampling for the deafblind students.

Criterion Purposive Sampling (for deaf students):

This type of purposive sampling technique is commonly used in qualitative research to select participants who possess specific characteristics or experiences relevant to the research objectives (Edmonds & Kennedy, 2017). Given the study's focus on interactions and communication between deaf and deafblind students, the number of deaf students were purposefully selected based on specific inclusion criteria:

- i. They must have had frequent interactions or collaborative experiences with deafblind peers.
- ii. They must have completed at least one full academic term of such interaction.
- iii. They must be able to communicate using sign language.

This method was appropriate because it allowed the researcher to select students who were most likely to provide deep insights into the research focus. As Patton (2002) explains, purposive sampling is effective when the goal is to study a specific subset of a population with relevant characteristics.

Total Population Sampling (for deafblind students):

All 3 deafblind students enrolled at DEMODEAF were included in the study. This is a form of total population sampling, a subtype of purposive sampling, where every member of a small, specialized population is selected due to the rarity or importance of the group in relation to the research question.

I chose the entire population of the deafblind because the size of the deafblind students available was very small.

Total population sampling is particularly useful when the group is small, but every member is crucial to understanding the phenomenon under investigation (Etikan, Musa, & Alkassim, 2016).

I used the two techniques because it was necessary to accommodate the distinct characteristics of each subgroup:

The deaf student group was large, requiring a purposive selection of those with direct, sustained interaction with deafblind peers.

The deafblind student group was very small, making total inclusion the most practical and informative approach.

This combined strategy ensured depth (from purposefully selected deaf students) and completeness (from all deafblind students), thereby enhancing the reliability and richness of the qualitative data collected.

### **3.8 Instrumentation**

In qualitative research, instruments serve as the tools through which in-depth understanding of lived experiences is accessed. Unlike quantitative research that employs numerical tools and standardized metrics, qualitative instrumentation is flexible and adaptive, enabling the researcher to explore complex social phenomena in naturalistic settings (Creswell & Poth, 2018).

This study employed semi-structured interviews as the primary data collection instrument. Semi-structured interviews combine the consistency of a pre-determined question guide with the flexibility to probe for details, allowing the researcher to delve deeper into participant experiences as they unfold (Kallio et al., 2016). The choice of semi-structured interviews is particularly suitable for phenomenological and exploratory studies, where the aim is to uncover the subjective meanings participants ascribe to their experiences—in this case, communication between deaf and deafblind students at DEMODEAF.

Interview questions were guided by key themes from the literature (e.g., communication forms, barriers, interpersonal dynamics). This flexibility enriched the data and promoted more authentic expression from participants, a hallmark of robust qualitative inquiry (Patton, 2015).

Additionally, the interviews were conducted in environments familiar to the participants, and when necessary, interpreters and communication facilitators were included to ensure accessibility—an essential ethical and methodological consideration in disability-related research (Slee, 2013).

### **3.9 Trustworthiness in Qualitative Research**

Establishing trustworthiness is fundamental to ensuring the rigor, validity, and reliability of qualitative research. Unlike quantitative studies, which are judged based on statistical reliability and validity, qualitative studies must be evaluated using criteria that reflect the interpretive and contextual nature of the research process. Scholars such as Lincoln and Guba (1985) have proposed a framework for assessing the rigor of qualitative research through the constructs of credibility, dependability, confirmability, and transferability—collectively referred to as the criteria for trustworthiness. In the context of this study, which employed a phenomenological

approach to explore the interactions between deaf and deafblind students at the Demonstration School for the Deaf (DEMODEAF), these four criteria were rigorously applied to ensure that the findings authentically represent the participants' lived experiences.

### **3.9.1 Credibility**

Credibility, often compared to internal validity in quantitative research, refers to the degree to which the findings of the research accurately reflect the participants' realities and perspectives (Lincoln & Guba, 1985). In phenomenological research, where the goal is to capture the lived experiences and meaning-making processes of participants, establishing credibility is crucial.

To ensure credibility in this study, member checking was employed as a central strategy. Member checking involves presenting participants with their transcripts, interpretive summaries, and emerging themes to validate that their perspectives have been accurately represented (Birt, Scott, Cavers, Campbell, & Walter, 2016). During this study, selected participants were asked to review summaries of their interviews and offer feedback on the interpretations made. This process served a dual purpose: it empowered participants by recognizing their role in knowledge production and reduced researcher bias by allowing corrections or elaborations to be made.

Additionally, prolonged engagement and persistent observation were used to enhance credibility. The researcher spent substantial time in the research setting, observing natural interactions between deaf and deafblind students and engaging informally with staff and students. This immersion helped the researcher develop contextual understanding, which in turn informed the interpretation of interview data (Shenton, 2004).

Triangulation of data sources—semi-structured interviews, observational notes, and institutional documents (e.g., communication guides and teaching materials)—further strengthened the credibility of the findings. By cross-verifying data from multiple sources, the researcher ensured that the conclusions were not solely dependent on one viewpoint or method (Patton, 2015).

### **3.9.2 Dependability**

Dependability in qualitative research is analogous to reliability in quantitative research and refers to the stability and consistency of findings over time and across conditions. It addresses the question of whether the research process is logical, traceable, and well-documented (Lincoln & Guba, 1985). In this study, an audit trail and thick description were the primary tools used to establish dependability.

A comprehensive audit trail was maintained throughout the research process. This included detailed documentation of the research design, rationale for methodological choices, interview protocols, coding decisions, theme development, and researcher reflections. This level of transparency allows other researchers to follow the study's path and assess its methodological soundness (Nowell et al., 2017).

The study also employed copious description to provide rich contextual detail of the school environment, participants' background, and the communication dynamics under investigation. Thick description not only aids in understanding the research setting but also adds realism and depth to the findings, allowing readers to enter the participants' social world (Denzin, 2001). According to Little and Rice (2021), this approach is essential in qualitative inquiry because it makes the setting and data come alive for the reader, contributing to both dependability and transferability.

Furthermore, the interview questions were pilot tested, and interview transcripts were reviewed multiple times to ensure consistency in interpretation. Emerging themes

were discussed with peers and experts in deaf education to verify their plausibility and robustness.

### **3.9.2 Confirmability**

Confirmability pertains to the objectivity of the research findings. It ensures that the data and interpretations are clearly derived from the participants' responses and not influenced by researcher bias, interests, or preconceptions (Connelly, 2016). To achieve confirmability, the researcher must demonstrate a clear linkage between the data and the conclusions drawn.

In this study, triangulation again played a key role in ensuring confirmability. By gathering data from interviews, direct observations, and school documents, and by analyzing the data through multiple lenses, the risk of subjective interpretation was minimized. For example, themes identified in interview data were cross-referenced with observations of student behavior in class and informal interactions to ensure alignment.

A reflexive journal was also maintained throughout the study. Reflexivity is the process by which the researcher critically examines their own role, assumptions, and influence on the research process. The journal included notes on the researcher's positionality, reflections on data collection experiences, emotional responses, and decisions made during analysis. According to Berger (2015), reflexive journaling is a cornerstone of qualitative rigor as it promotes transparency and reduces interpretive bias.

In addition, external audits were conducted by consulting with academic supervisors and experts in special education. These external reviewers evaluated the data and interpretations, ensuring that findings were grounded in the data and not skewed by the researcher's perspective.

