

The Implementation of Phonetic Transcription Strategy in Teaching Pronunciation to Students with Hearing Impairment

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Abstract. This research explores the use of phonetic transcription to teach English pronunciation to Grade 9 students with hearing disabilities at a Sekolah Luar Biasa (SLB) in North Sumatra, Indonesia. It also examines the difficulties encountered by the classroom teacher during its implementation. Using a descriptive qualitative approach, data were gathered through classroom observations, a semi-structured interview, and documentation. Data were then analyzed using Braun and Clarke's six-phase thematic analysis framework. The results indicate that the educator used phonetic transcription in three main practices: independent preparation with digital tools; structured repetition paired with visual aids like IPA charts and vocabulary images; and a multimodal feedback strategy that included hand signals and clear mouth and tongue demonstrations. Two primary challenges were identified. First, students struggled to recognize and produce IPA symbols, especially phonemes involving invisible articulators like /r/. Second, the diversity of students' residual hearing capabilities led to inconsistent learning outcomes within the same classroom. These results suggest that phonetic transcription can serve as a visually based pronunciation aid for learners with hearing impairments. However, it necessitates additional tactile approaches and focused professional training for SLB teachers to enhance its efficacy.

Keywords: Hearing impairment, IPA, Phonetic transcription, Pronunciation teaching, Special school

1. INTRODUCTION

Pronunciation is an essential aspect of language learning that greatly impacts a learner's ability to communicate effectively in English. In numerous classroom settings, teachers often focus more on grammar and vocabulary rather than on systematic pronunciation training, leading to ongoing mistakes among students [1]. Mompean & Gonzalez note that phonetic symbols are an underutilized but powerful tool, as their consistent application connects written and spoken language [2], and Mora & Mora- Plaza further show that task-based, phonetically grounded pronunciation instruction can be successfully applied in EFL contexts, providing a structured foundation for teaching specific sounds suited to learners with different perceptual skills [3]. Kenworthy contends that direct contact with phonetic symbols improves learners' self-monitoring skills and promotes autonomy in sound acquisition, while framing the broader aim of pronunciation instruction as achieving speech that is easily understood rather than native-like precision [4]. These difficulties often stem from phonological differences between learners' first language and English, inadequate exposure to genuine spoken input, and a lack of explicit teaching; Ali & Aughala highlight vowel confusion as a significant problem for EFL learners that often leads to communication failures [5], Yenkimaleki et al contend that systematic teaching should encompass both segmental and suprasegmental elements [6], as holistic instruction that integrates both aspects produces considerably improved results compared to teaching each element separately. These obstacles are especially evident for EFL learners in Indonesia: Ristati et al observe ongoing challenges in articulating English consonant fricatives due to elements lacking in the Indonesian phonological framework [7], while Yulianti et al report that segmental-level pronunciation mistakes among Indonesian EFL learners are both prevalent and systematic across proficiency tiers, underscoring the need for targeted phonetic teaching rather than incidental correction [8]. Kazuya & Plonsky show that focused phonetic instruction aimed at particular segmental characteristics greatly improves learners' pronunciation results in educational environments [9].

Among the methods studied in pronunciation instruction, phonetic transcription with the International Phonetic Alphabet (IPA) has gained increasing recognition as a useful educational tool. Roach defines phonetic transcription as the process of linking speech sounds to their corresponding phonemic symbols [10], allowing teachers and students to interact with a language's sound system accurately and uniformly, a

notably beneficial resource given the notoriously unreliable grapheme-to-phoneme relationship in English. Empirical evidence supports its efficacy: Riza & Kawakib indicate that IPA-based transcription significantly decreases mispronunciation [11], and Zela et al confirm statistically meaningful improvements in vowel pronunciation following structured phonetic transcription teaching [12], with mean scores increasing from 46.32 to 77.16. Talaroc et al further illustrate that the accuracy of IPA transcription is closely linked to overall pronunciation skills [13], while Dandee & Pornwiryakit find that focused IPA-based practices yield notable improvements in the articulation of nasal, liquid, and central vowel sounds [14]. Asadova notes that phonetic teaching using visual aids greatly enhances phonetic skills among various learner groups [15]. Whereas Durukan & Gokgoz- Kurt observe that EFL instructors view phonetic symbols as essential metalanguage for guiding learners' attention to target sounds through visual recognition [16]. Dumanggas further validates this through a pre-experimental study with Grade 12 students, finding that IPA symbol teaching results in significant pronunciation score enhancements from pretest to posttest [17].

