



The Effect of Video Media Usage for Improving Science Learning Achievement Toward Autism Students

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Abstract. Research background of this research is low achievement of science subject on autism students that caused by the distraction on focusing the attention, understanding communication or another distraction in planning and organizing learning information. This research is aimed to know the effect of using video media toward science learning achievement of autism students. The approach used in this research is quantitative research with pre-experimental One-Group Pretest-Posttest Design. The subjects in this study were 6 autistic students in grade 4 at SLB Negeri Surakarta. Data collection technique used in this research is 10 items of objective multiple choices test. Data analysis technique used in this research is nonparametric Wilcoxon Sign Rank Test with SPSS 24 software. Statistic analysis result of nonparametric statistic scale with Wilcoxon Sign Rank Test is $0,27 > 0,05$, therefore it can be concluded that alternative hypothesis is accepted and null hypothesis is rejected. Based on the research analysis result it can be concluded that there is a significant result of media video usage toward science learning achievements of autism students.

Keywords: Video Media, Science Learning Achievement, Autism

1 Introduction

Educators as learning resources, especially for students with autism, must improve the quality of learning to achieve optimally. Educators must develop attitudes of knowledge and skills of autistic students to become independent and developing individuals.

Autism comes from the word "Auto," which means alone. "Autism is a developmental disorder, understanding disorder or pervasive disorder and not a form of mental illness" [1] Autistic students tend to show language difficulties, both expressive and receptive, in focusing attention, recognizing sequences, planning, and organizing information on learning outcomes [2]. These disturbances can hinder science learning. Difficulty processing, integrating and responding to sensory stimuli has been described as a feature of autism spectrum disorders (ASD) since the disorder was first identified [3]

Children with autism spectrum or Autism is one of the many types that are included in special needs. Children with autism spectrum disorders have complex neurobiological developmental barriers that can affect communication skills, social interactions, and one's behavior and last a lifetime [4]. It is stated in the book DSM V that the characteristics of autistic children are communication and social interaction which causes autistic children to have an abstract way of thinking that is difficult to understand by the surrounding environment. With social interaction barriers, children have difficulty in concentrating so that it has an impact on children's learning achievements [5]. Learning achievement is the level of student success in receiving subject matter which is generally in the form of scores [6]. Through learning achievement, it can be seen the changes achieved by children.

One of the materials in school is natural science learning. Natural science is one of the subjects that studies the universe and the various mechanisms that occur in it [7]. The importance of Natural Science education is to make children aware of the various scopes of natural science itself and be able to use the basic parts in finding solutions to a problem faced by children [8]. This learning is very closely related to everyday life because it discusses living things, food, electricity, wind, water and plants.

Natural Science is one of the subjects that study the universe and the various mechanisms that occur in it [9]. This subject is very closely related to everyday life because it discusses living things, food, electricity, wind, water, and plants. The scope of science learning for grade 4 Autism includes: the main parts of animals and plants, growth of animals and plants, changes in the shape of objects.

Teachers as learning resources for autistic students must deliver learning materials according to their learning styles. [10] explains the learning styles of autistic students, namely: (1) Rote learners, namely children, tend to memorize information without understanding the meaning of the learned symbols, (2) Gestalt learners, namely children, tend to see things as a whole, (3) Visual learners, namely children, quickly understand what they see than what they hear, (4) Hands-on learners, namely children, like to try to do something and gain knowledge from experience tried it and (5) Auditory learners, who like to talk and understand what they hear more quickly than they see. Hogdon further stated that 90% of autistic individuals are visual learners and 10% are auditory learners [11]. Based on observations of 4 grade autistic students at SLB Negeri Surakarta. It is known that 3 students have auditory learner learning patterns, 1 student mixed learning pattern between hand learner and visual learner, 2 students rote learner and gestalt learner. The diversity of learning style characteristics of autistic students in one class causes teachers to experience obstacles in delivering science learning materials so that learning objectives are not achieved. This causes science learning outcomes for autistic students at SLB N Surakarta to be low.

One of the efforts to improve science learning outcomes for autistic students is to enhance learning strategies, one of which is exciting and educative learning media for children. One of the creative media is using video media. Video media has a great appeal to students' responsiveness. Video media has many advantages that can help teachers explain or convey information from the material being taught and make students easy to accept the material being taught and can be used as another alternative to replace the material being taught. Methods that teachers often use are the lecture method and

assignments [12]. The concept of video media is used by teachers in learning to improve science learning outcomes for autistic students. The material is made concerning the 2013 curriculum, which is modified according to student needs.

Video is a virtual tool and an example of multimedia learning because it involves combining various elements that is separated in traditional learning [13]. Using these videos will make autistic children more interested in role-playing activities, so that children do not feel bored. [14] also mentioned that the use of audio visual based media can support the learning process because it can help the five senses during the learning process. Audio visual based media are used to support the learning process of children with the autism spectrum, in addition to the use of audio visual based media, assistance by therapists and teachers and even parents also plays an important role in the child's learning process.