### 3.9.3 Transferability (Authenticity)

Transferability refers to how well the results of a qualitative study can be applied or related to different contexts, settings, or groups, with sufficient contextual detail provided so that readers can determine the relevance of the findings to their own situations (Stalmeijer, Brown, & O'Brien, 2024). While generalization in the statistical sense is not a goal of qualitative research, transferability ensures that readers are provided with enough contextual detail to make judgments about the relevance of findings to their own situations.

In this study, authenticity—a concept closely tied to transferability—was ensured by incorporating a wide range of participant perspectives and using direct quotations to support each emergent theme. Each quotation was linked to a participant code, ensuring traceability to the original data. As noted by Kyngäs et al. (2020), the use of citations from different participants allows researchers to fairly and faithfully show the range of realities encountered in the study. Moreover, context-rich narrative descriptions of the school, its social dynamics, and the educational environment were presented throughout the findings. These descriptions, combined with detailed thematic analysis, enable readers to draw analogies with other inclusive educational settings, especially in contexts where students with sensory disabilities interact. To further enhance transferability, the study sample included participants from diverse backgrounds (e.g., gender, grade levels, communication modalities). This variation allowed for the exploration of communication dynamics from multiple angles, increasing the likelihood that findings are relevant to a broader range of similar contexts.

### 3.10 Procedure for Data Collection

For data collection, accessing the participant through the right approaches is important.

The first thing I did was to explain the significance of the study to the headmaster before I could gather data from the students. I went home after the first visit with the headmaster and came back the next day to try and get access to collect the data. I then obtained permission to carry out the study from the head headmaster of Demonstration School for the Deaf with an introductory letter from the Department of Special Education. I was then directed to the person in charge of the blind unit by the headmaster. I could not reach him the first day I visited his office, so I returned the following day and met him at his office. I explained the purpose of my study and the assistance I would need from him. Since deaf students are part of the study, the headmaster told me to see the assistant headmaster who is the head of academics and had an interaction with him concerning the purpose of the study as well as the assistance I needed from him. I was then led to the classroom of the deafblind students where we met 3 deaf students communicating with their colleagues' deafblind students. Later that day, with the help of the facilitators I met all the deafblind participants and briefed them about the purpose of the study. During the engagement with them I introduced myself, explained the purpose of the study. The facilitators helped me to explain the consent form to the deafblind students. Soon after the interaction, all of them agreed and gave me the approval to conduct the interview with the participants in the school.

At the time of the meeting, I gave each of the participants (deafblind students) an information sheet. The information sheet was brailled, yet the facilitators helped explain it to the deafblind students. The participants were informed through the

information sheet about me as a researcher, the purpose of the study and the expectation of the study. They were also informed through the information sheet that their data would be recorded and they can choose whether to participate or not in the study. After the participants (deafblind) have read, all of the 3 deafblind students accepted to participate in the study and a consent form was given to each of the participants to append their signature by brailing and the researcher also signed in their presence. I contacted the facilitators to help schedule a time for the interview to begin. With the help of the facilitators, I interviewed the deafblind students using tactile sign language and recorded them using a mobile phone (Samsung S14) at their own convenient time which lasted for 35minutes.

Due to time, I had to go and come back a week later to meet with the deaf participants again in order to continue the interview. When I came the facilitators of DEMODEAF helped me to reach out to all the 5 deaf participants and held a meeting with them and explained to them the agenda for meeting them. During the meeting, I distributed the information sheet to each of the students. The information sheet introduced me as a researcher, the purpose of the study and the expectations in the study to them. On the information sheet, it was stated clearly that the interview with them would be video recorded because the interactions were conducted in Ghanaian Sign Language (GhSL) of which the facilitators assisted me to carry it out. The participants were also informed through the information sheet that their responses would be kept confidential and they can also withdraw from the study at any time they wish to do so. After the students read the information sheet, the facilitators assisting me further explained it to them in case they could not understand what they read. All the 5 students accepted to participate in the study and I gave them a consent form to sign and I equally sign in their presence. The facilitators assured me that, they would

communicate with and arrange with them on an agreed date, time and venue for the interview session. The interview was conducted on one-to-one with the assistance of their facilitators who were proficient in GhSL and were familiar to the students. The interview was conducted with the students in GhSL and was video recorded with an iPhone 10 camera in one of their classrooms at Demonstration School for the deaf which lasted for 35 minutes. The students were given the opportunity to express their views and feelings without any pressure on them. After I collected the data from all the participants (both deafblind and deaf students), I watched and transcribed the video-taped interview data verbatim from GhSL in Microsoft Word Document to correct English language. I cross-checked and read the transcriptions continuously to make sure the data represent the responses which was given by deafblind and deaf students during the interview soon after the transcription.

### **3.11 Data Analysis**

I adopted an inductive thematic approach to identify the key themes and sub-themes emerging from the data collected through interviews and field observations. In response to research question 1, four main themes were identified. For research question 2, four main themes emerged from the data. Lastly, in addressing research question 3, three main themes were also identified. I analyzed the data based on each theme derived from the research questions that I posed. I transcribed the data and read the data continuously and familiarized myself with the data. I developed codes and categorized them into a unit of sentences or phrase. I used the participants' verbatim expression when necessary to confirm their responses.

### **3.12 Ethical Consideration**

Ethics are principles that determine what behaviour is acceptable and inappropriate (Resnik,2012). Resnik (2012) further added that, they are approaches, protocols or viewpoints for choosing how to respond to a specific situation. Before I began the data collection process, I requested permission from the Headmaster of Demonstration school for the deaf Mampong, Akuapem and those in charge from the deafblind and the deaf units with an introduction letter from Department of Special Education and the heads granted me permission to carry out the study.

I prepared an information sheet and a consent form for each participant. The participants' expectations for the study, as well as my role as a researcher and the purpose of this study were explained to them on the information sheet. The participants through the information sheet were also informed to decide whether or not to participate in the study. The information sheet also gave them an explanation of how the study's data would be gathered and stored. After participants read and accepted to take part in the study, I gave them a consent form to sign and I equally signed in their presence as well. I agreed with the participants on schedule dates and time for data collection. The participants were also informed about their ability to withdraw from study at any time they wish to do so.

All the participants were assured that the data that was generated from them would be kept strictly confidential and used for academic purpose only.

## CHAPTER FOUR

### PRESENTATION AND ANALYSIS OF DATA

#### 4.0 Introduction

This chapter presents the findings of the study and analyzes the collected data. The chapter is structured according to the research objectives, with key themes emerging from the data. The findings are presented using qualitative descriptions, direct quotes from participants, and thematic analysis to provide a comprehensive understanding on the interaction between deaf and deaf blind students at Demonstration School for the deaf, Mampong-Akuapem.

