The Effect of Geoboard Media Usage toward Understanding the Geometric Concept for Student with Mild Intelectual Disability

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Abstract: The intellectual mild on mild intelectual disability students causes students to become less in their environmental and academic response. Mild intellectual disability students have difficulty in remembering a name or form. This study aims to determine the value in the students before and after using the media geoboard and know-how the big influence of geoboard media to understanding the geometric concept. This research method used Pre-experimental One Group Pretest-posttest. The subjects of this study were students of mild intellectual disability in Special School (SLB) of PGRI Dlanggu Mojokerto, which amounted to 5 students. Data were collected by using a written test method before treatment and after treatment with the same problem. There is a comparative value of pretest average and posttest average of 54%. So the conclusion of this research "There is a significant influence of geoboard media on the understanding of the geometric concept of students with mild intellectual disability SLB PGRI Dlanggu Mojokerto ''.

Keywords: geoboard media, geometric concept, mental retardation

INTRODUCTION

Autism is derived from the word auto which means itself. In 1943 the term autism was introduced by Leo Kanner. The number of people with autism is increasing from year to year. In the era of the 90s the number of autistic children registered was around 15-20 per 10,000 children, and an increase in 2000 estimated at 1 per 150 children with autism (Kaufman, 2008). The cause of the increase in autism is now not known with certainty, but in general, there is agreement among experts in the field that proves the existence of several factors causing autism. Factors causing autism are: (1) genetic factors, (2) prenatal, Christmas, and postnatal factors, (3) brain and blood structural factors and biochemical abnormalities (4) psychosocial theories of the causes of autism, (5) and the theory of poisoning factors in heavy metals (Winegal, Sudarsini, & Adi, 2018)

In general, autistic children are children who have very complex developmental disorders. These developmental disorders can affect the way a person communicates, interacts, and behaves in daily life (Suteja, 2014). The disorder occurs because of a nervous system disorder in the cerebellum that causes the brain to not function normally. In this case, the cerebellum functions to control motor activity in the body, and as a circuit that regulates sensory activities and attention control centers, if the circuit in the brain is damaged or disturbed it will disrupt the nervous system in other parts, such as disruption of the limbic system that regulates behavior and emotions (Daulay, 2008). Autistic children have different behaviors from normal children, they have excessive behaviors, deficient, even to the level of children not behaving (Tarjiah, Sumpena, & Riyanti, 2019).

One of the excessive behaviors shown by autistic children is the stereotypical behavior of children jumping up and down, unable to be quiet, circling, and wagging their hands. While behaviors that are deficient in autistic children such as lack of fine motor skills, gross motor skills, identifying, labeling, telling stories, and even they do not have behavior.

This can be a trigger for the difficulty of autistic children in carrying out activities every day, one of them in terms of independence. The independence of autistic children is classified as follows: a) poor prognosis, children cannot be independent (2/3 of the total number of people with autism), b) moderate prognosis, there is an increase in social and educational fields even though behavioral problems persist (1/4 of total autistic people), c) good prognosis, a child who is normal in his social life or can be said to be close to normal can either be in the school environment or at work (1/10 of all people with autism). One of the independence activities is taking care of oneself related to daily life such as drinking, eating, dressing, and decorating skills. In this study, the skills focused on eating skills. (Mesibov & Shea, 2010)

Eating is the most important requirement for humans. According to Wantah (2007), There are 2 ways to eat, that is eating with your hands, and eating using a spoon. For normal children, eating with a spoon and not spilling is a very easy job to do. This is different from autistic children who have very complex disorders, resulting in children who tend to depend on others when doing daily activities, especially in eating activities. For that, the child needs to be given training on how to eat well and correctly.

Based on the explanation above, autistic children need special services, one of which is a personal development program to develop their ability to do the work to take care and take care of themselves, with an effort and assistance in the form of training, guidance, planned and programmed for autistic students in building themselves into individuals and creatures social who can live independently during society (Dewantoro, S. Susilawati, & R. Pradipta, 2018; Efendi, 2006).

Autistic children's self-development programs generally need structured programs. Structured and integrated programs are very important to provide effective learning experiences for children with autism and can reduce anxiety levels experienced by children if the teacher can create a learning environment according to the needs of children (Thompson, 2010).

