



## JURNAL ASESMEN DAN INTERVENSI ANAK BERKEBUTUHAN KHUSUS

Jurnal homepage: <https://ejournal.upi.edu/index.php/jassi/index>



# Numeracy Learning for Children with hearing impairment in Elementary Schools

Maksud Khoshimov\*

Kedutaan Besar Republik Indonesia Tashkent, Uzbekistan

Correspondence: E-mail: [mhoshimov8927@gmail.com](mailto:mhoshimov8927@gmail.com)

### ABSTRACT

This study aimed to explore and understand the learning of arithmetic for children with hearing impairment in elementary schools. This study used a qualitative descriptive method with direct observation in several elementary schools that have Children with hearing impairment children. The results of the study indicate that the use of approaches, methods, and visual media as well as sign language greatly helps Children with hearing impairment children understand the concept of arithmetic. The role of supportive teachers greatly influences the success of mathematics learning for Children with hearing impairment children.

© 2023 Universitas Pendidikan Indonesia

### ARTICLE INFO

#### Article History:

Submitted/Received 03 Jul 2024

First Revised 01 Aug 2024

Accepted 10 Sep 2024

First Available online 01 Dec 2024

Publication Date 01 Dec 2024

#### Keyword:

Children with hearing  
impairment, Elementary School,  
Numeracy.

## 1. INTRODUCTION

Learning to count is an important part of mathematics education, which not only equips students with basic skills but also helps them develop logical thinking and problem-solving skills (Juhaini et al., 2024). For Children with hearing impairment children, learning to count in elementary schools has its own challenges due to limitations in verbal communication which often affects the way they understand mathematical concepts. Children with hearing impairment children are children who have problems in the communication aspect caused by problems in the hearing organs, which has an impact on the emergence of various problems in the learning aspect (Rusyani, E, et al. 2021; Maryanti, R. et al. 2021; Rizqita et al., 2024). The right approach, strategy, method, and learning media in teaching counting to Children with hearing impairment children need to be considered carefully so that they can master the mathematical skills needed for everyday life. Learning methods and media must be adjusted to the needs of students (Maryanti et al, 2021; Maryanti et al, 2021; Maryanti el al, 2020).

Deaf children often experience difficulties in receiving verbal instructions, so they need learning methods that can be adjusted to their needs (Hidayat, D.S., et al. 2020; Maryanti, R. et al. 2020; Maryanti, R. et al. 2021). Currently, there is a lot of research on learning for Children with hearing impairment children. One of them is research conducted by Rizqita & Susetyo (2023) which shows that the use of visual media, such as pictures and teaching aids, is very effective in improving Children with hearing impairment children's understanding of various concepts, including mathematics. This method can help Children with hearing impairment children connect number symbols with concrete representations, making it easier for them to understand basic operations such as addition and subtraction. Further research on the importance of an inclusive approach to learning to count for Children with hearing impairment children is further emphasized by research conducted by Pivik et al. (2002), which found that Children with hearing impairment children who are given access to visual and kinesthetic communication aids tend to have better learning outcomes. In this case, teachers must be able to create a learning atmosphere that supports the development of Children with hearing impairment children's cognitive abilities through various methods that are appropriate to their learning style, such as the use of sign language, pictures, and practical activities. However, until now there has been very little research on learning to count for Children with hearing impairment children in elementary schools.

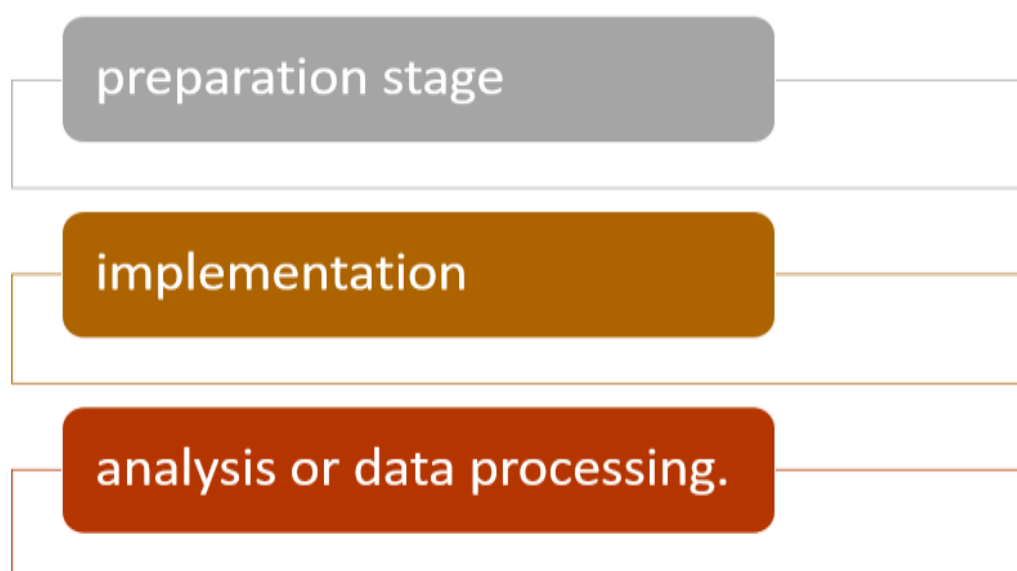
This study aimed to explore and understand numeracy learning for Children with hearing impairment children in elementary schools. Children with hearing impairment children have their own challenges in learning mathematical concepts, especially numeracy, which often rely on hearing in the process of understanding. More visual and sign language-based approaches, methods, and learning media that are appropriate to students' needs need to be developed to support their success in numeracy. This study used a qualitative descriptive method with direct observation in several elementary schools for Children with hearing impairment children. The results of the study indicate that the use of visual approaches, methods, and media such as pictures, diagrams, and visual-based applications and sign language greatly help Children with hearing impairment children understand basic numeracy concepts, such as multiplication, addition, subtraction, and division. In addition, the role of teachers as facilitators in providing a supportive learning environment greatly influences the success of mathematics learning for Children with hearing impairment children.

