

The Effect of Media Powerpoint on Achievements Learning Natural Sciences Student Primary

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Abstract—This research is descriptively aimed to know the tendency of learning achievement of science subject of earth and universe animals in grade III odd semester students of Jageran State Elementary School Yogyakarta in the 2017/2018 academic year by using powerpoint media and without using powerpoint media. Comparatively to know the difference of learning using powerpoint media to learning achievement of science subject of earth and universe in grade III odd semester students of Jageran State Elementary School Yogyakarta in the 2017/2018 academic year. This research design is quasi-experimental research with the Nonequivalent Control Group Design. Data collection techniques used in this research was documentation techniques to obtain students' fundamental skills and test techniques to obtain data on science learning outcomes. Data analysis technique uses t-test after test of requirements, a test of distribution of normality and variance of homogeneity tests. The results of descriptive research indicate that the tendency of learning achievement in science subject of the earth and the universe was in high category while using powerpoint as a media and the learning without used powerpoint as a media included in the medium category. In t-test obtained t count = 3.113 and $p = 0.003$. Because $p < 0.01$, then comparative from t-test results obtained the conclusion that hypothesis proposed accepted and there is a significant difference of learning achievement in science subject between students who study using power point as a media and the learning without using powerpoint.

Keywords: digital technology for education, learning achievement, natural science

I. INTRODUCTION

Natural Sciences (IPA) lessons are taught and introduced in formal education institutions starting at the elementary school level, then progressing to the junior high school and high school stages. On the one hand the purpose of teaching science reflects the policy arena of standards and market forces, in that there is a perceived pressure to ensure pupils acquire adequate scientific knowledge ultimately to gain high scores; yet on the other hand a clear justification for learning primary science reflects the genuine desire by schools to enable pupils to learn about the world in a practical, stimulating way [1]. Not all science materials can be delivered effectively and efficiently in elementary schools. Students who choose to study science deeply may take schools specifically in studying science such as high schools (high schools) that are specialized in the field of science.

Science subjects start from teaching the most basic things of science itself, then the higher the level of education, the higher the level of material studied. One of the fundamental things in studying science is to tell natural phenomena. Learning natural science is learning based on the principles, processes that can foster a scientific attitude of students to the concepts of science. Therefore, learning science in elementary schools is done with a simple investigation and not memorization of a collection of science concepts. With this activity, not only does it focus specifically on content and skills, but it presupposes what pupils should learn and gives very little justification for eliciting existing ideas as a basis for developing conceptual understanding [1]. With investigative activities such as observation, discussion, and simple inquiry activities, it is hoped that students can be active in every learning activity. With this activity, students are expected to gain direct experience of the material being learned. Such learning can foster a scientific attitude of students who indicated to formulate problems, draw conclusions so that they can think critically through science learning [2].

Based on observations at Jageran State Elementary School Yogyakarta, it shows that learning science on the subject matter "Forms of Energy in Daily Life," most students show less interest in the learning process. It also shows by indicating that learning is still one-way and lacks question and answer interaction between teachers and students will later affect learning achievement. Students find it difficult to understand and imagine abstract material concepts. It is because of the lack of use of media in learning by class teachers. The contributing factors include the lack of a teacher's ability to choose the right media to create good learning. As a result, students become bored and not interested in learning. So, learning becomes meaningless; students easily forget the material that has been taught.

Education is also inseparable from the technological aspects because this aspect is very supportive and supports the achievement of educational goals. Indonesia's today education has experienced progress, through the advancement of information technology, the teaching and learning process can be facilitated by the existence of information technology that can be accessed by Indonesian people through computers. By utilizing the equipped software facilities with various interactive animations that can visualize the processes related to science learning, to

facilitate student understanding of the material delivered by the teacher.

Based on the identification of the problem above, then the problem can be formulated descriptively 1) To what extent is the tendency of natural science learning achievement for third-grade students of the Odd Semester of Jageran State Elementary School Yogyakarta in the academic year 2017/2018 taught using powerpoint media? 2) To what extent is the tendency of science learning achievement for third-grade students in the odd semester of Jageran State Elementary School Yogyakarta in the academic year 2017/2018 taught without using powerpoint media? While comparatively are there differences in science learning achievement of third-grade students in the odd semester of Jageran State Elementary School Yogyakarta in the academic year 2017/2018 between those taught using powerpoint media and those taught without using powerpoint media?

The purpose of this study is descriptively 1) Knowing the tendency of natural science learning achievement of third-grade students of the Odd Semester of Jageran State Elementary School Yogyakarta in academic year 2017/2018 taught using powerpoint media. 2) Determine the tendency of science learning achievement for third-grade students of the Odd Semester in Jageran State Elementary School Yogyakarta in the 2017/2018 academic year taught without using powerpoint media. While comparatively to find out the difference between Natural Science learning achievement between those taught using powerpoint media and those taught without using powerpoint media for a third-grade semester of the Jageran State Elementary School Yogyakarta in the academic year 2017/2018.

