

## **Interaction of Deaf Students with Hearing Peers in Inclusive Elementary Schools: A Phenomenological Study**

**Anfal Zaeni Noor, Sriyanto Sriyanto\***

Master of Primary Education, Universitas Muhammadiyah Purwokerto, Banyumas, Indonesia

Email: [nooranfal27@gmail.com](mailto:nooranfal27@gmail.com), \*[sriyanto1907@ump.ac.id](mailto:sriyanto1907@ump.ac.id)

**Abstract:** The interaction of disabilities with their peers in inclusive elementary schools is a critical dimension of social and emotional development, yet existing research has largely emphasized communication barriers or institutional readiness rather than students' lived communicative experiences. This study examines how a deaf student constructs and negotiates communication with peers in an inclusive elementary school context. Using a qualitative phenomenological design, the study involved one deaf student, hearing peers, parents, and a homeroom teacher. Data were collected through observations, semi-structured interviews, and document analysis, and were analyzed using thematic analysis. The findings reveal that communication was predominantly mediated through spontaneous, non-standardized gestures, visual cues, and contextual meaning-making rather than formal sign language systems. Communication barriers emerged from limited early language exposure and peers' initial unfamiliarity with deaf communication; however, these barriers were progressively addressed through adaptive learning processes, such as co-creation of shared gestures, peer-supported interpretation, and situational adjustments to communication strategies during classroom interactions. By foregrounding the lived experience of a deaf student and highlighting peer-driven communicative adaptation, this study extends existing literature by demonstrating how inclusive communication is actively constructed through everyday social interaction. The findings underscore the importance of fostering communicative flexibility among teachers and peers to support meaningful participation and social inclusion in elementary school settings.

**Keywords:** students with disabilities; deaf students; peer communication; inclusive elementary school; phenomenological study.

### **INTRODUCTION**

Deafness and hearing loss affect more than 1.5 billion people worldwide, with approximately 430 million experiencing levels of impairment that significantly limit their daily lives ((World Health Organization. (2024). In Indonesia, data from the Center for Data and Information of the Ministry of Education, Culture, Research, and Technology for the 2022/2023 academic year report that 27,401 deaf students are enrolled in special schools (Sekolah Luar Biasa). However, comprehensive data on the total deaf population, out-of-school children, and access to higher education remain unavailable (Pusdatin Kemendikbud Ristek 2023). Despite the implementation of inclusive education policies, deaf students in inclusive elementary schools continue to face persistent communication challenges that restrict their academic participation and social interaction. Educational systems that are insufficiently responsive to diverse modes of communication hinder deaf students' opportunities to establish meaningful peer relationships, often resulting in social isolation and limited social engagement (Yousif, Yousef, and Abdelrahman 2021). These challenges are not unique to Indonesia but represent a broader global issue, particularly as inclusive education continues to expand while facing implementation constraints.

In Indonesia, inclusive education has been institutionalized through national policy, most notably the Regulation of the Minister of National Education No. 70 of 2009 on Inclusive Education for Learners with Disabilities and Those with Special Intellectual and/or Talented Potential (Farah et al. 2022). However, implementation often prioritizes physical placement in regular classrooms over meaningful participation, particularly in communication and peer interaction (Nowak, Kowalski, and Zielinska 2024). For deaf

students, engagement with hearing peers remains challenging due to the absence of a shared communicative system, a difficulty compounded by peers' limited communicative strategies (Cawthon 2021). These persistent barriers reduce classroom engagement, constrain peer relationship development, and heighten the risk of social exclusion (Amka and Mirnawati 2020; Byrne and McNamee 2025; Mohanty and Mishra 2020)

Communication among deaf children involves multiple modalities adapted to sensory and linguistic capacities, including sign language, oral communication, non-verbal cues, and visual supports (Comino, Roche, and Duncan 2024; Dostal et al. 2025; Kapur 2020). Visual communication, such as images and symbolic representations, further supports comprehension and learning by translating abstract concepts into concrete forms (Gale and Martin 2024). While these modalities are widely acknowledged, their practical use in everyday peer interaction within inclusive classrooms remains underexplored, particularly from the perspective of deaf students themselves.