Hearing loss is typically characterized as a partial or total decrease in the capacity to detect sound via the auditory system. Moores describes it as a continuum spanning from slight hearing loss to complete deafness, with each degree carrying unique educational and communication consequences that necessitate tailored teaching methods [18]. The World Health Organization classifies hearing loss by severity, ranging from mild (26–40 dB HL) to profound (81 dB HL or more), which significantly affects language development, as individuals lack consistent auditory access to the spoken language vital for communication growth. Students who are hard of hearing depend on visual signals such as lip movements and speech gestures to identify and mimic sounds, often resulting in misunderstandings and substitutions, especially with consonants requiring internal articulators like alveolar, velar, and nasal sounds [19]. Agustín et al state that these students face persistent educational challenges beyond communication, such as restricted access to teaching methods tailored to their specific perceptual requirements [20]. While sign language is the primary means of communication for deaf students in Indonesia, spoken communication remains crucial for wider engagement in social, academic, and professional contexts, underscoring the importance of focused pronunciation training. In Indonesia, students who are hearing impaired attend Sekolah Luar Biasa (SLB) for their formal education, where English is included in the national curriculum; however, the implementation of English pronunciation teaching in this context encounters ongoing structural difficulties. Suryanto et al point out that English teachers in SLBs face challenges such as students' restricted language skills, unpredictable classroom interactions, and a lack of adequate teaching materials [21], while Heriyanti et al similarly note that SLB teachers employ multiple adaptive techniques but face systemic challenges that undermine the consistency and effectiveness of pronunciation instruction [22]. Prasetya et al find that comparable resource and communication limitations obstruct vocabulary and pronunciation instruction at the SMALB level [23], and Rodrigues et al emphasize that teaching strategies for hearing-impaired learners should clearly connect written language to the sounds they represent through visual techniques [24]. Felisia et al indicate that English educators teaching deaf students in Bengkulu City encounter considerable difficulties in providing pronunciation lessons due to a lack of specialized training and appropriate resources [25], while Nur Fitria contends that ELT for hearing-impaired learners requires tailored strategies that account for their distinct communicative and perceptual needs, emphasizing that generic EFL methods fall short without intentional adjustment [26].

Studies in deaf education increasingly emphasize the significance of visually oriented teaching approaches for enhancing language acquisition among students with hearing disabilities. Research found that teachers of deaf and hard-of-hearing learners consistently acknowledge the essential role of visual cognition in their students' learning processes. Selami & Stathopoulou observe that teaching EFL to deaf pupils at the primary stage requires significantly adapted, visually focused strategies [27], a finding similarly relevant to junior high school environments like those examined in this research. At the classroom level, Bintaro et al observe that strategies in sign language education for deaf students in Jakarta SLBs are shaped by the need for visual clarity and communicative adaptation, demonstrating that effective English instruction for deaf students requires flexible, visually focused, and collaborative methods [28]. A stance supported by Duniangella et al who verify that visual and experiential strategies significantly improve English learning outcomes for deaf learners in SLB settings [29]. Olszak & Borowicz further note that the foreign language acquisition of deaf and hard-of-hearing students is enhanced by their abilities in visual memory and analytical processing, qualities that complement phonetic transcription as a visual tool for pronunciation support [30]. However, empirical research explicitly exploring phonetic transcription as a method for teaching pronunciation to hearing-impaired learners remains limited: studies on phonetic transcription have targeted only hearing students, while research on deaf education has focused on identifying obstacles rather than assessing particular teaching strategies.

Three critical gaps occur in the current literature regarding this broad evidence. Initially, research was carried out solely with hearing students in a typical EFL classroom and indicated that the use of phonetic transcription as a pronunciation approach for students with hearing disabilities has yet to be explored. Secondly, research focused on hearing-impaired learners in Indonesian SLB environments has investigated challenges in speech production but has not specifically assessed phonetic transcription as a teaching method, leaving the effectiveness of this visual approach for enhancing pronunciation development in the SLB context unaddressed. Third, current studies on deaf and hard-of-hearing students regarding foreign language acquisition have explored general learning styles and methods among junior high school learners, yet they have not focused on pronunciation-specific training through phonetic transcription at the Grade 9 level in an Indonesian SLB, a context and grade that has not been specifically investigated in earlier research. Furthermore, this study differs from earlier research in three important ways: first, it focuses on hearing-impaired students as the subject population rather than hearing EFL learners; second, it examines phonetic transcription as a practical instructional intervention in the particular setting of an Indonesian SLB; and third, it places the investigation at the Grade 9 junior high school level, addressing a level-specific gap that has not been addressed by previous studies on both phonetic transcription and deaf education.

