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READING IN SILENCE: EXPLORING ENGLISH READING DIFFICULTIES AND STRATEGY USE AMONG HEARING-IMPAIRED FORM 1 STUDENTS

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Abstract:

Reading is essential for language development and academic success, yet hearing-impaired students often face unique barriers when acquiring literacy skills in English as a Second Language (ESL). Limited access to auditory input can hinder vocabulary acquisition, syntactic understanding, and overall reading comprehension. This study examines the reading difficulties faced by Form 1 hearing-impaired students in a Malaysian secondary school and investigates the strategies they employ to overcome these challenges. Adopting a qualitative case study design, the research involved six participants selected through purposive sampling from a special education program. Data were gathered using reading comprehension tasks, classroom observations, and semi-structured interviews conducted in Malaysian Sign Language (BIM). Thematic analysis revealed four major difficulties: limited vocabulary knowledge, challenges with complex sentence structures, poor inferencing skills, and low reading confidence analyzed using NVivo 12 software. Despite these difficulties, students employed several compensatory strategies, including re-reading, peer collaboration, sign language translation, and identifying visual cues. The findings emphasize the importance of explicit reading strategy instruction and multimodal support in ESL classrooms. This study contributes to inclusive education discourse by highlighting the cognitive flexibility and resilience of hearing-impaired learners and recommending pedagogical practices tailored to their needs.

Keywords:

Hearing-Impaired, ESL, Reading Comprehension, Reading Strategies, Sign Language, Inclusive Education

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Introduction

Reading is a foundational skill for academic success and lifelong learning. In the Malaysian education system, proficiency in the English language is emphasized from the early years of schooling, as it supports comprehension across content areas and enhances communication skills. However, for students with hearing impairments, acquiring reading skills, particularly in a second language like English, presents significant challenges. Their learning pathways often differ from their hearing peers due to limited access to auditory input and exposure to spoken language, which can affect their phonological awareness, vocabulary development, and syntactic processing (Mosalli, Marandi, & Tajik, 2022).

In Malaysia, the Ministry of Education has made concerted efforts to promote inclusive education through various national policies and programs. One such initiative is the Program Pendidikan Khas Integrasi (PPKI), which integrates students with disabilities, including those with hearing impairments, into mainstream schools while providing specialized support services. Guided by the Malaysia Education Blueprint 2013–2025, the program aims to provide equitable access to quality education for all learners, in line with the principles of the UNESCO Salamanca Statement and the Convention on the Rights of Persons with Disabilities (CRPD). Despite these policies, practical challenges remain in implementing inclusive pedagogical practices, particularly in language acquisition domains, highlighting the importance of context-specific research into the learning needs of students with hearing impairments.

Despite educational policies promoting inclusive practices, the specific challenges faced by students with hearing impairments in reading English texts are often overlooked in mainstream research. The ability to decode, comprehend, and extract meaning from texts requires not only linguistic knowledge but also cognitive strategies that support reading fluency. For hearing-impaired learners, this process is further complicated by communication barriers and differences in language acquisition. Many struggles with complex sentence structures, unfamiliar vocabulary, and making inferences, all of which hinder comprehension (Luckner & Handley, 2008; Trevino, Harper, Werfel & Lund, 2025).

This study aims to explore the English reading difficulties faced by Form 1 hearing-impaired students in a Malaysian secondary school and to examine the strategies they employ to overcome these barriers. While past research by Luft (2018) has highlighted the relationship between vocabulary knowledge and reading comprehension among deaf and hard-of-hearing students in Malaysian secondary schools, and Luckner and Handley (2008) and Mosalli et al. (2022) have provided foundational international insights into deaf students' reading processes, few studies have examined how Malaysian students independently apply reading strategies in classroom environments. This study seeks to bridge that gap by focusing on student-driven strategies within actual ESL instruction, offering context-specific findings to inform inclusive pedagogical practices in Malaysia.

By focusing on this specific population, the research intends to provide valuable insights into their reading behaviour and contribute to the development of targeted support strategies in English as a Second Language (ESL) classrooms.

Objectives

1. To identify reading difficulties faced by Form 1 hearing-impaired students.
2. To examine the strategies used by students to overcome these difficulties.

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Research Questions

1. What English reading difficulties are experienced by hearing-impaired Form 1 students?
2. What reading strategies do these students use to cope with their reading challenges?

The findings of this study will be beneficial to ESL teachers, curriculum developers, and policymakers in special education. It aims to foster a more inclusive and responsive teaching approach that addresses the unique needs of students with hearing impairments.