Several previous studies have provided an overview of the positive effect of using video media to improve science learning achievement. Research results from [12] showed that video media with the theme "Natural Events in the Surrounding Environment" significantly influenced student learning outcomes regarding the material of natural events due to the influence of human activities for fifth-grade students at SDN Tanjung Sari Surabaya. Another study conducted [15] showed that research related to the use of video media applied to science subjects in grade 5 SD Muhammadiyah 1 Tulung Agung could foster attention and increase students' ease in understanding science subject matter. Research conducted by [10] proved that there was a positive influence on science learning using video media compared to science learning using picture media on learning motivation and cognitive learning outcomes in science learning. The video media provided by the teacher in the science learning process makes learning motivation and cognitive learning outcomes of students increase this is because students become more enthusiastic and passionate in learning because of new innovations given by the teacher during learning.

Based on the above background, this research is aimed of knowing the effect of using video media toward science learning achievement of autism students.

2 Research Method

This research was carried out at the Surakarta State Special School in Semester 1 of the 2019/2020 Academic Year. This study uses a quantitative approach with a pre-experimental design One-Group Pretest-Posttest. The subjects in this study were 6 autistic students in grade 4 at SLB Negeri Surakarta. The data collection technique used a cognitive aspect test instrument for science material in a multiple-choice objective test totaling 10 questions. The increase in cognitive aspect learning outcomes can be seen and measured with the same pretest and posttest questions. Data analysis techniques use nonparametric statistics Wilcoxon Sign Rank Test with the help of SPSS 24 software.

3 Result and Discussion

From the results obtained 1 time pretest, 1 time posttest and 4 times treatment, the data obtained in the table as follows:

Table 1. Recapitulation of Average Pre-test and Post-Test Scores of Science Learning Outcomes for Class 4 Autism Students at SLB Negeri Surakarta

| No | Subject Name | Pre Test (X1) | Post Test (X2) |
|-------------|--------------|---------------|----------------|
| 1 | AD | 50 | 90 |
| 2 | FK | 40 | 70 |
| 3 | LK | 60 | 90 |
| 4 | ZL | 50 | 60 |
| 5 | FN | 30 | 80 |
| 6 | RF | 40 | 60 |
| Mean | | 45 | 75 |

The increase in science learning outcomes for fourth grade students with autism at SLB Negeri Surakarta can be seen in the graph below:

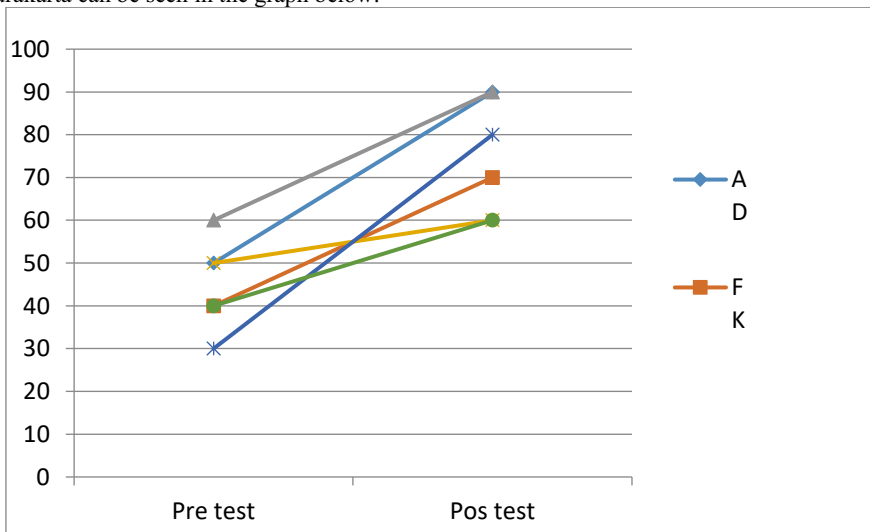


Fig. 1. Improving Science Learning Outcomes

The research data in the form of pre-test and post-test values entered into the work table and graph of changes above are then analyzed using nonparametric statistics Wilcoxon Sign Rank Test using SPSS 24 software. Data analysis of data analysis is shown in the table below.

Table 2. Analysis of the Calculation of Pre-test and Post-test scores for science learning outcomes

| | | Ranks | | |
|----------------------|----------------|----------------|-----------|--------------|
| | | N | Mean Rank | Sum of Ranks |
| Post test – Pre-test | Negative Ranks | 0 ^a | .00 | .00 |
| | Positive Ranks | 6 ^b | 3.50 | 21.00 |
| | Ties | 0 ^c | | |
| | Total | 6 | | |

a. Post test < Pre test

b. Post test > Pre test

c. Post test = Pre test

The data obtained from Table 2 shows that the results of the Wilcoxon Signed Rank Test analysis between the pretest and posttest scores did not have a negative rank. All subjects received a positive rank (positive rank), so it stated that all subjects experienced an increase in scores during the posttest with a mean rank (average rank) of 3.50 and a sum rank of 21.00.

