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Effectiveness of *Colored Stick* in Improving Addition Skills for Deaf Children

Cahaya Sha'adah Aiyouti[1], Zulmiyetri[2], Mega Iswari[3] , Setia Budi[4], Gaby Arnez[5]
(Special Education/Universitas Negeri Padang, Indonesia)

e-mail: cahayashaa04@gmail.com

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Abstract

This research aims to investigate the effectiveness of colored sticks in improving lateral addition skills, with sums ranging from more than 10 to 20, among sixth-grade deaf students at SLB Hikmah Reformasi Padang. The research employs an SSR approach with an A-B-A design. It consists of 13 sessions divided into three phases. The first phase, baseline (A1), spans 3 meetings, showing stable results with a score of 20. The second phase, intervention (B), lasts for 7 meetings, indicating improvement with scores increasing from 30 to 75 and demonstrating stability from the 9th to the 10th meeting. The final phase, another baseline (A2), takes place over 3 meetings, showing stable results with a score of 90 in the 12th and 13th meetings. These findings indicate an enhancement in addition skills, with results up to 20, using colored sticks among deaf children..

Keywords: *Colored Stick Media, Addition Skills, Deaf.*

Abstrak

Penelitian ini bertujuan untuk menyelidiki efektivitas penggunaan media *colored stick* dalam meningkatkan kemampuan penjumlahan deret kesamping, dengan hasil penjumlahan yang berkisar dari lebih dari 10 hingga 20, di antara siswa tunarungu kelas enam di SLB Hikmah Reformasi Padang. Penelitian ini menggunakan pendekatan SSR dengan desain A-B-A. Terdiri dari 13 sesi yang dibagi menjadi tiga fase. Fase pertama, baseline (A1), berlangsung selama 3 pertemuan, menunjukkan hasil stabil dengan skor 20. Fase kedua, intervensi (B), berlangsung selama 7 pertemuan, menunjukkan peningkatan dengan skor meningkat dari 30 menjadi 75 dan menunjukkan kestabilan dari pertemuan ke-9 hingga ke-10. Fase terakhir, baseline (A2), berlangsung selama 3 pertemuan, menunjukkan hasil stabil dengan skor 90 pada pertemuan ke-12 dan ke-13. Temuan ini menunjukkan peningkatan dalam kemampuan penjumlahan, dengan hasil hingga 20, menggunakan stick berwarna pada anak-anak tunarungu.

Kata Kunci: *Media Colored Stick, Kemampuan Penjumlahan, Tunarungu.*

Introduction

The importance of mathematics does not only apply to normal students, but also to students with special needs, especially Deaf Children in Special Schools (SLB). Deaf children are individuals who experience hearing loss, which can range from partial to total hearing loss. This condition can affect various aspects of their lives, including communication, difficulty in social interactions and understanding learning (Sulfanita and Zulmiyetri, 2018)[4]. In general, deaf children are potentially the same as normal children, but functionally their development is influenced by the level of language skills, limitations in auditory information, and the child's abstraction power (Ningsih, 2018)[3].

Abstract concepts in mathematics learning are one of the things that makes it difficult for deaf children to understand the material during learning. Therefore, it is necessary to instill abstract concepts, which often involve thinking about structures and how these structures are organized in a logical sequence (Amalia Yunia Rahmawati, 2020)[1]. Factors that influence deaf children in understanding mathematics learning:

1. Hearing limitations, children will experience difficulty in understanding verbal instructions from teachers or in communicating with classmates, which can hinder their understanding of the concept of addition.
2. Language limitations, children have difficulty understanding mathematical terms and concepts that are explained verbally, so they require a more visual and concrete approach to learning.
3. Limited Access to Materials, limited access to mathematics learning materials, such as textbooks or other learning resources that are not adapted to their needs.
4. Environmental Support, an important factor in helping deaf children understand addition, with an environment that supports and understands their needs can provide the motivation and encouragement needed in the learning process.

One form of support that can be done is providing learning media that suits the child's needs so that the child can easily understand a concept in learning mathematics. One of the media that can be used in learning mathematics is media *colored stick.*

Media *colored stick* is a learning aid in the shape of a stick and then given a certain color as a symbol of numbers and the result of summing the numbers (Aziz, 2021)[2]. Media *Colored stick* is a learning aid that can be used to develop children's mathematical logic skills, in this case the ability to number, the ability to recognize numbers, and the ability to understand mathematical concepts more specifically.

