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CORRELATION OF LEARNING STYLES WITH COGNITIVE LEARNING OUTCOME IN NATURAL SCIENCE SUBJECTS AT SECONDARY SCHOOL

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ABSTRACT

The purpose of this research is describing: 1) the learning style of grade VIII students in SMP Muhammadiyah 4 Porong Sidoarjo, 2) the learning outcome of natural science subjects at grade VIII students in SMP Muhammadiyah 4 Porong Sidoarjo, and 3) the correlation of learning style with cognitive learning outcome in natural science subjects in SMP Muhammadiyah 4 Porong. The research method uses quantitative research of correlation type, with descriptive and inferential statistic analysis technique with product moment regression test. Data collection techniques are obtained through questionnaires and documentation. The results showed: 1) grade VIII students of SMP Muhammadiyah 4 Porong Sidoarjo had a visual learning style of 13.79%, auditorial learning style 37.93%, kinesthetic learning style 41.38, and auditorial-kinesthetics learning style 6.89%, 2) students' cognitive learning outcomes include 65.52% with high predicate and 34.48% with a predicate so high that it can be said 100% complete, and 3) statistical calculation results, obtained correlation calculation at a level of significance 5% (0.048) then at the level of significance 5% hypothesis zero rejected, while alternative hypotheses are accepted, thus there can be concluded there is a significant correlation between learning styles and cognitive learning outcomes in science subjects in SMP Muhammadiyah 4 Porong Sidoarjo, and 0.37 in index figures against interpretation 0.021-0.40 is between variable X and variable Y there is a low correlation rate. It can also be said that learning style is not the only factor that affects students' cognitive learning outcomes. Further research is expected to uncover other factors that play a role in improving students' cognitive learning outcomes, such as learning motivation, teacher teaching style, and so on.

Keywords: correlation, learning style, cognitive learning outcome, natural science subjects, secondary school

INTRODUCTION

Learning results are the abilities that students have as learning activities, consisting of four types: knowledge, intellectual skills, motor skills, and attitude (Sumarno, 2011). Study results are statements that show what students might do as a result of their learning activities (Uno, 2011). Learning outcomes are internal abilities that include knowledge, skills, and attitudes that have become one's personal property and allow one to do something (Sumarno, 2011). Thus, learning outcomes are learning experiences that students gain in the form of certain abilities.

The result of learning is an acquisition resulting from an activity or process that results in a functional change of input. Learning is a stage of change throughout the behavior of relatively sedentary individuals as a result of experience and interaction with environments involving cognitive processes. The change in behavior in this case is not seen as a learning process. The result of learning is the potential realization or capacity that a person has (Kemenag, 2015). Learning results are often used as a measure of knowing how far a person has been to breast feed the materials that have been taught.

To formulate the results of the study, a series of measurements are required using a good and qualified evaluation tool. Such measurements are possible because measurement is a scientific activity that can be applied in various fields including education (Purwanto, 2013).

Achievement of learning outcomes in addition to being influenced by learning methods is also influenced by student characteristics, such as talent, needs, interests, and learning styles. Each student in learning has different characteristics and learning style preferences in the way they receive and process information, so the difference in characteristics greatly affects the student's learning outcomes, therefore in learning the teacher should pay attention to the learning style that the student has, while the learning style itself is determined by the personality, perception, talent and intelligence possessed by the student itself.

Factors that can affect the process and learning outcomes in each person are internal factors and external factors. Outside factors (external) consist of natural and social environments. Internal factors consisting of lessons, teachers, and in the students themselves consist of aspects of physiology, physical condition and five sensory conditions and psycholi aspects consist of interests, talents, intelligence, motivation, as well as cognitive abilities. The way students absorb information also determines how students learn. Each student has different ways of receiving information conveyed by the teacher, which causes each individual's learning outcomes to vary. How to learn students is often referred to as a learning style (Ghufron & Risnawati, 2014).

The learning style is one that each individual has in absorbing, organizing, and processing the information received. A suitable learning style is key to students' success in learning. The limited use of learning styles in a single style, especially those of a verbal or auditorial nature, can certainly lead to many differences in absorbing information. In learning activities, students should be helped and directed to recognize a learning style that is appropriate to themselves in order to learn to the fullest (Bire et al, 2014). Learning styles are the key to developing performance in work, in school and in inter-personal situations. Learning styles can make learning and communicating easier with learning styles (De Porter & Mike, 2011). Learning style is a way of recognizing various preferred learning methods that may be more effective for the students (Rahmawati & Daryanto, 2015). The learning style in question is to understand the methods in learning that are very important so that learning for students is more effective.