#### 4.1 Themes Based on Research Questions

**Table 4.1**

Research Question	Themes	n
1. What is the nature of communication between deaf and deafblind students?	<ul style="list-style-type: none"> <li>• Forms of Communication</li> <li>• Levels of Understanding of Interaction</li> <li>• Role of Interpersonal Relationships</li> </ul>	
2. What are the strategies deaf and deafblind students use to communicate among themselves?	<ul style="list-style-type: none"> <li>• Contextual and Situational Communication</li> <li>○ Use of Assistive Tools and Technology</li> <li>○ Peer-to-Peer Adaptation Techniques</li> <li>○ Teacher and Staff Support Strategies</li> <li>○ Non-verbal and Environmental Cues</li> </ul>	
3. What barriers hinder successful communication between deaf and deafblind students at Mampong School for the Deaf?	<ul style="list-style-type: none"> <li>• Lack of Specialized Communication Skills</li> <li>• Institutional and Resource Constraints</li> <li>• Social and Psychological Barriers</li> </ul>	

**Source:** Author's Computations from field Data 2024

### **Research Question One: How is the nature of interaction between deaf and deafblind students at Demonstration School for the deaf, Mampong-Akuapem?**

This section presents an in-depth analysis of four key themes that emerged from the study regarding the interaction between deaf and deaf blind students at Demonstration School for the deaf, Mampong-Akuapem. The themes analyzed include:

1. Forms of Communication
2. Levels of Understanding and Interaction
3. Role of Interpersonal Relationships
4. Contextual and Situational Communication

The analysis includes verbatim expressions from participants to provide authentic insights into their perspectives.

#### **Forms of Communication**

Communication as important as life, there should definitely be forms of communication used in every single interaction. The participants outlined the various forms of communication they use in interacting with one another at Demonstration School for the deaf, Mampong.

The understanding of each person's ability helps in communication. One deaf student said:

*“I use Ghanaian Sign Language with most friends, but for the deafblind ones, I touch their hands to sign.” (Deaf 4)*

On the other hand, the deafblind students also spoke about forms of communication they use. One of the deafblind students remarked:

*“I cannot see, so I understand better when someone signs into my palm or guides my hand to feel their signs.” (Deafblind 1)*

The findings suggest that there is a diversity of communication forms used between deaf and deafblind students. While Ghanaian Sign Language (GHSL) is common among deaf students, tactile signing, touch cues, and object-symbol communication are used with deafblind peers. The need for hand-over-hand signing shows that different modalities are required, and successful communication depends on whether the deaf student is trained in tactile methods.

### **Levels of Understanding and Interaction**

Despite the diversity in the form of communication used by the deaf and deafblind students, they both (deaf and deafblind) highlighted on the need to comprehend the interaction. The deaf students hinted on the stress they had to go through when they communicated with the deafblind students.

One deaf student stated:

*“when I am talking to my deaf friends I sign fast, with the deafblind sometimes they don’t understand me quickly, so we have to go slowly.”*

*(Deaf 3)*

Another deaf student reiterated on the difficulty knowing that an interaction is well understood on the part of the deafblind students:

*“I don’t always know if they understood me unless they respond with a smile or sign back.” (Deaf 1)*

On the part of the deafblind students they expressed how they want their communication to be for comprehension to take place. One deafblind student remarked:

*“If they move too fast, I get confused. I like when they take their time and touch my hand to explain.” (Deafblind 3)*

The findings highlighted that understanding varies depending on the pace and clarity of interaction. Deafblind students require slower, more deliberate communication, while deaf students may struggle to recognize signs of comprehension. This highlights the need for mutual adaptation and patience.

### **Role of Interpersonal Relationships**

The participants talked about the influence close bonding on communication.

One deaf said:

*“My deafblind friend likes it when I sit close and hold their hand while we talk.” (Deaf 5)*

Some of the participants highlighted the importance of time in influencing communication between a group of such sensory impairments.

Another deaf stated:

*“It’s easier to talk to my deafblind friend because we have known each other for some years, some students are shy to talk to the deafblind ones because they don’t know how.” (Deaf 2)*

One deafblind student reiterated:

*“I feel happy when someone I trust talks to me often. It makes me feel part of the group and makes communication easier.” (Deafblind 3)*

The findings suggest that familiarity and trust greatly influence interaction quality. Familiarity increases confidence among deaf students who are close to deafblind peers (who rely on consistent partners) and are more likely to make the extra effort required for effective communication, while others may withdraw due to discomfort or lack of skill. This theme emphasizes the role of emotional connection and familiarity in fostering inclusive communication.

## **Contextual and Situational Communication**

Settings also had influence on how the two parties communicate. A deaf student said:

*“When there is a lot of movement, it is harder to focus on signing but one-on-one moments, it’s easier to talk to my deafblind friend.” (Deaf 4)*

In agreement, one deafblind student remarked:

*“I can talk more when it’s quiet, and someone has time for me. It’s hard in a crowd because the deaf students get distracted.” (Deafblind 2)*

In another setting like the classroom, certain factors influenced communication. One deaf student highlighted:

*“In class, I get help from the teachers to talk to deafblind students. But outside, it is a bit hard when no one is around.” (Deaf 1)*

The findings highlighted that communication success fluctuates based on environment and structure. In structured settings (like classrooms), support from teachers enhances inclusion. However, in busy contexts, visual and tactile cues may be disrupted. One-on-one settings allow for more patient, intentional, and effective communication. This theme underscores how environmental and social context affect communication accessibility.

### **Research Question Two: What are the strategies deaf and deafblind students use to communicate at Demonstration School for the Deaf, Mampong?**

The interaction between deaf students and deafblind individuals presents unique challenges and necessitates the use of specialized communication strategies. Deafblindness, which is a combination of both visual and hearing impairments, significantly impacts the way individuals communicate, and the interaction strategies must be adapted accordingly. This section examines four key themes:

- i. Use of Assistive Tools and Technology
- ii. Peer-to-Peer Adaptation Techniques
- iii. Teacher Support Strategies
- iv. Non-verbal and Environmental Cues

The analysis incorporates participants perspectives on the various themes raised.

### **Use of Assistive Tools and Technology**

The absence of certain sense organs responsible for communication may pose significant challenge in interacting with similar impairment. Assistive technology plays a vital role in enhancing communication and learning for deaf and deafblind students. For deaf and deafblind students to benefit from each other, assistive tool turned out to be of a great assistance to both parties (deaf and deafblind). The deaf and the deafblind relied on the available assistive technology to communicate. One deaf student said:

–Some deafblind students use braille slates to write when we are playing, and I read it with help.” (Deaf 2)

With the assistive tools available, one deafblind student lamented:

–Not everyone uses technology because I have never used any apart from the braille slate. I think we do not have.” (deafblind 3)

Assistive tools such as braille play a supporting role in facilitating communication. Deaf students benefit more from visuals, while deafblind students use tactile tools. However, training is limited, restricting consistent use. Also, both groups report limited access to personalized devices, pointing to a gap in technological equity.

### **Peer-to-Peer Adaptation Techniques**

Peer adaptation techniques are pivotal in communication, most importantly interaction between deaf and deafblind individuals. Participants expressed how that strategy is vital in their daily interaction.

On deafblind student highlighted:

–Some friends create special touches to give me a signal of something or signs just for me. It helps a lot.” (Deafblind 2)

In agreement, one deaf student said:

–We sometimes create our own signs or tap patterns to show meaning.” (Deaf 1)

The findings revealed that students often create personalized systems (taps, hand gestures, tactile signs) demonstrating innovation. Deaf students adjust methods based on the deafblind student’s responsiveness, while deafblind students value these unique adaptations, indicating a flexible, peer-driven strategy.

### **Teacher Support Strategies**

Although deaf and deafblind students use different communication strategies to interact, teachers also played a role in facilitating a smooth interaction between the two parties (deaf and deafblind).

