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Improving Counting Skills Adding Natural Numbers 1 – 100 For Students with Autism Through Smart Board

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Abstract

This research focuses on improving the ability to calculate adding natural numbers 1 - 100 for students with autism at SLB Insan Mulia Payakumbuh using smart board media. Smart board media is a two-dimensional media in the form of a board that gives messages to the target and makes it easier for students to operate and understand additions properly and correctly. This research uses a quantitative approach with experimental methods, namely Single Subject Research (SSR) and A1-B-A2 Design, and data is analyzed using visual graphs by entering data in graphs which are then analyzed based on conditions A1-B-A2. The results of research using smart board media can improve the ability to calculate adding natural numbers 1-100 for students with autism at SLB Insan Mulia Payakumbuh.

Keywords: *Smart Board, Addition Counting, Autism Students*

Introduction

Education is an effort to guide students to achieve independence, education and learning are essentially human treatment for humans without exception, all students have the right to education, including students with special needs. In Law number 20 of 2003 concerning the national education system, special education is given to students with special needs who experience physical, intellectual, emotional and social difficulties so that children's learning

outcomes can be maximized (Yuni & Damri, 2019). One of the children with special needs is children with autism.

According to (Ulva & Amalia, 2020) defines autistic children as children who experience developmental disorders of brain function which appear to have problems in social interaction skills, communication with the environment, behavior and delays in academics. in line with opinion (Iswari et al., 2018) utism comes from the word "Auto" which means "self" which can be interpreted as a disorder that can affect children. This disorder causes children to experience problems in social interaction, sensory motor,communication, language and speech, as well as delays in cognitive areas socializing autistic children

The classification of autistic children includes childhood autism, pervasive developmental disorder not otherwise specified (PDD-NOS), rett syndrome, childhood disintegrative disorder, and asperger syndrome (Falevi, 2020). As a result of the problems experienced by autistic children, children experience complex brain development difficulties which can affect the functions of perception, desires, imagination and feelings. This condition occurs when children before the age of three years are characterized by qualitative obstacles in social interaction, communication and are obsessed with one activity or object where they need special educational services to develop their potential (Damri, 2019). One of the main challenges in educating children with autism is helping them develop academic skills. One of the academic skills needed by children with autism is the ability to count. In line with opinion (Himmah et al., 2021) Numeracy ability is the ability to complete calculations with numbers. There are many calculation errors made by students when working on mathematics problems.

Based on the results of a preliminary study conducted by researchers, at SLB Insan Mulia Payakumbuh there is a student with autism in class XII initials name FL male who is known to have a mild autism classification, with characteristics in the social and communication areas similar to children in general but a little stiff and standard.

Meanwhile, in the emotional field, if students are interested in a particular object, they will always look and see that object, they have high sensory sensitivity so that children can react emotionally excessively to stimuli such as loud noises in class, causing children to be restless and unfocused.

The academic aspect of children is able to participate in learning as usual, but this is not the same as learning mathematics. In learning mathematics, students are able to count and recognize numbers 1-100, know the sequence of numbers, understand the place value of tens of hundreds, name randomly arranged numbers, already know the operations of addition and subtraction. Meanwhile, in downward series arithmetic operations with values above 20, especially in addition where numbers are inserted, students are confused and find it difficult to do so. This is because when inserting numbers, students do not yet know the number of tens or units that will be inserted into the next number, or write all the numbers without inserting the numbers

so that children get wrong results in the addition.

From the problems that have been described, the author tries to provide a solution in the form of using smart board media. Smart board media or smart board is a two-dimensional media in the form of a board that provides messages to the target and makes it easier for students to operate addition and understand the concept of addition well. Apart from that, it also gives the impression of cool and enjoyable learning for students with autism.

Method

1. Types of Research

   This study used a quantitative approach. This approach is called a quantitative approach because the research data is in the form of numbers and the analysis uses statistics. Apart from that, in this research, in an effort to improve the ability to calculate addition, an experimental method with single subject research or SSR (Single Subject Research) was used. The basic principle of SSR experimental research is that there are two conditions for individuals to be studied, namely the condition when they are not treated and the condition after being given a pretest and posttest, the influence on the target will be studied in these two conditions (Djollong 2014). From this research we can find out whether Smart Board media given repeatedly to the subjects studied can have an influence or not.

   The research design used in this research is the A-B-A design. in baseline condition A1, namely to determine the child's initial ability in addition, it was carried out 3 times, then intervention condition B, namely providing assistance using smart board media, was carried out 6 times, finally, baseline condition A2 was to see the child's ability after being given treatment 4 times meeting.
2. Time and Place of Research

   This research will be carried out in April - May 2024, where the research location is in the Insan Mulia Payakumbuh SLB classroom and in the students' homes.
3. Research Subject

   The subject of this research is an autistic child with the initials F in class XII who has limitations in the field of learning mathematics, especially addition.
4. Research Procedure

   Research procedures are the stages carried out in research. The procedure for conducting research is as follows:

   a) Preparation phase

      Prepare the smartboard media that will be used.

   b) Implementation stage

      1) Conditioning the class.
      2) Explain to children how to use smart board media and the uses of this media.
      3) During the lesson, the researcher gave questions

and then the children worked on the questions using smart board media.

c) The evaluation stage is the stage of assessing the implementation results.

5. Data collection technique

The data collection techniques used are:

A. Observation techniques

Observation to observe changes in children's abilities.

