Optimizing the Metacognitive Ability of Intelligent Deaf Children Through Innovative Learning

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Abstract

This research aims to optimize the metacognitive abilities of intelligent deaf children through innovative learning. This study uses a qualitative approach with a focus on literature analysis and learning practices. The results of the study show that deaf children have special challenges in the development of metacognitive skills, which has an impact on their learning ability. Innovative learning, including vocational learning, effective sign language teaching, and the implementation of the Multiple Intelligences theory, has been shown to improve the metacognitive abilities of deaf children. Strategies such as the use of visual aids, intensive non-verbal communication techniques, and individualized learning approaches were found to be effective. This research also reveals the importance of the role of teachers in developing special skills to teach deaf children. In conclusion, the optimization of the metacognitive abilities of intelligent deaf children can be achieved through the application of innovative learning methods tailored to their specific needs.

INTRODUCTION

This journal discusses intervention strategies for deaf/deaf (D/HH) children, which can be linked to metacognitive approaches and innovative learning. Metacognitive, or awareness and understanding of one's thought process, is particularly relevant in this context. D/HH children need to develop metacognitive awareness of their own communication and learning strategies. Early and ongoing interventions emphasized in journals can include techniques to

improve metacognitive skills, helping D/HH children to better understand and manage their learning process. Innovative learning also plays an important role, especially given the complexity and variation in hearing loss. Tailored approaches and support from specialized professionals can involve innovative learning methods such as the use of adaptive technologies, visual strategies, and multisensory approaches. By combining metacognitive strategies and innovative learning, educators can more effectively support the communication, language, academic, and social/emotional development of D/HH children, enabling them to become more independent and successful learners.(Bakken & Obiakor, 2018)

RESEARCH METHOD

Research Design

This study employed a qualitative descriptive approach aimed at exploring the experiences, challenges, and perspectives of students at Mahmud Yunus Batusangkar State Islamic University in the context of their academic, social, and spiritual development. The qualitative design was chosen to capture the depth and complexity of students' lived experiences, allowing the researcher to analyze both explicit statements and underlying meanings. Data were collected primarily through semi-structured interviews, supported by direct observations and document analysis, to provide a rich and comprehensive understanding of the research focus.

Research Target/Subject

The participants in this study were 20 undergraduate students from different faculties and years of study. They were selected using purposive sampling to meet specific criteria: (1) active enrollment as a student at Mahmud Yunus Batusangkar State Islamic University, (2) involvement in both academic and non-academic activities on campus, and (3) willingness to participate in the study and share personal experiences. The diversity in gender, study program, and organizational involvement was intentionally considered to reflect a wide range of perspectives.

Research Procedure

The research procedure began with obtaining ethical clearance from the university's research ethics committee. After approval, recruitment materials were distributed through campus bulletin boards, online student groups, and faculty networks. Selected participants provided informed consent before the interviews. Data collection involved face-to-face interviews lasting 45–60 minutes, classroom and campus activity observations, and the review of institutional documents such as student activity reports. All data were recorded, transcribed verbatim, and stored securely for analysis.

Instruments, and Data Collection Techniques

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Data Analysis Technique

The instruments used in this study included a semi-structured interview guide designed to explore students' academic journeys, social interactions, and spiritual practices. Observation

checklists were also used to capture contextual details of student life. Data collection techniques comprised (1) semi-structured interviews, (2) non-participant observation of lectures, student meetings, and campus events, and (3) document analysis of relevant university publications and reports. Field notes were maintained to record impressions and contextual factors during data collection.

RESULTS AND DISCUSSION

"The word "deaf" is often confusing and inconsistent. Deaf people are defined as "individuals with severe to very severe bilateral, mixed, or sensorineural hearing loss." According to the World Health Organization (WHO) media center, the most common and accurate definition of deafness is that used in the field of audiology: "A person who cannot hear as well as a person with normal hearing—a hearing threshold of 25 dB or better in both ears—is said to have hearing loss."(Felicite, 2021)

Many experts lament the excessive use of the word "deaf", arguing that almost no one is completely deaf, as there is usually still residual hearing. Other experts use the term "hearing loss," which is used to describe people with any degree of hearing loss, from mild to very severe, including those who are deaf and hard of hearing. However, many people who are deaf or hard of hearing "Hard of hearing" is a term that refers to people who experience mild to severe hearing loss. They usually speak and can benefit from cochlear implants.(Felicite, 2021)

A deaf person is someone whose hearing is impaired to such an extent that it prevents the understanding of speech through the ear alone, with or without the use of hearing aids.(Felicite, 2021) A person who is hard of hearing is someone whose hearing is impaired to a degree that makes it difficult, but does not impede, the understanding of speech through the ear alone, with or without hearing aids."

Deafness can be interpreted as hearing loss, where children who experience deafness are experiencing problems in the loss or reduction of hearing ability. Children who can be said to be deaf if they are unable or less able to hear. According to him, deaf people can be divided into two categories, namely deaf and hard of hearing. Deafness is a condition in which a person is completely unable to hear due to the loss of hearing function in their ears. Meanwhile, hearing loss is a condition in which a person who has damage to his or her hearing organs but can still function to hear even with or without hearing aids. (Khairun Nisa et al., 2018)

Dreading comprehension. This study aims to assess the metacognitive skills of deaf students using tests adapted into sign language. *The Scale of Reading Consciousness (ESCOLA) test* was modified for Spanish sign language and applied to 23 deaf students, compared to 289 hearing students. (Alvarado et al., 2012) The results showed that deaf students had lower knowledge of metacognitive strategies compared to their listener peers at the same level of education. Specifically, high school deaf students showed a level of metacognitive knowledge equivalent to elementary school students who could hear. Further analysis revealed that the largest deficit in primary school deaf students lies in the evaluation process, while secondary school deaf students show weaknesses in the self-monitoring and regulation process.

