

MOTIVATION AND LEARNING ACHIEVEMENT IN NATURAL SCIENCE SUBJECT OF THE FIFTH GRADERS OF ELEMENTARY SCHOOL: A CORRELATIONAL STUDY

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Abstract

This study aims to find out the degree of correlation between students motivation and students' learning achievement in natural science subject. The sample are selected through cluster random sampling by selecting 40% of all fifth graders in elementary schools in Golewa sub district, Nusa Tenggara Timur, Indonesia. There are two instruments used to collect the data namely questionnaire about motivation and achievement test. The test consists of 22 items of multiple choice and the questionnaire consists of 20 questions. From the hypothesis testing, it is gained that the $r_{xy} = 0.899$ which then being compared to the r_{table} with 5% of significance level and results in $r_{table} = 0.320$. Thus, since $r_{xy} > r_{table}$ or $0.899 > 0.320$ the H_1 is accepted. The degree of correlation between students' motivation and the natural science learning achievement is $r = 0.90$ with 81% of determination coefficient. In conclusion, there is a high correlation between students' learning motivation and the natural science learning achievement.

Keywords: learning, motivation, achievement, natural science

Introduction

A rapid development of human resources is a precondition for Indonesia to compete with other nations. In this globalisation era, only high competitive nations can survive in such a free trade. Taking into account to this relation, educational field plays a key role and strategic position because it can become one of the ways to improve human quality, thus it is a must that education become a priority for the government.

Innovation and effort other efforts to improve the quality of education in Indonesia has undergone for many years. A number of innovation and educational programme have been conducted, some to mention are the revision of the curriculum, procurement of material books, improving the quality of teachers through workshop and training, improving the management and supporting facilities, yet the result has not been satisfying. Besides, there is misconception of how we should improve the quality of education. In fact, it is the quantity that is put as priority. The implication of this policy affects not only the quality itself but also the productivity, relevance, and growing number of other serious problems.

One of the indicators of good quality of education is an optimal learning achievement by students whether it is cognitively, affectively, psychomotor. Students' learning achievement is much influenced by many factors of learning such as (1) the instrument input including curriculum, library, and teachers, (2) Raw input including students, motivation, and learning strategy, (3) environmental input including environment, social and culture (Subagia & Sudiana, 2002). From these three factors, the researcher focuses on students' efforts to motivate themselves in order to achieve optimal result of learning.

Furthermore, the existence of efforts and motivation are fundamental to get better achievement. It also does in natural science learning. The intensity motivation is in direct effect students achievement. Motivation problem often becomes a cause for learners to be not comfortable with the learning atmosphere because it delays learners' encouragement whether from outside or inside them. The low motivation is also in effect of their low achievement. According to Greenberg as cited in Djaali (2011:105), someone's motivation is determined by two factors namely, the expectation of an object and the value of that object itself. Therefore, the higher someone's expectation of an object and its value, the motivation will be higher as well. Uno(2009:23) argues that motivation and learning are two complementary things. The learning motivation can emerge from intrinsic motivation such as the will and obsession to succeed, the doctrine that learning is a need, and other future goals. While the extrinsic motivation emerges from the will to get an appreciation, a conducive learning environment and interesting learning activity.

For instance, there are some students become motivated to learn because their teacher frequently deliver positive comments or rewards and good scoring on their learning. In line with Uno's argument, Hamalik (2009:40) state that motivation is divided into two types, intrinsic motivation and extrinsic motivation. Intrinsic motivation is an inner will to get proper learning condition and fulfilling the needs of somebody as a learner. Meanwhile,

extrinsic motivation is motivation which is influenced by external factors aside from learning situation such as credits, certificate, rewards, and competition with other learners. Considering the importance of motivation in learning, the researcher believes that special attention to this aspect is necessary. Moreover, teachers need to really understand their students motivation about his/her subject, and further action about their motivation is obligatory. Teachers must be able to support or motivate their students to get better achievement.

Natural science is a subject containing materials of universe that requires students to understand more about it. Generally natural science materials are often seen difficult for some students. It affects them positively and negatively. Some sees this as an opportunity to learn more about it, but some also feel unmotivated to learn it. Based on an interview with teachers of natural science subject, it is revealed that a number of students have less motivation to learn natural science because they think it is difficult since they are required to memorize all the materials. This also influences their learning achievement because they must achieve a good score during the test. This has decreased their interest to learn natural science and resulted in low achievement during the test. The following effect is that many students avoid this subject. Therefore, the solution to this problem depends on teachers' creativity in delivering the materials in multi methods so that the students have a will to learn this again.

In its relation to the effort of improving students' achievement, the Indonesian government has conducted a number of supporting actions such as delivering books for teachers and students, training, and other beneficial programs. However, there are still many people who blame teachers for incapability of their children with some reasons (1) teachers have direct and frequent contact to students in school, (2) teachers do not have adequate competence to teach and creating a competitive graduates, (3) most of teachers time are used to personal life rather than their duty, and (4) teachers do not have enough salary.