One deaf said in appreciation:

–Our teacher in charge of the deafblind students teach us how to read braille and how to braille so that we can communicate with the deafblind students.” (Deaf 5)

Another deaf added:

–sometimes our teachers group us and teach us how to talk slowly and better with the deafblind friends using tactile sign language.” (Deaf 3)

The deafblind also appreciated how the teachers had helped their interaction with their deaf peers, one deafblind remarked:

–Sometimes the teachers explain the hand orientation to my deaf friends so that they know how to hold my hand and sign.” (deafblind 2)

The findings highlighted that teacher play a bridging role, modeling inclusive behavior and facilitating understanding among deaf and deafblind students.

### **Non-verbal and Environmental Cues**

Due to the loss of some of the sense organs, the participants sometimes relied on the environment to enhance the mode of communication. On deaf student attested:

–I tap the shoulder or wave in front of her to get her attention.” (Deaf 4)

Other participants also shared their views on the importance of non-verbal cues.

One deafblind student said:

–I feel for movements or touches. If the light changes or someone moves my hand, I know someone is around.” (Deafblind 2)

The findings suggested that communication is enhanced through non-verbal cues like tapping, movement, or touch. Deaf students often initiate with physical signals, while deafblind students interpret through touch and environmental changes. This underlines the importance of physical awareness in communication.

### **Research Question 3: What are the barriers to successful communication between deaf and deafblind students at Demonstration School for the Deaf, Mampong?**

Despite the different strategies and support they use in the communication: deaf and deafblind students face peculiar challenges when interacting with each other. These are discussed under the following themes:

- i. Lack of Specialized Communication Skills
- ii. Institutional and Resource Constraints
- iii. Social and Psychological Barriers

### **Lack of Specialized Communication Skills**

Despite the school being inclusive, students do not have the skills needed to communicate with each other (deaf and deafblind). One deaf lamented

–Nobody taught us how to communicate with deafblind students properly, when you make friends with them, that is all.” (Deaf 5)

Another Deaf added:

–Sometimes I want to say something, but I don’t know the right way to show it.” (Deaf 2)

In addition, one deafblind person remarked:

–Some people don’t know how to talk to me. They stop trying if I don’t respond fast.” (Deafblind 3)

The findings suggest that both groups suffer from limited training in tactile or adapted sign language, especially among deaf students. Deaf students lack confidence, while deafblind students feel neglected due to communication breakdowns. This lack of training leads to communication breakdowns and reduced interaction. The absence of formal instruction in specialized communication methods widens the gap between deaf and deafblind peers, despite the willingness to connect.

### **Institutional and Resource Constraints**

For deaf and deafblind students to communicate effectively, the institution they find themselves in also play a vital role in enhancing the mode at which they

communicate. Participants lamented on how inadequate resources and the availability of resources affect their communication. A deaf student said:

–The school does not have enough materials to help talk easily with the deafblind students.” (Deaf 5)

–There are not many people who know how to help me, and I don’t have my own tools.” (Deafblind 1)

The findings suggest that both groups recognize the lack of adequate resources and tailored materials. Deaf students feel unprepared to help, and deafblind students feel unsupported. These structural gaps hinder everyday communication and inclusion.

### **Social and Psychological Barriers**

Communication between the deaf and deafblind students sometimes came to a halt, although the participants are willing to communicate more often but certain barriers came in their way. One deaf student reiterated:

–My friend (deafblind) likes conversation, but signing into her hands for a long time is too hard for me.” (Deaf 2)

The deafblind also talked about the reason why communication breaks down between them and the deaf. A deafblind student said:

–Sometimes I feel lonely when no one comes to talk. Maybe their friends who are deaf how they spend too much time with me so I think they are shy of sitting too long with me.” (Deafblind 3)

The findings highlighted that social discomfort can discourage communication attempts. Psychological barriers such as shyness, anxiety, or fear of exclusion affect both deaf and deafblind students. The result is social distancing and emotional isolation for deafblind individuals. These emotional barriers can be addressed through empathy training, confidence-building, and peer sensitization programs.

## CHAPTER FIVE

### DISCUSSION OF FINDINGS

#### 5.0 Introduction

Chapter five presents a comprehensive discussion of the findings deduced from the study, aligning them with existing literature and theoretical perspectives. This chapter critically examines the nature of communication between deaf and deafblind students, the strategies deaf and deafblind students use to communicate and barriers to successful communication between deaf and deafblind students. By comparing the study's findings with previous research, the discussion highlights agreements, contradictions, and emerging insights that contribute to a deeper understanding of the interaction between the deaf and deafblind students at Demonstration School for the deaf, Mampong-Akuapem.

**Research Question One: How is the nature of interaction between the deaf and deafblind students at Demonstration School for the Deaf, Mampong-Akuapem?**

Communication is a fundamental aspect of human interaction, serving as a bridge that connects individuals and fosters social integration. In inclusive educational settings, such as the Demonstration School for the Deaf in Mampong-Akuapem, understanding the communication dynamics between deaf and deafblind students is vital for promoting equitable learning and social experiences. This section explores the nature of interaction through four key themes: forms of communication, levels of understanding and interaction, interpersonal relationships, and contextual and situational communication.

### **Forms of Communication**

In the context of Mampong School for the Deaf, the study found that deaf and deafblind students employ a range of communication methods including Ghanaian Sign Language (GHSL), tactile signing, hand-over-hand signing, and non-verbal physical cues such as tapping or guiding hands. These findings are consistent with Schroeder et al. (2019), who emphasize that effective communication in deafblind communities requires individualized and adaptive communication strategies, tailored to each student's sensory profile.

Further, Dammeyer and Larsen (2016) emphasize the importance of sensory-based adaptations in communication, noting that the loss of one or more senses fundamentally alters how individuals perceive, access, and convey information.

In particular, tactile communication methods like tactile fingerspelling and ProTactile communication are vital tools for those who are deafblind, especially when visual sign language is inaccessible (Petronio & Dively, 2006). However, despite the use of these adaptive strategies, the study revealed a lack of standardized training among peers and staff in tactile communication. This echoes the findings of Mitchell et al. (2020), who assert that training in inclusive communication strategies is critical for ensuring that all students, regardless of sensory abilities, can engage meaningfully with each other. The absence of such training contributes to communication gaps and social isolation for deafblind students.

### **Levels of Understanding and Interaction**

The study observed that the level of mutual understanding between deaf and deafblind students varied significantly based on the communication method and context. Deaf students expressed difficulty in confirming whether their deafblind peers had understood their message unless there was explicit feedback. Conversely, deafblind

students indicated that communication required slower pacing, repeated gestures, and deliberate touch-based signals to ensure clarity. This need for deliberate and patient communication aligns with Marschark and Knoors (2012), who note that the effectiveness of communication between individuals with hearing and vision impairments depends on the adaptability and clarity of the method used. Heed et al. (2020) further affirm that intentional communication practices, such as confirmation checks and feedback loops, are essential for bridging gaps in understanding. Moreover, misunderstandings were common, which supports the argument by Dye et al. (2018) that inclusive educational practices should incorporate peer-assisted learning, where students help clarify concepts and correct communication errors collaboratively. This peer scaffolding not only facilitates understanding but also fosters empathy and interdependence among students.

### **Role of Interpersonal Relationships**

A central theme that emerged from the study was the significance of interpersonal relationships in enhancing communication. Both deaf and deafblind students reported that communication was more successful with familiar peers. Long-standing friendships built trust, predictability, and emotional safety, which in turn improved interaction quality. This finding is in line with Vygotsky's Social Development Theory (1978), which posits that social interaction is foundational to cognitive and communicative development. When peers share emotional bonds and social histories, their ability to co-construct meaning and navigate communication barriers is enhanced.