Literature Review

The Importance of Reading in ESL Contexts

Reading is a core skill in second language acquisition, playing a critical role in vocabulary expansion, grammar reinforcement, and overall language development. Effective reading facilitates access to new knowledge and supports learners in both academic and everyday settings. For ESL learners, reading is not only about decoding text but also about engaging cognitively and strategically with language input (Zhao, Wu, Sun, & Chen, 2021).

Reading Difficulties among Hearing-Impaired Students

Hearing-impaired learners face unique challenges in developing reading proficiency, particularly in languages that are not their mother tongue. Studies have shown that these students often struggle with vocabulary acquisition, limited syntax understanding, and difficulties making inferences due to reduced exposure to spoken language (Zhang, Ke, Anglin-Jaffe, & Yang, 2023; Mosalli, Marandi, & Tajik, 2022). Additionally, the lack of access to phonological cues can hinder decoding, leading to slower reading rates and lower comprehension (Mosalli, Marandi, & Tajik, 2022). Furthermore, students with hearing loss may rely more heavily on visual learning cues and may require sign-supported reading instruction to fully access text meaning. Research suggests that even when hearing-impaired students demonstrate decoding ability, they may still struggle with higher-order comprehension processes such as summarizing or identifying the main idea (Kelly & Barac-Cikoja, 2007).

In the Malaysian context, research on the literacy development of hearing-impaired students has begun to receive greater attention. Juhkam et al. (2023) investigated English reading comprehension among students in special education programs and found that limited lexical knowledge and insufficient use of reading strategies significantly impacted reading fluency. Similarly, Daza Gonzalez, Phillips-Silver, Maurno, García & Ruiz-Castañeda (2023) emphasized the importance of multimodal literacy instruction in enhancing reading engagement for deaf learners, suggesting that integrating visual, tactile, and linguistic supports can improve outcomes in ESL classrooms. Fernández Batanero, Rueda Montenegro, Cerero Fernández and García Alonso (2022). Domagała-Zyśk (2018) further reported that English reading difficulties among students with hearing impairments were exacerbated by the lack of teacher training in inclusive strategies and insufficient resources tailored to their needs. These findings collectively underscore the pressing need to adapt pedagogical methods and materials in Malaysian ESL classrooms to better accommodate learners with hearing impairments.

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Strategy Use in Reading

Reading strategies are essential for learners to manage, monitor, and enhance their comprehension. Oxford (1990) categorizes these into cognitive (e.g., guessing meaning, note-taking), metacognitive (e.g., self-monitoring, setting goals), and social/affective (e.g., seeking clarification) strategies. For hearing-impaired students, these strategies may take on alternative forms such as using sign language to process written information, engaging in fingerspelling, or relying on picture-text associations.

While many studies emphasize the importance of explicit strategy instruction for hearing-impaired learners (Luckner & Handley, 2008), there remains a gap in understanding how students organically apply or adapt such strategies in real classroom contexts. Local research, such as King-Sears (2021), found that most ESL classrooms in Malaysian special education settings do not integrate strategy training into reading instruction, often leaving students to rely on self-taught or peer-scaffolded approaches. These findings suggest the need for more structured yet flexible pedagogical models that include explicit strategy instruction aligned with students' communication modes.

Research Gap

While international literature provides foundational insights into the reading profiles of deaf and hard-of-hearing (DHH) learners, and Malaysian research is beginning to address ESL challenges in special education, few studies focus specifically on how hearing-impaired students in Malaysian PPKI settings employ compensatory reading strategies (Kumar & Yadav, 2025). The limited number of qualitative investigations capturing student-driven adaptations in authentic classroom environments means that critical aspects of learner agency and cognitive resilience may remain underexplored. Furthermore, there is a lack of systematic documentation on how bilingual modalities, such as Malaysian Sign Language (BIM), interact with reading strategy use in ESL contexts (Sudharshana, 2018).

This study addresses these gaps by investigating both the reading difficulties and the spontaneous strategies used among Form 1 hearing-impaired students within a Malaysian secondary school under the PPKI program (Abdullah & Hanim Ismail, 2025). By focusing on student experiences, this research contributes localized, evidence-based insights to inform inclusive ESL pedagogy, curriculum design, and teacher training (Abdullah & Hanim Ismail, 2025).

Theoretical Framework

This study is anchored in two complementary theoretical perspectives: Cognitive Strategy Theory and Social Constructivism. Cognitive Strategy Theory (Oxford, 1990; McComas, 2014) emphasizes the role of deliberate mental operations in facilitating reading comprehension. These include cognitive strategies such as re-reading and decoding, and metacognitive strategies like planning and monitoring comprehension, both of which are essential for hearing-impaired learners who often rely on visual cues and sign language translation.