This research is significant not only for its theoretical contribution to special education and English language instruction but also for its practical relevance to classroom educators in SLB settings throughout Indonesia. Students with hearing loss are equally entitled to receive quality English language education, including pronunciation instruction, as part of their overall educational and communicative development. Gharamah et al found that direct phonetics instruction significantly improves pronunciation outcomes when systematically integrated into classroom activities, suggesting that structured approaches such as phonetic transcription have considerable potential when adapted to meet the specific perceptual needs of students with hearing impairments [31]. Therefore, this study aims to generate evidence-based insights by examining the use of phonetic transcription as a pronunciation teaching method for Grade 9 students with hearing impairments. It seeks to contribute to the development of more inclusive and adaptable language instruction practices in special education settings. Considering this context, this study is guided by the following research questions:

1. What approach is used for phonetic transcription in teaching pronunciation to Grade 9 students with hearing impairments in a special education setting?
2. What difficulties does the classroom teacher encounter when applying the phonetic transcription method for teaching pronunciation to Grade 9 students with hearing impairments in a special education setting?

These research questions aim to address two critical aspects of the implementation process. The first question focuses on describing the practical steps involved in implementing phonetic transcription in the classroom, including the techniques, resources, and strategies employed by the teacher when delivering pronunciation instruction to students with hearing impairments. The second question seeks to identify the challenges and barriers encountered by the teacher during the implementation process, recognizing that teaching pronunciation through phonetic transcription in an SLB setting presents unique difficulties that differ from those found in mainstream educational contexts. Collectively, these questions are intended to provide a comprehensive and nuanced understanding of the use of phonetic transcription as a strategy for teaching pronunciation within the context of special education in Indonesia.

2. METHODS

Research Design

This study employed a descriptive qualitative approach to examine the use of phonetic transcription as a strategy for teaching pronunciation to students with hearing impairments in a special junior high school. A qualitative approach was selected because it enables researchers to explore and describe phenomena comprehensively within their natural setting, focusing on meaning, processes, and experiences rather than numerical data [32]. Descriptive qualitative research is particularly appropriate for this study because it aims to provide a detailed and accurate account of how phonetic transcription is implemented in the classroom, the challenges that arise during its implementation, and how students with hearing impairments respond to this instructional method. This research design aligns with the nature of the research questions, which seek to understand a complex educational phenomenon within a specific and underexplored context rather than test hypotheses or generalize findings to a broader population.

Participants

Participants in this research were chosen through purposive sampling, a method where individuals are deliberately selected based on their significance to and firsthand experience with the phenomenon being studied. The group included six ninth-grade students with hearing disabilities attending a special education school (SLB) in North Sumatra, which consisted of four boys and two girls, accompanied by one classroom teacher who taught the class and was directly engaged in applying phonetic transcription as a strategy for teaching pronunciation. All student participants were identified with hearing loss and were undergoing structured English instruction as part of the national curriculum, whereas the classroom teacher had direct experience in teaching the class and utilized phonetic transcription methods for pronunciation instruction. Ninth-grade students were chosen due to their adequate prior experience with English language learning, enabling them to participate effectively in phonetic transcription tasks, while the classroom teacher was selected for being directly involved in creating and implementing the instructional strategy being examined. The relatively limited sample size aligns with qualitative research principles, emphasizing the depth and richness of data rather than breadth and representativeness.

Data Collection

Information for this research was gathered using three methods: classroom observation, semi-structured interviews, and documentation [33]. Table 1 below outlines the objectives and information generated by each technique.