Recent studies have expanded the understanding of communication challenges faced by deaf students in inclusive settings. Research by Silvia Widi Ayomsari and Nur Azizah (2024) identified limitations in facilities, adaptive learning media, and teacher competence. Similarly, Malado (2024) reported academic and social difficulties among deaf students in Ethiopia are due to the absence of sign language interpreters, which requires reliance on alternative communication methods. Experimental research in Iran demonstrated that role-playing activities enhanced deaf students' communication skills and social engagement (Sayahi, Vakili, and Asaseh 2024), while phenomenological research in Tanzania emphasized the role of peers and local interpreters in facilitating classroom communication, alongside the continued importance of professional interpreters (Charles, Bali, and Sungwa 2024). Collectively, these studies highlight structural and instructional challenges but offer limited insight into how deaf students experience and manage communication in everyday peer interactions.

Although intervention-based approaches such as role-playing and interpreter support have demonstrated effectiveness (McDermid 2020), they often underemphasize the role of personal experience in shaping how deaf students construct meaning and select communication strategies in interaction with hearing peers (Beal, Dostal, and Easterbrooks 2024). Addressing this gap, the present study adopts a phenomenological perspective to foreground the lived communicative experiences of a deaf student. Prior research has largely focused on academic outcomes, teacher perspectives, or societal attitudes toward inclusion (Clark et al. 2020), leaving the subjective dimensions of peer communication relatively underexamined. As global attention increasingly centers on the quality of inclusive education, a deeper exploration of deaf students' social interaction experiences is warranted (Antoninis et al. 2020). Focusing on a single participant enables analytical depth, allowing for a nuanced examination of emotional processes, interpretive practices, and communicative adaptation, an approach aligned with ongoing methodological debates in qualitative disability research regarding depth versus breadth.

This study is grounded in symbolic interactionism theory (Blumer 2012), which offers a conceptual framework for examining how meaning is constructed and negotiated through social interaction. Drawing on Mead's perspective, interaction is understood as a process mediated by symbols that acquire meaning through interpretation (Töpfer and Behrmann 2021). In this study, gestures, facial expressions, and improvised signs function as symbolic resources through which shared understanding is established between the deaf student and peers. The core assumptions of symbolic interactionism, that action is guided by meaning, that meaning emerges through interaction, and that meaning is continuously modified through interpretation, provide an analytical lens for understanding how communicative

practices shape social participation in inclusive classrooms (Stryker, Serpe, and Powell 2020).

The purpose of this study is to develop an in-depth understanding of how a deaf student communicates with peers in an inclusive elementary school context. Specifically, it examines how communication strategies are managed and adapted in everyday social interaction and identifies the communication barriers encountered in peer engagement. By foregrounding lived experience within a developing country context, this study aims to contribute novel, contextually grounded insights to inclusive education scholarship and to extend international discussions on inclusive and meaningful communication practices in elementary education.

## **METHOD**

### **Research Approach and Design**

This study employed a qualitative, phenomenological design. Phenomenology is particularly valuable for understanding and interpreting the deeper meanings underlying individuals' lived experiences (Suddick et al. 2020). The phenomenological design was selected because the study aims to gain an in-depth understanding of a deaf student's lived experiences in communicating with peers within an inclusive elementary school context. Consistent with previous research (Haambozi et al. 2024; Scheibler 2021). Phenomenology is well-suited for exploring the profound meanings embedded in participants' experiences. Through a process of double hermeneutics, the researcher interprets how the deaf student experiences and enacts communication, thereby generating a nuanced understanding of peer interaction involving deaf students in inclusive school environments.

### **Participants and Research Setting**

The primary participant in this study was a male deaf student enrolled in an inclusive elementary school in Banjarnegara Regency, Indonesia. The participant was selected using purposive sampling, a deliberate selection of informants based on predefined criteria (Robinson 2023). Specific criteria for peer participants included: a peer who demonstrated the highest level of care and support (T1), a peer with strong social understanding (T2), and a peer representing female students (T3).

The study involved two participant groups: primary participants and supporting participants. The primary participant was the deaf student, hereafter referred to as U. The supporting participants included the parent of the deaf student (hereafter T0), three peers (two male students (T1 and T2) and one female student (T3)) as well as the classroom teacher of the deaf student (hereafter T4). Participant selection was guided by the following criteria: (1) having the status of a deaf student, (2) actively interacting with the deaf student, particularly the three peer participants, and (3) possessing direct experience in communicating with the deaf student. The research was conducted within the school environment where the student was enrolled to ensure that the observed interactions occurred in an authentic, contextually relevant setting.