In parallel, Social Constructivist Theory (Vygotsky, 1978) highlights the significance of peer collaboration and scaffolding in learning processes. In inclusive classrooms, deaf and hard-of-hearing students often co-construct meaning with peers through discussion and shared strategy use, particularly when navigating unfamiliar vocabulary or complex texts. These theoretical

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lenses frame the current study's exploration of how hearing-impaired students in Malaysia deploy individual and social strategies to overcome reading difficulties in English.

Methodology

Research Design

This study employed a qualitative case study design to gain an in-depth understanding of the reading experiences of hearing-impaired Form 1 students. A case study approach was chosen due to its suitability for exploring complex, context-dependent phenomena, particularly in special education settings. The qualitative lens allows the researcher to capture the voices of the participants and uncover the nuanced strategies they employ while reading English texts (Yin, 2014).

Participants

This study involved six Form 1 students with diagnosed hearing impairments enrolled in a government secondary school under Malaysia's Program Pendidikan Khas Integrasi (PPKI). Participants were selected using purposive sampling to ensure that each met the following criteria: (i) formal identification as hearing-impaired by the Ministry of Health or Education, (ii) basic or emergent proficiency in English reading based on curriculum-based assessments, and (iii) active enrolment in an ESL instructional program that includes reading comprehension components. Reading level was determined using a teacher-administered diagnostic checklist aligned with the Form 1 *Kurikulum Standard Sekolah Rendah (KSSR) Semakan* English curriculum. The checklist evaluated students' ability to: (1) recognize sight words, (2) decode simple and compound sentences, (3) answer literal comprehension questions, and (4) apply inferencing skills. Students were categorized as having either Basic (limited decoding and literal comprehension) or Emergent (some inferencing, partial comprehension) reading abilities.

Spoken English proficiency varied among participants and was evaluated through teacher observations, oral performance in class, and informal speech samples. Based on these assessments, students were classified into three levels of proficiency. Those with minimal proficiency rarely used spoken English and relied almost exclusively on Bahasa Isyarat Malaysia (BIM) to communicate. Participants with basic proficiency were able to produce short spoken phrases; however, they still depended heavily on sign language to ensure clarity and understanding. Meanwhile, students with moderate proficiency demonstrated the ability to engage in brief verbal communication, though their speech was often supplemented with signs or gestures to support comprehension. All six participants primarily used BIM or a combination of BIM and spoken English as their main communication mode in classroom settings.

A detailed breakdown of participants' reading levels, spoken language proficiency, and communication modes is provided in Table 1: Participant Profile Table.

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Table 1: Participant Profile Table.

Participant ID	Gender	Age	English Reading Level	Spoken English Proficiency	Primary Communication Mode
Student A	Male	13	Basic recognizes sight words; limited comprehension	Minimal - uses primarily BIM, few spoken words	BIM
Student B	Female	13	Basic- simple sentence decoding; struggles with inference	Basic- short spoken phrases; relies on a sign for clarification	BIM + Spoken
Student C	Male	13	Emergent- able to answer literal questions; poor vocabulary	Moderate - attempts sentence-level speech; limited clarity	BIM + Spoken
Student D	Female	13	Basic- requires support for all comprehension tasks	Minimal - avoids speaking, fully dependent on sign	BIM
Student E	Male	13	Emergent- uses re-reading; partial comprehension	Basic- simple responses, gestures, and sign mix	BIM + Gestures
Student F	Female	13	Basic- heavy reliance on peer support	Moderate- engages in brief speech with frequent sign support	BIM + Spoken

Source: (Author's Work)

Research Instruments

Three primary instruments were used to gather data:

i. Reading Tasks: Short English texts followed by comprehension questions were used to observe decoding and comprehension difficulties.

Observation of Decoding Behaviors

Decoding was closely observed during the reading tasks through multiple behavioral indicators. These included how students approached unfamiliar words, paused or hesitated during reading, attempted to sound out or fingerspell terms, or visually scanned the text multiple times for clues. When encountering challenging vocabulary, students often showed signs of decoding attempts by mouthing syllables silently, signing the word in BIM, or looking for matching visual cues in accompanying images or peer responses. These behaviours were recorded using an observational checklist that captured specific decoding-related actions, such as syllabic breakdown, eye-tracking patterns (e.g., regression to earlier text), and the use of fingerspelling. The frequency and context of these decoding strategies were triangulated with interview responses and

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reading comprehension scores to understand how students processed written English at the word and sentence level.