Table 1. Data Collection Methods and Corresponding Focus Areas

Method	Purpose / RQ Addressed	Focus Areas	Data Produced
Classroom Observation	RQ 1: Implementation of phonetic transcription in teaching pronunciation	(a) Teacher's introduction, clarification, and practice of IPA symbols using visual aids, gestures, and mouth demonstrations (b) Student interactions and responses, including IPA symbol reading and pronunciation attempts (c) Teacher's communication strategies for hearing-impaired students	Field notes on instructional procedures, student responses, and visual strategies
Semi-Structured Interview	RQ 2: Challenges in implementing the phonetic transcription strategy	(a) Students' unfamiliarity with IPA symbols and difficulty conveying articulation without auditory feedback (b) Availability of teaching materials, time distribution, and lack of dedicated SLB resources (c) Teacher's adaptations, techniques, and	Verbatim transcript of teacher responses

Method	Purpose / RQ Addressed	Focus Areas	Data Produced
		recommendations for additional support or training	
Documentation	RQ 1 & RQ 2: Corroboration and enrichment of observational and interview data	(a) Teaching materials: IPA charts and phonetic symbol word cards (b) Classroom photographs of the setting, teaching activities, and instructional resources	IPA charts, phonetic word cards, and classroom photographs

- a) Classroom observation was carried out to address the initial research question regarding the application of the phonetic transcription method in instructing pronunciation to Grade 9 students with hearing disabilities. The researcher attended English pronunciation classes and recorded field notes throughout each session [34].
- b) Semi-structured interviews took place with the classroom teacher following the observation sessions to address the second research question regarding the difficulties encountered in applying the phonetic transcription strategy. The interview was conducted in a casual, open atmosphere to enable the teacher to express experiences openly.
- c) Documentation was gathered to reinforce and enhance the information obtained via observation and interviews. The documents furnished further proof regarding the implementation of the phonetic transcription method in the classroom.

Data Analysis

The data collected in this study were analyzed using thematic analysis, following the six-phase framework developed by Braun and Clarke, as described by [35]. Thematic analysis is a widely used and flexible qualitative method that enables researchers to systematically identify, analyze, and interpret patterns of meaning within a dataset. This approach is particularly suitable for exploring complex educational phenomena, such as the implementation of a specific teaching strategy in a special school setting.

The analysis was conducted through six stages. In the first stage, the researcher familiarized themselves with the data by reviewing and rereading the observation field notes, interview transcripts, and documentation materials. In the second stage, initial codes were systematically generated to identify significant features relevant to the research questions. In the third stage, the codes were organized into potential themes that reflected recurring patterns across the data sources. The fourth stage involved reviewing and refining the themes to ensure that they accurately represented the data and were clearly distinct from one another. In the fifth stage, each theme was defined and named to capture its central meaning. Finally, in the sixth stage, the findings were presented in a coherent analytical narrative.

To enhance the trustworthiness of the analysis, member checking, peer debriefing, and data triangulation across multiple sources were employed throughout the analytical process.

Ethical Considerations

Before gathering data, the researcher presented an official research permission letter to the school principal to secure institutional approval for conducting the study in the school environment. This authorization included consent for all data gathering efforts, such as classroom observation, teacher interviews, and documentation. All participants were made aware of the study's purpose and procedures before the commencement of any data collection activities. Participation was completely voluntary, and everyone was informed of their right to exit at any moment without repercussions. To safeguard the privacy of every participant, this report does not reveal any personally identifying information; the school, teacher, and students are identified through descriptive labels instead of by their names. All information, such as

field notes, interview recordings, transcripts, and images, was securely stored and could only be accessed by the researcher. Photos were utilized exclusively as observational proof and were not distributed outside of this research setting.

3. FINDINGS

This section presents the findings from classroom observation and a semi-structured interview conducted with the English teacher at a Sekolah Luar Biasa (SLB) in Indonesia. The data were analyzed using the six-phase thematic analysis framework proposed by Braun and Clarke, which yielded five themes organized around the two research questions of this study. Results and their theoretical implications are presented together in each sub-section in accordance with journal format requirements.

The Implementation of the Phonetic Transcription Strategy in Teaching Pronunciation to Grade 9 Students with Hearing Impairments

The initial research question aims to explore the implementation of phonetic transcription methods in instructing pronunciation to Grade 9 students with hearing disabilities in a specialized educational setting. From the classroom observation and interview data, three themes arose in relation to this question: (1) Teacher Readiness and Independent Learning, (2) Teaching Methods via Repetition and Visual Support, and (3) Diverse Feedback and Expression Display.

Teacher Preparation and Self-Directed Learning

The classroom teacher, accountable for every subject at the SLB, including English, has not undergone formal training in phonetics or phonetic transcription. She stated that she developed her understanding of IPA symbols on her own by using online resources:

"We have studied English before at school, so maybe to understand the material better, we often open YouTube and learn from there."