Teachers have a role to critically develop a learning activity and evaluating every process of it. Teachers need to adapt and correspond to students' characteristic and learning situation. Therefore, teachers should reflect their teaching continuously and motivate students during the learning.

Sudjana (2004: 46) conveys that students' learning achievement is another word for a changing from behaviour. This new behaviour is a result from learning whether it is cognitively, affectively, or psychomotor. The assessment to their achievement is necessary as a reflection on how far the target and goals have been achieved. The learning achievement is shown by the cognitive process which is also influenced by affective and psychomotor aspects. In fact, the use of cognitive aspect is more intense compared to the other two. However the assessment still need to assess these three aspects.

Based on the aforementioned explanation, this study aims at investigating whether or not there is a correlation between students' motivation and their learning achievement in natural science subject of the fifth graders.

Method

This study is conducted toward fifth graders in areas II of Golewa subdistrict. This study is undertaken in May 2016. This present study is a correlational study where the researcher seeks for correlation between variables. Further, this study also looks at the cause and effect and describing the variables or the relation between independent and dependent variable (Tanzeh, 2011: 132). Those variables are symbolised as X and Y, in which X is students' learning motivation and Y is the students' learning achievement. The relation between variables is provided on the following figure.

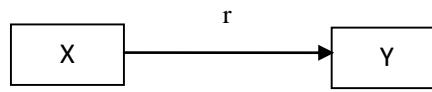


Figure 1. The Research Design

Note:

X= Learning Motivation (Independent Variable)

Y= Students' Learning Achievement (Dependent Variable)

r = the relation between X and Y

Population is all source of data that we focus on within scope and time allocation that we decided (Margono, 2004:118). Sugiyono (2013:117) explains population as a generalisation area consisted of object/subject that has quality and certain characteristics, being chosen by the researcher to seek for conclusion. The population in this study is all fifth grade students in areas II of Golewa sub district in the academic year of 2015/2016 with total number of 112 students. The total number of population can be seen as follows:

Table 1. Population of the Study

No	Schools	Total Number of Students		Total
		Male	Female	
1	SDI Nirmala	15	16	31
2	SDI Zaa	8	14	22
3	SDI Utaseko	15	13	28
4	SDI Maumbawa	16	15	31
	Total	54	58	112

Sample is a part of population which is selected as the source of data. The selection of sample is done when the number of population is too big and it is believed those samples are the representative of the population (Sugiyono, 2013: 118). This present study employs a cluster random sampling. This technique enables the researcher to take classes from population with ideal number as sample. As results, two classes with total number of 40 students are selected as the sample in this study. The complete distribution can be seen on the following table.

Table 2. Sample Distribution

No	School	Number of Students		Total
		Male	Female	
1	SDI Zaa	8	14	22
2	SDI Utaseko	15	13	28
	Total		23	27
				40

The expected data collected is the students' learning motivation and students' learning achievement in natural science subject. Learning motivation is an encouragement to be able to do something better. Meanwhile, the data from students' learning achievement is collected through achievement test after treatment.

The researcher utilises two instruments in this study. The first instrument is questionnaire. This instrument is used to collect the data about students' motivation and students' learning achievement. Among several types of questionnaire, the researcher uses likert scale to collect the data. In addition, this likert scale covers several categories such as attitude, opinion, and perception of a person or a group of people about phenomena in education. This type of questionnaire provides 5 alternative answers for positive statement, namely very often= 5 , often= 4 , moderate = 3, rare= 2, never= 1, and the other way around for negative statement.

Regarding the test, the researcher utilises a test containing 45 items of questions where 30 items are multiple choice, 10 items are short answer, and the rest 5 items are essay. This test is expected to reveal students' achievement in natural science subject. In answering the multiple choice test, samples are provided with four alternative answers (a,b,c, and d) and each item is scored 1 when students choose the right answer, and 0 for wrong answer. Every short answer will be valued 1 if it is correct and 0 if it is incorrect. A slight different criteria is used for essay test. A correct answer will be valued 6, almost correct is valued 3, 1 for almost incorrect answer, and 0 for wrong answer. Each score will be calculated and the result of calculation is the learning achievement score. The range of the score will be between 0-100where 0 is the minimum scoring while 100 is the maximum ideal score.

Before conducting the hypothesis testing, the researcher undergoes two analysis namely (1) linearity test and (2) normality test. The linearity test uses the residue analysis and continued by normality test. After all requirements are fulfilled, the researcher conducts regression analysis and simple correlation test to know the correlation between variable X and Y.