Determining Comprehension Difficulties

Comprehension difficulties were identified using a combination of task performance analysis, classroom observation, and post-task interviews. During reading tasks, students were presented with short English passages followed by a set of literal and inferential comprehension questions. Difficulty was inferred when students provided incomplete, irrelevant, or literal-only answers to inferential prompts, showed visible signs of confusion (e.g., pausing, glancing at peers), or required prompts to continue. Observational data included noting when students skipped text, failed to respond to questions, or relied heavily on peer cues to explain passage content. Interview data further illuminated comprehension barriers, as students often articulated uncertainty about vocabulary meaning, sentence structure, or storyline interpretation. A comprehension difficulty was confirmed when a student (i) consistently misunderstood key information, (ii) misinterpreted the main idea or intent of the passage, or (iii) displayed surface-level understanding despite reading the full text. These indicators were triangulated across all instruments and analyzed thematically using NVivo to ensure accurate interpretation.

ii. Observational Checklist: The researcher documented reading behaviors, signs of struggle, and evidence of strategy use during reading sessions.

Observation Checklist Criteria

The observational checklist was developed to capture both overt and subtle indicators of reading-related behaviours exhibited by students during classroom sessions. It focused on two primary domains: decoding efforts and comprehension engagement. Observations were conducted in real time during reading task performance, with each behaviour coded and subsequently triangulated with semi-structured interview data and reading task outcomes.

Decoding behaviours included observable attempts to sound out or fingerspell unfamiliar words, mouthing of syllables or whispering under breath, and notable pauses or regression in eye movement while processing text. Additional indicators, such as the use of Bahasa Isyarat Malaysia (BIM) to translate specific words and the repetition of lines or phrases, were also classified as decoding strategies. For comprehension, the checklist documented the accuracy of student responses to both literal and inferential questions, alongside behavioural indicators such as requests for clarification from peers or teachers, skipping or disregarding complex sentence structures, and reliance on visual scanning techniques like keyword identification. Instances of hesitation or visible confusion manifested through facial expressions or body language were also systematically recorded.

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Observers used a low-to-high engagement scale to rate the frequency and intensity of each behaviour and took detailed field notes to contextualise the observed strategies. These data were then thematically analysed using NVivo software to identify recurring patterns in reading difficulties and strategy use across participants.

iii. Semi-structured Interviews: Conducted in BIM with interpreter support, the interviews explored students' reflections on their reading experiences and strategies used.

Semi-Structured Interview Guide

The semi-structured interviews were conducted in BIM (Bahasa Isyarat Malaysia) with interpreter support and focused on eliciting students' perspectives on their reading experiences. The following guiding questions were used, with follow-up probes as needed:

Can you tell me how you feel when reading English texts?
Probe: What do you do when you don't understand a word?
What parts of reading are easy or hard for you?
Probe: Are there certain words or sentences you find confusing?
Do you use any strategies to help you understand a story or text?
Probe: Do you read again, ask a friend, or sign it to yourself?
Do you use sign language when reading? How does it help you?
Probe: Which signs help you most? Do you use fingerspelling?
Do you ever talk to your friends or teacher when you need help reading?
Probe: What kind of help do they give?
How confident do you feel when you read English in class?
Probe: Do you feel nervous, happy, or confused? Why?

Each interview lasted 15–20 minutes and was video recorded for transcription and analysis. The interview protocol aimed to capture both cognitive (strategy-based) and affective (emotional, motivational) aspects of students' reading behaviours.

Data Collection Procedure

Data were collected over six weeks. Participants were observed during English reading sessions twice a week, with each session lasting approximately 30 minutes. Reading tasks were administered in small-group settings, and interviews were conducted individually at the end of the observation period. All sessions were video recorded for transcription and analysis, with parental and institutional consent secured in advance.

All video recordings of interviews and classroom sessions were transcribed verbatim, with special attention given to signed communication in BIM, which was translated into English during transcription. Transcription was performed manually and verified by a trained interpreter proficient in both BIM and English. The finalized transcripts were then uploaded into NVivo 12 software for coding and analysis.

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Data Analysis

The data were analyzed thematically using inductive coding. Patterns related to types of reading difficulties and strategy use were identified and categorized. To enhance credibility, data triangulation was conducted across observation, reading task responses, and interview transcripts (Jentoft & Olsen, 2017).

The coding process followed an inductive thematic approach, where categories emerged from the data rather than being pre-defined. Codes related to reading difficulties (e.g., "vocabulary struggle," "sentence confusion") and strategy use (e.g., "peer help," "re-reading") were clustered and refined into overarching themes. NVivo enabled the systematic organization of the data and supported cross-source comparison across observation notes, reading responses, and interview transcripts.

To guide the thematic analysis, a coding framework was developed through iterative readings of the data. Initial open coding produced a wide range of descriptive codes related to both reading difficulties and strategy use. These were then grouped into broader categories through axial coding. The final framework consisted of two overarching themes: *(1) Types of Reading Difficulties* and *(2) Compensatory Strategies Used*. Each theme included several sub-codes, as summarized in Table 2 below.

