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THE EFFECTS OF SCIENTIFIC-BASED LEARNING STRATEGY (IMAGES MEDIA AND LECTURE METHOD) AND STUDENTS' LEARNING MOTIVATION TOWARDS SCIENCE ACHIEVEMENT ON STUDENTS OF CIRUAS 2 ELEMENTARY SCHOOL

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Abstract

This study aims to determine the effects of scientific-based learning strategy (images media and lecture method) and students' learning motivation towards the students' achievement of learning science. This research applied 2 x 2 factorial design, a type ofquasi-experimental design. Results are as follows: (1) there are differences in the students' achievement of learning science between students who are taught using thescientific-basedlearning strategy withimages media and students who are taught usingscientific-basedlearning strategywith lecture method, (2) there are differences in the students' achievement of learning science between students who have a strong learning motivation and students who have a weak learning motivation, (3) For students who have a strong learning motivation, whether the students' achievement of learning science are higher when taught withscientific-based learning strategywith images media than with the lecture method, (4) For students who have a weak learning motivation, are the results of learning science higher when taught with the scientific-based learning strategy with lecture method compared to thescientific-basedlearning strategy withimages media, (5) there is an interaction between scientific-based learning strategyand students' learning motivation towards students' achievement of learning science.

Keywords: Scientific Based Learning, students' learning motivation, students' achievement of learning science

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INTRODUCTION

Some students have a low interest in reading when learning science at Ciruas 2 Elementary SchoolSerang Regency because students tend to not read carefully; therefore, students get imbalancedscience scores, the use of science teaching aids is not optimal. Science education is one of the main elements that are important in realizing a quality learning process, the quality of education could develop following the increase in moresophisticated technology. Science education is essential to answer the challenges of ever-changing times, educated humans who are faithful and devoted to God Almighty, have a noble character, are healthy, knowledgeable, competent, creative, and independent.

The scientific-based learning strategy is a learning method that is following with the condition of the child so that learning is more interesting, active, creative, fun, and appropriate to the context of the environment around us. A teacher is required to have four competencies and the ability to increase high creativity to promotean effective and efficient way of learning. One aspect of the abilities that a teacher must have is the understanding and mastery of the learning approach. By using a scientific approach, students are expected to be able to learn independently and creatively so that they get optimum learning achievement.

The development of science is an increase in the quality of both the teaching and learning process so that elementary school students get to obtainmore knowledge from both the school environment and the surrounding environment. In this case, students need to havethe self-confidence to express their ideas as a form of confidence in their abilities. Trust is the main capital of every student to express their ideas, opinions, thoughts, etc. in developing their insights, they can present theiropinion or argument by involving themselfas a subject of science.

The teacher as an educator needs to instill character in students atan early age so that high moral values are embedded and become the initial foundation in education. Teachers are the spearhead in education, the success of education is supported by high human resources, optimal use of natural resources, high science of technology and art, and faith and piety towards The One Almighty God.

The students' learning motivation is a positive encouragement that comes from within students and from their surrounding environment. With high encouragement and enthusiasm, it can provide positive learning achievement. Students' learning motivation can be developed through a good learning process by exploring the child's knowledge.

Learning achievement is an effort to obtain the values that we want to achieve, which affect the student's achievements (Santosa, Prabawanto & Marethi, 2019). The interest and students' learning motivation are the factors that most determine learning achievement. In this case, the teacher acts as a facilitator and the learning process could perform student-centered learning (Santosa, Suryadi, Prabawanto & Syamsuri, 2018). Students are explained and are directed so that during the learning process students can follow the instructionsand assignments given by the teacher so that students canform groups to complete all assignments.

Teachers in providing science learning strategies appropriately to students, teachers are expected to be able innovate, motivate, and instill students with courage and a confident attitude towardstheir abilities, so that students are able to express their opinions in public well. This was stated by Marjan *et.al.* (2014) the effect of learning with a scientific approach on the results of learning biology and science processing skills. *Scientific based learning* is a learning method that is in accordance with the condition of the child so that it is more interesting, active, creative, fun, appropriate to the context and the environment around us. Thus we can conclude that the availability of time, expertise, facilities and infrastructure is an activity that is not easy to carry out. A teacher is required to have a high ability and creativity so that learning can be carried out effectively and efficiently. One aspect of the ability that a teacher must have is an understanding and mastery of the learning approach. The influence of *scientific based learning* in learning has a positive impact and results in a positive way of learning for students.