According to [3] argues that "in broad terms, the factors that influence learning and learning achievement can be classified into two parts, namely factors from within (internal) and factors from outside (external). The school environment is an external factor that can be classified into three parts, namely infrastructure, teacher competency, curriculum, and teaching methods. Facilities and infrastructure, including the completeness of school facilities, such as whiteboards and OHP, will help smooth teaching and learning in schools. Besides, the shape of the room, air circulation, and the environment around the school can influence teaching and learning activities.

According to [4], " media comes from Latin and is a plural form of medium which means an intermediary or introduction. The media is an intermediary or messenger of messages from the sender to the recipient of the message ". In line with the above opinion, [5] states that "the media are understood in broad outlines as humans, material, events that build conditions that make students able to obtain knowledge, skills, or attitudes. Media is very influential in teaching and learning activities ". With the rapid development of computer multimedia technology, traditional teaching way which just only depends on teachers' speaking and students' listening embodies a lot of disadvantages, it makes the class content and form be boring and monotonous, so the students fail to concentrate on it last long time and greatly influent efficiency [6]. Media is very influential in teaching and learning activities. The results suggest that educational technology such as PowerPoint

improves students' attitudes toward the instructor and course presentation [7].

According to [8], "is an application that is in a Microsoft office package used to make presentation slides, regarding the function of the program is often used for business people, educators, students, and also trainers. Presentation slides can contain text, graphics, images, videos, and other objects that are set freely. Components of the construction of PowerPoint slides were examined, specifically contrasting the use of text and visual representations to facilitate student learning, PowerPoint slides provide an overall structure to the instructional episode, and each individual slide can be viewed as a mini advance organizer in the context of the larger lesson.[9]

Powerpoint media in this study are intermediaries in the learning process that can be seen and are informative and are expected to improve student achievement. PowerPoint is an application that is in a Microsoft office package used to make presentation slides, regarding the function of the program is often used for business people, educators, students, and also trainers. Presentation slides can contain text, graphics, images, videos, and other objects that are set freely [10]. According to [11] found that students retained more information when there was only a title accompanied by a pertinent graphic and little text. (Smith-Peavler) in his research about the use of powerpoint in biology class stated that PowerPoint slides help visual representations of physical and natural phenomena are important components of the teaching and learning of elementary student.

PowerPoint presentations help class administrators organize materials, and support important points [12].

According to [13], the advantages of powerpoint media 1) It is concrete, more realistically shows the problem when compared with mere verbal. 2) Visuals/images can overcome space and time, meaning that not all objects, event objects can be brought to class. Then it needs to be created by making pictures or photos of these objects. 3) Clarify a problem presentation in any field and for any age level. 4) Cheaper, easier to obtain, and used without the need for special equipment.

II. RESEARCH METHODS

This research belongs to the category of Quasi Experiment, which is a research that is close to quasi-experimental. [14] argues, " this experiment is usually called a pseudo experiment because various things, especially concerning controlling variables, are likely to be very difficult to use pure experiments." The same as pure experimental research, the difference is in controlling variables. In quasi-experimental, the control is only carried out on one variable that is considered the most dominant. In this study, there are two classes, the first class is called the control group, and the second class is called the experimental group [14]. This research was conducted at Jageran State Elementary School Yogyakarta. The research activities carried out for five months, namely in August to December 2017.

[15] states that "The research variable is everything in the form of whatever is determined by the researcher to be

studied in order to obtain information about it, then concluding." In this study, there are two kinds of variables, namely the independent variable and the dependent variable. The independent variable in this study is the use of instructional media consisting of: (A1) is learning using powerpoint media and (A2) is learning without using powerpoint media. The dependent variable in this study is the learning achievement of natural science, which is symbolized by the letter (Y). The research design showed in table 1.

Table 1
Research design

Group	Pre-test	Treatment	Post-test
Experiment	X_{E1}	A_1	Y_{E1}
Control	X_{E2}	A_2	Y_{E2}

Note:

X_{E1} : Pre-test of experiment group
 X_{E2} : Pre-test of control group
 A_1 : Learning using video
 A_2 : Learning without video
 Y_{E1} : Post-test of experiment group
 Y_{E2} : Post-test of control group

In this study, the population was grade III of Jageran State Elementary School Yogyakarta in the odd semester of the 2017/2018 academic year consisting of two classes totaling 60 students. D an entire population of the research samples is class III A as classroom control and class III B as a class experiment. Before being given the treatment to find out whether the experimental group with the control group departed from the same initial ability or not, then both groups were tested using the t-test. Results p CALC t-test obtained by value t initial = -0.715 and $p = 0,516$ since $p > 0.05$, two groups no difference or depart from the same starting capabilities. Data collection techniques use documentation techniques to obtain students' initial abilities and test techniques to obtain data on science learning outcomes on the subject of the earth and the universe.

