The Use of Modification Audio Media in Recognition of Braille Letters Symbol on Multiple Disabilities with Visual Impairment (MDVI) Students

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Abstract. This study aims to determine the use of modified audio media in the introduction of braille symbols to students with Multiple Disabilities With Visual Impairment (MDVI) in class VI at Special Elementary School (SLB) Negeri Branjangan Jember. This study uses the Single Subject Research (SSR) method A-B design. The subjects of this study were students with visual impairment (blindness) accompanied by cognitive impairment with the initial "Rx". This research was conducted in 10 sessions consisting of two phases, the Baseline phase (A) and the Intervention phase (B) where each phase consisted of 5 sessions. The percentage results from the baseline phase (A) are 31%, 25%, 25%, 25%, and 25%. While the percentage results of the intervention phase (B) are 50%, 69%, 69%, 75%, and 75%. The data were then analyzed using analysis in conditions and ~~analysis~~ between conditions. The Mran level obtained in the baseline phase (A) is 26.2 while in the intervention phase (B) is 67.6. The difference in the level of change in the baseline and intervention phases is 25–50 = (+25) which shows an increase and the percentage of overlap is 0%. Therefore, it can be seen that the use of modified audio media in the introduction of braille symbols in students with Multiple Disabilities With Visual Impairment (MDVI) is increase.

Keywords: Modification Audio · Braille · Visual Impairmen

1 Introduction

Multiple disabled with visual impairments (MDVI) are a term developed in the United States. The term refers to an individual with visual impairment accompanied by other disabilities, both intellectual, physical hearing, emotion and so on [1]. Another term in Indonesia is Children with multiple barriers. Children with multiple barriers are children with barriers and special learning needs caused by a combination of barriers between physical, sensory, social, emotional, intellectual and other barriers [2]. Disability of vision or other terms known as visually impaired is a person with barriers to use their sense of sight either partially or completely. For blind students, to obtain information, they can only use the senses of hearing, touch, and smell without using visual vision.

J. Handhika et al. (Eds.): ICETECH 2022, ASSEHR 745, pp. 676–684, 2023.
https://doi.org/10.2991/978-2-38476-056-5_65

This causes the visually impaired to have less experience in visual concepts. Therefore, the information that they obtain is not optimal. In addition to limitations of visual impairment students in moving/mobility, they also experience obstacles in visual learning. However, there are other impacts that occur in children with Multiple Disabled with Visual Impairments (MDVI) learning is less than optimal.

Based on the results of the observations conducted at SLB Negeri Branjangan Jember in class VI, there were students with Multiple Disabilities with Visual Impairments (MDVI), which means that they have multiple barriers, in which apart from having visual impairments, the child is cognitively impaired. At the age range and the fact that they are in class VI, students have not been able to master the dots in Braille, especially the letters D, F, E, I, H, J, R, W. In addition, students have difficulty in remembering the dots in Braille and distinguishing each of them due to the similar and differences in locations of those letters in Braille. As a result, students often experience confusion when distinguishing certain letters in Braille.

Reading is a critical and important written language skill. It is said to be critical because through reading, someone gains information, knowledge, and new experiences. Without the ability to read, a person has difficulty in obtaining information, learning and others. The letters used by students with visual impairments are Braille. As stated by [3] in their research in 2018, the average understanding ability of fifth graders at SD Negeri OKU is in the low to medium category, meaning that special attention is needed.

Braille is a type of touch writing system used by blind people or people with visual impairment. Braille writing has now been recognized for its effectiveness and accepted as writing used by people with visual impairment all over the world. In addition, braille is not also a means of communication but also as a representation of competence. Braille letters are arranged in a 6-dot pattern with 3 vertical and horizontal positions (similar to a domino pattern). The dots are given a fixed number 1, 2, 3, 4, 5, and 6. Reading Braille is an activity of paying attention, seeing, feeling a piece of writing that can be touched. In reading braille, a blind person uses the sense of touch to read an article that has meaning.

Based on field observations, students with MDVI need learning media or braille that are in accordance with the characteristics and needs of these students. According to [4] media comes from the word medium which means intermediary. In other words, media is defined as an introduction to messages from the sender to the recipient. The media used must be innovative and creative in accordance with the characteristics and needs of students. This is in line with research conducted by [5] which states that the use of learning media requires creativity and innovation from an educator who understands the strengths and weaknesses of each student and can be adapted to the theme of learning with the conditions of the students, so that it is effective in learning.