This is supported by several opinions from researchers about scientific. According to Machin (2014), the approach of *scientific-based learning* is student-centered. Based on this research, it can be concluded that the *scientific based learning* approach can develop intellectual abilities, students can solve problems, and have character. Character is a person's nature that is carried from birth. Changes in a student's character are influenced by the environment around them. The *scientific-based learning* approach can improve students' high intellectual abilities, students think critically, learn comfortably and in pleasant conditions, and train students to develop their talents optimally.

The *Scientific based learning* method aims to improve the quality of students' learning in the classroom and outside the classroom (learning

more meaningfully and fun). Learning science will be more interesting if the learning process is packaged with careful planning, demonstrations or activities that need alternative answers, and reflection. ***Scientific based learning*** has a positive impact on students' scientific writing. Students who study ***scientific based learning*** emphasize more on sentences that reflect applications and use high-level cognitive sentences (Probosari, 2015).

This agrees with Prabowo (2015) that the results of the study shows that there is a significant increase in mastery of SPS *(science process skills*) by applying ***scientific-based learning***, while the increase in conventional learning classes is not significant enough. With *Scientific based learning* or scientific based learning, students experience an increase in learning. Thus students are more interested, motivated, and find it more enjoyable when the learning process takes place. In this case the teacher must increase their high creativity in order to produce quality education.

In learning, there is an increase in the results of cognitive learning and creative thinking skills as a result of applying the model (Wibowo and Suhandi, 2013). Knowledge is obtained throughdifferent processes, requiring creative learning skills that will shape educational outcomes in the form of learning that is not yet relevant to be appropriate, so that education is able to prepare students to move forward where there are norms or rules that apply so that students think like scientists. The world of education will be more advanced in the future supported by the readiness of students, educators, facilities and infrastructure, and the surrounding environment.

This is supported by several opinions from researchers about motivation. According to Hamdu and Agustina (2011) motivation affects the success of students' learning activities, without motivation it will be difficult for the learning process to achieve optimum success. Thus we can conclude that motivation is a way to determine the optimal learning process. Optimal student learning can foster a character that is influenced by different backgrounds.

Learning outcomes are a way to do something and learning motivation is a learning outcome that is achieved as a part of the learning process. Daud (2012) learning motivation has an effect on student learning outcomes. Thus we can conclude that learning must prepare students to survive in their environment, have the opportunity to build *life skills*, and students are required to be more independent (*self-directed*). The knowledge that is built andobtainedthroughdirect practice will be easier to remember, so as to obtain meaningful learning for students.

This is supported by several opinions from researchers about learning outcomes according to Melati (2011) that student-centered learning is more effective and efficient. Thus we can conclude that learning outcomes are a real learning process that comes from direct or indirect experience, physically which requires a person's behavior, actions, and treatment to use the knowledge they have. Based on this research, it can be concluded that learning outcomes are the actions and behavior of students who can find the desired answers. Thus learning outcomes can be interpreted as a way and an appropriate plan to be used and arranged in the form of real activities.

A similar thought was expressed by Lestari, (2011) which revealed that learning achievement was related to learning outcomes and the student's self-regulation. Thus we can conclude that students with high learning outcomes in the learning process towards the end of the lesson are given exercises whose aim is to assess the extent to which students use self-regulatory(discipline) activities such as assignments, completions and solutions, as well as cognitive strategies in accordance with the given task. Teachers examine and condition effective student learning patterns. With high learning motivation, students are expected to be able to learn conducive. The success of students in absorbing learning is an assessment process carried out by the teacher after the implementation of learning in order to improve students' achievements.

Thus the teacher must be able to set the right learning strategy. Teachers are able to process and organize the class in a variety of ways so that children are not bored so that learning will appear lively, fun, and full of enthusiasm. In addition, school facilities and infrastructure can support student success in the learning process both in class and outside the classroom.

Motivation to learn is an encouragement or a way to do all activities in the learning process. This is supported by several opinions from researchers about motivation. Motivation is the most basic of teaching. the need for management and development, so that there is an increase in the quality of learning (achievement) of elementary school age children (SD).

This is supported by several opinions from researchers about motivation. According to Hamdu and Agustina (2011) motivation affects student learning success activities, without motivation the learning process will be difficult to achieve optimum success. Motivation is a way to determine the optimal learning process.

