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THE HEARING-IMPAIRED STUDENT'S COMPREHENSION IN LEARNING ENGLISH THROUGH INTERACTIVE AUDIO-VISUAL VIDEO

Siti Zahara Wulandari

Universitas Islam Negeri Sumatera Utara Medan, Indonesia

Email: Siti0304222066@uinsu.ac.id

ABSTRACT

This study aimed to explore English comprehension among deaf students through English Interactive Audio-Visual Video (EIAVV), examine how comprehension was demonstrated during the learning process, and identify the factors influencing its development. A qualitative case study design was employed at SLB ABC Melati Aisyiah Deli Serdang. The participants consisted of one deaf student as the main participant, four supporting participants, and an English teacher as an additional source of information selected through purposive sampling. Data were collected through classroom observations, semi-structured interviews, and comprehension tests. The data were analyzed using data condensation, data display, and conclusion drawing, while credibility was established through methodological triangulation and member checking. The findings revealed that deaf students were able to comprehend English learning materials through EIAVV, particularly vocabulary and contextual information presented through visual representations. Their comprehension was demonstrated through answering questions, recognizing vocabulary from visual cues, following instructions, completing tasks, and participating in classroom activities. However, difficulties remained in understanding longer sentences and complex language structures. Students' comprehension was influenced by visual support, repetition, teacher adaptation, motivation, and individual learning characteristics. The findings suggest that EIAVV provides meaningful support for inclusive English learning when combined with adaptive teaching practices.

Keywords: Deaf Students, English Comprehension, Visual Learning, Inclusive Education.

INTRODUCTION

English has become an essential international language that plays a significant role in education, science, technology, and global communication. As English proficiency increasingly influences learners' access to academic resources and future career opportunities, providing equitable English language education has become an important concern for educational institutions worldwide (Harmer, 2007). This responsibility also applies to students with special educational needs, including deaf students, who have the same right to access meaningful learning experiences that support their academic development. Inclusive education emphasizes that every learner should receive equal educational opportunities through instructional practices that accommodate diverse learning characteristics rather than requiring students to adapt to uniform teaching approaches (Florian, 2008). Therefore, English instruction should provide accessible learning environments that enable deaf students to participate actively and achieve meaningful learning outcomes based on their individual needs (Levesque, E. & Duncan, 2024).

Deaf students experience unique challenges in learning English because they rely on different ways of accessing and constructing information compared with hearing

students. Due to limited access to auditory input, deaf students primarily depend on visual information, including written texts, sign language, facial expressions, gestures, and contextual illustrations, to interpret and communicate meaning (Gayathri, A., & Kumar, 2017). These characteristics influence their ability to acquire vocabulary, understand sentence structures, and develop English comprehension. Consequently, conventional English teaching approaches that rely heavily on oral explanations and listening activities may not adequately address the learning needs of deaf students (Adi, S. S., et al., 2017). Effective English instruction for deaf learners should therefore emphasize visual accessibility and provide learning experiences that allow students to construct meaning through appropriate visual representations (Higgins, M., & Lieberman, 2016).

The advancement of educational technology has provided new opportunities to enhance English learning through interactive multimedia that integrates visual, textual, and audio elements into meaningful instructional experiences. Multimedia-based learning enables students to process information through multiple representations, making language concepts easier to understand and increasing learners' engagement during the learning process (Mayer, 2009). For deaf students, technology-supported visual learning is particularly relevant because it corresponds with their dominant learning modality and provides greater access to linguistic information. Previous studies have demonstrated that multimedia-based English learning materials can improve accessibility and encourage participation among deaf learners (Adnyani, N. L. P. S., 2021). Building upon these developments, English Interactive Audio-Visual Video (EIAVV) provides an instructional medium that combines subtitles, visual illustrations, contextual videos, and interactive activities to support English comprehension. These features allow students to connect linguistic forms with visual contexts, facilitating vocabulary recognition, sentence interpretation, and meaning construction during English learning activities (Anggraeni, M. E., 2020).