Observation data verified that the teacher effectively presented IPA symbols visually (Indicator 1: Yes), handed out printed IPA charts to every student, and displayed IPA symbols next to English words on the blackboard (Indicator 2: Yes). The educator has been employed at the SLB for twenty-one years and slowly assumed the role of teaching English as the school grew to incorporate a junior high school level.

"When the elementary school students graduated, we made sure there was a junior high school so the children would not go to another school. That is where I started handling everything, as a homeroom teacher and English teacher."

These findings suggest that phonetic transcription teaching in this SLB is conducted by a non-expert instructor whose understanding of the subject evolved through informal, self-guided methods over a long duration instead of through official training in English or phonetics.

Instructional Delivery Through Repetition and Visual Scaffolding

The data from observations and interviews consistently show that the teacher's main teaching method was to use phonetic transcription, with repeated practice and visual support techniques. The teacher outlined her main teaching approach in the following way:

"This must be repeated over and over again, because sometimes these children, if we can say, should understand Indonesian first. English is only for learning at school. But this must be repeated. If we point to this again and ask what this is, they will say I, not ai. So we remind them that in English, I is read as ai."

This passage indicates that the teacher has recognized and tackled the influence of Indonesian phonological patterns on students' English pronunciation, a situation where learners use the sound values from their native language on English letters and symbols. The teacher addresses this challenge by utilizing consistent and ongoing repetition as the main corrective approach, emphasizing the accurate English phoneme-symbol connections whenever a mistake is made.

Observation data verified that the teacher connected IPA symbols to known vocabulary by utilizing an English picture book that included items like book, pen, and bag with their IPA representations (Indicator 5: Yes). Students were individually summoned to the front of the class to work on pronunciation (Indicator 9: Yes), showing that the teaching emphasized personal practice under the direct guidance of the teacher rather than collective recitation.

The findings indicate that the teacher recognizes the impact of Indonesian phonological structures on students' English pronunciation and addresses it by implementing systematic repetition as the main corrective approach, reinforcing correct phoneme-symbol associations whenever a mistake is made.

Multimodal Feedback and Articulation Demonstration

The educator explained her method of feedback as integrating visual, gestural, and physical representations:

"The feedback is given one by one at the front of the way of writing, the way of reading, and the way of pronouncing the meaning of the object or animal name we mentioned. I also use hand gestures and directly point to the correct mouth or tongue position slowly so that they understand."

Observation data confirmed all three components: the teacher employed hand gestures and sign-like signals instead of verbal commands (Indicator 10: Yes), tailored her communication for students who cannot depend on auditory input (Indicator 11: Yes), delivered visual corrective feedback during articulation mistakes (Indicator 12: Yes), and clearly showcased mouth movements and tongue positions at a deliberate pace (Indicators 3 and 4: Yes).

These findings suggest that phonetic transcription teaching in this SLB class relies heavily on a visual and multimodal strategy, where the instructor regularly transforms phonetic details into visible, demonstrable formats that are understandable to students with hearing disabilities.

Challenges Faced by the Classroom Teacher in Implementing the Phonetic Transcription Strategy

The second research question explores the difficulties of the classroom teacher in applying the phonetic transcription method to teach pronunciation to Grade 9 students with hearing disabilities. The information revealed two themes related to this inquiry: (1) Students' Challenges in Identifying and Creating IPA Symbols, and (2) Diversity of Students' Remaining Hearing and Its Influence on Learning.

Students' Difficulties in Recognizing and Producing IPA Symbols

The teacher identified the recognition and production of IPA symbols as the primary barrier for hearing-impaired students:

"The difficulty comes from the way of writing and the way of reading. Because some IPA symbols are different from ordinary letters. We introduce the basic symbols, their pronunciation, and their meanings, and the students need more time to memorize and understand them because they cannot rely on sound."

Observation data verified that mistakes in interpreting IPA symbols happened during lessons (Indicator 6: Yes) and that students faced specific challenges with consonants needing internal articulators (Indicator 8: Yes). The /r/ phoneme was recognized as particularly challenging:

"Sounds with the letter R are very difficult. R is hard. Some students can do it, like student A. R requires them to be fluent in saying R. Sometimes these children cannot be forced, but they know it is the letter R."