Optimal student learning can foster character or character that is influenced by different backgrounds. The motivation possessed by

students is very important for the teacher to know before he starts learning, thus it can be seen whether students already have initial knowledge which is a prerequisite for taking part in learning, the extent to which students know what material will be presented.

Learning that uses information technology and communication. Students who are able to read, write and count will better understand other things and develop and develop mental maturity. Students grow more skilled in activities that require intellectual intelligence. Students who are able to read, write and count will be more skilled in solving the problems they face because they have physical and mental maturity. Every student has various experiences, conditions and potentials when entering a learning situation. As stated by Sjukur (2012) Differences in learning motivation and student learning outcomes using *blended learning*.

Another thing revealed by Yuniastuti (2013) that motivation is the process of increasing science skills in motivating students to learn from their surroundings so that they get good (maximum) learning outcomes. Students can learn on their own, can learn independently, actively, creatively, are able to process learning, and students are able to draw conclusions from the material presented by the teacher. Meanwhile, another thing that arises in science learning is the motivation of students before and after participating in the learning that will be given. Every student has various experiences, conditions and potentials when entering a learning situation.

Learning outcomes are a way to do something and learning motivation is a learning outcome that is achieved part of the learning process. Daud (2012) learning motivation has an effect on student learning outcomes. Thus we can conclude that learning must prepare students to survive in their environment, have the opportunity to build *life skills*, and students are required to be more independent (*self-directed*). The knowledge that is built is obtained by direct practice, it will be easier to remember, so as to obtain learning meaningful for students.

METHOD

This research uses a quasi-experimental research type in different classes, namely the experimental class 1 and the experimental class 2. In the VA class it is assigned to the experimental group 1, and in the VB class it is designated as the experimental group 2. In the experimental class 1 the learning strategy is treated. *Scientific based learning* using image media and experimental class 2 treated strategies *scientific based learning with lecture media.* To find out and compare the average value of student learning outcomes in science learning. Researchers in data collection used several tests, namely normality test, homogeneity test, and two-way Anova test.

Research Design

This research is included in quantitative research. The research design can be described as follows.

Table 1. 2 x 2 Factorialization Design

Learning Motivation	For Strategies *Scientific Based Learning (A)*	
	Scientific Based Learning Media Picture (A_1)	*Scientific Based Learning* Lecture (A_2)
Strong (B_1)	A_1B_1	A_2B_1
Weak (B_2)	A_1B_2	A_2B_2

Source: Putrawan (2017)

Description:

A_1: Groups of students who are taught using learning strategies *scientific based learning* on image media.

*A*2: The group of students who studied with *scientific based* lecture *learning.*

B_1: Groups of students who have strong motivation to learn.

B_2: Groups of students who have learning with weak motivation.

A_1B1: A group of students learning by using strategies learning *scientific based learning* media images have a stronger motivation to learn.

A_2B1: A group of students taught with *scientific based learning* lecture have a strong motivation to learn more.

A_1B_2: A group of students who learn to use the strategy learning *scientific based* on image media have a weak learning motivation.

A_2B_2: A group of students who are learning to use strategies learning *scientific based learning* lecture motivation learning weak.

Research Objectives

In this study using a multiple choice test. Meanwhile, to obtain data on science learning outcomes using the grid of research instruments. Based on the results of the spread of the statement, the Spearman rank correlation was obtained.

Researchers used the data normality test to prove whether the population in the study was normally distributed or not. Where it is known that the calculation results are greater than 0.05, it means that they are normally distributed. If the calculated value is less than 0.05, it means that it is not normally distributed. With the hypothesis

H0: data states normally distributed
H1: data states not normally distributed

In this study using F count and not a significance level, to obtain the F table value, the researcher calculates the value of Df 1 = 3-1 = 2, and the value of Df 2 = 40 - 3 - 1 = 36. Then look at the F table to obtain the F table value of 3.26.

Research Objectives Researchers

The observing responses of students regarding learning motivation and student learning outcomes. Then compare the results to determine how much of the influence ofapproach to learning strategies *the scientific based learning* media images andapproach to learning strategies *scientific based learning* lectures. Then it will be examined whether this approach affects learning motivation and student learning outcomes in science learning for students who have strong learning motivation and weak learning motivation.

Data Collection Techniques

Based on the existing population, it can be categorized as small population, so the sample in this study was class V Ciruas 2 Elementary students, namely class VA male = 12 people, 24 female students and male VB = 13 students, and 23 female students, so a total of 72 students were taken. The sample used was simple random sampling.