To make it easier for students to learn braille, the modified audio learning media is considered to suit the needs of students as this media is adjusted to the preferences of students. Modified Audio Media is a drum-shaped instrument which consists of 6 drums in 1 bundle forming dots on braille letters. Media that resembles a drum is made of bamboo with a diameter of between 10/11cm and a height of 20cm with the top layer covered with rubber tires with different tightness in each drum in order to produce a different sound. With the different audio, students are able to remember the points of

Braille letters which have something in common. In support to this, [6] argues that the main means of learning for blind individuals is to utilize their hearing and tactile senses.

According to [7] most of the indicators measured were in the category of developing according to expectations (BSH) and developing very well (BSB) and one indicator was in the category of starting to develop (MB). This explanation proves that there is a change in the ability of students with visual impairment to improve. In addition, the needs of students with visual impaorment are very diverse, this is also in line with research conducted by [8] which states that the implementation of the school literacy program for visually impaired students has been implemented but has not been maximized, this is due to Some of the obstacles include the diversity of students' abilities.

2 Methods

This study is a single subject study. Single-subject research is research conducted to determine the effect of a treatment given to the subject repeatedly and within a predetermined time which is experimental [9]. This study uses the A-B design which is the basis consisting of the condition (A) baseline, the condition of students before receiving treatment or intervention, while Condition (B) intervention is the condition of students after the treatment. The subject of this study was students (Rx) class VI with Multiple disabled with visual impairments (MDVI), students experiencing visual and cognitive barriers. With the characteristics of students experiencing difficulties in distinguishing braille symbols including the letters d and f, e and i, h and j and r and w. This research was conducted in SLB Negeri Branjangan Jember. The implementation time in this study was conducted in 2 stages, the baseline stage and the intervention stage. In the baseline phase, 5 sessions were conducted with each session lasting 60 min, while in the intervention phase, 5 sessions were conducted with each session lasting 60 min. The scope and aspect of this research is the ability to recognize and distinguish braille symbols d, f, e, i, h, j, w, r by measuring the process. The research procedure includes the baseline stage, intervention stage, data analysis under conditions and between conditions.

3 Result and Discussion

3.1 Result

The collection of data in baseline phase is conducted in 5 sessions with each lasting for 1 h a day. The data obtained from the result of students' test in the form of braille read by students. Below is the result of the students' test (Table 1 and Fig. 1).

After obtaining stable data related to the ability to recognize braille symbols performed by Rx in the baseline phase (A), the next phase of research was conducted, namely the intervention phase (B). By doing research on the ability to recognize braille letter symbols using modified drum media. The following are the results of the intervention research (B) (Table 2 and Fig. 2):

Based on Fig. 2, it can be seen that Rx's ability to recognize the braille symbol has increased compared to the previous phase, facial baseline (A). R is used to and is able

Table 1. List of score in baseline phase (A)

Session	Number of questions	Maximum Point	Point	Score
1	16	16	5	31
2	16	16	4	25
3	16	16	4	25
4	16	16	4	25
5	16	16	4	25

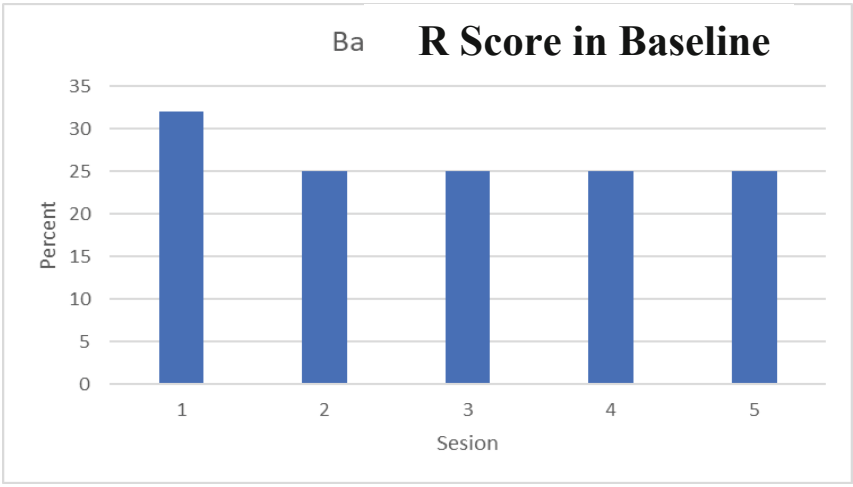

Fig. 1. The score obtained by R in baseline phase (A)