Raghavendra et al. (2020) also emphasize the value of peer relationships in promoting social inclusion for students with disabilities, noting that friendships are powerful tools for reducing isolation and increasing participation. However, the study also

found that some deaf students avoided interaction with their deafblind peers due to fear of saying or doing the wrong thing—a concern validated by Miller et al. (2016), who explore the psychological barriers such as fear, anxiety, and discomfort associated with unfamiliar communication needs. Thus, building stronger interpersonal ties and fostering empathy through inclusive training can mitigate these fears and enhance interaction frequency and quality.

### **Contextual and Situational Communication**

The study highlights that the context and setting significantly influenced communication success. Structured, quiet, and distraction-free environments facilitated more effective interaction, while noisy or visually cluttered settings hindered understanding particularly for deafblind students, who rely on tactile cues and sometimes environmental feedback like vibrations or spatial orientation.

This is supported by Gregory et al. (2013), who argue that the classroom environment plays a pivotal role in facilitating inclusive communication, especially for students with sensory impairments. Similarly, Lederberg et al. (2013) note that physical environments must be intentionally designed to support multimodal communication, ensuring accessibility through layout, lighting, and sound control. The lack of designated quiet zones or adaptive classroom designs in some parts of the school created significant challenges. This aligns with the work of Bruce et al. (2016), who argue for the implementation of universal design principles to support diverse learners, including those with dual sensory loss.

### **Conclusion**

In conclusion, the interaction between deaf and deafblind students at Mampong School for the Deaf is characterized by a complex interplay of adaptive

communication methods, interpersonal familiarity, and environmental influences. While deaf students primarily use Ghanaian Sign Language (GHS�), deafblind students depend on tactile and touch-based communication, necessitating mutual adaptation and shared understanding.

Training in tactile signing, peer-led learning, and the creation of inclusive, structured environments are critical to enhancing these interactions. Furthermore, fostering trust-based relationships and reducing psychological barriers such as fear and discomfort are vital to improving the social and educational experiences of both deaf and deafblind students.

### **Research Question Two: What Strategies Do Deaf and Deafblind Students Use to Communicate at Demonstration School for the Deaf, Mampong-Akuapem?**

In inclusive educational environments, effective communication strategies are vital to enabling full participation and learning for all students, especially those with sensory impairments. At the Demonstration School for the Deaf in Mampong-Akuapem, deaf and deafblind students employ a variety of communication strategies to overcome communication barriers. These include the use of assistive tools and technology, peer-to-peer adaptation techniques, teacher support strategies, and non-verbal and environmental cues. Each theme is explored below with elaboration and supported by relevant literature.

#### **Use of Assistive Tools and Technology**

Assistive technologies are widely recognized as essential in supporting communication for students with sensory disabilities. At Mampong, tools such as braille slates, vibrating alert devices, visual alarms, and occasionally communication boards are used. However, their application remains context-specific and inconsistent,

mainly due to uneven access, limited institutional resources, and lack of user training. This is consistent with Hersh & Johnson (2008), who argue that while assistive technologies offer the potential to bridge major communication gaps, they are only effective when matched with appropriate user training and system-level support. The lack of autonomy in device use at Mampong, with students often depending on peers or teachers to facilitate access further underscores the need for systematic training programs, as also recommended by Lamb and Klein (2013), who found that student independence improves when both students and staff are trained to use assistive technologies effectively. The opportunity here lies in the scaling of access and capacity-building among users. As Kelly & Smith (2011) emphasize, assistive technology can transform learning when integrated holistically into school systems. Investment in technology alone is insufficient: the ecosystem of support must include maintenance, customization, and user empowerment.

### **Peer-to-Peer Adaptation Techniques**

Among the most impactful strategies identified in the study is peer-led adaptation. Deaf students at Mampong often learn tactile sign language, create personalized gestures, and develop informal systems like tapping patterns or touch-based signals to communicate with their deafblind peers. These emergent practices are typically self-taught or learned from more experienced peers and are responsive to the immediate social context. This perspective aligns with Catalano's (2015) discussion of Lave and Wenger's situated learning theory, which highlights that knowledge is deeply embedded in the specific activities, social contexts, and cultural practices in which it is acquired and applied. Deaf and deafblind students are actively co-constructing communication systems through daily interaction, creating a dynamic community of practice. This is echoed by Fried-Oken et al. (2012), who found that in environments

lacking formal instruction, informal peer-mediated strategies often serve as critical communication bridges. Such strategies demonstrate high levels of social intelligence and empathy, as students adapt their behavior to include peers with different sensory profiles. According to Gustafson & Rönnberg (2008), peer interaction also helps reduce anxiety and improves communication confidence. Formalizing this model into a structured peer mentoring or buddy system, with training and support, could significantly enhance both academic and social inclusion.

### **Teacher Support Strategies**

Teachers at Mampong are instrumental in mediating communication through deliberate strategies such as slowed-down or adapted sign language, direct tactile engagement, visual supports, and differentiated grouping in classrooms. These actions reflect a clear institutional intent toward inclusion, even in the face of constrained resources. However, the data show that the capacity of teachers varies, particularly in knowledge of deafblind-specific communication strategies such as hand-over-hand signing or ProTactile communication. This limitation mirrors findings by Ainscow & Miles (2008), who argue that inclusive practices must be backed by specialized training and systemic support for educators. Without continuous professional development, even well-meaning strategies may fall short. Luckner & Sebald (2013) emphasize that teachers in deaf education settings need targeted pedagogical skills, particularly when working with students who experience dual sensory loss. Enhancing professional development through workshops, in-service training, and collaborative planning will increase teachers' confidence and effectiveness in inclusive communication. Furthermore, the adoption of Individualized Education Programs (IEPs) designed to address students' specific communication needs can help ensure

that support strategies are proactively integrated into the curriculum, rather than applied only in response to challenges (Donaire, Hurtada, & Cagape, 2024).

### **Non-Verbal and Environmental Cues**

Beyond formal language systems, students frequently use non-verbal cues such as tapping tables, touching shoulders, guiding hands to objects, using light signals, or pointing to environmental references to initiate or sustain communication. These approaches demonstrate how communication is also spatial, physical, and intuitive particularly important when formal linguistic systems are inaccessible or slow.

This finding echoes Bruce et al. (2016), who highlight the role of embodied communication in deafblind education, noting that multi-sensory and environmental cues can effectively substitute or complement traditional communication modes. Recent research on multimodal communication reinforces the idea that meaning is constructed through a combination of verbal, gestural, spatial, and material cues, rather than solely through symbolic language. Consequently, learning environments that incorporate multisensory elements such as consistent spatial layouts, textured surfaces, or vibro-tactile features can enhance students' ability to orient themselves and interpret information effectively (Moreno-Núñez & Casla, 2024).

Darling-Hammond (2015) stresses the importance of the learning environment as a communication facilitator, particularly for students with diverse needs. Moreover, the concept of communication ecology, as described by Alper & Raharinirina (2006), supports the idea that effective communication emerges from an interaction of people, tools, and context, not just individual skill sets.

## **Conclusion**

The communication strategies employed by deaf and deafblind students at Mampong School for the Deaf are multifaceted, context-responsive, and deeply social. While technology provides an important layer of support, it is the peer-driven innovations, teacher-facilitated adjustments, and non-verbal environmental cues that most significantly shape daily communication practices. However, the study also reveals systemic limitations, which is gaps in teacher training, limited access to tools, and underutilization of structured peer mentoring which, if addressed, could greatly enhance communication equity and effectiveness. To build a truly inclusive environment, the school must invest in both infrastructure and human capacity, ensuring that students are not only given tools but also the skills and environments to use them meaningfully.