Table 2: Coding Framework for Thematic Analysis of Reading Difficulties and Strategy Use

Theme	Sub-Codes	Description
Reading Difficulties	Vocabulary Challenges	Difficulty understanding unfamiliar or abstract words.
	Syntax Misunderstanding	Confusion with sentence structure (e.g., passive voice)
	Inference Limitations	Inability to identify implied meanings or draw conclusions
	Low Confidence	Avoidant behaviour and reluctance to engage with texts
Strategy Use	Re-reading	Multiple reading attempts to clarify the meaning
	Sign Language Translation	Use of BIM to process written English
	Peer Collaboration	Seeking clarification or discussing answers with peers
	Keyword Highlighting	Visual scanning and marking important text cues

Source: (Author's Work)

To elaborate, the coding framework functioned as a central analytic tool that enabled consistent identification and interpretation of student behaviours and responses across the three data sources: reading tasks, classroom observations, and semi-structured interviews. Each emergent theme and sub-theme, such as vocabulary struggles, re-reading, or peer collaboration, was operationally defined with clear inclusion criteria to avoid subjective interpretation. The codes were iteratively refined through multiple rounds of transcript reviews, with overlapping categories merged or split as patterns became more distinct. Using NVivo 12, all data were systematically tagged according to this framework, allowing for the cross-referencing of qualitative evidence from different sources. For example, a student's repeated use of sign language during reading (observational data) could be linked to their self-reported strategy in interviews and confirmed through their task performance. This process of triangulation not only enhanced the credibility and dependability of the findings but also revealed nuanced

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interconnections between observed strategies and perceived reading challenges, thereby grounding interpretations in rich, multi-modal evidence.

Ethical Considerations

Ethical approval was obtained from the school's administrative body and the relevant education department. Informed consent was secured from students and their guardians. Participants' identities were anonymized using pseudonyms. Efforts were made to ensure that students felt safe, supported, and understood throughout the research process.

Findings

The study yielded two main themes:

1. Reading difficulties faced by hearing-impaired Form 1 students, and
2. Reading strategies employed to overcome these challenges.

Reading Difficulties

Table 3: Reading Difficulties Summary

Difficulty Type	Description	Student Example
Vocabulary Challenges	Difficulty with unfamiliar words	"Saya tidak faham perkataan itu" I don't understand that word (Student A)
Syntax Misunderstanding	Confusion with sentence structure, especially passive voice	Misinterpreted subject-object relationship
Inference Limitations	Unable to infer implied meanings or predict outcomes	Failed to answer, "Why did the character?"
Motivation/Confidence	Low self-esteem, avoids difficult sections	Hesitant to attempt unfamiliar passages

Source: (Author's Work)

The reading challenges encountered by the hearing-impaired Form 1 students were diverse yet interrelated, affecting both their decoding and comprehension processes. As detailed in Table 3, four primary categories of difficulty were identified through thematic analysis: vocabulary challenges, syntactic misunderstandings, inferencing limitations, and low motivation or reading confidence. Vocabulary challenges were the most prevalent, where students consistently demonstrated difficulty in interpreting unfamiliar or abstract terms. Syntactic misunderstandings emerged when students failed to grasp sentence structures, particularly those involving passive voice or complex clauses. The inability to make inferences, such as identifying implied meanings or predicting story outcomes, limited their engagement with higher-order comprehension tasks. Lastly, signs of low motivation or reading confidence, such as skipping difficult passages or deferring to peers, were frequently observed, further compounding the impact of linguistic difficulties. These findings underscore the need for targeted interventions that address both linguistic and affective barriers in ESL literacy development for students with hearing impairments.

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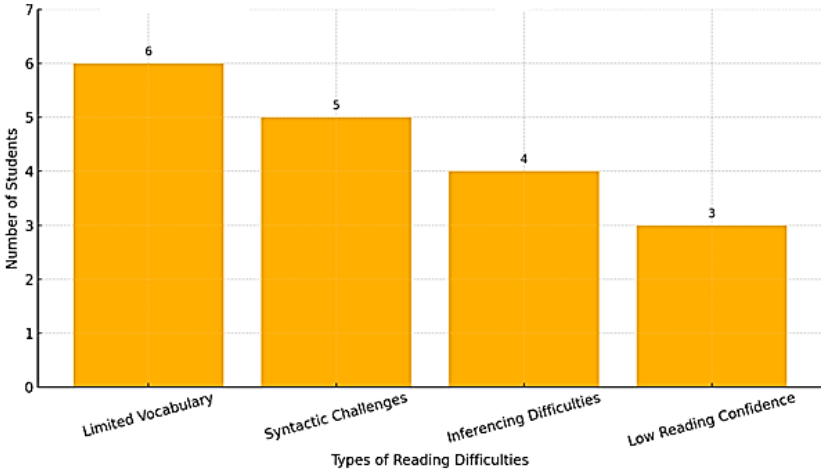