Table 2. List of R Score in Intervention Phase (B)

Session	Number of Question	Maximum Point	Point	Score
6	16	16	8	50
7	16	16	11	69
8	16	16	11	69
9	16	16	12	75
10	16	16	12	75

to answer questions given by researchers about the ability to recognize braille symbols properly and correctly, which can be seen in Fig. 3:

Below is the summary of analysis component in the condition (Table 3):

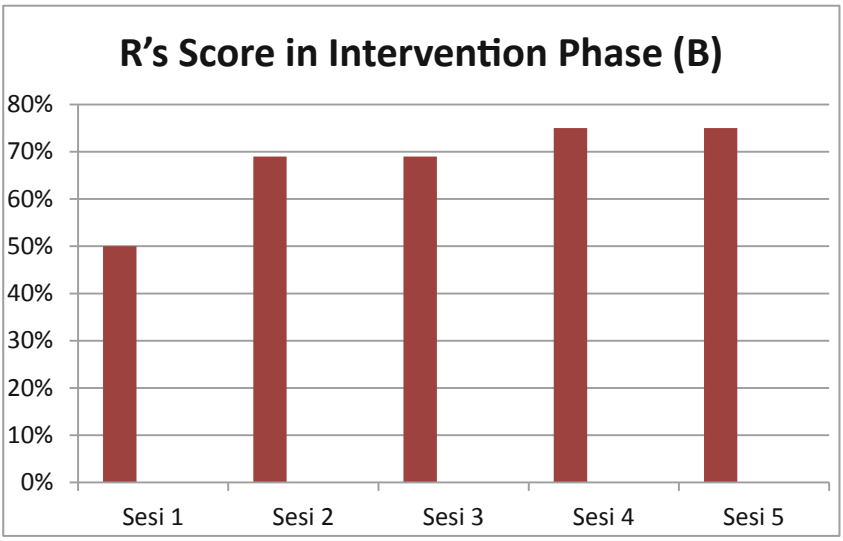

Fig. 2. R's Score Obtained in Intervention Phase (B)

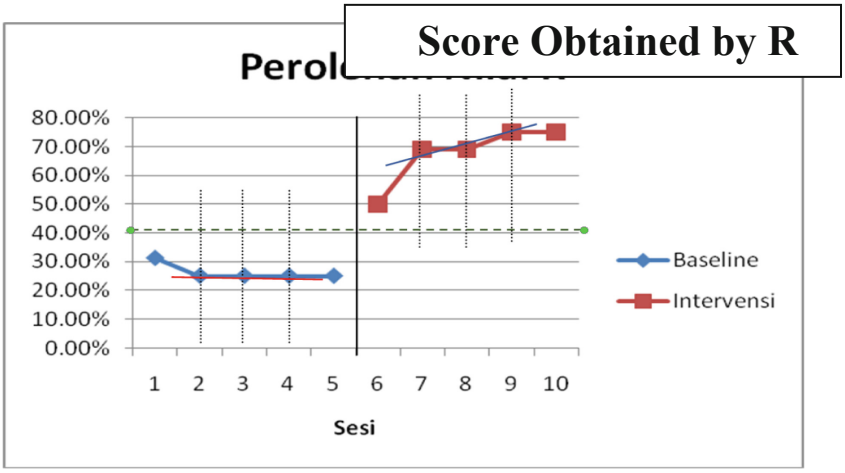

Fig. 3. The Whole Result of the Research on the Ability in Recognizing Symbol in Braille.

Based on the graph above, there are no values found in the intervention phase (B) which fall within the upper and lower limits of the baseline phase (A). To make it easier to understand overlapping data, the following is a table of overlapping data (Table 4).