To find out the validity of the item test was using the correlation formula. The correlation formula used is the Pearson Product Moment correlation formula [15]. From the results of the analysis of 30 items, stated that valid questions were 27 items and which knock out 3 items. And to find out the reliability in research instruments was using the Kuder and Richardson formula known as the KR-20 formula [16]. The results of the KR-20 reliability test analysis are $r_{tt} = 0.883$ and $P = 0.003$. Because $P < 0.01$, then the instrument is reliable with a reliable status.

III. RESEARCH RESULTS AND DISCUSSION

Testing the analysis requirements in this study include the homogeneity test of variant s and the test for normality of distribution. The homogeneity test of variant s was used to find out whether the sample used in the study came from

a homogeneous population or not. Based on data analysis obtained data $F = 1,695$ with a value of $p = 0,081$. Because $p > 0.05$, the variants of both groups are homogeneous.

This normality test aims to determine whether the data in this study are normally distributed or not. Based on the results of the normality test distribution result for a group lesson with powerpoint is 19.167 and $p = 0,332$, while for the group that learning without the use of media powerpoint is 14.333 and $p = 0,108$. Because $p > 0.05$, the data distribution is normally distributed.

Table 2
Normality Test

Group	SD	χ^2	P	Spread
Experiment	5,180	19.167	0,332	Normal
Control	6,743	14.333	0,108	Normal

After analyzing the items, 27 items are valid so that the provisions for the ideal maximum score are 27 minimum ideal scores are 0.

Table 3
Normal curve criteria:

$21.6 < X < 27.0$	Very high
$16.2 < X < 21.6$	High
$10.8 < X < 16.2$	Moderate
$5.4 < X < 10.8$	Low
$0.0 < X < 5.4$	Very Low

Based on the science learning outcomes test for third-grade students of Jageran State Elementary School Yogyakarta in the odd semester of the 2017/2018 academic year, the average group of students learning using powerpoint media obtained the highest score 26, the lowest score 10, the average score 19,167 and the standard deviation 5,180. The normal curve lies at intervals of $16.2 < X < 21.6$ and is included in the high category. While the average group of students who studied without using the media a powerpoint obtained the highest score of 26, the lowest score of 5, the average score of 14.333 and the standard deviation of 6.743 so that the normal curve lies at intervals of $10.8 < X < 16.2$ and included in the category is on.

Table 4

Group	HS	Mean	LS	SD
Eksperiment	26	19.167	10	5,180
Control	26	14.333	6	6,743

Note:

HS : High Score
 LS : Low Score
 SD : Standard Deviation

Following the proposed hypothesis, "There is a difference in science learning achievement between those who taught using powerpoint media and those who taught using sketch media for third-grade students in the odd semester of Jageran State Elementary School Yogyakarta in the academic year 2017/2018 ". Then this section is

presented with the t-test hypothesis testing. Based on the t-test obtained that the value of $p = 0.003$ means $p < 0.01$, then the hypothesis proposed is accepted and is very significant.

The tendency of natural science learning achievement on the subject of the earth and the universe of third-grade students of Jageran State Elementary School Yogyakarta in the odd semester of the academic year 2017/2018 by using powerpoint media include in the high category. In the age of elementary school students, they have not been able to think abstractly; they still think based on real experiences. With learning that uses powerpoint media can make abstract learning more real. The more concrete the information provided to students, the easier it will be for students to receive that information. Powerpoint media can also help teachers to design science learning creatively. With a creative design, the science learning process in primary schools becomes more innovative, attractive, interactive, effective, the quality of student learning can be improved.

The tendency of natural science learning achievement on the subject of the earth and the universe without using media power points include in the medium category. This result happens because students only get the learning material from books or from the teacher in the learning process, which causes low visualization of students about the material studied.

The research findings show that some students in the experimental class find the photos and descriptions on the PowerPoint slides very helpful in learning science, considering that this study was conducted in elementary schools which range in age from 9 to 10 years, which means they are still in the concrete operational stage [17].

There were also findings of differences in perception between the control group and the experimental group. The difference is seen from the test scores given between the control group and the experimental group. The overall value that the researcher obtained from the experimental class and the control class clearly showed a higher experimental class [17].

This study shows that the use of powerpoint media helps improve learning outcomes because powerpoint media are equipped with multimedia features so the teacher can utilize this media to explain abstract material to students so that learning is more meaningful so that in this research assumption student achievement will increase [17].