Figure 1: Reading Difficulties Among Hearing-Impaired Form 1 Students
Source: (Author's Work)

The participants in this study experienced a range of reading difficulties that align with the findings in the literature (Mosalli, Marandi, & Tajik, 2022; Paul & Wang, 2012). This diagram summarizes the primary reading difficulties experienced by hearing-impaired Form 1 students as identified through classroom observation and interview data. These include (1) limited vocabulary knowledge, where students struggled with unfamiliar or abstract words; (2) syntactic challenges, particularly with passive structures and complex sentence forms; (3) inferencing difficulties, including problems identifying implied meanings or main ideas; and (4) low reading confidence, which manifested in avoidance behaviours and reliance on peer support. These categories reflect both linguistic and affective barriers to effective reading comprehension in ESL contexts. A summary of these difficulties is illustrated in Figure 1.

Lexical and Vocabulary Limitations

All participants demonstrated difficulty decoding unfamiliar English words, particularly abstract nouns and verbs (Zhao, Wu, Sun & Chen, 2021). Despite prior exposure in the classroom, words such as *"explain," "reason,"* and *"compare"* triggered hesitation and misinterpretation. "I don't know what *'explain'* means, even though I saw it before. It's hard because it doesn't have a picture," shared Student A, expressing frustration during a comprehension task. This supports previous research indicating that hearing-impaired students often acquire a limited vocabulary range (Paul & Wang, 2012; Luft, 2018).

Syntactic Complexity

Students struggled with understanding longer or more complex sentence constructions, such as those involving conditionals, passive voice, or compound structures. For example, when reading the sentence, *"The homework was completed by the student before the teacher arrived,"* Student B interpreted it as "the teacher did the homework," highlighting confusion with the passive voice. This aligns with the findings by Mosalli et al. (2022), who emphasized the syntactic processing gap among deaf and hard-of-hearing (DHH) learners.

Difficulty in Making Inferences

Higher-order reading tasks, including summarizing and predicting, were particularly challenging. When asked, "Why did the main character leave the house?" Student C replied, "Because the house is there," indicating difficulty in making logical inferences beyond literal

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interpretation. Most responses were confined to direct translation of sentences rather than integrated comprehension. This echoes findings from Kelly and Barac-Cikoja (2007) regarding metacognitive constraints in DHH learners.

Low Confidence and Avoidance Behavior

Observation revealed signs of anxiety and reluctance to engage with longer texts. During one session, Student D hesitated and whispered to a peer, "Can you read this? I don't want to say it wrong," indicating low confidence and dependence on peer reassurance. Students often skipped reading aloud or asked peers for help before attempting answers, suggesting low confidence in reading comprehension. These behaviors suggest emotional and affective factors influencing reading engagement.

Reading Strategies Used

Table 4: Reading Strategies Summary

Strategy	Description	Observed Use / Frequency
Re-reading Sentences	Reading the same line multiple times for better understanding	Used consistently by all six students
Sign Language Translation	Signing words or phrases for meaning support	Common during independent reading sessions
Peer Support	Discussing answers or asking peers for help	Used in 4 out of 6 observed sessions
Keyword Highlighting	Underlining or visually scanning for important words	Noted in 3 students with higher confidence

Source: (Author's Work)

Despite the challenges they faced, students actively employed a variety of adaptive reading strategies, many of which reflect both cognitive and collaborative learning mechanisms. Table 4 provides a summary of these strategies, detailing how and when they were applied during reading tasks. Re-reading was the most consistently observed strategy, used by all participants to reinforce understanding and clarify meaning. Sign language translation, particularly the use of Malaysian Sign Language (BIM), served as a crucial support tool for internalizing unfamiliar English words and phrases. Peer support was also a common practice, wherein students sought clarification or affirmed understanding through brief interactions. Keyword highlighting and visual scanning, although less frequently used, were observed among students who displayed higher confidence levels. These strategies not only reveal the students' agency in managing their reading difficulties but also suggest the importance of building classroom environments that promote visual and social learning modalities in support of inclusive literacy instruction.