In testing the hypothesis, pearson product moment is used as means of calculation with details taken from Ibid (2005:266).:

$$r_{xy} = 1 + \frac{N\sum XY - (\sum X)(\sum Y)}{\sqrt{(N\sum X)^2(N\sum Y^2 - (\sum Y)^2)}}$$

Note:

- r_{xy} : Coefficient Correlation between variables
- $\sum XY$: Result of X multiple by Y
- $\sum X$: Total of Variable X
- $\sum Y$: Total of Variable Y

Further, in observing the degree of correlation between learning motivation and students' learning achievement, coefficient determination is calculated with the equation r^2 is stated in percentage (%) to show the degree of correlation between motivation (X) and learning achievement (Y). The detail is provided as follows:

KD: $r^2 \times 100\%$

Note:

- KD : Coefficient Determination
r : Correlation Coefficient

Every statistical hypothesis with one direction is formulated as follows:

$H_0 : p = 0$

$H_1 : p > 0$

Note:

- H_0 : There is no positive correlation between students' learning motivation and natural science learning achievement.
 H_1 : There is a positive correlation between students' learning motivation and natural science learning achievement.

Findings and Discussion

Findings

Based on the result of calculation on students' motivation above, the researcher makes a table of learning motivation frequency. Before coming to that point, the researcher calculate the range, number of classes and the length of class which resulted in range=28, number of class = 5, and the length of the class = 5. The distribution learning motivation frequency is provided as follows:

Table 3. The Distribution of Learning Motivation Frequency

No	Data	The Class Limit	Frequency	F_{total}
1	62-66	66,5	5	5
2	67-71	71,5	6	11
3	72-76	76,5	7	17
4	77-81	81,5	7	25
5	82-86	86,5	11	36
6	87-91	91,5	4	40

Based on this table, the scatter of the data can be seen in the following figure

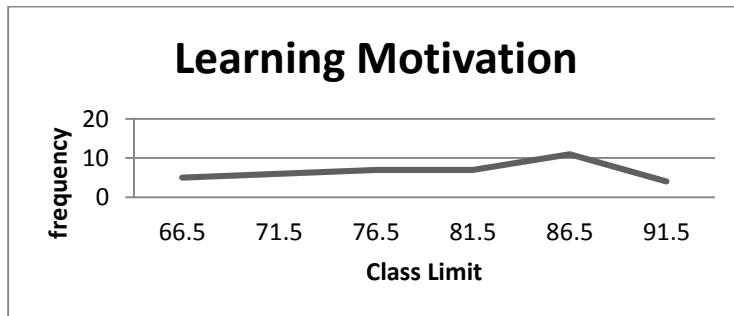


Figure 2. The Histogram of Learning Motivation

The figure and table above describe that among 40 students who are selected as sample, all of them follow the achievement test. After the score is obtained, there 2 students who get score between 30-39, 3 students get score between 40-49, 9 students get 50-59, 12 students get 60-69, 11 students get 70-79, and 3 students get 80-89.

Based on the score obtained and the normality test for instrument, the researcher can further analyse the degree of correlation between students' learning motivation and natural science learning achievement by calculating it on Product Moment. The result shows that there is a correlation between students' learning motivation and natural science learning achievement. It is gained that r_{table} for (df) 38 and $\alpha = 0,05$, score of $r_{xy} = 0.899$. It is bigger than the r_{table} ($r_{count} = 0.899$ and $r_{table} = 0.320$). Thus, the H_1 is accepted since the result shows that there is a correlation between them.

The contribution of variable X (learning motivation) to the variable Y(natural science learning achievement) is decided by squaring the correlation coefficient and results in 81%.

Discussion

Based on the data analysis, the researcher finds out that there is a strong correlation between students' learning motivation and natural science learning achievement. This strong correlation is reflected by correlation coefficient which is $r = 0.90$ and coefficient determination which is 81%, this means motivation is in direct correlation to determine students achievement in natural science object. In other words, if their motivation is strong, students will put more effort to reach their own target.

Learning motivation is one of learning principles that influences learning achievement. Motivation helps learners to anticipate failure, create innovation, be responsible with their duty and have a close relationship to the society where they live. It also determines the success of learners in reaching their goals whether in career or in learning itself.

Desire and aspiration that students have is a decisive factor to the success of learning. For those who have desire, they will not have any burden or being forced to learn for their own good. Students' problem is that they cannot manage their time well and it affects their learning achievement.

Conclusion

Based on the aforementioned explanation, the researcher concludes that there is a strong correlation between students' learning motivation and natural science learning achievement. It is shown by the correlation coefficient which is $r= 0.90$ and coefficient of determination in total of 81%. In other words, if their motivation is strong, students will put more effort to reach their own target.

This study also leaves the researcher with some suggestions for some parties. The first one is students need to know that to achieve better result of learning, they need to have a strong motivation internally and externally. As for teachers, they need to consider the students condition when the teaching-learning process begins because their psychological condition influences their motivation, and motivation influences their achievement. As for schools stakeholders, they need realise that education is not merely about improving intelligence, but also emotional quotation to face learning problems. Schools are also responsible to solve problems faced by students such as giving proper facilities, creating learning environment, and providing ideal number of teachers.

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