



Application of Project Based Learning (PBL) Model for Materials of Salt Hydrolysis to Encourage Students' Entrepreneurship Behaviour

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Abstract

This research aims to understand the influence of the application of PjBL model etnosains charged to the student's entrepreneurial attitudes and learning outcomes to the matterial Hydrolysis Salt using experimental research and quantitative method Sampling was done using simple random sampling technique with research design using pretest-posttest control group design. Entrepreneur attitude and learning outcome obtained using the research instrument which is consist of observation sheet, questionnaire, and question sheet. Analysis of the growth of entrepreneurial attitude using score analysis with triple observation. Gender influence to entrepreneurial attitude analized using uji beda t-test and the analysis of learning outcome using n-gain and score analysis. The research results show that (1) attitude entrepreneurial students experienced growth all these aspects on experimental group and aspects confident on control group; (2) no gender affect attitude entrepreneurial students; (3) the value n-gain on theexperimental group is 0,51 and for control group is 0.13 the criteria are. While learning outcomes psychomotor 3,45 criteria it is good to experimental group and 3,10 criteria good for control group.

How to Cite

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INTRODUCTION

The 2013 curriculum has several aspects, including attitudes, knowledge, and skills (Kemendikbud, 2016). Aspects of knowledge includes learning outcomes, as for aspects of attitude and skills which can be associated with growing entrepreneurship in students' attitudes. Behavior-based learning and entrepreneurial-based entrepreneurship skills are essential to foster entrepreneurial attitudes and student learning outcomes. This is evidenced by the research with the results of classical learning completeness of 90.63%, N-gain of 0.6 at the level of medium achievement and percentage of student entrepreneurial interests 82.81% with criteria 'began to grow' in MTs Ma'arif NU 1 Brebes (Ria, 2016).

Implementation of the 2013 curriculum in fact there are still many who have not applied aspects of attitude, knowledge and skills. The condition can be seen from the unfinished lessons with entrepreneurial attitudes and learning skills based on the culture that surrounds (ethnosains). SMA Negeri 1 Krangkeng Indramayu Regency is one of the schools that has not linked between the aspects of knowledge with ethnosains and aspects of entrepreneurial attitudes and skills.

This situation can have an impact on increasing unemployment rate in Indramayu Regency caused by lack of entrepreneurial skill owned by Indramayu community. Data from the Central Bureau of Statistics Indramayu Regency states the unemployment rate or unemployed 8.01% in 2014 and rose to 8.51% in 2015. Increase is a problem that must be solved by applying PjBL learning charged with ethnosains to reduce the number of unemployment in Indramayu District (BPS, 2015: 5).

Ethnosains is the knowledge gained by the language and culture of a person who can be tested in truth and this can be innovated in science-based learning in the classroom (Abonyi et al., 2014). The research of Sudarmin (2014) in the field of ethnochemical research is divided into three ethnoscience studies that focus on culture, the environment, and a set of underlying principles to create, build events, and to gather individuals or people (Sudarmin, 2014).

Penerapan etnosains dan kewirausahaan diikuti dengan materi Hidrolisis Garam. Materi Hidrolisis Garam sangat penting karena berkaitan dengan etnosains yang ada di sekitar SMA Negeri 1 Krangkeng Indramayu. Hidrolisis adalah reaksi penguraian garam oleh air atau reaksi antara kation dan atau anion dari garam dengan air. Garam adalah senyawa elektrolit yang dihasilkan dari reaksi netralisasi antara asam dengan basa (Permana, 2009: 132-133).

Application of ethnosains and entrepreneurship is followed by Salt Hydrolysis material. Salt Hydrolysis material is very important because it is associated with ethnosains that exist around SMA Negeri 1 Krangkeng Indramayu. Hydrolysis is the reaction of the salt decomposition by water or the reaction between the cation and or anion of the salt with water. Salt is an electrolyte compound resulting from a neutralization reaction between an acid and a base (Permana, 2009: 132-133).

Teachers at State Senior High School 1 Krangkeng Indramayu in the lesson have not implemented ethnosains with Salt Hydrolysis materials to foster student entrepreneurial attitude. This is because there are still at least references owned by teachers. Nancy's (2013) entrepreneurial attitude covers aspects of leadership, confidence, task-oriented, future-oriented, risk-taking, and integrity (Nancy, 2013).

Ethnosains and Salt Hydrolysis would be appropriate to instill entrepreneurial attitudes if it is applied using a Learning Based Learning (PjBL) model supported by Student Worksheet (LKS). LKS can make students interact with teachers to solve the tasks that are in it, in addition LKS facilitate teachers to monitor students' work (Choo et al., 2011: 519).

Retha's research (2014) on PjBL strategy is an effective learning to improve student learning outcomes. This is reinforced by the average estimation test showing the cognitive learning outcomes of the experimental class which is greater than the control class of 78.51-82.29%. PjBL provides students with opportunities to learn and work together to solve problems and then present solutions. The result shows that the students are active in defining problems, problem solving, decision-makers, and actors in other investigations (Rose and Supreme, 2014). PjBL also gives students the opportunity to work on creating authentic projects, building collaboration, presentation, and communication skills (Cho, 2013: 752).