Previous studies have highlighted the contribution of technology-assisted instructional media in supporting English learning among deaf students. Multimedia learning materials have been reported to provide more accessible learning experiences by integrating visual elements that accommodate the communication needs of deaf and hard-of-hearing learners (Adnyani, N. L. P. S., 2021). Similarly, interactive learning media supported by Indonesian Sign Language (SIBI) has been found to facilitate students' understanding of English vocabulary and simple sentence construction through visual demonstrations and structured learning activities (Ali, Z. R., et al., 2023). Multimodal learning practices that combine written texts, visual representations, gestures, and digital media have also been associated with meaningful classroom interaction and language development among students with hearing impairments (Ikasari, B., et al., 2019). In addition, a recent systematic review indicated that educational technology integration can contribute to student engagement, communication, and academic performance among hearing-impaired students across different educational contexts (Alit, N., 2025). These studies indicate that visual and technology-supported instruction has considerable relevance for English learning among deaf students.

Despite these findings, previous research has largely focused on the development of instructional media, vocabulary acquisition, writing skills, and learner engagement rather than examining how deaf students develop and demonstrate English comprehension during the learning process (Khoirul Huda, 2023). Limited attention has also been given to an integrated instructional medium that combines contextual videos, subtitles, visual illustrations, and interactive activities to support English

comprehension, particularly in Indonesian special school contexts (Acilo, J. V., et al., 2025). Consequently, there remains a need for research that examines not only whether technology-assisted media can support deaf students' English learning, but also how comprehension is demonstrated during classroom activities and what factors influence its development.

Addressing this gap, the present study examines English comprehension among deaf students through the implementation of English Interactive Audio-Visual Video (EIAVV) at SLB ABC Melati Aisyiyah Deli Serdang. Unlike studies that primarily emphasize media development or individual language components such as vocabulary and sentence construction, this study focuses on the students' comprehension processes when engaging with English materials presented through EIAVV. It also investigates how comprehension is demonstrated through classroom participation and learning tasks, as well as the factors that influence students' comprehension. This focus provides a more contextual understanding of the use of interactive audio-visual media in English learning for deaf students within an Indonesian special school setting.

The study is significant both theoretically and practically. Theoretically, it contributes empirical insight into English comprehension among deaf students by describing how visual and interactive representations can support the process of constructing meaning from English learning materials. Practically, the findings may assist English teachers, special education practitioners, and curriculum developers in selecting and implementing instructional media that correspond to the visual learning characteristics and individual needs of deaf students. The study may also contribute to the development of more inclusive English learning practices through the integration of technology-based instructional media (Berry, 2021).

Based on the identified research gap, this study aims to analyze English comprehension among deaf students through the use of English Interactive Audio-Visual Video (EIAVV) at SLB ABC Melati Aisyiyah Deli Serdang. Specifically, the study explores how students comprehend English learning materials presented through EIAVV, how their comprehension is demonstrated during the learning process, and what factors influence their comprehension. To achieve these objectives, the study employs a qualitative case study approach involving classroom observations, semi-structured interviews, and comprehension tests. This approach is intended to provide an in-depth understanding of students' comprehension processes and learning experiences in the context of English instruction for deaf students.

RESEARCH METHOD

This study employed a qualitative approach with a case study design to investigate deaf students' English comprehension through the implementation of English Interactive Audio-Visual Video (EIAVV). A qualitative case study was considered appropriate because the study focused on understanding students' comprehension processes, learning responses, and the factors influencing their comprehension within a natural classroom setting. The research was conducted at the junior high school level of SLB ABC Melati Aisyiyah Deli Serdang. The school was selected because English learning activities incorporated visual-based instructional practices that were relevant to the use of audio-visual learning media. The study focused on English learning activities involving deaf students and was conducted within the regular classroom learning context.