The learning style consisting of visual, auditorial and kinetic learning styles is very important for teachers to know, because the learning style is an expression of individual uniqueness relevant to education. Related to classroom teaching, the learning style can be used by teachers to design high achievement (Sopatin & Sahrani, 2011). Learning style is one way to absorb information, then organize information, and process that information becomes meaningful (Rahmawati & Daryanto, 2015).

Learning style is a mindset that is specific to individuals in the process of receiving new information and developing new skills (Irham & Wijayani, 2013). Each individual's learning style is expressed according to their own habits and preoccupations. Some learn by reading, and some learn by finding. Each individual not only has one learning style, but basically the dominant learning style has only one individual, in accordance with the individual's ability to understand the learning process. Various learning styles aim to allow students to learn comfortably, so it is hoped that the learning goals can be achieved well.

Learning style is an important form and way of learning students like and that will differ from one student to another, because each individual has their own passion and uniqueness that will not be the same as the other individual in general the learning style is the way we prefer and makes us comfortable in thinking, processing and understanding information. Learning styles are a way of recognizing the preferred learning methods that may be more effective for the student (Parulian & Situmorang, 2013). A student can more easily understand the lesson if it suits his heart and is pleasant (Hartono, 2013).

Based on the preliminary observations at SMP Muhammadiyah 4 Porong Sidoarjo, shows that science subjects are in demand by students at SMP Muhammadiyah 4 Porong. This is proven by the daily replay of students with 100% complete. There are allegations that not only the learning style affects the student's cognitive learning outcomes, there

are several things that can also affect the student's cognitive learning outcomes such as learning motivation, teacher teaching style, difficulty level of problems given, and environmental factors. As for the problem of science learning in the classroom, the teacher has not noticed the learning style of his students, teachers teach with diverse learning methods. However, it has no impact on students' learning outcomes.

Based on the above description, researchers want to examine the relationship between learning styles to the cognitive learning outcomes of students in science subjects in grade VIII SMP Muhammadiyah 4 Porong Sidoarjo.

METHODS

The research method uses quantitative type correlational research, is a study that aims to find causes that allow changes in behavior, symptoms or phenomena caused by an event, behavior or things that cause changes in free variables that have overall already occurred (Arikunto, 2014). According to Wallen & Hyun (2011), this research is a study conducted to examine events that have occurred or that have occurred (ex-posed facto). Research instruments are a tool used to measure a natural and social phenomenon observed. Research instruments are tools or facilities used in collecting data to make the work easier and the results better, in a more careful, complete and systematic sense so that it is easy to process (Sugiyono, 2013). So, instruments are tools used to measure things to be observed. The research instruments used in this study are questionnaires and documentation. The questionnaire contains questions given to others who are willing to respond according to the user's request and is closed (Arikunto, 2014), while documentation is a data collection technique that is not directly addressed to the research subject in order to obtain information related to research objects (Sugiyono, 2016). Data analysis techniques use descriptive and inference statistics. Descriptive analysis is used to describe a student's learning style and cognitive learning outcomes, while inference statistics are used to test the relationship between learning styles and students' cognitive learning outcomes. This study uses t₃ Normality Test as a condition of the hypothesis test. Normality tests are performed to test whether on a regression model, an independent variable and dependent variable or both have a normal distribution (Ghozali, 2016). Hypothesis test is to perform calculations to describe the data and conduct hypothetical testing using statistics (Supriyono, 2015).

RESULTS AND DISCUSSIONS

The following will be presented the results of the research data:

1. Learning Style of Grade VIII Students at SMP Muhammadiyah 4 Porong Sidoarjo

Table 1. Classifying Students by Learning Style Tendencies

Numb.	Type of Learning Styles	Present (%)
1	Visual	13.79
2	Auditorial	37.93
3	Kinesthetic	41.38
4	Audi-kinesthetic	6.89

Based on Table 1, the number of kinesthetic learning styles is the most compared to other types of learning styles. According to Widayanti (2013) & Papilaya (2016), that each individual has a different learning style in receiving information. This also applies to grade VIII students at SMP Muhammadiyah 4 Porong Sidoarjo, that there are 4 learning styles in the class, namely visual, auditorial, kinesthetic, and auditorial-kinesthetics.