The method that uses a structured learning approach is the TEACCH method. The TEACCH method is structured learning that aims to train independence in autistic children. TEACCH techniques for children who needed to learn to do independent work or task completion. The purpose of this opinion is that the TEACCH method is used for children to do work or complete their tasks independently. More broadly Mesibov & Shea (2010) states that the principles of the TEACCH method are: (1) Environmental management in the form of structuring the physical environment, schedules, and work systems. Structuring the physical environment to help children identify a place so they can know what activities will be carried out. The use of schedules in learning autistic children can be adjusted to their needs. Schedules are made in the form of writing, drawings, symbols, or real objects that can represent an activity. The work system is used to reduce the confusion of children in doing the activities he does. (2) Visual information is needed to increase children's involvement in activities and reduce stress and confusion because too many languages were given to children. (3) Special interest as an amplifier that is given after the child completes a task. The purpose of using an amplifier is so that children are more eager to complete the given task. (4) Meaningful communication is contained in the TEACCH method in the form of objects or visual symbols combined with words or instructions, with this, the child can more easily accept and understand the activities carried out.

Based on the explanation above, this research aims to describe the influence of the TEACCH method on the eating skills of Autistic students. The presence or not the effect of using the TEACCH method can be seen from the results of the mean level in each condition and the amount of overlap data.

METHOD

In this research, researchers used a quantitative approach in the form of Single-Subject Research (SSR), with an A-B-A design. Research using the SSR method is a method used to obtain the data needed by looking at the results of a treatment that is given repeatedly to the subject (Sunanto, Takeuchi, & Nakata, 2005). SSR research has two variables, the dependent variable, and the independent variable. The ability of eating skills is the dependent variable and the TEACCH method is the independent variable of this research.

The subject in this research was a 12-year-old autistic student, who had visible looks from birth (infantile) with barriers to communication, interaction, behavior, and emotions. Communication barriers are known since childhood murmuring that usually appears before children can speak at that time have not been seen in children, and now children use non-verbal language. Barriers to interaction often avoid or refuse eye contact, prefer to be alone, but still want to be hugged. Barriers to behavior often clash feet on tables, chairs, and anywhere, sometimes the behavior is not directed to suddenly run and jump up and down, picking up things that are around. Emotional barriers that are still unstable like to throw tantrums and get angry when they don't get what they want, sometimes hurting those around them by holding their hands or fingers as hard as they can. The most prominent obstacle to RG is in its emotional barriers because it still often cannot be controlled properly. So this also has an impact on children's behavior.

The ability to eating skills a child can eat using a spoon but his food is still scattered on the table, have not done a good hand washing, take or scoop food only side dishes, want to spend the rice if the teacher gives additional side dishes, other than that if the side dishes run out the child tends suddenly take a side dish of his friend, often chew slowly or quickly when in an emotional state, eating with two hands on the table, children also often jumping around, shaking hands, running away from their seats so that children find it difficult to sit upright and calm facing the dining table.

Table 1. Recapitulation Results of Eating Skills Measurement

Conditions	Session	Score	%
Baseline 1	1	69	69%
	2	67	67%
	3	70	70%
	4	71	71%
Intervention	5	84	74%
	6	86	86%
	7	89	89%
	8	96	96%
	9	96	96%
baseline-2	10	91	91%
	11	87	87%
	12	85	85%
	13	87	87%

Table 2. Summary of Results of Data Analysis in Conditions

Conditions	A-1	B	A-2
Long condition	4	5	4
Estimates inclination directions	(+)	(+)	(-)
The tendency of stability	100% Stable	100% Stable	100% Stable
Trace data	(+)	(+)	(-)
Level stability and range	Stable 67% -71%	Stable 84% -96%	Stable 85% -91%
Level changes	71% -69% (+2)	96% -84% (+12)	87% -91% (-4)
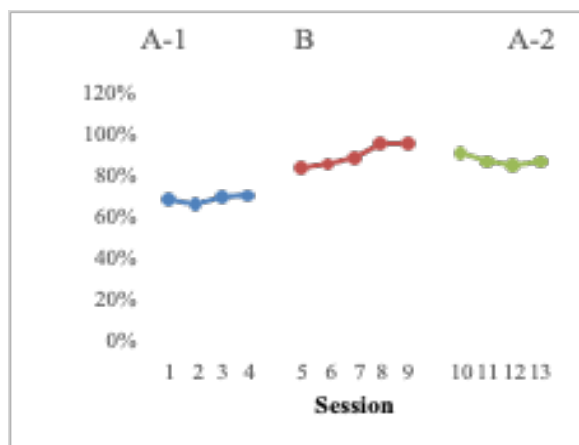
Figure 1. Results of Eating Skills

Data collection techniques to find out this is done by observation and interviews with the parties concerned. In addition to this, the researcher used an eating skills instrument in the form of an observational checklist compiled based on an analysis of the task in the form of an assessment rubric that had been validated by material experts and practitioners using a Likert scale. According to (Sugiyono, 2010), the Likert scale is useful for measuring the opinions, attitudes, and perceptions of a person or group of people about social phenomena with response categories in the form of very relevant, relevant, less relevant, and not relevant. Based on the calculation of the instrument validation test results obtained, a value of 96.42% means that the instrument used is very relevant. The data analysis technique used in this research is in the form of descriptive statistics in the form of graphs with component analysis in conditions and data analysis between conditions.