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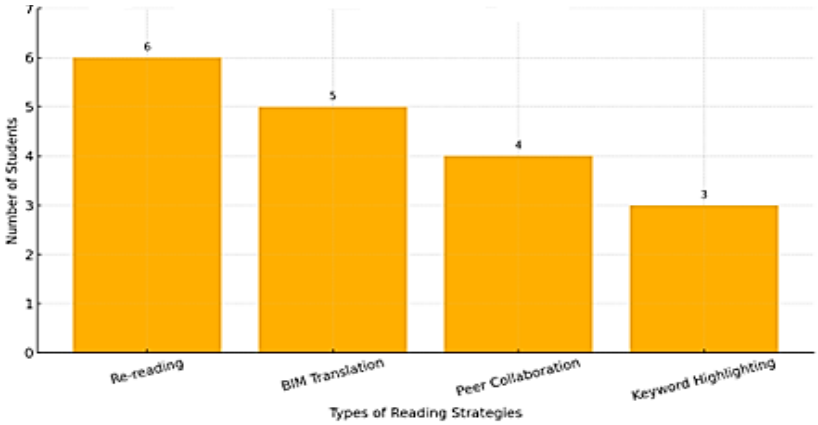

Figure 2: Reading Strategies Used by Hearing-Impaired Form 1 Students
Source: (Author's Work)

Figure 2 presents a summary of the cognitive and behavioural reading strategies employed by participants. Strategies included re-reading text passages to improve comprehension, translating unfamiliar words or sentences into Malaysian Sign Language (BIM) to support understanding, peer collaboration for clarification and shared meaning-making, and identifying or highlighting keywords to aid in information retrieval. These strategies reflect the learners' adaptive responses to their reading challenges and indicate an intuitive use of multimodal and socially supported reading practices.

Despite the challenges, students demonstrated several adaptive behaviours and strategies:

Re-reading and Scanning

Re-reading was the most frequently observed behaviour. Student E was observed mouthing the same sentence three times before answering, later explaining, "I read again to be sure. The word 'before' is confusing". Students often reread difficult passages multiple times, especially when preparing to answer comprehension questions. Visual scanning for keywords helped anchor their understanding. This strategy helped reinforce understanding when lexical or syntactic challenges arose (Zhang, Zhou, Chen, Lei, & Chen, 2025).

Sign Language Self-Translation

Participants translated difficult words into BIM, either internally or by signing to a nearby peer. Student A, when encountering the word *"prepare,"* immediately signed the equivalent in BIM and said, "I know this because the teacher showed in sign last time". This bilingual strategy served as a bridge between written English and internalized meaning, supporting the visual-based cognitive processing style described in studies by Schick et al. (2006).

Peer Assistance and Collaborative Support

Students actively sought peer support during reading activities. "I don't know what 'reason' means. You?" Student F asked during a task, initiating collaborative meaning-making that often-clarified difficult sections for both students. Group discussions were often initiated without prompting, showing the natural role of peer scaffolding in inclusive settings (Abune, 2019).

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Discussion

Alignment with Previous Studies

This study confirms the pattern observed in international literature: hearing-impaired students face consistent difficulties with vocabulary, syntax, and inferencing in English reading (Paul & Wang, 2012; Mosalli, Marandi, & Tajik, 2022). The fact that most participants depended on literal comprehension reaffirms earlier findings by Luckner and Handley (2008), suggesting that surface-level understanding dominates unless specific scaffolding is introduced.

Strategy Use Reflects Adaptive Intelligence

While formal instruction in reading strategies was not evident, students demonstrated self-initiated adaptations, especially through bilingual support (BIM-English translation) and peer interaction. These strategies highlight cognitive flexibility despite limited linguistic access. Re-reading, for instance, aligns with cognitive strategy theory (Oxford, 1990), while peer discussions underscore the social constructivist perspective (Vygotsky, 1978).

Implications for Teaching

The findings of this study highlight a clear need for more targeted instructional approaches to support hearing-impaired learners in English reading. First, there is a strong case for the explicit teaching of reading strategies, including inference-making, summarization, and prediction, to help students engage with texts beyond the literal level. Additionally, the integration of visual scaffolds such as sign-supported texts and video-captioned materials can enhance accessibility and support comprehension by aligning with the learners' preferred visual processing modes. When compared to their mainstream hearing peers, hearing-impaired students often display slower reading development and greater reliance on external supports due to reduced access to phonological input.

While mainstream students may benefit from auditory cues and incidental learning through spoken language, hearing-impaired learners require deliberate visual and bilingual scaffolding. This difference underscores the need for differentiated instruction, a flexible approach that modifies content delivery, learning strategies, and assessments to match students' communication needs and literacy profiles. The study also underscores the value of collaborative learning models, where students are provided with opportunities to discuss and negotiate meaning in a safe and supportive environment. Finally, there is a pressing need for comprehensive teacher training in the use of assistive communication methods, particularly the integration of Malaysian Sign Language (BIM) into reading instruction, to ensure that teaching practices are inclusive, responsive, and linguistically appropriate for students with hearing impairments.

