The Effect of Self-Efficacy and Sense of Community towards Students' Higher Order Thinking Skills

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ABSTRACT

This study aims to find out the effect of students' self-efficacy and students' sense of community on higher order thinking skills in physics learning. The research is correlational research with two variables, those are independent and dependent variables. The independent variables is self-efficacy and sense of community, while the dependent variable is the higher order thinking skills. The research is carried out in a month by using blended learning method towards the students of X IPA SMA Bandarlampung. The data obtained were tested using single linear regression and multiple linear regression. A single linear regression test of self-efficacy towards higher order thinking skills obtained R value that is .142. The correlation coefficient is positive. R value of .142 is in the very low range. This shows that self-efficacy is positive but its effect is very low, so it has no influences on the population. The single linear regression test of sense of community towards the higher order thinking skills obtained an R value of .242. The correlation is positive. R of .242 is in the very low range of influence, so it has no influences on the population. The multiple linear regression test of self-efficacy and sense of community towards higher order thinking skills obtained the coefficient of determination (R) of .270. R of 0.270 is in the very low range that means its no influence on the population. The calculated F value is 2.405. This value is smaller than the value of F table at a 5% significance level that is 3.15. This shows that there is a positive but no influences between self-efficacy and sense of community on students' higher order thinking skills. From those three relationships, no one has an influence on students' higher order thinking skills, but beyond the focus of the researchers.

Keywords : self-efficacy, sense of community, higher order thinking skills

I. Introduction

Physics is one part of Natural Sciences that studies about natural phenomena or natural behavior and various forms of symptoms. Physics educators, both in high schools and universities face a reality that physics is an unattractive subject. In fact, science and technology are currently developing as a result of the development and research of physics. Physics is not interesting because it is difficult for students to understand and do the complex and high level

physics exercises as well as the lack of interesting media used in learning. Science in the present century has developed in accordance with the demands of life which also develops. One effort to face the demands of the 4.0 industrial revolution which is always related to IoT or the Internet of Things can be done by using an internet-based Learning Management System such as Schoology for face-to-face and online learning processes.

In learning physics, students tend to memorize the formulas in solving problems, but they do not understand the concepts so that they are not able to solve the real problems that are found inside or outside the classroom. Students are also less confident in their ability to do the physics exercises given by the teacher. A student is said to be able to solve a problem if he is able to study a problem and use his knowledge into a new situation with the level of difficulty of analyzing, evaluating, and creating based on the revised Bloom's taxonomy. This is usually known as the higher order thinking skills. (Hyland, Kampen, & Noland, 2017) reveals that students have difficulty in learning physics especially in the conceptual understanding section, difficulty in the ability to encapsulate action and processes as a object, and difficulty in doing the excercises with high level of difficulty. These show that many students have difficulty in higher order thinking skills. In the learning processes, there are several internal and external influences in determining students learning outcomes, especially their higher order thinking skills. The external influence is such as teacher quality (Ozer & Gelen, 2008), meanwhile the internal influences are self-efficacy (Suciati, 2014: 2) and sense of community (Yoannita, Busi, & Rustana, 2016); (Yilmaz, 2016).

Confidence towards self-ability in students can affect the feelings, ways of thinking, motivation and social behavior. The stronger self-efficacy a person has, the higher the achievement and individual abilities he can achieve. Self-efficacy can also be interpreted as a person's evaluation of the ability or competence of oneself in carrying out a task, achieving goals, or overcoming a problem (Suciati, 2014: 2). Feeling of interconnected with others from within to work on difficult physics exercises has a relationship with the sense of community (Colombo & Senatore 2005). In higher-order thinking, a student who doubts his ability to do a task, or has low self-efficacy, will reduce his efforts or give up easily when facing difficult

and challenging situations in doing a task. As research conducted by (Ahriana, Yani, & Maruf, 2017) states that there is no significant positive relationship between self-efficacy and students' learning physics outcomes. In contrast, (Yoannita, Busi, & Rustana, 2016);(Yilmaz, 2016) state that there is a positive and significant relationship between self-efficacy and students' learning outcomes. Those two things show a significant difference in results among the two studies.