These findings show that although students are aware of the IPA symbol for /r/ and identify it as a unique sound, they cannot produce it correctly. The unusual appearance of some IPA symbols, combined with the lack of auditory support, significantly complicates the memorization of symbols and sounds for students with hearing impairments. The /r/ sound poses a specific challenge as its production relies on the position of the tongue inside the mouth, which cannot be seen through lip-reading or visual mimicry.

Heterogeneity of Students' Residual Hearing and Its Impact on Learning

A second notable challenge revealed in the data is the substantial differences among students in their residual hearing abilities and the varying effects on their capacity to participate in phonetic transcription training. The educator noted:

"It is quite helpful, especially for students who still have residual hearing. Student A has a little residual hearing, but it is faint, like a startled shouting sound. Because there is residual hearing, not all students are the same. Those who have some residual hearing may understand better and grasp the symbols more quickly."

The teacher noted that *"even with mouth movements, the results still require a lengthy process,"* highlighting the time-consuming nature of teaching phonetic transcription in this scenario.

These findings indicate that the classroom includes students with different levels of hearing impairment, ranging from total deafness to slight residual hearing, rendering a one-size-fits-all teaching method inadequate. Students with remaining hearing gain from incidental auditory support that fully deaf classmates do not receive, leading to differing rates of advancement in the same classroom. This variety, along with the need for continuous personalized attention, puts significant stress on one non-specialist teacher accountable for every subject in the SLB environment.

4. DISCUSSION

This part analyzes the research results concerning current literature, theoretical models, and earlier empirical studies. The dialogue is structured around the two research questions, examining the importance of each result within the wider framework of teaching phonetic transcription and special education for students with hearing disabilities.

The Implementation of the Phonetic Transcription Strategy in Teaching Pronunciation to Grade 9 Students with Hearing Impairments

The findings indicate that phonetic transcription teaching in this SLB classroom was influenced by three interconnected factors: the teacher's independent planning, her dependence on repetition and visual aids during lessons, and her application of multimodal feedback techniques. Collectively, these aspects indicate a teaching approach that has evolved flexibly without formal specialist assistance, rather than one based on organized professional education in English phonetics.

This research revealed that the classroom teacher utilized informal digital platforms, especially YouTube, to autonomously prepare for phonetic transcription lessons, a result that indicates a structural deficiency in institutional support rather than a shortcoming of personal effort. While previous research like Suryanto et al and Heriyanti et al has recorded the overall resource limitations encountered by SLB teachers in Indonesia, this study offers concrete evidence of how these limitations appear during lesson planning for a linguistically challenging task: teaching IPA-focused pronunciation [21] [22]. The literature widely emphasizes the need for well-supported SLB environments, yet this study provides a specific example of the consequences of lacking such resources for a committed teacher developing phonetic understanding on their own, devoid of organized support in articulatory phonetics or pronunciation teaching methods. Asadova contended that proficient phonetics teaching necessitates educators to possess a strong understanding of the IPA system along with methodologically robust strategies for explicitly and systematically teaching sounds [15]. The findings of this study indicate that meeting this standard is challenging under the existing SLB conditions in Indonesia. Furthermore, professional development programs for SLB educators should extend beyond general special education skills to incorporate focused phonetics training, a limitation that Trisnantari et al recognize indirectly but do not directly address in the Indonesian context [36].

This research revealed that systematic repetition was the main corrective approach used by the teacher, a technique closely linked to the issue of L1 phonological interference. Students were noted replacing the Indonesian vowel /i/ with the English diphthong /ai/ when faced with the letter I, a particular case of negative transfer that hearing students frequently adjust through auditory feedback, but which hearing-impaired students are unable to do. Current research on negative transfer, including Ali & Aughala examines this issue in general EFL settings but overlooks the additional challenges posed when auditory self-monitoring cannot be utilized [5]. This research thus enhances the current knowledge of phonological interference by placing it in a learning context limited by perception, where the teacher's explicit and frequent correction serves as the only means of correction accessible to students. The teacher's employment of English picture books to connect IPA symbols with tangible vocabulary is consistent with the findings of Duniangella et al and Zela et al who discovered that context-based phonetic teaching enhances pronunciation results, yet neither research involved hearing-impaired students [12], [29], rendering this study's application of the principle to an SLB environment a unique addition.