PjBL learning model containing ethnosciences is expected to grow entrepreneurial attitude, because each project contained in the LKS requires students to be active entrepreneurship. This is because the learning model PjBL integrated with ethnosains end product in the form of utilization of traditional salt. Therefore, the application of learning model PjBL Hydrolyzed Salt material integrated with ethnosains utilization of traditional salt is expected to grow student entrepreneurship attitude and student learning outcomes.

Problems in this research are: 1) how the influence of application of project based learning model (PjBL) material Hydrolysis Salt charged with ethnosciences to instill student's entrepreneur attitude; 2) how the influence of sex on student entrepreneur attitude; 3) how is the influence of application of project based learning model (PjBL) Hydrolyzed Salt material containing ethnosains to student learning outcomes. The purpose of this research is to know: 1) how the influence of application of project based learning model (PjBL) material Hydrolysis Salt charged with ethnosciences to instill student entrepreneur attitude; 2) how the influence of sex on student entrepreneur attitude; 3) how is the influence of application of project based learning model (PjBL) Hydrolyzed Salt material containing ethnosains to student learning outcomes.

METHODS

The study was conducted in the grade IX MIPA of State Senior High School 1 Krangkeng Indramayu in February as in March of 2017. Research population from IX MIPA grade 1 up to IX MIPA 5 with 185 students, consisting of 71 men and women 114 People. This study is an experimental study using quantitative methods. Quantitative methods are methods with research data in the form of numbers and analysis using statistics. Entrepreneurial attitude and learning outcomes are obtained using research instruments consisting of observation sheets, questionnaire sheets, and test-test instruments.

Sampling using simple random sampling technique. The independent variable in this research is the learning model. The PjBL learning model is loaded with ethnosciences in the experimental class and learning models of lectures and discussions on control classes. The control variables in this study are similarities in the teachers, the curriculum, the learning materials, and the learning time. Dependent variable is student entrepreneur attitude and student learning outcomes. The research design used pretest-posttest controle group design (Sugiyono, 2015: 112-113). Data collection methods use ethnosciences and entrepreneurial issues, observation sheets, questionnaires, and documentation. Entrepreneurship attitudes are obtained through an observation sheet for later known by score analysis (Wikhdah, 2015).

RESULTS AND DISCUSSION

The data of the research conducted in the class consists of four main data types collected include cognitive learning outcomes, entrepreneurship observation, psychomotor observation, and questionnaire analysis. Data is used to present the following four discussions

The Influence of PJBL Models Loaded Ethnosists on Cognitive Learning Outcomes

Based on the data analysis, there is a positive effect of learning using the PjBL model containing etnosains to students' cognitive learning outcomes. Posttest data is known that the average of cognitive learning result of experiment class is bigger than control class, that is 61 and 29 respectively. Hypothesis to know whether cognitive learning result by using PjBL model with etnosains loaded on experimental class is better than control class is used test Difference of two average right-hand side or two parties. The formula used is non parametric t test (Hendikawati, 2015). This is because the experimental class and control class have different variance where the count variance is greater than the variance of the table is 2.3836 and 1.94. The calculation results obtained t-count price of -1.14 while the price of t (0.95) (72) amounted to $-1.99 < t < 1.99$ because t count smaller than the table so that H_0 different in the rejection

region, it can be concluded That there is a difference in learning outcomes between the experimental class and the control class.

Hypothesis test to know the improvement of cognitive learning result or not on application of PjBL model charged used normalized gain (N-Gain) test in both experiment and control class. The result of N-Gain result of students' cognitive learning achievement was 0,51 for experiment class with medium criterion and 0,13 for control class with low criterion, adjusted with N-Gain value (Sugiyono, 2015). The overall presentation of N-Gain values for the experimental class is low 10.81%, medium 81.08%, and high 8.11%. The overall presentation of N-Gain values for the control class is low 94.59%, moderate 5.41%, and high 0%, the data is the number of 37 students in each class. This can be seen in figure 1.

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Learning outcomes

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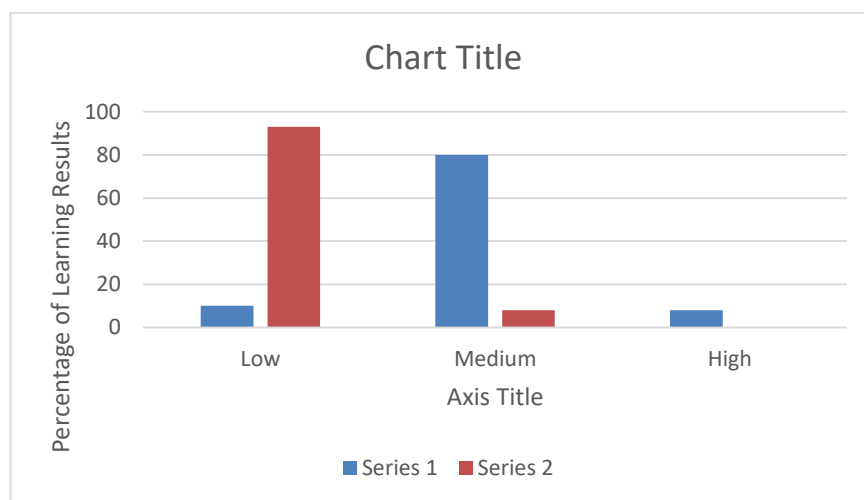