### **Data Collection Procedures**

This study employed three primary data collection techniques: in-depth semi-structured interviews, non-participant observation, and document analysis. These methods were selected to comprehensively capture participants' subjective and contextual experiences within a phenomenological framework.

### ***Interviews***

In-depth semi-structured interviews served as the primary data source. The interviews were conducted face-to-face and guided by open-ended questions that allowed flexibility and responsiveness to each participant's narrative. To facilitate communication, visual media, body movements, and parental assistance as an interpreter were utilized when necessary. The interview sessions followed a planned sequence involving the student's mother, the deaf student, the classroom teacher, and several peers. This sequencing enabled a holistic understanding of the student's everyday communication processes from multiple perspectives.

### ***Observation***

Non-participant observations were conducted both inside and outside the classroom, in accordance with (Hofmeister 2021), to minimize disruption to natural social interactions. Observation enabled the researcher to identify nonverbal expressions, communication patterns, and peer responses that were not fully captured through interviews.

### ***Documentation***

Supporting documents included school records, teacher reports, and visual materials that demonstrated the deaf student's learning outcomes. The combined data set was prepared for coding and thematic analysis in order to extract salient meanings from participants' communicative experiences, consistent with phenomenological principles.

During interviews with the deaf student, parental assistance was used to facilitate communication due to the student's limited access to standardized language systems. While necessary to reduce communicative barriers, this mediation constitutes a methodological consideration, as the presence of a parent may have influenced responses through clarification or paraphrasing. Accordingly, interview data are understood as mediated and co-constructed rather than entirely unfiltered accounts. To mitigate this influence, data triangulation was employed through prolonged classroom observations and interviews with teachers and peers to enhance credibility.

### ***Data Analysis Procedures***

Data analysis in this study followed a phenomenological thematic coding approach, supported by qualitative data analysis software to ensure methodological rigor and transparency. The analytic process consisted of several stages. Data preparation involved verbatim transcription of all interview recordings. Observation notes and relevant documents were digitized and organized into an integrated database. Familiarization was then conducted through repeated reading of transcripts and field notes to achieve a comprehensive understanding of participants' lived experiences.

Subsequently, initial coding was performed to identify salient statements and recurring patterns related to communication strategies, communication barriers, and communication processes within learning contexts. The coding process was facilitated by qualitative analysis software, which enabled the systematic organization of codes into broader thematic categories. The primary themes that emerged included gestural and visual communication methods, adaptive learning processes in responding to communication barriers, and emotional responses to acceptance or misunderstanding.

During thematic analysis, the themes were refined and elaborated to capture the essence of participants' experiences. Each theme was cross-referenced with data from

interviews, observations, and documents through triangulation to enhance validity. The themes were then interpreted with particular attention to how meaning is constructed and continuously negotiated within social interaction. In the final stage, the findings were synthesized into rich descriptions, supported by direct quotations, that provide nuanced insights into communication strategies, lived experiences, and adaptive social processes relevant to inclusive peer communication.

This study has received ethical approval from Universitas Muhammadiyah Purwokerto (No. A12-11/014-S.Re/LPPM/1/2026). All participants provided informed consent, accompanied by a guarantee of anonymity and data confidentiality, as well as the right to withdraw from the study at any time without consequences.

## FINDING AND DISCUSSION

### Finding(s)

The results are presented descriptively based on thematic coding derived from interviews, observations, and documentation. This section focuses on what was observed and expressed by participants, particularly the deaf student (U), without advancing theoretical interpretation, which is addressed separately in the discussion.

#### 1. *Interaction and Communication*

**Table 1. Coding Frame Illustrating Communication Strategies and Peer Interaction of a Deaf Student**

Informant	Code	Indicator / Description	Quote Example	Theme
T1	Communication with hand gestures & pictures	Friends using gestures; without formal gesture basis	"Use sign language or hand gestures... sometimes use pictures too." (There is no indication of the use of SIBI/BISINDO)	Spontaneous visual communication
T1	Signal not default	Using gestures created by the children themselves	The quote shows improvisation: "if the friend does not understand, the son shows with more movement."	Improvised / child-made cues
T3	Simple emotional cues	Using gestures for "Don't", "cry"; not from SIBI/BISINDO	"I love hand gestures to say 'no' '...' and 'cry'." gestures are not official gestures.	Gestural expression

The findings indicate that U's daily communication with peers was predominantly conducted through spontaneous and non-standardized visual modalities. These modalities included hand gestures, facial expressions, body movements, and the use of concrete objects or pictures. None of the observed interactions reflected the systematic use of formal sign language systems such as SIBI or BISINDO. Instead, communication signs emerged organically during interaction and were shaped by immediate situational needs.