Those two things show a significant differences because the two brain hemispheres have different functions. Muñoz et al., 2012 in (Tuarez, Delgano, Teran, & Martin, 2019) said that the left hemisphere is characterized by verbal analysis, language, logical reasoning, numerical calculations. The right brain focuses on non-verbal aspects such as spatial orientation, intuition, artistic ability, musical and among others. Neuroscience can lead to a significant contribution to the teaching-learning process. The other authors (Gago & Elgier, 2018), argue that knowing how the brain works lead to the readjustment of pedagogical and educational practice. Teachers makes them able to adjust teaching strategies according to the needs of students by using the knowledge of neuroscience (Alma, 2013). The 2013 curriculum requires the education centered to be on students and then teachers stand as facilitators. Students are more active in learning, asking questions, or making arguments. In order to train the student in making argumentation, the teacher will divide students into groups where students must have social skills in a community as we know sense of community.

Besides individually, students are also required to solve problems in groups. In teaching and learning activities, students are required to communicate and feel themselves accepted in the group or class. The sense of community indirectly impacts on student learning outcomes, especially on students' higher-order thinking skills (Yilmaz, 2016); (Luo, Zhang, & Qi, 2017). In addition, research on the effect of self-efficacy and sense of community on higher-order thinking skills is still very rarely conducted. Based on the previous description, the researchers consider it is necessary to know how the influence of sense of community and self-efficacy towards students' higher-order thinking skills in physics lessons on material that requires high reasoning using tools such as LMS. Therefore, the researchers are interested in conducting research with the title "The

Effect of Blended Learning Assisted by Schoology Seen from the Self-efficacy and Sense of community on Students' Higher Order Thinking Skills in Learning Physics.

II. Method

The research is a correlational study using a quantitative approach, descriptive-inferential statistical analysis methods. The study uses two stages, namely the observation phase and the implementation of research. The implementation phase consisted of two steps, namely the preparation phase and the implementation phase. The preparation phase consists of developing learning tools. The learning implementation phase consists of; (1) Conducting Schoology-assisted learning activities in the two sample classes with the same treatment. (2) Carrying out an assessment of learning outcomes with the same questions in the sample class as data on the value of high-order thinking skills. (3) Distributing questionnaires of self-efficacy and sense of community to students. (4) Tabulating and analyzing data. (5) Drawing conclusions.

The population of this study was seven classes of X IPA in SMAN 9 Bandar Lampung. The samples were 3 classes that were chosen using purposive random sampling technique. The research is conducted for 1 month in the span of mid-January until February 2019. The research took place at SMAN 9 Bandar Lampung where the research was carried out both offline and online.

Quantitative data in the study were collected using instruments in the form of self-efficacy scales, sense of community scales, and answering the high-order thinking questions that aimed at knowing the effect of self-efficacy and sense of community towards students' high-order thinking skills on Newton's law material about motion assisted by Schoology. Before the instrument is tested on a research sample, the test instrument must be tested using a validity and reliability test first. All instruments have been tested and the results are valid and reliable.

In January-February 2020, researchers conducted the research at the destination school. After obtaining the primary data, researchers conducted a normality test, a multicollinearity test, a linearity test, and both a single and multiple regression tests. Normality test is carried out to find out whether the data is normally distributed or not. Multicollinearity test is used to determine whether

there is a relationship between the two independent variables. The linearity test is used to find out whether there is a relationship between the independent variables and the dependent variable. Regression test is used to find out how much influence the independent variable with the dependent variable, while the multiple linear regression test is used to determine the relationship between the two independent variables with the dependent variable.

III. Result and Discussion

A. Result

Based on the primary research data, self-efficacy, sense of community, and high-order thinking skills of students in the class are not the same. Each student has their own value of self-efficacy. Identification of the category of tendency, or high-low self-efficacy (SE) of students in research is based on the four categories with certain conditions (Arikunto, 2014: 127). The distribution of SE students' tendency can be seen in Table 1.

Table 1. The distribution of SE students' tendency

Categories	Interval	F	Percentage
Very good	> 86	2	3.12
Good	66 – 85	10	15.63
Sufficient	46 – 65	48	75.00
Less	< 45	4	6.25
Total		64	100

Self-Efficacy of the research samples is mostly in a sufficient range with 48 students by 75%. The second largest number is in a good range with 10 students at 16%. The third highest number is in the less range with 4 students by 6%. The fourth highest number is in a very good range with 2 students at 6%. The tendency of SE students in both experimental classes are sufficient. The tendency of SE students can be seen in Figure 1.