## 2. METHODS

This study uses a qualitative approach with a descriptive method. The researcher conducted direct observation of the mathematics learning process in the classroom involving Children with hearing impairment children in several elementary schools. In addition, interviews with teachers and several Children with hearing impairment children were conducted to gain perspective on how they learn to count and the challenges they face. Data obtained from observations and interviews were analyzed using thematic analysis techniques to find patterns in effective learning methods.

Participants in this study consisted of teachers and Children with hearing impairment children in elementary schools. The teachers involved had teaching experience and background as teachers of Children with hearing impairment children, and all Children with hearing impairment children had varying degrees of hearing loss from mild to severe.

The research procedure that we carried out was in several stages, starting from the preparation stage, implementation, and analysis or data processing (**Figure 1**).



**Figure 1.** The end Procedure of research.

## 3. RESULTS AND DISCUSSION

The results of the study showed that an approach that combines various visual media, such as pictures, diagrams, and visual-based educational technology, is very effective in helping Children with hearing impairment children understand the concept of counting. The use of visual media that combines the use of sound, diagrams, and also depicts interactions between objects such as users makes it easier for children to understand the material. (Telaumbanua, P., & Bu'ulolo, B. 2024). Children with hearing impairment tend to find it easier to understand basic mathematical operations such as addition and subtraction using real pictures or objects, compared to just listening to verbal explanations. Children with hearing impairment children are visual learning children (Hidayat, D. S., et al., 2022).

In addition, the use of sign language as a means of communication during learning has also been shown to improve the understanding of the concept of counting in Children with hearing impairment children. The use of sign language in learning to count can make it easier for Children with hearing impairment students to understand information (Fauzan, R. A., Wijastuti, A., & Yuliyati, Y. 2023). In this case, teachers who master sign language and use two-way communication methods (between teachers and students) facilitate more interactive and easily understood learning for Children with hearing impairment children.

Several visual-based educational applications, such as counting applications that display numbers and images that can be moved, have also been shown to help Children with hearing impairment children practice counting independently. Effective media helps Children with hearing impairment students learn independently (Sultonah, N., Nurfadilah, R. I., Sari, N. W., Fahmy, Z., & Masfia, I. 2024). However, not all Children with hearing impairment children can adapt quickly, so teacher assistance is still needed.

In this case, teachers play a key role as facilitators, not only in providing materials, but also in creating a supportive learning environment, as well as regulating the rhythm and method of delivering materials according to students' needs. Teachers who provide opportunities for Children with hearing impairment children to interact directly with learning materials, either through physical media or technology, are more successful in improving the numeracy skills of Children with hearing impairment children. This study shows that numeracy learning for Children with hearing impairment children requires approaches, methods, and media that are appropriate to students' needs, and are more visual and interactive. The active role of teachers in facilitating in-depth communication and interaction between children and learning materials. In addition, cooperation between teachers, parents, and experts is also very important to support the development of Children with hearing impairment children's learning. Inclusive education that provides equal opportunities for Children with hearing impairment children to learn to count in elementary schools requires not only the right teaching methods, but also a deep understanding of the needs and potential of each Children with hearing impairment child. With the right approach, Children with hearing impairment children can develop numeracy skills that are not only useful in educational contexts, but also in their daily lives.

#### 4. CONCLUSION

Deaf children have their own challenges in learning mathematical concepts, especially counting. Knowing that learning to count for Children with hearing impairment children in elementary schools has several important benefits. The approach, method, and learning media must be according to students' needs to support their success in counting. The qualitative descriptive method with direct observation was used in this study. The use of approaches, methods, and visual media such as pictures, diagrams, and visual-based applications and sign language greatly helps Children with hearing impairment children understand basic counting concepts. In addition, the role of teachers as facilitators in providing a supportive learning environment greatly influences the success of mathematics learning for Children with hearing impairment children.

## 5. ACKNOWLEDGMENT

We acknowledged to all participant.

## 6. AUTHORS' NOTE

The authors declare that there is no conflict of interest regarding the publication of this article. Authors confirmed that the paper was free of plagiarism.