Peers reported that gestures were used flexibly and often adjusted when initial attempts were not understood. One peer explained that communication relied on visible actions rather than predefined signs, stating that gestures were repeated or exaggerated when meaning was unclear. This pattern was consistently observed during classroom and break-time interactions.

U described his own communicative actions in simple terms, emphasizing physical movement and pointing as primary strategies. He stated, "I point if I want something... if they don't understand, I move closer and show it again." This description illustrates how U relied on proximity, repetition, and bodily movement to support message delivery.

Observational data further show that U frequently combined multiple cues simultaneously. For example, when requesting help, he pulled a peer's arm, pointed toward

the object of interest, and altered facial expressions to indicate urgency. These actions occurred naturally within ongoing activities and did not interrupt peer engagement.



**Figure 1. A Deaf Student Engaging in Peer Communication in an Inclusive Elementary School**

Figure 1 documents one such instance of peer interaction, in which U engaged with classmates through hand movements and facial cues while participating in a shared task.

Peers also demonstrated adaptive responses. Rather than expecting U to conform to spoken language, they modified their own actions, such as slowing movements, using clearer gestures, or directly demonstrating intended meanings. One peer stated, “We usually just show it directly so he understands.” These responses emerged through repeated interaction rather than formal instruction.

## **2. Communication Barriers and Constraints**

Despite ongoing interaction, several communication barriers were identified. Interview data indicate that U experienced difficulty expressing messages verbally, even though he was capable of producing vocal sounds. According to both parental and teacher accounts, this limitation was linked to limited early language exposure, which restricted vocabulary development.

**Table 2. Coding Frame of Communication Barriers among Deaf Students**

<b>Informant</b>	<b>Code</b>	<b>Indicator / Description</b>	<b>Quote Example</b>	<b>Theme</b>
U	Early communication barriers in school	Friends / teachers initially confused to understand the gesture	“I can make sounds, but they don’t understand.”	Communication adaptation
T2	Difficulty understanding the meaning of U	Difficulty interpreting desires U	“For example, you ask for something but I don’t understand.”	Communication constraints

U himself acknowledged challenges in expressing ideas through speech, stating, “I can make sounds, but friends don’t understand what I mean.” This statement reflects a perceived gap between vocal expression and communicative effectiveness.

Additional constraints were associated with U’s reluctance to use hearing aids. The parent reported that previous medical experiences contributed to fear and discomfort, resulting in inconsistent use of auditory support devices. This condition limited U’s access to spoken input during fast-paced interactions.

Peers also described difficulties interpreting U’s intentions. One peer stated, “Sometimes he asks for something, but I don’t know what he wants.” Such moments often resulted in pauses, repetition of gestures, or temporary withdrawal from interaction.

Observation records indicate that misunderstandings occurred most frequently during group activities involving rapid verbal exchanges. In these situations, U tended to disengage and shift attention to solitary activities or visual tasks, particularly when clarification was not immediately achieved.

Importantly, peers reported receiving no prior guidance or training on how to communicate with deaf students. As a result, they relied on trial-and-error strategies and personal intuition, which occasionally led to misinterpretation or hesitation during interaction.

### 3. *Interaction Processes in Learning*

Instructional interactions between the teacher and U were characterized by a visual, motor-based, and experiential approach. Classroom observations consistently showed that verbal explanations were accompanied by gestures, demonstrations, images, or physical modeling to support comprehension.

**Table 3. Coding Frame of Communication Barriers among Deaf Students**

Informant	Code	Indicator / Description	Quote Example
T4	Visual & motor learning process	Using visual media due to limited official communication	"I always involve the son in Class Activities..."