## **Research Question Three: What are the Barriers to Successful Communication between deaf and deafblind at DEMODEAF?**

While communication is a fundamental aspect of human interaction, it is susceptible to numerous barriers especially in contexts involving sensory impairments. At the Demonstration School for the Deaf in Mampong-Akuapem, several obstacles hinder successful communication between deaf and deafblind students, compromising both educational outcomes and social integration. These include: lack of specialized communication skills, institutional and resource constraints, physical and sensory limitations, and social and psychological barriers. This section critically examines each barrier in light of relevant literature.

### **Lack of Specialized Communication Skills**

The absence of training in specialized communication methods, especially tactile sign language emerged as one of the most significant impediments to effective interaction. Both deaf and deafblind students reported feeling uncertain, unprepared, or limited in their ability to communicate across sensory differences. Deaf students, while proficient in Ghanaian Sign Language (GHS�), often lacked exposure to tactile forms of signing, leaving deafblind peers unable to participate fully in conversations. This aligns with the findings of Brazeau et al. (2017), who argue that the absence of instruction in tactile and adapted sign languages is a major barrier to interaction in mixed-sensory classrooms. Similarly, Riggio & McLetchie (2008) emphasize that effective communication with deafblind individuals requires explicit, hands-on training, not just general sign language instruction. Without this specialized knowledge, misunderstandings are frequent, and opportunities for inclusive peer interaction are limited. Moreover, the barrier is not only about skill absence but also a lack of institutional recognition of tactile communication as a necessary literacy. As Miles (2003) argues, many schools for the deaf worldwide fail to incorporate deafblind-specific communication needs into teacher training or curriculum development, leading to systemic exclusion.

### **Institutional and Resource Constraints**

The study revealed persistent resource shortages, including inadequate access to Braille materials, tactile teaching aids, and assistive technologies such as vibrating pagers, screen readers, or customized communication boards. In many cases, deafblind students had to rely on peer improvisation or teacher support to navigate lessons, further reinforcing dependency and limiting autonomy. This finding is consistent with Parker et al. (2014), who emphasize that educational institutions often

lack adequate resources and trained personnel to effectively support deafblind students. The shortage of specialized personnel, such as communication facilitators or interveners, further weakens the school's capacity to offer individualized learning support. The UNESCO (2020) Global Education Monitoring Report reinforces that insufficient funding and infrastructure disproportionately affect learners with multiple disabilities. It highlights how under-resourced educational environments contribute to social exclusion, academic underachievement, and limited participation for disabled learners. In this sense, resource inequality is a structural barrier, not just a logistical inconvenience. Overcoming this barrier requires systemic investment, not only in physical tools but in training programs, personnel development, and infrastructure redesign that aligns with universal design for learning (UDL) principles, as promoted by Rose & Dalton (2009).

### **Physical and Sensory Limitations**

Deafblind students, by nature of their dual sensory loss, encounter significant barriers that are often amplified by inadequate environmental accommodations. For instance, poor classroom lighting, background noise, or lack of tactile-friendly instructional materials can make both academic learning and informal interaction difficult or impossible. Physical barriers are often compounded by rigid instructional methods that do not account for multi-sensory engagement. As Hartmann (2015) notes, communication strategies for deafblind individuals must be context-sensitive and multimodal, involving touch, movement, proximity, and adapted pacing. Unfortunately, traditional classroom environments tend to privilege visual and auditory modalities, effectively sidelining those who require tactile input. The need to redesign learning environments to accommodate diverse sensory needs is echoed by Bruce et al. (2016), who recommend spatial adaptations such as tactile landmarks,

quiet zones, and proximity-based seating arrangements. At Mampong, the absence of such accommodations serves as a silent but persistent communication barrier.

### **Social and Psychological Barriers**

Beyond physical and technical obstacles, the study uncovered significant emotional and social barriers to communication. Several students expressed fear, anxiety, or embarrassment about initiating communication with deafblind peers, particularly due to unfamiliarity with appropriate techniques or fear of making mistakes. This often led to social avoidance, isolation of deafblind students, and missed opportunities for mutual learning. This reflects findings by Miller et al. (2016), who observed that psychological discomfort especially fear of the unknown acts as a powerful deterrent to cross-disability interaction. Deaf students, despite having shared experiences of marginalization, may still feel unequipped to relate meaningfully to peers with more complex needs. Booth & Ainscow (2002) emphasize the importance of fostering a “culture of belonging” in schools, where all students are encouraged to take risks, build empathy, and connect despite differences. Creating such a culture requires not only technical training but emotional education which means building student confidence, compassion, and resilience through inclusive group activities, guided role-play, and peer reflection exercises.

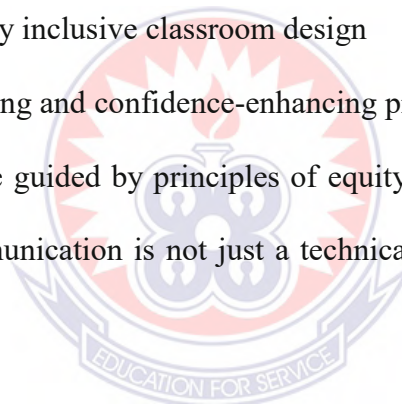
Additionally, lack of visibility and normalization of deafblindness within the school community intensifies these psychological barriers. As noted by Dyson et al. (2004), when disability remains stigmatized or misunderstood, it becomes more difficult to bridge social divides, even among students with disabilities themselves.

## **Conclusion**

Barriers to successful communication between deaf and deafblind students at the Demonstration School for the Deaf are complex and multifaceted, encompassing skills gaps, material shortages, environmental challenges, and psychosocial dynamics. Each of these domains—if unaddressed reduces the likelihood of meaningful, inclusive engagement, leaving deafblind students on the periphery of both learning and social life. To address these challenges, the school and its stakeholders must invest in:

- i. Targeted training in tactile and adaptive communication
- ii. Increased access to assistive tools and materials
- iii. Environmentally inclusive classroom design
- iv. Empathy-building and confidence-enhancing programs

These reforms must be guided by principles of equity, inclusion, and empowerment, recognizing that communication is not just a technical skill but a human right and a social bridge.



## CHAPTER SIX

### SUMMARY OF FINDINGS, CONCLUSION AND RECOMENDATIONS

This chapter presents a comprehensive summary of the key findings derived from the study, highlighting the interaction between deaf and deafblind at Demonstration School for the Deaf, Mampong-Akuapem. It synthesizes insights on the nature of interaction between the deaf and deafblind, strategies they use when communicating and the barriers that is impeding the communication successes. The chapter further provides a conclusion drawn from the study's findings, emphasizing their implications for educational practice, policy, and community engagement. Finally, recommendations are proposed to enhance effectiveness of communication between the deaf and deaf at DEMODEAF. These recommendations are aimed at fostering inclusive educational environments and ensuring that deaf and deafblind students can communicate with each other, and the necessary material to be used.