## 7. REFERENCES

- Dunst, C. J., Trivette, C. M., & Hamby, D. W. (2012). "Social influences and early intervention programs for children with disabilities." *Journal of Early Intervention*, 34(3), 198-210.
- Fauzan, R. A., Wijastuti, A., & Yuliyati, Y. (2023). Pengembangan media pembelajaran matematika materi pecahan dengan pendekatan multirepresentasi berbasis web bagi peserta didik SMPLB tunarungu. *GRAB KIDS: Journal of Special Education Need*, 3(1), 16-30.
- Hidayat, D. S.; Rahmat, C.; Fattah, N.; Rochyadi, E.; Nandiyanto, A. B. D. N.; and Maryanti, R. (2020). Understanding archimedes law: what the best teaching strategies for vocational high school students with hearing impairment. *Journal of Technical Education and Training*, 12(1).
- Hidayat, D. S.; Rahmat, C.; Suryadi, A.; Rochyadi, E.; Nandiyanto, A. B. D. N.; and Maryanti, R. (2022). Wheat flour as a thermal insulator for learning media for students with hearing impairment. *Journal of Engineering Science and Technology*, 17(1), 0085-0094.
- Juhanaini, J., Rizqita, A. J., Bela, M. R. W. A. T., Hernawati, T., Qolbi, I. N., & Khimmataliyev, D. O. (2024). Android-based technology: development of game-based learning media based on the results of analysis of arithmetic learning difficulties. *Journal of Advanced Research in Applied Sciences and Engineering Technology*, 48(1), 1-28.
- Maryanti, R.; Hufad, A.; Nandiyanto, A. B. D.; and Tukimin, S. (2021). Teaching the corrosion of iron particles in saline water to students with special needs. *Journal of Engineering Science and Technology*, 16(1), 601-611.
- Maryanti, R., Nandiyanto, A. B. D., Hufad, A., and Sunardi, S. (2021). Science education for students with special needs in Indonesia: From definition, systematic review, education system, to curriculum. *Indonesian Journal of Community and Special Needs Education*, 1(1), 1-8.
- Maryanti, R.; Hufad, A.; Nandiyanto, A. B. D.; and Tukimin, S. (2021). Teaching heat transfer on solid-to-liquid phase transition phenomena to students with intellectual disabilities. *Journal of Engineering Science and Technology*, 16(3), 2245-2259.
- Maryanti, R.; Hufad, A.; Sunardi, S.; and Nandiyanto, A. B. D. (2021). Analysis of curriculum for science education for students with special needs in vocational high schools. *Journal of Technical Education and Training*, 13(3), 54-66.

- Maryanti, R.; Hufad, A.; Sunardi, S.; and Nandiyanto, A. B. D. (2022). Teaching high school students with/without special needs and their misconception on corrosion. *Journal of Engineering Science and Technology*, 17(1), 0225-0238.
- Maryanti, R.; Hufad, A.; Tukimin, S.; Nandiyanto, A. B. D.; and Manullang, T. I. B.; (2020). The importance of teaching viscosity using experimental demonstration from daily products on learning process especially for students with special needs. *Journal of Engineering Science and Technology*, 15, 19-29.
- Maryanti, R.; Nandiyanto, A. B. D.; Manullang, T. I. B.; Hufad, A.; and Sunardi, S. (2020). Adsorption of dye on carbon microparticles: physicochemical properties during adsorption, adsorption isotherm and education for students with special needs. *Sains Malaysiana*, 49(12), 2949-2960.
- Pivik, J., McComas, J., & Laflamme, M. (2002). "An analysis of the educational needs of children with hearing impairments." *Journal of Children with hearing impairment Studies and Children with hearing impairment Education*, 7(1), 15-22.
- Rizqita, A. J., Sunardi, S., & Bela, M. R. W. A. T. Development of traluli program of family-resourced early intervention for multiple disability and visual impairment (MDVI) children with fine motor impairment in inclusive school. *Indonesian Journal of Community and Special Needs Education*, 4(1), 65-74.
- Rizqita, A. J., & Susetyo, B. (2023). Effectiveness of know-want-learned learning strategies on improving comprehension in deaf students. *Edumaspul: Jurnal Pendidikan*, 7(1), 1373-1376.
- Rusyani, E.; Maryanti, R.; Muktiarni, M.; and Nandiyanto, A. B. D. (2021). Teaching on the concept of energy to students with hearing impairment: changes of electrical energy to light and heat. *Journal of Engineering Science and Technology*, 16(3), 2502-2517
- Sultonah, N., Nurfadilah, R. I., Sari, N. W., Fahmy, Z., & Masfia, I. (2024). Analisis gaya belajar dalam pemahaman akademik anak tunarungu di SLB Negeri Semarang. *Innovative: Journal Of Social Science Research*, 4(3), 13871-13887
- Telaumbanua, P., & Bu'ulolo, B. (2024). Penerapan metode pembelajaran audio video visual terhadap anak berkebutuhan khusus (ABK). *Indo Green Journal*, 2(2), 138-145.