The next step is the process of calculating the test results. Calculation of test results also uses the Wilcoxon Signed Ranks Test analysis. Based on the non-parametric total of the Wilcoxon Signed Ranks Test, the results of Account and Asymp will obtain. Sig (2-tailed) or P-value. This study uses a significance level of = 0.05 or 5%. The following are the results of statistical test calculations.

Table 3. Statistical Test Calculation Results

| Test Statistics ^a | |
|------------------------------|---------------------|
| | Posttest – Pretest |
| Z | -2.207 ^b |
| Asymp. Sig. (2-tailed) | 0.27 |

a. Wilcoxon Signed Ranks Test

b. Based on negative ranks.

Calculation of statistical tests based on pretest and posttest scores obtained Zcount = -2.207 with Asymp. Sig. (2-tailed) = 0.27. The probability value in Zcount is then compared with a predetermined significance level, namely = 0.05. Based on the results of these calculations. There is a significant difference between the pretest and posttest scores with a P-value of 0.27, which is greater than the significance level of 0.05. The

results of the study stated that the six subjects studied experienced an increase in learning outcomes. Thus, it can be concluded that there is a significant effect of using video on science learning outcomes for autistic students.

The results of this study are in accordance with the results of previous studies that there is a positive influence on the use of video media to improve science learning outcomes. The results of [12] research show that the influence of video media on improving student learning outcomes in science learning about natural events in the surrounding environment. In addition, the results of [15] show that the use of video media applied to science subjects in grade 5 SD Muhammadiyah 1 Tulungagung seems to foster attention and increase students' ease in understanding science subjects matter.

This is supported by several studies conducted by [16] which explain that the use of digital media in the learning process of autistic students shows effective results. The results of this study also explain that the use of video media can show changes in the subject's behavior because video media can increase learning motivation in the subject. These behavioral changes led the researcher to explain that watching videos/television can automatically strengthen some autistic children. Interactive videos are able to stimulate students to respond to the material presented quickly and actively, and cause interaction during the learning process [17]. The learning video with the main parts of animals and plants, it can help stimulate autistic students to be able to see directly. In addition, [18] stated that video media is effective in helping develop communication patterns of autistic students.

There are several other studies related to the use of video media as a learning medium. Research conducted by [19] using video modeling found that video modeling is able to help improve the memory of autistic children to remember every step that will be taken in completing self-development tasks. [5] stated that the use of video media in learning has an effect on improving skills in cognitive aspects, life skills, and social skills. [20] stated that the use of video animation for children with autism can increase attention. In the use of video in learning, children give more attention, enthusiasm, and enthusiasm in receiving learning. In line with [21] research that the use of video media in learning affects the learning outcomes of autistic children, namely changes in behavior and increasing skills of autistic children. So it can be concluded that video media has an effect on the learning achievement of autistic students.

Based on learning using audio visual media, it turns out that the results are quite satisfactory. Learning activities that conducted several times can have an effect on children with autism that is the effect of imitating the movements shown in the video. It is necessary to remember that autistic children have disorders, one of which is communication, especially verbal communication. This barrier can be overcome by visual communication through the video that is displayed. By watching the video, autistic children can follow the intended movement so that they can imitate the movements. Based on the results of this study and previous studies, it was showed the use of video media could improve science learning outcomes for autistic students in grade 4 at SLB Negeri Surakarta on the main parts of animals and plants, growth of animals and plants, and changes in the shape of objects. The use of video media makes it easier for autistic students to understand learning material, forms social interactions between teachers and

autistic students, and makes learning more fun tailored to the characteristics of the learning styles of autistic students.

4 Conclusion and Recommendation

Based on the discussion of the study results, it shows that "there is a significant effect of the use of video media on the science learning outcomes of 4 grade autistic students at SLB Negeri Surakarta." The average value of science learning outcomes increased from 45 to 75 after giving treatment in using video media in the science learning process.

Research on the use of video media for science learning has been completed with all its shortcomings. The author hopes that fellow educators will be more innovative and creative in carrying out learning, especially for the use of learning media by the characteristics and needs of autistic students. Technological developments are increasingly sophisticated, educators as learning resources for students are expected to continue learning and developing to serve education, especially for students with special needs. The willingness to learn and develop educators is expected to facilitate students to achieve optimal learning goals. To students with autism, the authors hope that they will be more diligent in learning science. To the principal, the authors hope that they will always facilitate the development of learning so that the school's vision and mission for quality education services for children with special needs can be adequately achieved.

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