2. Cognitive Learning Outcome of Grade VIII Students in SMP Muhammadiyah 4 Porong Sidoarjo in Natural Science Subjects

Table 2. Cognitive Learning Outcome

Numb.	Category	Present (%)
1	Very High	34.48
2	High	65.52
Description		100% complete

Based on Table 2, it is obtained that very high categories are in the value range of 85-100 and the high categories are in the range of 65-84. According to Mulyasa (2013), students are said to be classically complete, when at least 85% of the number of students in one class get KKM (Minimum Completion Criteria) grades. The value of KKM for science subjects at SMP Muhammadiyah 4 Porong Sidoarjo is 72.

3. Correlation of Learning Style with Cognitive Learning Outcome of Students in Natural Science Subjects at SMP Muhammadiyah 4 Porong Sidoarjo

Test results of normality of learning style data with cognitive learning outcomes can be presented as follows:

Table 3. Normalitas Test with One-Sample of Kolmogorov-Smirnov Test

		Unstandardized Residual
N		29
Normal	Mean	,8467204
Parameter ^{a,b}	Std. Deviation	3,92926278
Most Extreme	Absolute	,137
Differences	Positive	,136
	Negative	-,137
Test Statistic		,137
Asymp. Sig. (2-tailed)		,171 ^c
a. Test distribution is Normal.		
b. Calculated from data.		
c. Lilliefors Significance Correction.		

Based on Table 3, the normality test result obtained using SPSS 25 is known to be a significance value of 0.171, meaning that the value is greater than the level of significance of 0.05 or 5%, so it is said that the data is attributable to normal. If the data is distributed normally, then the hypothesis can be tested, the following are presented hypothetical test results with Pearson Product Moment correlation test:

Table 4. Study Style Correlation Test with Student Cognitive Learning Outcome

Correlations			
Gaya Belajar	Pearson	1	,370*
	Correlation		
	Sig. (2-tailed)		,048
Hasil Belajar Kognitif	Pearson	,370*	1
	Correlation		
	Sig. (2-tailed)	,048	
	N	29	29

*Correlation is significant at the 0.05 level (2-tailed)

The hypothesis of this study is that "there is a correlation of learning styles with students' cognitive learning outcomes". Hypothetical tests are calculated through Pearson Product Moment correlation with the help of SPSS 25. Based on Table 3 (SPSS 25 output), a value of 0.048 is obtained, when compared to the significance criteria of 0.05 then there is a significant correlation, due to the significance value of 0.048 < 0.05. Using Pearson Correlation of 0.37 belongs to the category of low correlation.

This suggests that the correlation between learning styles consisting of visual, auditorial, and kinetic learning styles to low or weak cognitive learning outcomes or correlations can both be eliminated.

It is also reinforced by the results of Haviz's research (2020), showing data calculations of the relationship of styles between visual learning styles and student cognitive learning outcomes, auditorial learning styles with cognitive learning outcomes and kinetic learning styles with students' cognitive learning outcomes. As well as the combination of visual, auditorial, and kinetic aesthetic learning styles with student biology learning outcomes, there is no positive and significant relationship.

It can be seen that learning style is not the main factor that affects the learning outcomes, other factors besides that include talent, motivation, student attitude, health, condition of the classroom environment and so on teacher teaching style or difficulty level of problems given to students, environmental factors can also affect students' learning outcomes (Rahmawati, 2016 & Hamsar, 2017). Thus it is true when the correlation between learning style and student cognitive learning outcomes is said to be low.

3 CONCLUSIONS

Based on the results and discussions, it can be formulated as follows:

1. The learning style of grade VIII students of SMP Muhammadiyah 4 Porong Sidoarjo is more dominant in auditorial learning style than visual or kinetic learning style.
2. The cognitive learning outcome of grade VIII students in SMP 4 Muhammadiyah 4 Porong Sidoarjo in science subjects can be said to be complete, because the daily replay value of students above KKM.
3. Correlation of learning style with cognitive learning outcome of grade VIII students of SMP Muhammadiyah 4 Porong Sidoarjo in science subjects of 37% with low category.

SUGGESTION

3
Based on the results of research conducted by researchers, then suggestions that can be submitted as follows:

1. Teachers should pay attention to learning styles so as to choose the appropriate learning model.
2. Learning style is not the only determining factor in the finality of learning outcomes, it needs to be studied more deeply about other factors that contribute to improving students' learning outcomes.
3. Natural science subject is a field of science that studies the symptoms of nature, it is quite proven that is not a scary lesson.

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