The multimodal feedback method described in this research, integrating hand gestures, personalized mouth and tongue demonstrations, and one-on-one corrective engagement, signifies the most instructionally vital aspect of the execution. Anggraeni et al found that students with hearing impairments in Indonesian SLBs depend on observing articulation to produce speech [19], while Duniangella et al noted that effective deaf education practices are defined by adaptive and personalized teaching [29]. This research supports both conclusions but extends the analysis by detailing the precise methods a non-specialist teacher employs to enact these principles without formal instruction, utilizing gestures instead of verbal explanations, slowing down mouth movements for clarity, and asking students to come to the front for close-up articulation demonstration. Olszak & Borowicz noted that successful foreign language teaching for deaf students leverages their visual memory and spatial skills [30]. This research offers classroom-level proof of how these abilities are engaged through teacher-directed gestural and demonstrative feedback in an Indonesian SLB, an environment not previously explored in this literature.

Challenges Faced by the Classroom Teacher in Implementing the Phonetic Transcription Strategy

The findings highlight two main issues: students struggle with recognizing and creating IPA symbols, and the inconsistency of residual hearing among students impacts learning outcomes differently. Both challenges have consequences not just for classroom practices but also for teacher training and institutional policies within the Indonesian SLB framework.

This research revealed that students with hearing impairments needed significantly more time than their hearing counterparts to recognize and assimilate IPA symbols, and that specific phonemes, particularly /r/, were still unproduced even when students could accurately identify the relevant symbols. This result highlights a difference between declarative phonemic knowledge (identifying a symbol and its related sound) and procedural phonemic knowledge (actually articulating that sound), a separation that has been observed in the wider deaf education literature but has not been recorded before in relation to IPA-focused pronunciation teaching in an Indonesian SLB. Kenworthy noted that even students with normal hearing need prolonged teaching to build confidence with IPA symbols [4]; this research shows that for learners with hearing impairments, this difficulty is fundamentally different, not just more intense, since the lack of auditory feedback eliminates the main channel for solidifying phoneme-symbol connections. The finding that mistakes occurred most often in consonants utilizing internal articulators, alveolar, velar, and nasal sounds, directly supports Anggraeni et al, who identified the same trend via acoustic phonetic analysis [19]. What this research contributes is the educational viewpoint: it records not only the occurrence of these mistakes but also their persistence despite the teacher's proactive visual and gestural correction attempts, indicating that visual demonstration alone might not be adequate for phonemes whose production is entirely internal and thus not visible.

The variety in students' residual hearing appeared as a unique and insufficiently studied obstacle that greatly complicates the provision of consistent phonetic transcription teaching. The research indicated that students with slight residual hearing exhibited quicker symbol recognition and improved retention compared to their completely deaf counterparts, a result that aligns with Olszak & Borowicz regarding the influence of hearing loss severity on foreign language learning results [30]. Nonetheless, whereas that research tackled the matter broadly, this research places it within the particular instructional requirements of IPA education in a mixed-ability SLB classroom led by one non-specialist educator. The challenge of differentiation this presents is quite substantial: the teacher's current method of having students come forward individually offers a type of inherent differentiation, but it demands considerable resources and is not sustainable as the only approach when one teacher oversees all subjects. Moores determined that the development of spoken language in deaf and hard-of-hearing students is a naturally extended process [18]. The results of this study support that finding and indicate that the speed is also influenced by differences in residual hearing among students, an aspect that current teaching models for phonetic transcription do not consider.

The findings reveal two primary challenges encountered by classroom educators in utilizing phonetic transcription: students' difficulties in recognizing and pronouncing IPA symbols, and the differences in students' residual hearing capabilities and their diverse impacts on learning outcomes. Both challenges have significant theoretical and practical implications for instructing phonetic transcription in SLB environments.

The challenge of identifying IPA symbols emphasized in this research reveals a significant tension inherent in using phonetic transcription as a teaching approach for learners with hearing disabilities. While phonetic transcription is conceptually suitable for this group because of its visual features, its effectiveness depends on learners first getting accustomed to a complex and new symbol system, which is much more difficult for students who cannot use sound as a learning aid. Kenworthy observed that even hearing students require ample time and straightforward guidance to build confidence with IPA symbols, and this challenge is heightened for hearing-impaired learners who depend exclusively on visual recall and motor mimicry to establish symbol-sound associations [4]. The teacher recognizes that students require significantly more time to remember and understand IPA symbols because they cannot rely on sound, revealing a deeper epistemological constraint that fundamentally affects the pace and direction of phonetic transcription learning for this group. The specific difficulty linked to the /r/ phoneme mentioned in the findings emphasizes this problem, as the /r/ sound in English is produced through a complex tongue positioning that is not visible to an onlooker, making it one of the most challenging phonemes for hearing-impaired students to learn through visual mimicry. The teacher's observation that students can identify the /r/ symbol but have difficulty articulating it points to a gap between declarative phonemic knowledge, which is understanding the name of a sound and its related symbol, and procedural phonemic knowledge, which is the skill of physically producing that sound. This dissociation is a well-established trait of phonetic