It shows that the science learning achievement on the subject of the earth and the universe whose learning uses powerpoint media is better than those whose learning without using powerpoint media.

Natural science learning achievement using powerpoint media is better because it can provide real/concrete experiences about the lessons given by the teacher in the form of pictures and animations. Students will be easier to understand the lesson. Another case with learning without using powerpoint media, students only get material from the teacher and books, without any real visualization of the material, so that it will make it difficult for students to understand the material. The conclusion obtained is the learning of science on the subject of the earth and the universe of third-grade students of Jageran State Elementary School Yogyakarta in the odd semester of the academic year 2017/2018, more effective and produces

better learning outcomes if the learning uses powerpoint media.

IV. CONCLUSIONS

Descriptively, the results of this study are the tendency of natural science learning achievement on the subject of the earth and universe third-grade students of Jageran State Elementary School Yogyakarta in the odd semester of the academic year 2017/2018 by using powerpoint media. The result includes in the high category, and those learning without using powerpoint media in the medium category. Comparatively, in the results of this study, there are significant differences in the achievement of natural science degrees on the subject of the universe funds in third-grade students of Jageran State Elementary School Yogyakarta in the odd semester of the academic year 2017/2018 between those learning using powerpoint media and those learning without using powerpoint media.

Through learning by using powerpoint media, it is expected that teachers design active and creative learning to increase students' natural science learning achievement to the maximum. Furthermore, students are expected to increase the activity and creativity in teaching and learning activities so that science learning achievement can be improved. For this reason, schools should provide adequate facilities for all students, especially in the field of technology and information, and provide training and guidance on information technology to teachers.

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REFERENCES

- [1] Eady, S. (2008). What is the purpose of learning science? An analysis of policy and practice in the primary school. *British Journal of Educational Studies*, 56(1), 4–19
- [2] Ahmad Susanto. 2013. *Teori Belajar dan Pembelajaran di Sekolah Dasar*. Jakarta: Kencana Prenadamedia Group.
- [3] Hamdani Hamid. 2013. *Pengembangan Sistem Pendidikan di Indonesia*. Bandung: CV. Pustaka Setia.
- [4] Arief S. Sadiman, dkk. 2014. *Media Pendidikan, Pengertian, Pengembangan, dan Pemanfaatannya*. Jakarta: PT. RajaGrafindo Persada.
- [5] Azhar Arsyad. 2014. *Media Pembelajaran*. Jakarta: PT Raja Gafindo Persada.
- [6] Zhang, Z. (2012). Studies on multimedia english teaching from students' angle of view. *Proceedings of the 2012 National Conference on Information*

- Technology and Computer Science, CITCS 2012, (Citcs), 1046–1049
- [7] Kasper, G. M., & Morris, A. H. (1987). The effect of presentation media on recipient performance in text-based information systems. *Journal of Management Information Systems*, 4(3), 25–43
 - [8] Jubilee Enterprise. 2016. *Belajar Komputer untuk Semua Orang*. Jakarta: PT Elex Media komputindo.
 - [9] Arneson, J. B., & Offerdahl, E. G. (2018). Visual literacy in bloom: Using Bloom's taxonomy to support visual learning skills. *CBE-Life Sciences Education*, 17(1), ar7.
 - [10] Clark, J. (2008). Powerpoint and Pedagogy. *College Teaching*, 56(1), 39–45
 - [11] Kustritz, M. V. R. (2014). Effect of differing PowerPoint design on multiple-choice test scores for assessment of knowledge and retention in a theriogenology course. *Journal of Veterinary Medical Education*, 41(3), 1–22.
 - [12] Pandey, N. N. (2014). the Effect of Powerpoint Presentations on Academic. *Spije*, 4(2), 76–85
 - [13] Hujair AH Sanaky. 2009. *Media Pembelajaran*. Yogyakarta: Safiria Insania Press.
 - [14] Nana Syaodih Sukmadinata. 2013. *Metode Penelitian Pendidikan*. Bandung: PT Remaja Rosdakarya
 - [15] Sugiyono. 2016. *Metode Penelitian Pendidikan Pendekatan Kuantitatif, Kualitatif, dan R&D*. Bandung: CV. Alfabeta. PT Bumi Aksara.
 - [16] Suharsimi Arikunto. 2013. *Dasar-Dasar Evaluasi Pendidikan*. Jakarta: CV. Alfabeta.
 - [17] Smith-Peavler, Emily; Gardner, Grant E; Otter, Ryan. (2019). PowerPoint Use in the Undergraduate Biology Classroom: Perceptions and Impacts on Student Learning. *Journal of College Science Teaching; Washington* Vol. 48, Iss. 3, (Jan/Feb 2019): 74–83.