#### 6.1 Summary of Biographic Information

The study involved a total of 8 respondents, comprising three (3) deafblind students and five (5) deaf students who were purposively selected based on the relationship the deaf students have with the deafblind that is the friendship they share in Demonstration School for the deaf, Mampong-Akuapem. Due that bond between them, they were mostly engaged in an interaction. The level of impairment of the deafblind students were varied, their visual impairment ranges from moderate to severe. Also, the level of their hearing loss was as varied as the vision.

Regarding the deaf students too, their level of hearing loss also ranged from severe to profound. Regarding gender distribution, there was a fairly balanced representation of male and female participants, ensuring diverse perspectives on the issue. The

educational level of the deafblind and the deaf students were different. Most of them were in the JHS level which meant that they could sign and are willing to share their experiences.

## **6.2 Summary of Key Findings**

This study explored the interaction between deaf and deafblind students at the Demonstration School for the Deaf, Mampong-Akuapem. The study was guided by three research questions focused on the nature of interaction, the strategies employed, and the barriers to successful communication between these two groups. The findings were drawn from rich qualitative data supported by direct participant expressions. The results are summarized across the three core research questions.

### **Research Question one: How is the nature of interaction between deaf and deafblind at DEMODEAF?**

With the interaction between the deaf and deafblind students, four main themes were derived and discussed: forms of communication, levels of understanding interaction, role of interpersonal relationships contextual and situational communication.

The study found that while deaf students predominantly use Ghanaian Sign Language (GHS�), communication with deafblind peers involves tactile sign language, hand-over-hand signing, touch cues, and occasionally braille. These forms are shaped by the sensory limitations of deafblind individuals.

Comprehension varied depending on the clarity, pace, and familiarity with tactile methods. Deafblind students required slow and deliberate communication, and deaf students often found it difficult to determine whether their peers had understood them, leading to communication breakdowns.

Familiarity and trust significantly influenced communication quality. Long-standing friendships encouraged more frequent and meaningful interaction. Students who were not close to deafblind peers often avoided contact due to lack of confidence or training.

Communication success fluctuated based on environmental conditions. Structured environments like classrooms, with teacher support, facilitated better interaction. Conversely, noisy or crowded settings reduced communication effectiveness.

### **Research Question Two: What strategies do deaf and deafblind students use to communicate at Demonstration School for the Deaf?**

The findings were based on the following themes: use of assistive tools and technology, peer-to-peer adaptation techniques, teacher support strategies and non-verbal and environmental cues. The findings highlighted that the use of various assistive devices and learning tools to support communication, including Braille slates, tactile books, and devices with visual or tactile outputs. Visual aids, such as charts and gesture-based symbols, were common among deaf students, while deafblind students relied more on tactile tools like Braille. However, a recurring issue highlighted by participants was the limited availability of specialized equipment, including tactile communication devices and Braille-compatible technology. Furthermore, even when these tools were available, many students expressed that they had not received adequate training on how to use them effectively, reducing the tools' impact on communication outcomes.

In response to limited access to formal communication tools, students often developed personalized communication methods tailored to their specific needs and those of their peers. These included informal signs, hand taps and body cues designed to gain attention or convey specific meanings. For example, some deaf students developed

tapping sequences to communicate simple instructions to their deafblind classmates. These strategies demonstrated a high level of creativity, empathy, and initiative among the students, suggesting an environment that encourages mutual support and problem-solving. However, these methods were informal and non-standardized, which occasionally led to misunderstandings and required ongoing negotiation of meaning between communication partners.

Teachers played a pivotal role in facilitating communication and fostering inclusive learning environments. Their efforts included explicit instruction in Braille and tactile sign language, helping both deaf and deafblind students acquire foundational skills for accessing educational content and interacting with others. Teachers also strategically grouped students to promote collaboration and peer support, creating opportunities for shared learning experiences. Moreover, educators were instrumental in reinforcing inclusive behaviors, such as encouraging students to be patient communicators, to wait for tactile responses, and to incorporate tactile or visual cues depending on their peers' sensory needs. The teacher's role was central not only in skill development but also in promoting a culture of respect and inclusion.

Finally, in the absence of auditory or visual input, many students, particularly deafblind individuals—relied on non-verbal cues such as touch, movement, vibration, and light as key signaling mechanisms. Deaf students often used taps on their shoulders get the attention of their deafblind peers. These environmental cues were adapted into daily routines and became essential forms of communication, especially during group activities or classroom transitions. The use of tactile feedback, such as guiding a peer's hand or creating movement-based signals, was common and emphasized the importance of multi-sensory communication approaches in this context.

**Research Question Three: What are the barriers to successful communication between deaf and deafblind student at DEMODEAF?**

The findings were based on three main themes, which are lack of specialized communication skills, institutional and resource constraints and social and psychological barriers. It was then revealed that many deaf students lacked formal training in tactile communication methods, and deafblind students often felt neglected when their peers failed to use accessible methods.

The school lacked adequate resources such as braille materials, tactile devices, and trained staff to support communication. This placed a burden on students and limited the potential for inclusive interactions.

Emotional discomfort, fear of embarrassment, and low confidence hindered attempts to communicate. Deaf students sometimes avoided interaction due to perceived difficulty, and deafblind students often experienced isolation as a result.

**6.3 Conclusion**

This study highlighted the complexity of communication between deaf and deafblind students in a special school setting. Despite significant sensory barriers, students at the Demonstration School for the Deaf, Mampong-Akuapem, demonstrate resilience and creativity in their interactions. The findings show that successful communication is multi-faceted which means it is shaped not only by technical skills and resources but also by interpersonal relationships, environmental conditions, and emotional factors. Again, peer-led strategies and teacher support promote inclusion, fostering both deaf and deafblind students to communicate effectively. Nonetheless, the communication process is constrained by significant systemic and structural barriers. Limited resources, insufficient training, and emotional hesitation hinder more equitable interaction. A key conclusion from this study is that while informal

strategies fill some gaps, sustainable and inclusive communication requires a deliberate and well-supported institutional approach. Providing the right tools, skills, and support systems is essential not only for effective learning but for upholding the relationship between deaf and deafblind students. Addressing these challenges will require targeted interventions that build communication capacity, increase access to assistive technology, and foster empathy and confidence among students.

Communication is the bedrock of learning, social inclusion, and personal development. At Demonstration School for the Deaf, Mampong, deaf and deafblind students are doing their part by innovating, adapting, and reaching out. It is now the responsibility of educators, policymakers, and society at large to meet them halfway by removing barriers, providing tools, and creating environments where all students can truly feel comfortable and enjoy each other's company.

#### **6.4 Recommendations**

Based on the findings, some recommendations are proposed to improve interaction between deaf and deafblind students at the Demonstration School for the Deaf.

Firstly, regarding the nature of interaction between deaf and deafblind students, it is recommended that DEMODEAF organize structured social and academic activities that encourage meaningful peer engagement, collaboration, and mutual learning, creating opportunities for deaf and deafblind students to interact regularly in a supportive environment.

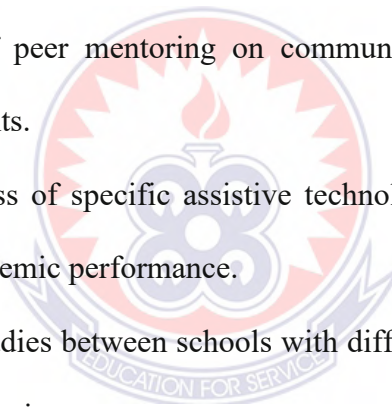
Again, about the communication strategies, it is recommended that teachers and school staff receive specialized training in both visual and tactile communication methods, enabling them to facilitate effective peer-to-peer interactions and equip students with adaptive strategies to communicate across sensory modalities.