The data analysis between the above condition can be summarized as follow (Table 5):

Table 3. In Condition Analysis

Condition	A/1	B/2
The Length of Condition	5	5
Estimation of Directional Tendency	(=)	(+)
Stability Tendency	Variable 80%	Stability 40%
Trace of Data	(=)	(+)
Level of Stability and Range	Variable 31-25 (+6)	Variable 75-50 (+25)
Change of Data	31-25	75-50

Table 4. Overlapping Data

Condition	B_1A_1
Overlapping Percentage	0:5x 100% 0%

Table 5. Analysis between Condition

Condition	B_1A_1
Condition Comparison	2:1
Length of Condition	1
Estimation of Directional Tendency	(+) (=)
The Change of Directional Tendency	Variable to Variable
The Change of Level	25 50 (+25)
Overlapping percentage	0%

4 Discussion

In the first session of baseline phase (A), R obtained 31,25 where student still facing difficulty in recognizing braille symbol and felt bored during the activity. During the second to the fifth session, the results tend to be very low and almost the same with the first session which obtained 25,00. This is caused by the fact that student felt tired and bored with the tests given which resulted in the same result. Therefore, this phase obtained the lowest result of 25 and the highest result of 31,25. On the other hand, during the intervention phase (B) using audio modification, the result reached the maximum of 50% in the sixth phase. This is due to the fact that student felt happy and excited to learn braille symbol using this audio modification media. In the seventh phase, the result reached 69. This is due to the fact that in this session, the researcher and the student used

the media together accompanied by singing which made the student felt enthusiast in learning the symbol of braille letters using audio modification media. In session 8, the students still obtained 69. This happened because the song sung in the eighth session was the same as the previous session which caused the student to feel bored with the song. Meanwhile, in the ninth and tenth sessions, the result reached 75%. This is because Rx began to understand braille symbols by using modified audio media even without using a song. Students have understood the concept of dots in braille between reading and writing. Students have understood the symbols of braille, especially the letters "d" and "f", "e" and "i", and "r" and "w". In the intervention phase (B) this improvement continues to occur slowly, although not significant, but there is a fairly good change in students. In the intervention phase (B), the lowest score was 50 and the highest was 75.

Analysis between conditions is the second analysis in terms of conditions, in the analysis between conditions the number of variables is two and changes in trends and their effects have increased (+) which can be proven by a line pointing upward. Changes in the trend of stability are variable to variable as well as changes in the level of difference which reached up to +25.00. Therefore, it means that there is an increase and influence between the baseline phase (A) and the intervention phase (B). The percentage of overlap in the analysis between conditions is 0%. This is evidenced by the absence of intervention data that entered the baseline phase. These results can be seen from the mean level in the baseline phase (A) which is 26.2 while the mean level in the intervention phase (B) is 67.6. The changes in level in the analysis between conditions is also increasing by +25%. The overlapping percentage data also proves that there is an effect of modified audio media on the ability to memorize braille symbols where the data overlap is 0%.

From the discussion above, it can be proven that the use of modified audio media in Recognizing Braille Symbols for Multiple Disability With Visual Impairment (MDVI) student in 6th grade of SLBN Branjangan Jember has increased. This is in line with several research results which show that audio and innovative media or teaching materials are needed for students with special needs, especially those with visual impairments. The results of the study include audio media made visual impairment students to be more motivated and able to understand learning easily, as well as able to learn and imagine sounds with audio. Therefore, blind students can better understand the material presented [10] In addition, [11] regarding the effectiveness of using audio media "clear and easy smart solutions" (splash) on science learning outcomes in class VII students at MTSLB Yaketunis Yogyakarta, shows that the average results of pre-test and post-test scores shows an increase. Another research that uses audio is an Arduino-based Hijaiyah letter learning tool for the blind which aims to hopefully help Muslim blind people learn the Hijaiyah letter in order to enable them read the Quran well. The result shows that the media able to make blind people to learn hijaiyah letters [12] and there is an influence on the application of audio-assisted practical learning on students' motor skills. Second, there is the effect of the application of audio-assisted practical learning on the learning motivation of junior high school students at SLB A Negeri Denpasar [13].

5 Conclusion

Based on the results of using modified audio media in Recognizing Braille Symbols in Student with Multiple Disability With Visual Impairment (MDVI) in class VI student at SLB Negeri Branjangan Jember, it can be concluded that there is an increase and effect of using modified audio media in recognizing braille symbols on students with multiple disabilities with Visual Impairment (MDVI) grade VI SD at SLB Negeri Branjangan Jember. This is evident in the results of the study that there was an increase in the student's ability in recognizing braille symbols by using modified audio media for visually impaired students in grade VI, Rx. This can be seen from the mean level of the baseline phase (A) which is 26.2 while the mean level in the intervention phase (B) is 67.6. The difference in the level of change from the baseline phase (A) to the beginning of the intervention phase (B) reaches (+25%).

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