FINDINGS & DISCUSSIONS

Findings

The data obtained by researchers from the results of the research on the effect of the TEACCH method on eating skills of students with grade III autism, conducted for 13 sessions which can be seen in Table 1.

Based on table 1, the research results obtained from the effect of the TEACCH method on improving the ability to eat skills of autistic students (taking cutlery, spoons, lunchbox) independently, washing hands before eating, sitting in an upright and calm position, praying before eating, taking/scooping food from the lunchbox using a spoon without scattered, put food in the mouth without scattered, chewing food slowly and not sounds, swallowing food slowly, praying after eating, tidying the lunch box after eating, returning the tableware (spoon, lunchbox) to place, washing hands after eating) can be described in figure1.

The blue line on the graph explains the results of data at baseline-1 (A1), the red line describes the results of intervention condition data (B), and the green line describes the results of a data baseline condition-2 (A2).

Analysis In Conditions

The results of the analysis are summarized in Table 2. Data explains the length of conditions carried out at baseline-1 as many 4 sessions, intervention as many 5 sessions, and baseline-2 as many 4 sessions.

The line of estimation of direction tendency, baseline-1 conditions, and intervention direction tendency increases (+), whereas in baseline-2 conditions the direction of tendency decreases (-).

Table 3. Summary of Analysis Inter-condition.

Comparison Conditions	B/ A-1	B/A2
The number of variables	1	1
Changes in direction tendency	(+) (+)	(+) (-)
Changing trends of stability	Stable to Stable	Stable to Stable
level changes	84% -71% (+13)	84% -87% (-3)
percentage overlap	0: 5 x 100% = 0%	

The results of the stability tendency data in each condition show several 100% which means stable. Line of trace data, baseline condition-1 and intervention at her tendency to increase (+), and the baseline condition-2 decrease (-).

The level of stability in each condition was declared stable with a range of baseline-1 conditions of 67% -71%, interventions of 84% -96%, and in baseline-2 conditions, the range was 85% -91%. The level of change in baseline-1 data (+2) and intervention shows data (+12) which means increasing, and in baseline-2 data condition (-4) which means decreasing.

Analysis Inter-condition.

Analysis inter-condition is the activity of analyzing between baseline conditions and interventions after the data obtained show stability. The following data analysis between conditions can be summarized in table 3.

Based on Table 3 variables are changed as much as one is eating skills of students with autism in the baseline condition for intervention. Changes in direction tendency at baseline-1 intervention to baseline-2 the score obtained by students decreased -3 this was due to the intervention being stopped.

The percentage overlap at baseline-1 to the intervention shows 0%. This means that the interventions affect the dependent variable, the smaller the number of overlap percentages, the better the effect. Thus the giving of the TEACCH method affects the eating skills of grade III autistic students.

Discussion

The Ability of Autistic Child's Eating Skills Before Being Given Intervention

The results of the calculation of the ability score of eating skills before being given intervention (baseline-1) the first session by 69%, the second session by 67%, the third session by 70%, and the fourth session by 71%. The data has a mean level of 69.25%, which shows a child eating skills enough, where children have not done eating skills activities properly such as washing hands and scooping foods that are less true, eating still scattered, do not want to chew and swallow properly. So that teachers still often assist in the form of prompt verbal and physical prompt in conducting independence activities.

The lack of independence of children is caused by the behavior experienced by autistic children, namely the lack of ability to work independently on a task (Safitri, 2018). Autistic students need to be developed and trained for their independence, although this independence is still in the initial stages regarding how to care for themselves, it can make children more confident when dealing with others (Efendi, 2018).

Therefore, after knowing the results of the data at baseline-1 conditions so that the ability to eat skills in children can be increased, it is necessary to provide an intervention that suits the needs and characteristics of the children.

The Ability Eating Skills Of Autistic Children After Being Given An Intervention

The ability of children's eating skills after being given intervention has increased. This is indicated by the child being able to wash his hands properly, eat without scattered, be able to independently pick up and return the utensils independently, can do the procedures for eating well with only 1-2 instructions and a little help.

The intervention given researchers from of the TEACCH method in the presence of 1) structuring the environment (physical structure, schedule, work system), 2) visual information, 3) special interest as a child amplifier, and 4) meaningful communication (Yamada, Kobayashi, & Sasaki, 2008).