In this study, researchers observed students of in the learning process not to differentiate between one student and another so there was no need to be randomized. In this study students in the experimental class 1 used *scientific based learning* media images while students in the experimental class 2 used *scientific based learning* lectures given the same treatment with different methods whose purpose was to process data to be used as research samples.

Basically, all classes are considered homogeneous (the same), so the experimental class 1 and experimental class 2 are determined based on this assumption. Each class consists of approximately 30 students who have variations in learning skills and different learning motivation, and it is hoped that the distribution is quite balanced.

RESULT AND DISCUSSION

The researcher took the data and conducted experiments 1- 4 times on students on the grounds that the data tested first might not have been understood by the students so that when the data was inputted with a significance value less than 0.05, the researcher conducted a second, third, and retest test. The fourth time with the same question in order to obtain normal data.

Table 2. Two-Path Anova Test

Source Variance	JK	Dk	RJK	F hit	F Table 0.05	F Table 0.01
Between Groups (AK)	210 2.5	500				
Within Groups (DK)	467 0	722. 500 467				
Learning Strategies	902, 500	0.00 0				
Learning Motivation	210 2,	176 100.				
Learning Strategies * Learning Motivation		000 839 7.50 0 3				
Error		36 1				
Total Corrected						

Based on the two-way ANOVA test above, it is known that

1. It is the learning strategy has f count> f table, namely 6.957> 3.26, which means that there is a difference between the *scientific based learning* media images and the *scientific based learning* lectures.
2. It is known that student learning motivation has f count 16.208> f table which is 3.26, which means that there is a difference between strong learning motivation and weak learning motivation.
3. It is known that for strong learning motivation, science learning outcomes are higher when taught with thelearning strategy *scientific based* on image media compared to thelearning strategy *scientific based on learning* lecture. This can be done by further testing because of the interaction.
4. It is known that for students who have weak learning motivation, science learning outcomes are higher when taught with the *scientific based learning* lecturestrategy compared to thelearning strategy *scientific based learning* on image media. This can be done by further testing because of the interaction.
5. It is known that student learning motivation has f count 5,570> f table which is 3.26, which means that there is an interaction between strategies *scientific based learning* and motivation.

Based on the results of the two-way ANOVA test table, it isknown that the learning strategy has f count> f table, namely 6.957> 3.26, which

means that there is a difference between the *scientific based learning* media images and the *scientific based learning* lectures. Based on the results of the research that learning using strategies *scientific based learning* is a process of activities and interactions designed in such a way that students are directly involved, think creatively, critically, pleasantly and can build previous knowledge concepts, the stages of observing (identifying or finding problems), reasoning (formulating problems), asking questions (asking problem questions and hypotheses), communicating (collecting data, analyzing data, drawing conclusions, concepts, and information found). This is supported by several opinions from researchers about scientific. According to Juliastini. K., (2016) said that the scientific approach assisted by image media could improve students' creative thinking and writing skills.

Learning outcomes are a way to do something and learning motivation is a learning outcome that is achieved part of the learning process. Daud (2012) learning motivation has an effect on student learning outcomes. Thus we can conclude that learning must prepare students to survive in their environment, have the opportunity to build *life skills*, and students are required to be more independent (*self-directed*). The knowledge that is built is obtained by direct practice, it will be easier to remember, so as to obtain meaningful learning for students.

CONCLUSIONS AND SUGGESTIONS

Conclusions

Based on the results of data analysis and testing, the following conclusions can be drawn:

1. There are differences in student science learning outcomes, where it is known that those who use the *scientific based learning* media image are higher than using the learning strategy *scientific based on learning* lecture.
2. There are differences in student science learning outcomes, where students who have strong learning motivation are higher than students who have weak learning motivation.
3. Science learning outcomes of students who have strong learning motivation are higher when taught with learning strategies *based scientific* image-compared to students who are taught using learning strategies *based scientific* lecture-.
4. Science learning outcomes of students who have weak learning motivation are higher when taught with the learning strategy *scientific based on learning* lecture compared if taught with the *scientific based learning image media learning strategy*.
5. There is an influence of the interaction between learning strategies and learning motivation on science learning outcomes.

Suggestions

This research should be developed again to obtain maximum research results. Teachers should use learning strategies to be more measurable with students' abilities.

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