The participants were selected through purposive sampling and consisted of five deaf students and one English teacher from the selected class. All five students participated in the EIAVV-based English learning activities. However, one student was

selected as the main participant for in-depth analysis because the student actively participated in the learning activities, responded to the learning tasks, and attended the learning sessions consistently during the research period. The other four deaf students and the English teacher served as supporting participants. Their participation provided additional information for understanding classroom interactions, students' responses, learning characteristics, and the implementation of EIAVV. The involvement of supporting participants also enabled the researcher to compare information obtained from the main participant with observations of the broader classroom context.

Data were collected through classroom observations, semi-structured interviews, and comprehension questions administered after the students engaged with EIAVV-based learning activities. The research instruments consisted of an observation sheet, semi-structured interview guidelines, and comprehension questions. The observation sheet was used to record teacher and student activities, students' attention, participation, responses, and observable comprehension during the learning process. Semi-structured interviews were conducted with the English teacher to obtain information about the students' learning characteristics, comprehension difficulties, classroom responses, and the implementation of EIAVV. The comprehension questions were used to identify students' understanding of the English material presented through the video. During the learning activity, the students watched an English audio-visual video about animals that had been adapted to their English proficiency level based on information provided by the teacher. The video presented visual and textual information about animal characteristics, habitats, and behaviours. After watching the video, the students responded to comprehension questions related to the material presented. The researcher documented the learning process through observation notes, interview transcripts, and students' responses to the comprehension questions.

The data were analyzed using the interactive model of qualitative data analysis proposed by Miles et al. (2014), which consists of data condensation, data display, and conclusion drawing or verification (Miles, H., et al., 2014). First, the researcher condensed the data by selecting, organizing, and categorizing information relevant to students' English comprehension, observable learning responses, and factors influencing comprehension. Second, the condensed data were displayed descriptively to identify patterns and relationships across observations, interview findings, and comprehension responses. Finally, conclusions were drawn by interpreting the identified patterns and continuously verifying them against the collected data. To establish the trustworthiness of the findings, the study employed methodological triangulation and member checking (Creswell, 2014). Methodological triangulation was conducted by comparing information obtained through classroom observations, teacher interviews, and students' comprehension responses. Member checking was conducted by confirming the researcher's interpretation of the interview information with the English teacher. These procedures were used to strengthen the credibility of the findings and ensure that the interpretation reflected the classroom learning context and the participants' learning experiences (Lincoln, Y. S., & Guba, 1985). The methodological scope of the study was limited to the English learning activities observed in the selected class and the experiences of the participants involved; therefore, the findings were intended to provide an in-depth contextual understanding rather than statistical generalization to all deaf students.

FINDINGS AND DISCUSSION

Students' English Comprehension through EIAVV

The findings revealed that deaf students demonstrated a relatively good level of English comprehension through the use of English Interactive Audio-Visual Video (EIAVV), particularly in understanding vocabulary and explicit information presented in the learning materials. The students were able to identify English words, associate vocabulary with visual representations, and retrieve information from the video content. However, their comprehension was more developed at the vocabulary level than at the sentence level, as understanding longer sentences and more complex meanings remained challenging for some students.

Students' comprehension was identified through comprehension task results, classroom observations, and interviews with the English teacher. The comprehension tasks were based on the EIAVV material about animals, which presented information related to animal characteristics, habitats, and behaviours through visual illustrations and written explanations. The results showed that students were able to answer most of the questions correctly, indicating that they could understand the main information presented in the video.

Table 1. Students' Comprehension Test Results

Participants	Score
Student 1	100
Student 2	100
Student 3	100
Student 4	90
Student 5	80

The comprehension results indicate that the students were able to recognize and understand English vocabulary introduced through EIAVV. Classroom observations supported these results, as students actively watched the video, responded to teacher instructions, identified objects presented in the video, and participated in related learning activities. These responses demonstrate that students' comprehension was not only reflected through their test performance but also through their ability to connect visual information with English meanings during the learning process.