The teacher emphasized inclusive participation by actively involving U in classroom routines. As stated by the teacher, "I always involve him in class activities, so he can see and follow directly." Rather than relying on verbal explanation, learning tasks were typically demonstrated step-by-step using concrete objects, visual media, and movement-based instruction. During lessons, U was observed following instructions primarily by watching peers and imitating demonstrated actions, instead of responding to spoken commands.

Beyond teacher-led instruction, learning interactions were also shaped by adaptive communication processes that emerged through everyday classroom engagement. Observational data indicate that U and his peers gradually developed shared gestures through repeated interaction. Certain gestures became mutually understood within the classroom context, such as specific hand movements indicating task completion, requests for learning materials, or turn-taking during group activities. These gestures were not formally taught but evolved naturally as part of routine learning interactions.

Peer-supported interpretation played an important role in sustaining U's engagement during learning activities. When U appeared uncertain or did not immediately respond to instructions, peers frequently assisted by demonstrating the required actions, guiding U's hand movements, or repositioning learning materials within his visual field. In several instances, peers were observed repeating the teacher's actions rather than providing verbal clarification, enabling U to follow the task sequence through visual and motor cues. This form of peer support occurred spontaneously and was embedded in daily classroom practices.

Situational adjustment of communication strategies was also evident across different learning contexts. During whole-class instruction, communication relied heavily on collective visual demonstrations and modeling. In contrast, during small-group or practical activities, peers adjusted their communication by reducing physical distance, slowing down

movements, and using more explicit gestures. These adjustments allowed U to remain engaged despite variations in classroom dynamics and instructional demands.

Overall, documentation and observation data indicate that instructional interaction in the classroom was supported through a combination of teacher-led visual strategies and peer-driven adaptive communication processes. These collaborative and context-dependent practices enabled instructional activities to proceed effectively despite the absence of standardized sign language use and supported U's active participation in everyday classroom learning.

## **Discussion**

This discussion interprets the findings through Blumer's three core premises of symbolic interactionism while extending the analysis beyond descriptive repetition. Particular attention is given to the limitations and risks of relying on non-standardized communication systems, as well as their implications for long-term academic, social, and policy outcomes in inclusive education.

### ***Communication as an Effort to Construct Meaning in Interaction***

The findings demonstrate that U's communication practices are rooted in meaning construction derived from lived experience rather than formal linguistic systems. In line with symbolic interactionism, U's actions (such as pointing, pulling a peer's arm, or intensifying gestures) function as symbolic acts guided by meanings that emerge through interaction. However, while these strategies enable immediate communicative functionality, they also reveal structural vulnerabilities.

The absence of early language exposure and limited access to standardized sign language constrain the range and stability of meanings that U can construct and convey. Although gestures and contextual cues allow U to participate in everyday interaction, these meanings remain highly situational and dependent on shared experience. From an analytical perspective, this raises concerns regarding the transferability of meaning across contexts, particularly as academic demands increase and social interactions become more abstract.

Previous research suggests that while experiential meaning-making supports early participation, it may not sustain long-term academic literacy or conceptual development without systematic language input (Beal et al. 2024; Clark et al. 2020). Thus, meaning construction through improvisation should be understood as an adaptive response rather than an optimal or sustainable communicative condition.

### ***Non-Standard Symbols and Gestures in Interaction***

The co-construction of non-standardized symbols between U and peers reflects Blumer's second premise that meaning emerges through social interaction mediated by symbols. These improvised gestures function as locally meaningful symbols that facilitate interaction within a specific social group. Similar patterns have been documented in inclusive settings where formal communication support is absent (Charles et al. 2024; Malado 2024)

Nevertheless, the findings also reveal the inherent instability of improvised communication systems. Because these symbols are not standardized, they are prone to misinterpretation, inconsistency, and breakdown, particularly when new peers, teachers, or contexts are introduced. The recurring peer statements expressing uncertainty in understanding U's intentions indicate that shared meaning is fragile and continuously renegotiated.

Critically, reliance on such systems poses risks for social equity and communicative autonomy. Deaf students may become dependent on familiar peers for interpretation, limiting independent participation and increasing vulnerability to exclusion when supportive peers are absent. As (Byrne and McNamee 2025) argue, unstable communication systems can exacerbate social fatigue and withdrawal over time. Therefore, while improvised gestures demonstrate resilience and adaptability, they should not be misconstrued as sufficient substitutes for accessible, standardized communication systems.