Finally, with the barriers to effective communication, it is recommended that the school provide appropriate resources and adaptive tools, such as tactile learning aids, hand-over-hand guidance, and peer mentoring programs, to help students overcome communication challenges and promote inclusion, social participation, and equitable access to academic and social activities.

### **6.5 Suggestions for Future Researchers**

Given the scope of this study, future research could explore:

1. Further studies could examine the psychological effects of communication barriers on deafblind students, including issues of self-esteem, belonging, and emotional well-being.
2. The impacts of peer mentoring on communication skills among deaf and deafblind students.
3. The effectiveness of specific assistive technologies in improving interaction quality and academic performance.
4. Comparative studies between schools with different resource levels to identify scalable best practices.



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## APPENDICES

### Interview Guide

Interview guide on research objective

**RESEARCH QUESTION 1:** Explore the Nature of Interaction Between Deaf and Deafblind Students at DEMODEAF?

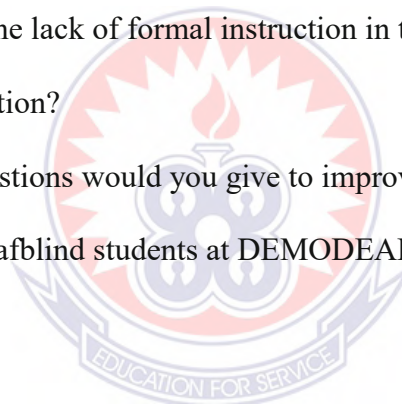
1. Can you describe how deaf and deafblind students interact during a typical school day?
2. How do friendships or social relationships between deaf and deafblind students develop here at DEMODEAF?
3. What kinds of activities do deaf and deafblind students do together, both inside and outside the classroom?
4. In what ways do deaf and deafblind students support one another at school?

**RESEARCH QUESTION 2:** Investigate the communication strategies used when deaf students interact with deafblind students at DEMODEAF?

1. What methods do deaf students use to communicate with deafblind students?
2. Are there differences in communication strategies depending on the context (e.g., learning vs. socializing)?
3. How do students overcome misunderstandings during communication?
4. Do deaf and deafblind students receive any training or support in learning to communicate with each other?
5. How do students adapt signs, gestures, or movements when communicating with a deafblind peer?
6. What role does trial-and-error or improvisation play in building communication between deaf and deafblind students?

**RESEARCH QUESTION 3:** Find Out the Barriers to Successful Communication Between Deaf and Deafblind Students at DEMODEAF?

1. What are some of the biggest challenges deaf students face when trying to communicate with deafblind peers?
2. Are there emotional or psychological barriers (e.g., fear, frustration) that impact communication efforts?
3. Are there enough resources (e.g., interpreters, devices, training) to support communication between these groups?
4. How does the school environment or physical space affect how students communicate?
5. How does the lack of formal instruction in tactile sign language affect communication?
6. What suggestions would you give to improve communication between deaf and deafblind students at DEMODEAF?



## INFORMATION SHEET

### STUDY TITLE

INTERACTION BETWEEN DEAF AND DEAFBLIND STUDENTS AT  
DEMONSTRATION SCHOOL FOR THE DEAF, MAMPONG-AKUAPIM

*Please, read carefully through all the information below before making a decision*

As part of the requirements for a Masters of Philosophy at the University of Education, Winneba, I have to carry out a research study.

You will be needed to participate this study by giving your consent to be videoed when you are engaged in an interaction with your colleagues. It is totally up to you whether or not to take part in this study. There won't be any pressure to stay if you decide not to at any point.

You can be sure that all of the information you give will be kept private and anonymous. No information you enter will be accessible to anybody else. This video will be kept solely for the purpose of this study and will be discarded afterwards.

We'll manage the data in a way that makes it impossible to identify you specifically. Therefore, if names are mentioned, they will be fictitious names. If you have any concerns on anything that was said here, you can contact the researcher with the information below. If you agree to take part in the study, a consent form will need to be signed.

### Researcher

Name: Seth Kojo Antwi

Phone: 0542970850

### Supervisor

Name: Adam Awini (Phd)

Phone: 0243732293

## PARTICIPANT CONSENT FORM

### STUDY TITLE

INTERACTION BETWEEN DEAF AND DEAFBLIND STUDENTS AT  
DEMONSTRATION SCHOOL FOR THE DEAF, MAMPONG-AKUAPIM

*Please tick the appropriate response to the following questions*

- |   | YES                      | NO                       |
|---|--------------------------|--------------------------|
| 1. I have read the study's information sheet and had all the details of the study explained to me.  | <input type="checkbox"/> | <input type="checkbox"/> |
| 2. I do hereby consent to the use of my image and video to be used in the study.  | <input type="checkbox"/> | <input type="checkbox"/> |
| 3. I consent to sharing information with the researcher in accordance with the Information Sheet's confidentiality guidelines.                            | <input type="checkbox"/> | <input type="checkbox"/> |
| 4. I agree to participate in the study under the terms outlined in the Information Sheet.   | <input type="checkbox"/> | <input type="checkbox"/> |
| 5. I consent to the use of the data collected for the study, after it has been anonymized (so that I cannot be identified), for future research projects. | <input type="checkbox"/> | <input type="checkbox"/> |
| 6. I believe that the study-related questions I seek have been satisfactorily addressed, but I may still have more to ask.                                | <input type="checkbox"/> | <input type="checkbox"/> |

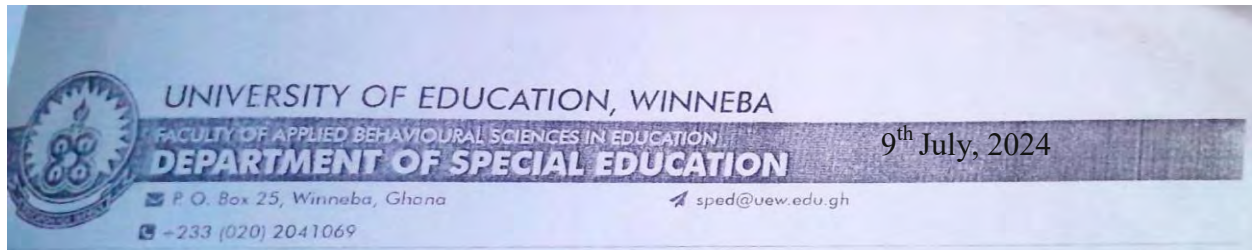
Signature of Participant: ..... Date: .....

Contact of Participant: .....

Name of Researcher: ..... Date: .....

Signature of Researcher: .....

## INTRODUCTORY LETTER



### TO WHOM IT MAY CONCERN

Dear Sir/Madam,

#### ***LETTER OF INTRODUCTION: MR. SETH KOJO ANTWI***

I write to introduce to you, Mr. Seth Kojo Antwi an M Phil student of the Department of Special Education with index number 8230150020.

He is currently working on his thesis on a topic: **"Interaction between Deaf and Deafblind Students at Demonstration School for the Deaf."** He needs to conduct in your school.

I would be grateful if you could give him the needed assistance.

Thank you for the consideration and assistance.

Yours faithfully,

A handwritten signature in blue ink, appearing to read 'F. Mensah', written over a dotted line.

**MRS. FLORENCE AKUA MENSAH**  
**(Ag. Head of Department)**