learning in students with hearing impairments and highlights the need for instructional approaches that go beyond symbol recognition, integrating specific tactile and kinesthetic feedback techniques that can improve the visual presentations typically employed by the teacher. The collected observation data further confirmed that errors in consonant production were particularly prevalent for sounds involving internal articulators, like alveolar, velar, and nasal consonants, which are created using tongue movements that are partially or entirely hidden from view. This pattern corresponds with the findings of Anggraeni et al [19], who applied acoustic phonetic analysis to demonstrate that students with hearing disabilities in Indonesian SLBs show the highest occurrences of phonemic substitution and omission particularly in consonants, which rely on internal movements that cannot be seen through lip-reading, providing compelling cross-methodological evidence that the invisibility of internal articulators creates an ongoing and systematic challenge in teaching pronunciation to hearing-impaired learners.

The varying residual hearing abilities of students greatly impact the approach to designing and delivering phonetic transcription instruction in SLB classrooms. The teacher's observation that students with partial hearing progress faster and grasp IPA symbols more effectively than those who are entirely deaf corresponds with a well-established principle in deaf education research: the degree of hearing loss significantly influences the language learning outcomes of hearing-impaired students. Even minimal residual hearing provides students with a constrained auditory route that aids in reinforcing phoneme-symbol connections, improving the internalization of IPA symbols, and reducing the cognitive burden of symbol-sound relationships. Students with total deafness do not possess this partial auditory structure, making them fully dependent on visual and gestural signals for all aspects of phonetic learning. This variety poses a significant differentiation challenge for the classroom teacher, who must simultaneously address the needs of students at different points along the hearing loss spectrum within a single instructional setting. The teacher's current approach of calling students to the front one by one for personalized practice illustrates a form of natural differentiation that somewhat addresses this problem, but it has limitations concerning instructional efficiency because the teacher handles every subject independently in the SLB classroom. The educator's acknowledgment that enhancing pronunciation through phonetic transcription is a gradual process, even with continuous visual support, corresponds with Moores' [18] conclusions that fostering spoken language skills in deaf and hard-of-hearing students is a fundamentally extended undertaking requiring persistent instructional commitment over years rather than just weeks or months. This situation significantly impacts curriculum development and assessment in SLB settings, underscoring the necessity of providing SLB teachers with institutional support, customized resources, and professional development options that can sustain and enhance their ability to deliver evidence-based pronunciation instruction during the extended time needed for phonetic progress in hearing-impaired learners.

5. CONCLUSION

This research explored the use of phonetic transcription as a method for teaching pronunciation to Grade 9 students with hearing disabilities at an Indonesian SLB, along with the difficulties faced by the classroom teacher. Results show that the educator utilized a visual, repetition-oriented, and multimodal strategy integrating IPA charts, blackboard drawings, picture-oriented vocabulary, and articulatory displays using hand gestures and mouth motions to offset the lack of auditory feedback. Two main challenges were recognized: students' struggles with identifying and producing IPA symbols, especially consonants involving internal articulators like /r/, and the variability of students' residual hearing, leading to inconsistent learning results in the same classroom. These results show that phonetic transcription can be an effective pronunciation teaching resource in SLB contexts; however, its success relies on ongoing multimodal assistance, personalized instruction, and specialized training for SLB educators in English phonetics.

This study is limited by a small sample size of six students from one SLB in North Sumatra, and the lack of longitudinal data means that long-term impacts on pronunciation advancement could not be assessed. Future research should include larger samples from various SLB schools and utilize pre- and post-intervention assessments to measure pronunciation results over time.

Training programs for SLB educators, both pre-service and in-service, should include focused modules on IPA-centered pronunciation teaching, considering that the educator in this study acquired her phonetic knowledge solely through independent study. Curriculum designers ought to create organized phonetic transcription resources tailored for hearing-impaired students, and teaching methods should be broadened to incorporate tactile and kinesthetic feedback techniques that target phonemes, where the articulation involves internal articulators not visible in lip-reading.

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