Research methods

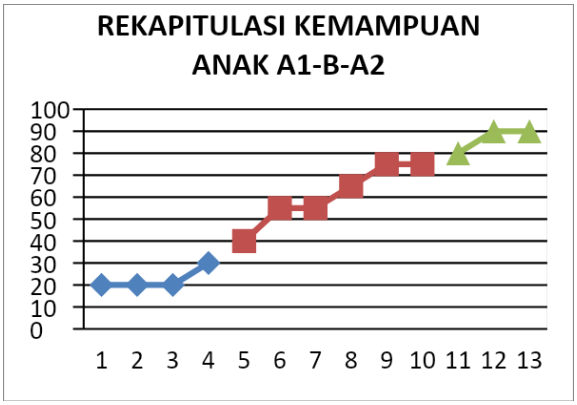
The study employs the Single Subject Research (SSR) methodology utilizing an A-B-A design, which consists of three phases: baseline (A1), intervention (B), and baseline (A2) phases. The participant involved in the study is a deaf child. Data collection is conducted through observation and recording of students' skills using a checklist.

Results and Discussion

The study comprises three stages. In the baseline phase (A1), the child's capacity to independently perform lateral additions up to 20 is assessed before any intervention. The intervention phase (B) evaluates the child's addition skills following intervention with colored sticks. Lastly, the post-intervention baseline phase (A2) assesses the child's addition abilities subsequent to the intervention.

The gathered outcomes undergo graphical analysis. Initial data (A1) from three sessions showed scores of 20 each.

During the intervention phase (B) across seven sessions, scores varied: 30, 40, 55, 55, 65, 75, and 75. In the subsequent baseline phase (A2), scores from three sessions were 80, 90, and 90. This can be illustrated in the graph below:



Information :

	Baseline (A1)
	Intervention
	Baseline (A2)

Grafik 1. Recapitulasi A1-B-A2

The following summarizes the results of data analysis in the form of the following table:

Table 1. Recapitulation of analysis results in conditions

No	Condition	A1	B	A2
1.	Condition length	3	7	3
2.	Estimation of directional tendencies	(=)	(+)	(+)
3.	Stability tendencies	100% Stable	29% Unstable	100% stable
4.	Data trail tendencies	(=)	(+)	(+)
5.	Stability level and range	Variable 20 - 20	Variable 30 - 75	Variable 80 – 90
6.	Level of change	20 – 20 = 0 (=)	90 – 30 = 50 (+)	90 – 80 = 10 (+)

Based on the table above, it can be concluded that the level of change in *baseline* (A1) and intervention (B) get a result of 10. Then the level of change in level at the intervention stage (B) and stage *baseline* (A2) gets a result of 60. Therefore, it can be interpreted that there is a change with an increase in each condition.

The following is a recapitulation of the components of the analysis between conditions which are presented in tabular form:

Table 1. Recapitulation of analysis results between conditions

No	Condition	A1	B	A2
1.	The number of variables changed	1		
2.	Changes in direction trends and their effects	(=)	(+)	(+)
3.	Changes in stability trends	Stable – Unstable - Stable		
4.	Level of change a. B/A1 b. B/A2	a. 30 – 20 = 10 b. 90 – 30 = 60		

5.	Percentage *overlap* data a. A1 with B b. A2 with B	a. $\frac{0}{7}\ x\ 100\% = 0\%$ b. $\frac{0}{7}\ x\ 100\% = 0\%$

Based on the calculation results *overlap* The data above is that at stages A1 and B the percentage is 0%, as well as at stages B and A2 the percentage is 0%. For *overlap* data, if the percentage results are smaller, the better the effect of the intervention on the target *behavior*. Therefore, it can be concluded that the intervention provided in this study had a good influence on the target *behavior*.

Conclusion

Based on the explanation above, this research aims to find out whether the media *colored stick* effective in improving the addition skills of deaf children, as evidenced by research conducted at 13 meetings held at the Padang Hikmah Reform SLB.

This research is divided into 3 stages, namely, the first stage *baseline* (A1) then the intervention stage (B) and the last stage *baseline* (A2). In stage A1, 3 meetings were held with a stable score of 20. Next, in the intervention stage, 7 meetings were held with an initial score of 30 and a final score of 75. For the final stage, namely A2, 3 meetings were held with an initial score of 80 and The score of the second last meeting was stable, namely 90.

From the results of the research conducted, it is proven that the media *colored stick* effective for improving addition skills for deaf children. This can be seen from stage A1 with the child's condition not being good at understanding addition of lateral series with results up to 20, after being given intervention (B) using media. *colored stick* The child slowly improves in understanding addition of side series which results up to 20.

Then proceed to stage A2 where observations are carried out without using media *colored stick* Children do well adding sideways series with results up to 20. So research on the ability to add sideways series with results up to 20 increases after being given media. *colored stick.*

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Author Profile

The light of Sha'adah Aiyouti. Gadang Island, 03 March 2001 ; Special Education, Faculty of Education, Padang State University.