The interview data with the English teacher further confirmed that students showed better understanding when English materials were presented through visual support. The teacher explained that visual media helped students understand vocabulary more easily:

"They are generally able to understand vocabulary. For example, when learning the names of fruits, I use pictures or other visual materials, and they are able to understand the vocabulary presented." (*English Teacher Interview*)

The teacher's statement indicates that visual representation played an important role in supporting students' English comprehension. For deaf learners, visual input becomes a significant pathway for accessing and constructing meaning because they have limited access to auditory information. This finding is consistent with Higgins and Lieberman (2016), who emphasized that deaf students rely heavily on visual communication and contextual information to develop language understanding. In the context of this study, EIAVV provided visual and contextual support that enabled students to associate English vocabulary with concrete meanings.

Nevertheless, the findings also showed that students experienced difficulties when comprehension required understanding longer sentences or more complex language structures. Although students were able to identify individual words and explicit information from the video, interpreting broader meanings remained more

challenging. This suggests that visual support provided by EIAVV facilitated access to English input but did not completely eliminate challenges related to students' limited vocabulary knowledge and language development (Agyire-Tettey, E. E. M., 2017).

This finding supports (Gerald, C. & Joseph, 2025), who reported that deaf students often encounter difficulties in understanding complex language due to differences in language exposure and development. However, the present study extends previous findings by showing that these challenges remain even when English materials are presented through interactive visual media. Therefore, EIAVV should be understood as a supportive medium that facilitates deaf students' comprehension development while still requiring appropriate instructional strategies to address challenges related to linguistic complexity (Alverson, 2019).

The Process of Comprehension Development through EIAVV

The findings indicated that deaf students' comprehension through English Interactive Audio-Visual Video (EIAVV) developed through several interconnected processes during the learning activities. Students did not immediately understand the English materials after watching the video; instead, they gradually constructed meaning by observing visual information, connecting visual representations with English vocabulary, interpreting contextual information, and demonstrating their understanding through learning responses. This process shows that comprehension among deaf students was developed through the interaction between accessible visual input, students' existing knowledge, and teacher instructional support.

Classroom observations showed that students initially relied on the visual elements presented in the EIAVV, including pictures, animations, and contextual illustrations. These visual features helped students identify objects and situations before associating them with English words. During the learning activities, students were observed paying attention to the video, pointing at objects displayed on the screen, identifying vocabulary related to the materials, and responding to questions provided by the teacher. These behaviours indicate that visual information functioned as an important entry point for students to access English learning content.

After recognizing visual information, students gradually developed connections between images and English vocabulary. For example, when the video presented animal-related materials, students were able to identify animal names and relate them to their physical characteristics and contexts. This process suggests that students' comprehension was not developed through memorization alone but through meaningful associations between visual representations and language forms. The use of EIAVV allowed students to encounter English vocabulary within contextual situations, making the meaning of unfamiliar words easier to understand.

The students' ability to interpret meaning was further reflected through their responses to comprehension activities. The comprehension test results and classroom observations showed that students were able to answer questions related to the information presented in the video. Their responses demonstrated that they were not only able to recognize individual vocabulary items but also understand the relationship between the vocabulary and the information provided in the learning materials. Therefore, EIAVV supported the movement from simple vocabulary recognition toward broader comprehension of English content.

The teacher interview supported these findings by emphasizing the importance of visual support and repetition in helping students understand English materials. The teacher explained:

"I use flashcards, visual materials, and repetition to ensure that the students truly understand the lesson." (*English Teacher Interview*)

The teacher's statement highlights that comprehension development among deaf students requires continuous exposure to accessible learning materials. Repetition provided students with opportunities to review vocabulary and strengthen the connection between visual information and English meanings. This finding is consistent with Mayer's (2009) multimedia learning theory, which explains that learners achieve deeper understanding when information is presented through both verbal and visual representations because these elements help learners organize and integrate new knowledge.