Sense of community of students in the class are not the same. Each student has his own sense of community value. Identification of the category of tendency or high-low sense of community students in research is based on the four categories

with certain conditions (Arikunto, 2014: 127). The distribution of students' sense of community tendency can be seen in Table 2.

Table 2. The distribution of students' sense of community tendency

Categories	Interval	F	Percentage
Very good	> 86	1	1.56
Good	66 – 85	9	14.06
Sufficient	46 – 65	53	82.82
Less	< 45	1	1.56
Total		64	100

From Table 2 it is found that the sense of community of students from the sample class is mostly in a sufficient range with 53 students by 83%. The second highest number is in a good range with 9 students at 14%. The third highest number is in the very good range and less range with the number of student for each is 1 by 2%. Based on the distribution table of students' sense of community tendencies in Table 5, it can be concluded that blended learning seen from the Sense of community of experimental class students tends to be sufficient.

Based on the primary research data, the students' high-order thinking skills vary, some are low, medium, or high. The identification of the tendency categories or the high-low order thinking skills of students in research is based on the four categories with certain conditions (Arikunto, 2014: 127). The tendency distribution tables for students' higher-order thinking skills can be seen in Table 3.

Table 3. The distribution table of high order thinking skills' tendency

Categories	Interval	F	Percentage
Very good	> 86	6	9.38
Good	66 – 85	29	45.31
Sufficient	46 – 65	22	34.38
Less	< 45	7	10.93
Total		64	100

From Table 3 it is found that the higher order thinking skills of students in class X MIPA 5 and X MIPA 6 SMAN 9 Bandar Lampung are mostly in a good range with 29 students by 45%. The second largest number is in the sufficient range of 22 students by 34%. The third largest number is in the range of less with 7

students by 11%. The fourth or last most number is in a very good range with 6 students by 10%. Based on Table 5, the distribution of the tendency of high-order thinking skills of experimental class students tends to be good.

B. Discussion

The first hypothesis in this study is that there is a positive and significant effect of Schoology-assisted blended learning on high-order thinking skills seen from students' self-efficacy. Self-efficacy encourages the responsive students to improve their learning methods and can predict the results they achieve. Self-efficacy about academic ability plays an essential role in creating learning motivation in order to achieve academic ability (Zimmerman, 2000: 89). The self-efficacy analysis of higher-order thinking skills using linear regression test results R value of .215 and R square of .046.

The correlation is positive so that self-efficacy of higher-order thinking skills has a positive relationship. R value of .215 means, if the value of self-efficacy (X_1) increases by 1 point, the value of students' high-order thinking skills (Y) will increase by .215 points. The R square value of .031 in Table 9 shows that only 3.1% of changes in the students' high-order thinking skills variable (Y) that can be determined by self-efficacy (X_1), while 96.9% is influenced by other variables which are not examined in this research. R value of .215 is in the very low range. This shows that self-efficacy is positive but its effect is very low on the population. This is in line with the findings of research conducted by (Ahriana, Yani, & Maruf, 2017) which states that there is no significant positive relationship between self-efficacy towards students' physics learning outcomes. This relation is also strengthened by the results of the interviews which involves 6 selected students from the experimental class who get easier to learn through blended learning anytime and anywhere using a smartphone, but it does not change their self-efficacy because some students still feel less confident even though they have the qualified knowledge. It can be concluded that there is a positive but not significant relationship between Schoology-assisted blended learning and higher-order thinking skills seen from students' self-efficacy. The hypothesis that there is a

positive and significant influence of higher-order thinking skills seen from students' self-efficacy is unacceptable.