### ***Meaning, Adaptation, and Learning Processes***

The adaptive learning processes observed (such as peer-supported interpretation and situational adjustment of communication strategies) illustrate Blumer's third premise, wherein meaning is continuously interpreted and modified through cognitive processes. U's repeated modification of gestures and peers' trial-and-error interpretation reflect ongoing interpretive labor on both sides.

However, this constant adaptation also represents a cognitive and emotional burden, particularly for the deaf student. The need to continuously adjust gestures, monitor peers' responses, and withdraw when misunderstandings persist may limit cognitive resources available for learning content itself. Research has shown that excessive communicative effort can negatively affect academic engagement and emotional well-being among deaf students in inclusive settings ((Iturriaga 2025; Yousif et al. 2021).

From a pedagogical standpoint, adaptive strategies are effective as short-term solutions but insufficient as long-term instructional foundations. Without structured support, adaptive communication risks becoming compensatory rather than developmental, maintaining participation at a surface level while constraining deeper academic and linguistic growth.

### ***Implications for Inclusive Learning Environments and Teacher Training***

The findings underscore the critical role of teachers as mediators of meaning within inclusive classrooms. visual, motor-based, and experiential instructional strategies effectively bridge immediate communication gaps and support participation. However, the study also highlights the limits of relying solely on individual teacher creativity and peer goodwill.

At the policy level, these findings point to a gap between inclusive placement and inclusive communication. Inclusive education policies must move beyond physical integration to ensure systematic access to shared communication systems, including early exposure to sign language and the availability of trained personnel. Without such support, inclusive settings risk normalizing improvised communication as adequate, thereby masking structural inequities.

In terms of teacher training, the study suggests a need for explicit preparation in deaf-aware pedagogy, basic sign language competence, and strategies for fostering inclusive peer communication. Training should emphasize not only adaptive techniques but also critical awareness of the limitations and risks of non-standardized communication systems. As Holcomb, Dostal, and Wolbers (2025) noted, teachers play a decisive role in determining whether adaptive practices evolve into inclusive competence or remain temporary coping mechanisms.

### ***Synthesis***

Taken together, the findings align with symbolic interactionism in demonstrating that communication is a dynamic process of meaning negotiation. However, this study extends

the framework by highlighting that not all meaning-making processes are equally sustainable or equitable. While U's communication strategies and peer adaptations enable participation, their reliance on improvised systems exposes risks to long-term academic progression, social independence, and the quality of inclusion.

Accordingly, inclusive education should be understood not merely as facilitating interaction but as ensuring stable, transferable, and developmentally supportive communication systems. This study contributes to international discourse by emphasizing that communicative flexibility must be supported by structural measures to ensure inclusive education achieves meaningful and lasting outcomes.

## CONCLUSION

This study demonstrates that communication between a deaf student and hearing peers in an inclusive elementary school is primarily constructed through experience-based interaction rather than formal sign language systems. Meaning is negotiated through spontaneous gestures, facial expressions, bodily movements, and contextual cues that emerge within everyday classroom routines. While these non-standardized practices enable immediate participation and peer engagement, they remain highly situational and dependent on shared familiarity, revealing both their functional value and structural limitations.

The findings further emphasize the role of adaptive learning processes in sustaining classroom interaction, particularly through visual and motor-based instructional strategies, peer-supported interpretation, and situational adjustment of communication approaches. Teachers act as central mediators of meaning by creating visually accessible learning environments, while peers co-construct shared gestures and support interpretation during learning activities. These collaborative practices facilitate short-term inclusion but do not fully address long-term communicative and academic needs. Reliance on improvised communication systems carries potential risks for academic progression, communicative autonomy, and social independence. Therefore, inclusive education should be supported by institutional and policy-level measures, including basic exposure to sign language, accessible communication resources, and systematic teacher preparation in deaf-aware pedagogy. Inclusive policies must move beyond physical placement to ensure stable, transferable communication systems in regular classrooms.

This study is limited by its single-case phenomenological design, which constrains generalizability but enables in-depth exploration of lived communicative experience. Future research should extend this work through multi-case and longitudinal studies to examine how communication practices develop across inclusive contexts. Overall, the study underscores that meaningful inclusion depends not only on communicative flexibility but also on sustained structural support that ensures equitable participation and long-term educational outcomes for deaf students.

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