The arrangement of the environment in the form of setting the physical structure in the visual information, the seat of the child is arranged differently from his habit but is still in the same room as the seat is set near the tableware storage cabinet and provides pictures ordinances eating skills were in paste on the wall to indicate the child was sitting up at the time of eating activity. Also, there are arrangements for cupboards for storing tableware and arranging hand washing equipment in the form of soap and clothes. At each intervention session, the child is seen sitting in a place that has been provided more calmly. Children can also take their utensils in the cupboard independently, washing their hands in the right way unlike in baseline conditions ¬ 1 soap is discarded and spilled. The arrangement of the physical structure of the classroom-proven to be able to provide limits on autistic children

to minimize other stimuli and be more focused when learning (Thompson, 2010).

Another supporter in the regulation of physical structure in the TEACCH method is the existence of a visual strategy which is a means of focusing on the sense of sight that can be taken into consideration in assisting the process of education for autistic children (Antonius, 2014). In this research, the child conducts the eating by looking at the schedule visualized form of picture card media ordinance eating skills shown by the researcher, then the child observes and equals the card with a picture of structured skills at the table. The pictorial media can facilitate autistic children in learning (efendi, 2017).

In addition to this, there is a working system such as children taking and returning eating utensils, children washing their hands before and after eating. On the sidelines of activities when the child can do the eating activities correctly the child is given a cracker or his favorite food as an amplifier or reward. In carrying out this activity, communication is always done by combining visual symbols or objects, which are accompanied by researchers to interpret the activities being carried out. Giving information and instructions visually makes everything more meaningful for autistic children so that children can be more independent in learning(Yamada et al., 2008)

After the intervention, it was proven that children eating skills improved with the acquisition of the fifth session score of 84%, the sixth session by 86%, the seventh session by 89%, the eighth session by 96%, and the ninth session by 96%, with the acquisition of the mean level of 90, 2%. These results indicate a significant increase from the baseline-1 results with a mean level of 69.25%. After measuring the intervention conditions, measurement of baseline-2 as control is needed to conclude the functional relationship between the independent variable and the dependent variable measurement the target behavior in this condition will be returned to the early state that is without intervention.

Eating skills of children in baseline-2 conditions have decreased but not too much from the intervention conditions. This is shown in the calculation of data analysis in baseline-2 with the results of the tenth session score by 91%, eleventh session by 87%, twelfth session by 85%, and thirteenth session by 87% with a mean level of 87.5%. In this condition, the results of the mean level obtained by the child can be decreased because of the cessation of the intervention.

The Effect of the TEACCH Method on the Improvement of the Eating Skills of Class III Autistic Students.

The selection of learning methods must consider the characteristics of children and use methods that are felt to be appropriate for the child's circumstances. Not only academic learning but to increase the potential of children need a special program in the form of self-development programs carried out in daily life.

One of the self-development programs can be done explicitly through stages of the early intervention program delivered by Efendi (2017) such as DTT from Lovaas, LEAP, floor time, and TEACCH. Agreeing with that statement Noviza revealed that the methods that can be used for children with autism are 1) the therapeutic method (ABA), and 2) the TEACCH therapy method (Suteja, 2014). Based on the statement this is researchers using the TEACCH method as a method of delivering a self-development program for eating skills in class III autistic children which is a program to serve people with autism.

Prior research conducted has proven to be able to exert an influence as well as being a suitable method to increase the independence of autistic children (Cahyani & Huda, 2016). The effect of this method is shown by the change in the ability to brush the teeth of autistic students with the mean level results in baseline-1 conditions from 55.8% to 69.5% at the time of intervention and 76.6% at baseline 2.

Subsequent research was carried out by Widati (2011) with the title "Improving Motor Coordination Capabilities of Autistic Children Through Structured Teaching Based on the TEACCH Method. With the results of testing the hypothesis obtained T count (0) <T table (2), the null hypothesis is rejected and the working hypothesis is accepted. This means the use of structured teaching with the TEACCH method affects the improvement of motor coordination skills, especially in wearing clothes, brushing teeth, and tying the shoelaces of children with autism in SLB-D YPAC Bandung.

CONCLUSION

The conclusions obtained from the results of the research of the application of the TEACCH method affect the eating skills of grade III autistic students. This is evidenced from the results of the mean level acquisition and calculation of the overlapping data obtained. The mean level of baseline-1 condition was 69.25%, and it increased by 90.2% in the intervention condition. In the baseline-2 condition, the eating skills of autistic children decreased. This is shown in the results of the mean level by 87.5% which means the data is decreasing, but not so much and is still in a stable condition, while the percentage data overlap at baseline-1 to the intervention condition by 0%.

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