The second hypothesis in this research is that there is a positive and significant influence on Schoology-assisted blended learning seen from self-efficacy on the high-order thinking skills of students at SMAN 9 Bandar Lampung. The second hypothesis test uses a simple regression test. (Nugroho, Rahma, & Yulianingsih, 2018) states that the Sense of community of the students will foster a feeling of security, comfort and responsibility in their learning environment, so that students can be saved from academic procrastination or the habit of delaying completing the assignments. The results of the analysis using linear regression shows a correlation coefficient R of .142. The correlation coefficient is positive so it shows a positive relationship. The R square value of .020 in the table shows that only 2% of changes in the variable high-order thinking skills of students (Y) which can be determined by Sense of Community (X_2), while 98% is explained by other variables which are not examined in this research. R value of .142 is in the very low range. This shows that the sense of community is positive but the effect is very low on the population. The results of the research contradict the research (Luo, Zhang, & Qi, 2017) which states that in online learning, the sense of community plays a positive role in shaping students' sense of togetherness and significantly strengthening their sense of membership thereby increasing learning outcomes. This relation is also strengthened by the results of interviews with 6 selected students where the 4 of them are doing blended learning, but they often feel overwhelmed by their friends who do not want to do assignments in groups. Besides, there are some students who still dominate the course of class activities that makes the students who have either fair or low sense of community become more inferior. It can be concluded that there is a positive but not significant relationship between Schoology-assisted blended learning towards high-order thinking skills seen from students' sense of community. The hypothesis that there is a positive and significant influence of Schoology-assisted blended learning towards the higher order thinking skills as seen by students' sense of community is unacceptable.

The third hypothesis is that there is a positive and significant effect of Schoology-assisted blended learning towards high-order thinking skills seen from students' sense of community and self-efficacy. The third hypothesis testing uses multiple regression analysis where multicollinearity prerequisite tests has previously been carried out. The results of the analysis using the multiple regression test are shown in Table 3.

Table 3. The results of Multiple Regression Analysis

Model	Coefficient
Self-Efficacy	.411
Sense of	.214
Constant	26.694
R	.270
r^2	.073

The equation of the regression based on Table 3 is as follows.

$$Y = .411\ X_1 + .214X_2 + 26.694$$

The equation shows that the coefficient value of X_1 is .441. It means, if the value of self-efficacy (X_1) increases by 1 point, the value of students' high-order thinking skills (Y) will increase by .441 points, assuming X_2 is fixed. Coefficient X_2 of .214 means that if the value of sense of community (X_2) increases by 1 point, the value added to students' high-order thinking skills (Y) by .214 points, assuming X_1 is fixed. The regression analysis above shows the coefficient price of determination (r^2) that is .073. This value indicates that 7.3% change in the variable Students High Order Thinking Skills (Y) can be determined by Self-efficacy (X_1) and Sense of community (X_2). 96.3% is explained by other variables which are not examined in this research. The third hypothesis significance test shows the calculated F value of 2.405. This value is smaller than the value of F_{table} at a 5% significance level of 3.15. This shows that there is a positive but not significant relationship between Blended learning assisted by Schoology as seen from the sense of community and students' self-efficacy towards students' high-order thinking skills. These results are new findings because there is no researchers who has examined self-efficacy together with the sense of community on learning outcomes, especially on the results of students' higher-order thinking skills.

IV. Closing

Based on the results of the hypothesis test, it is concluded, (1) there is a positive but not significant effect of self-efficacy towards the high-order thinking skills in physics learning. The Product Moment Correlation is .215. The correlation is positive, so the self-efficacy and high-order thinking skills have a positive relationship. The correlation coefficient of .215 is positive so there is a positive relationship. R value of .142 is in the very low range. This shows that self-efficacy is positive but the effect is very low so it does not have an effect on the population. (2) There is a positive but not significant effect of sense of community towards the high order thinking skills in physics learning. Product Moment Correlation shows the correlation coefficient of .142 and the price of sig. (2 tailed) at .263. The correlation coefficient is positive so there is a positive relationship. The correlation coefficient or R of .142 is in the very low range. This shows that the sense of community is positive but the effect is so low that it has no influences on the population. (3) There is a positive but not significant effect of blended learning seen from the self-efficacy and sense of community towards the high-order thinking skills in physics learning. The results of the regression analysis shows the coefficient of determination (r^2) that is .073. This value means that 7.3% change in the variable of Higher Order Thinking Skills of Students (Y) can be determined by Self-efficacy (X_1) and Sense of community (X_2), while 96.3% is explained by other variables which are not examined in this research. The third hypothesis significance test shows the value of F_{count} is 2.405. This value is smaller than the value of F_{table} at a 5% significance level of 3.15. This shows that there is a positive but not significant relationship so that it does not affect the population.

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