Distinctive Nature of Reading Challenges Among DHH Learners

While the core reading difficulties identified in this study, such as limited vocabulary, syntactic confusion, and difficulty with inferencing, may superficially resemble those encountered by hearing ESL learners, their causes and manifestations are notably different in students with hearing impairments. Vocabulary limitations, for instance, are often intensified by reduced access to incidental spoken language exposure and limited opportunities for overheard learning factors critical for natural vocabulary acquisition among hearing peers (Zhao et al., 2021). Similarly, syntactic misunderstandings and inference failures were often the result of direct

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one-to-one translation from sign language to written English, which lacks grammatical parity, especially concerning sentence structure and function words.

Unlike hearing learners who may use phonological decoding strategies, the students in this study lacked consistent access to sound-symbol correspondence, making visual decoding strategies, such as fingerspelling or re-reading, more prominent. Additionally, low reading confidence among these students was shaped not only by language difficulty but also by communication anxiety and prior negative experiences in mainstream academic settings. Thus, while some challenges may appear general to ESL reading, the underlying cognitive, linguistic, and socio-emotional dimensions are distinct in DHH learners, reinforcing the need for differentiated instructional strategies, bilingual scaffolds, and sign-integrated reading supports.

Limitations

This study is limited by its small sample size and specific school context. The absence of a longitudinal perspective also means that the development of reading strategies over time could not be observed. Additionally, interpreter involvement may have influenced responses during interviews. Another important limitation is the potential language bias introduced during the translation process. Since interviews and some reading reflections were conducted in Malaysian Sign Language (BIM) and later translated into English for analysis, there is a risk that certain nuances, emotions, or conceptual meanings were lost or altered during the interpretation. This may have affected how students' strategies or reading challenges were described and understood in the final analysis. Future studies should consider incorporating bilingual coders or direct analysis of signed data (e.g., through video-based coding) to preserve the authenticity of participant voices.

Future research

Future research should explore the effectiveness of specific scaffolded interventions designed to enhance reading comprehension among hearing-impaired learners, particularly those targeting vocabulary development, syntactic understanding, and inferencing skills. Additionally, investigating the role of technology in sign-supported reading instruction, such as the use of captioned videos, interactive e-books, and digital platforms incorporating Malaysian Sign Language (BIM), could provide valuable insights into innovative approaches for inclusive education.

There is also a compelling need for action research conducted by classroom teachers to explore how inclusive reading strategies can be integrated and refined within real teaching contexts. Such practitioner-led inquiries can yield contextually relevant insights and support the continuous improvement of ESL practices for students with hearing impairments.

Furthermore, longitudinal studies are recommended to track the development of reading skills and strategy use over time among hearing-impaired learners. By observing students across multiple academic years, researchers can better understand how interventions, teacher input, and classroom environments influence reading proficiency, confidence, and long-term academic outcomes.

Comparative studies between mainstream and special education classrooms would also offer a deeper understanding of how different instructional environments influence the reading

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outcomes and strategy use of hearing-impaired students, thereby informing more equitable and effective pedagogical practices.

Conclusion

This study explored English reading difficulties and the strategies employed by hearing-impaired Form 1 students in a Malaysian secondary school. The findings revealed persistent lexical, syntactic, and inferencing challenges, accompanied by low self-confidence in reading. However, students also demonstrated intuitive use of compensatory strategies such as re-reading, sign language translation, and peer collaboration.

These insights offer practical implications for ESL instruction in inclusive settings. Educators must embrace a multimodal approach that includes strategy instruction, visual support, and bilingual resources to foster literacy among DHH learners. More importantly, future curriculum development and teacher education programs must be restructured to systematically embed inclusive practices, including sign language integration, differentiated reading instruction, and visual literacy strategies tailored to diverse learners.

At the policy level, there is an urgent need for the Ministry of Education to institutionalize support frameworks for hearing-impaired students beyond basic accommodations. This includes revising the ESL curriculum to be more inclusive, expanding the availability of trained sign language interpreters and resource teachers, and ensuring that inclusive reading strategies are part of national teacher training standards. These reforms are essential to achieving the goals outlined in the Malaysia Education Blueprint 2013–2025 and the principles of equitable access and inclusive excellence for all learners.

Future research can further contribute by examining how policy implementation translates into classroom practice and how sustained teacher development in inclusive literacy pedagogy can improve long-term outcomes for hearing-impaired students.

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