The present finding also supports previous research on visual-based English learning among deaf students. Khoirul Huda et al. (2023) emphasized that visual support plays an important role in facilitating English learning for deaf learners. While their study focused on writing skills, the current study extends this understanding by demonstrating that visual accessibility also contributes to the development of comprehension during English learning activities. Similarly, Anggraeni et al. (2020) found that interactive learning media supported deaf students' understanding by presenting language through visual demonstrations and structured learning activities. The present study strengthens these findings by showing how students gradually construct meaning when engaging with interactive audio-visual materials.

Furthermore, the development of students' comprehension was supported by teacher adaptation. The teacher explained that learning materials needed to be adjusted according to students' abilities because some curriculum materials were considered too complex:

"The lesson plans are often too advanced for the students, so I adjust the material according to their abilities. For example, when learning about a house, I focus on identifying objects found in the house rather than asking them to write detailed descriptions." (*English Teacher Interview*)

This finding demonstrates that comprehension development through EIAVV was not solely determined by the technology used but also by the instructional decisions made by the teacher. By simplifying learning objectives and providing appropriate tasks, the teacher created opportunities for students to demonstrate understanding according to their learning characteristics. This finding aligns with Levesque and Duncan (2024), who emphasized that inclusive education requires instructional practices that accommodate students' individual needs and provide accessible learning experiences.

Overall, the findings demonstrate that deaf students' comprehension through EIAVV developed through a gradual meaning-making process. Students accessed English materials through visual information, established connections between images and vocabulary, interpreted contextual meanings, and demonstrated comprehension through classroom participation and learning tasks. These findings highlight that interactive audio-visual media can provide meaningful support for deaf learners when combined with appropriate teacher guidance and adaptive instructional practices.

Factors Influencing Deaf Students' English Comprehension through EIAVV

The findings revealed that deaf students' English comprehension through EIAVV was influenced by several factors related to learning materials, instructional practices,

and students' individual language characteristics. Although EIAVV provided meaningful visual support that facilitated students' understanding, the development of comprehension was also shaped by teacher assistance, repetition, students' vocabulary knowledge, and challenges related to English language characteristics. These factors demonstrate that students' comprehension was developed through the interaction between accessible learning media and appropriate instructional support.

One of the main factors supporting students' comprehension was the use of visual-based learning materials. The findings showed that students were able to understand English vocabulary more easily when words were accompanied by pictures, videos, and contextual illustrations. During classroom observations, students showed greater attention and participation when the learning materials were presented visually through EIAVV. The teacher also emphasized that visual support was essential in helping students understand English concepts:

"They are generally able to understand vocabulary. For example, when learning the names of fruits, I use pictures or other visual materials, and they are able to understand the vocabulary presented." (*English Teacher Interview*)

This finding indicates that visual representation served as an important support system for deaf students because it allowed them to access meaning without relying primarily on auditory information. This is consistent with Higgins and Lieberman (2016), who explained that deaf learners depend strongly on visual communication and contextual information in language development. The present study further demonstrates that visual elements integrated into EIAVV can help students establish connections between English words and their meanings.

Another factor influencing students' comprehension was repetition during the learning process. The teacher explained that repeated exposure to vocabulary and learning materials was necessary to ensure that students fully understood the lesson. Through repetition, students had opportunities to review information and strengthen their understanding of previously introduced vocabulary. This finding supports Acilo et al. (2025), who highlighted the importance of continuous instructional support in improving learning experiences among hearing-impaired students. In the context of this study, repetition functioned as reinforcement that helped students gradually develop comprehension despite their language learning challenges.

Teacher adaptation was also identified as an important factor affecting students' comprehension. The findings showed that the teacher adjusted learning materials and classroom activities according to students' abilities rather than following the curriculum content without modification. The teacher explained:

"The lesson plans are often too advanced for the students, so I adjust the material according to their abilities. For example, when learning about a house, I focus on identifying objects found in the house rather than asking them to write detailed descriptions." (*English Teacher Interview*)

This adaptation allowed students to engage with learning materials at an appropriate level and provided opportunities for them to demonstrate understanding. The finding supports Levesque and Duncan (2024), who emphasized that inclusive education requires instructional approaches that accommodate learners' diverse characteristics. The current study shows that technology-based learning media becomes more meaningful when supported by teacher decisions that consider students' specific

learning needs.