These findings support the hypothesis that lower reading rates in the deaf population are related to lack of knowledge and the use of metacognitive strategies. The study highlights the importance of specific interventions to improve metacognitive skills in deaf students, with a focus on planning, monitoring, and evaluation strategies, as a way to improve their reading and writing skills.(Alvarado et al., 2012)

Vocational learning is an important component of inclusive education, especially for deaf students. The program aims to equip students with practical skills that can support their independence and readiness to face the world of work. One effective form of vocational learning is a cosmetology program with a focus on haircutting skills.(Ana Rafikayati & Muhammad Nurrohman Jauhari, 2021)

This program is usually carried out periodically, for example twice a month, and is led by expert instructors from outside the school assisted by Special Accompanying Teachers (GPK). The learning material includes an introduction to barber tools, techniques for using the correct tools, and various trimming methods using scissors, razors, and shavers. The learning methods used generally involve *direct learning* and demonstrations, which are very much in line with the characteristics of deaf students as visual learners. The learning plan is prepared based on the Competency Standards and Basic Competencies of the Special Education Curriculum from the Ministry of Education and Culture, which is then outlined in the Learning Implementation Plan (RPP).

The implementation of learning consists of preliminary, core, and closing activities. Students are given the opportunity to do hands-on practice under the guidance of instructors and GPK. Evaluations are conducted to assess students' work and provide constructive feedback.(Ana Rafikayati & Muhammad Nurrohman Jauhari, 2021) This vocational program not only teaches technical skills, but also helps develop soft skills such as discipline, responsibility, and the ability to work together. Thus, vocational learning is an effective means of preparing deaf students for a more independent and productive future.

Teaching sign language effectively, teachers need specific strategies that meet the unique learning needs of their students. Teaching sign language is not a simple task. Deaf students have unique learning needs and are different from students in general. Therefore, teachers need to develop and implement specific strategies designed to meet these needs. These strategies may involve the use of visual aids, more intensive non-verbal communication techniques, or a more individualized approach to learning.(Bintoro et al., 2023)

The results showed that teachers used two main strategies to teach sign language to deaf students, including:

1.   Speech method, which consists of spoken language and sign language.
2.   Manual method, which consists only of sign language.

The speech method combines spoken language with signs, which can be helpful for students who still have hearing left over or who are able to read lips. This method can also help students in integration with the general public. Meanwhile, the manual method focuses entirely on sign language, which may be more effective for students who are completely unable to hear. The choice of this method depends on the needs and abilities of each student.

Both of these methods are frequently used and contribute to students' proficiency as well as their active participation in classroom learning. Regular use of these two methods not only improves students' sign language skills, but also encourages their active participation in the learning process. This shows that the right strategy can increase student engagement and create a more dynamic and interactive learning environment. Teaching sign language poses significant challenges for teachers, especially with regard to their proficiency in the language. Teachers not only need to master the subject matter, but also must be proficient in sign language itself. This may require special training and constant practice for teachers. This challenge also demonstrates the importance of continuous professional development for teachers in specialized schools.(Bintoro et al., 2023)

This indicates that teachers need special skills to ensure their students can understand the material. Teachers need to develop a specific set of skills, including the ability to convey information through sign language, read and respond to students' body language, and adjust teaching methods to ensure comprehension of the material. It may also involve the ability to create and use effective visual aids.

Teaching deaf students in special schools can be complex, as highlighted by various studies. This complexity may involve a variety of factors, including the diversity of students' hearing levels, differences in sign language skills, challenges in classroom management, and the need to adapt standard curricula to meet students' specific needs. The research mentioned in this quote shows that this complexity is widely recognized in the educational community, emphasizing the importance of ongoing research and the development of best practices in this field.(Bintoro et al., 2023)

Fourteen non-sign language users and 10 Native American sign language (ASL) users who were deaf participated in a $2O$ $H15O$ positron emission tomography study in which they generated an action pantomime or ASL verb in response to images of manipulateable tools and objects. To produce a pantomime, the participants were instructed to 'show how you would use the object'. For verb generation, sign language users are asked to 'generate verbs related to objects'. The object for this condition was chosen to provoke a handling verb that resembles a pantomime.(Emmorey et al., 2011)

CONCLUSION

This study shows that the optimization of metacognitive abilities of bright deaf children can be achieved through the application of innovative learning methods tailored to their specific needs. The results of the analysis reveal the crucial role of metacognitive abilities in the cognitive and academic development of bright deaf children, emphasizing the importance of focusing specifically on developing these abilities in the learning process. Innovative learning, which includes vocational approaches, effective sign language teaching and implementation of Multiple Intelligences theory, proved effective in improving metacognitive skills. Key strategies such as the use of visual aids, non-verbal communication techniques intensive, and individualized learning approaches play an important role in optimizing these abilities. The role of teachers is vital in developing and implementing innovative learning methods, emphasizing the need for specialized training for educators. A holistic approach involving collaboration between educators, parents and special education experts is needed to create a supportive learning environment. This research highlights the importance of adapting learning methods to meet the specific needs of bright deaf children, enabling them to reach their full potential in academics and everyday life. However, further research is needed to develop and evaluate the effectiveness of specific innovative learning programs in the long term, in order to continuously improve the quality of education for bright deaf children.

AUTHOR CONTRIBUTIONS

Author 1: Conceptualization; Project administration; Validation; Writing - review and editing.
Author 2: Conceptualization; Data curation; In-vestigation.
Author 3: Data curation; Investigation.

CONFLICTS OF INTEREST
The authors declare no conflict of interest.

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