B. Documentation

To obtain results from the intervention.

C. Test

To identify the child with the changes achieved.

6. Data analysis technique

The data obtained was then analyzed further. The data analysis technique was carried out using analysis within conditions and analysis between conditions which were analyzed into graphs. The results for each condition were in the form of baseline condition A1, intervention B and baseline condition A2.

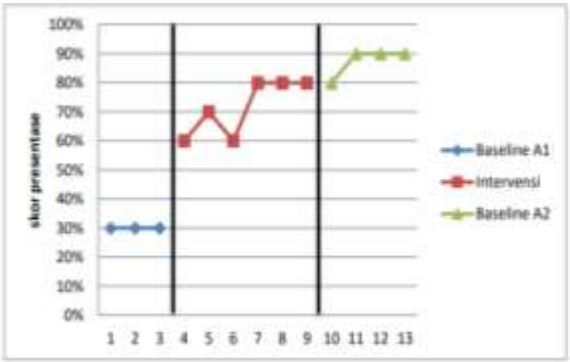
Results and Discussion

This research was carried out in 13 meetings to obtain data consisting of 3 stages, namely baseline (A1) was carried out during 3 meetings, intervention (B) was carried out during 3 meetings, and baseline (A2) was carried out during 4 meetings.

At baseline (A1), they observed students with autism to see their ability to calculate the addition of natural numbers 1 - 100 in 3 meetings with percentage results of 30%, 30%, 30%. In intervention (B) using smart board media which was carried out in 6 meetings with the assessment aspect using ordered and random numeracy test instruments, the percentage results obtained were 60%, 70%, 60%, 80%, 80% and 80%. Furthermore, the baseline (A2) without treatment on the target was carried out 3 times with percentage results of 80%, 90%, 90% and 90%.

Based on the data collected at these 3 stages, namely baseline (A1), intervention (B), and baseline (A2), the researcher ended the observation because the data had shown stable results at the last 4 meetings at baseline (A2).

The following is a summary of the percentages in 3 conditions: Baseline (A1), Intervention (B), Baseline (A2):



Graph 2 Recapitulation of percentage date A1, B and A2

In graph 2, based on the data written in the graph, it shows that there is an effect of changes in the ability to calculate the addition of natural numbers 1 - 100 after being given treatment.

Table 1. Recapitulation in Conditions

No	Condition	A1	B	A2
1.	Condition Length	3	6	4
2.	Estimated directional tendency	(=)	(+)	(+)
3.	Stability tendency	Stable	Unstable	Unstable
4.	Data footprint trends	(=)	(+)	(+)
5.	Stability level and range	Variable (30%)	Variable (60% - 80%)	Variable (80% - 90%)
6.	Level of change	30-30 = 0 (=)	80-60 = 20 (+)	90-80 = 10 (+)

The results of these percentages are then processed and analyzed within conditions and between conditions. The advantage of analyzing the conditions is that the estimated trend in conditions A1, B, and A2 tends to increase (+), which is presented in table 1 and table 2 as follows.

Table 2. Recapitulation between Conditions

No	Conditation	A1	B	A1
1.	Number of changed variable	1		
2.	Changes in directional inclination and their effects	(=)	(+)	(+)
3.	Changes in stability tendencies	Stable	Unstable	Unstable
4.	Level of Change			
	Conditation B/A1	60% - 30% = 30%		
	Conditation B/A2	90% - 60% = 30%		
5.	Overlap percentage			
	Conditation B/A1	0%		
	Conditation B/A2	50%		

Discussion of research results on improving the ability to calculate adding natural numbers 1 - 100 for students with autism through smart board media which was carried out by providing intervention using smart board learning media at SLB Insan Mulia Payakumbuh.

One of the big parts of mathematics is addition, addition is also called core or basic because to understand the mathematical aspect you need to understand addition first. Addition (+) is one of the basic arithmetic operations. Addition is the addition of two numbers to form a number which is a sum. Addition of more than two numbers can be seen as a repeated addition operation, this procedure is known as total addition, which also includes the addition of an infinite number of numbers. (Irawati et al., 2017)

To improve children's learning processes, special strategies and services are needed to support children's learning achievements. One of them is by using and optimizing learning media that can be interesting, fun and reduce boredom, namely smart board. In the opinion of Maghfi (2020) Smart Board Media or smart board is a two-dimensional media in the form of a board that provides messages to the target regarding how to add downwards.

Based on the research conducted, it can be seen that the first phase, namely baseline (A1), was carried out in 3 meetings, showing stable results with a score of 30%. The Intervention Phase (B) was carried out 6 times, showing an improvement with a score of 60% - 80%. Next, the baseline phase (A2) was carried out 4 times, showing a stable score of

90%. The results of the research show that providing intervention sequentially and repeatedly using smart board media can have an impact on the ability to calculate adding natural numbers for students with autism.

Based on the discussion above, it is proven that smart board media can improve the ability to calculate adding natural numbers 1 - 100 for special students at SLB Insan Mulia Payakumbuh.

Conclusions and suggestions

Based on the results of research and discussions carried out, it was found that the ability to calculate the addition of natural numbers 1 -100 increased when using smart board media. This increase is depicted through a graph showing the increase from the baseline phase (A1) to the intervention and baseline phase (A2). However, this research still shows several shortcomings both in terms of writing and research results. Therefore, we hope for cooperation between schools, teachers and parents to collaborate in helping children learn mathematics to count additions.

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