Despite the supporting factors, the findings also revealed several challenges that influenced students' English comprehension. One challenge was related to the differences between English spelling and pronunciation. The teacher explained that students sometimes experienced difficulties because the written forms of English words did not always correspond to their pronunciation:

"In English, the spelling and pronunciation are often different. Because of that, students sometimes misunderstand the words, so I usually write the pronunciation on the board to help them understand." (*English Teacher Interview*)

This finding indicates that deaf students may encounter additional difficulties when learning English because they have limited access to spoken language patterns. Although EIAVV provides visual support, certain linguistic aspects of English still require additional explanation and instructional assistance. Therefore, visual media should be combined with appropriate language teaching strategies to address challenges related to English pronunciation and word forms.

Students' limited vocabulary knowledge and communication challenges also influenced their comprehension. The teacher explained that learning English was demanding for deaf students because they already experienced difficulties in communication, making the acquisition of a foreign language more challenging. This finding is consistent with Gerald and Joseph (2025), who reported that deaf students often face difficulties in language development due to differences in language exposure. The current study confirms that while EIAVV can facilitate access to English materials, students' existing language abilities remain an important factor affecting comprehension.

Finally, students' interest and motivation contributed positively to the learning process. The teacher reported that EIAVV attracted students' attention because it provided a different and engaging learning experience:

"Interactive audio-visual videos are very effective because students can understand the material directly, and it is something new for them, which makes them excited about learning." (*English Teacher Interview*)

This finding supports Brennan (2018), who suggested that engaging learning environments can encourage participation among deaf learners. In this study, the interactive characteristics of EIAVV increased students' willingness to participate, which indirectly supported their comprehension development. However, motivation worked together with other factors, such as visual accessibility and teacher support, rather than functioning as an independent factor.

The findings demonstrate that deaf students' English comprehension through EIAVV was influenced by a combination of supportive and limiting factors. Visual learning support, repetition, teacher adaptation, and students' motivation facilitated comprehension, while challenges related to pronunciation, vocabulary limitations, and language development affected their ability to understand more complex English content. These findings highlight that successful technology-supported learning for deaf students requires not only appropriate media but also adaptive teaching practices that respond to students' individual characteristics.

Collectively, the findings of this study indicate that EIAVV provides meaningful support for deaf students' English comprehension by facilitating access to language through visual and interactive representations. The study extends previous research by

demonstrating not only the benefits of multimedia-based instruction but also how deaf students construct understanding and the conditions that support their learning process. The effectiveness of EIAVV is therefore not determined solely by the technology itself but by the interaction between accessible learning media, students' visual learning characteristics, and responsive teacher practices. These findings emphasize the importance of integrating educational technology with inclusive pedagogical approaches to create meaningful English learning experiences for deaf students.

CONCLUSION

This study concludes that English Interactive Audio-Visual Video (EIAVV) supports deaf students in developing English comprehension by providing accessible visual and interactive learning experiences. The findings demonstrate that students constructed understanding through the connection between visual representations, English vocabulary, and contextual information, which was reflected in their ability to recognize meanings, respond to questions, and participate in learning activities. However, comprehension development was not determined by the media itself but was influenced by the interaction between visual learning support, repeated exposure, teacher instructional adaptation, and students' individual learning characteristics.

The findings contribute to a deeper understanding of English learning among deaf students by highlighting not only the role of multimedia-based instruction but also the process and conditions that support comprehension development. Practically, this study suggests that teachers and special education practitioners should integrate interactive visual media with adaptive teaching strategies to create more accessible English learning environments. Nevertheless, this study is limited by its small number of participants, specific research setting, and short observation period. Future research may involve broader contexts, more participants, and longer implementation periods to further explore the use of EIAVV in supporting English learning among deaf learners.

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