Figure 1. Graphics of Improvement Percentage of Students' Cognitive Learning results

The PjBL model is loaded with ethnoscience capable of attributing the interrelatedness between the material learned to the cultures that exist in everyday life, as well as exercising self-confidence, and the responsibility of the students towards the group's friends. According to Sultan and Zaki (2015) learning PjBL loaded culture can improve students' cognitive learning outcomes in English learning. The results showed that the application of chemistry learning with the model of PjBL loaded with ethnoscience have a positive effect on students' cognitive learning outcomes.

Fitzsimons and Turner (2013) studies show that cognitive learning outcomes given the PjBL model strategy are significantly better when compared than not using the PjBL model strategy. Previous research on the study of ethnochemical loads on improving cognitive learning outcomes was carried out by Rosyidah (2013), Nisa (2015), and Mahendrani (2015) with the value of N-Gain cognitive learning respectively 0.67 with moderate criteria, 0.65 With moderate criteria, and 0.5 with moderate criteria. Research Mursiti (2008) states that learning with chemo-entrepreneurship approach improves learning outcomes, this can be seen from the percentage of learning result completeness improvement of 12.5%, 87.5%, and 100%.

The Influence of the PjBL Model Emphasizes Ethnosains on the Growth of Student Entrepreneurship Attitudes

The results of the analysis showed the students' psychomotor learning outcomes better than the control class. This is because the instructional model applied to the experimental class is different from the control class, ie the learning model of PjBL is charged with ethnoscience. So that the experimental class students can master the aspects of entrepreneurial attitudes observed. There are aspects that get the same criteria of discipline and hard work. Both classes have a good sense of discipline and hard work in learning. This is presented in Table 1.

Table 1. Average of every aspect of students psychomotor learning outcomes.

Assessed Aspect	Average of Each Aspect		Criteria	
	Experimental	Control	Experimental	Control
Confidence	3,52	3,05	Very Good	Good
Discipline and Hard-Working	3,30	3,12	Good	Good
Honest and Independent	3,53	3,14	Very Good	Good

The difference between the two classes is in the self-confident and honest and independent aspects. The difference occurs because the experimental class in the learning process is required to sell entrepreneurial products within the school environment. The experiential self-confidence aspect is better because students are shamelessly doing the product in the school environment. So the experiment class students are more confident than the control class. As for the honest and independent aspects seen in the process of returning the buyer back honestly and receive feedback or criticism from the buyer.

Psychomotor learning result of experiment class student has better result than control class. In line with previous research conducted by Kanigola et al (2013) learning model PjBL can improve students' psychomotorics in Lean Six and Six Sigma courses. Another research that is research about learning chemo-entrepreneurship approach to psychomotor learning result by Supartono (2013) showed experimental class learning to get average value of psychomotor aspect both with percentage of 76,07% compared to control class.

The Influence of the PjBL Model Emphasizes Ethnosains on the Growth of Student Entrepreneurship Attitudes

The result of the analysis shows the entrepreneur attitude of the experimental class students experiencing stronger growth than the control class. However, some aspects of growth are the numbers of

self-confidence, leadership aspects, and the aspect of originality, but a stable growth in the self-confidence aspect. This both classes have a good confidence in learning. This can be seen in Figures 2, 3 and 4.

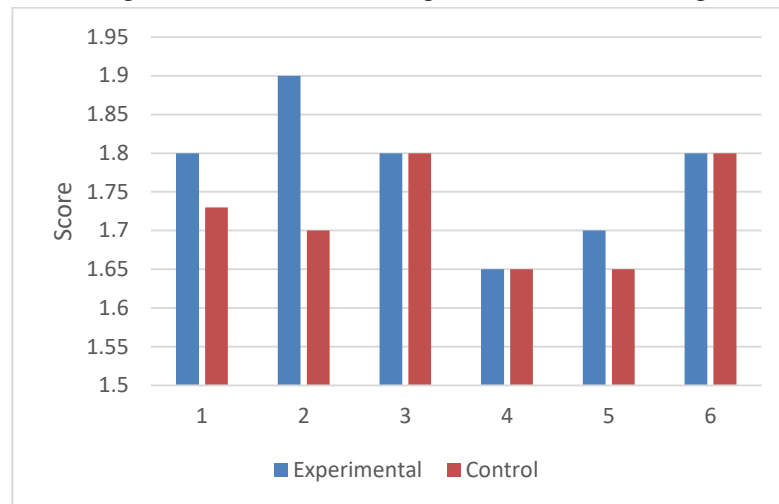


Figure 2. Graph showing the growth of entrepreneurship attitude in the first observation

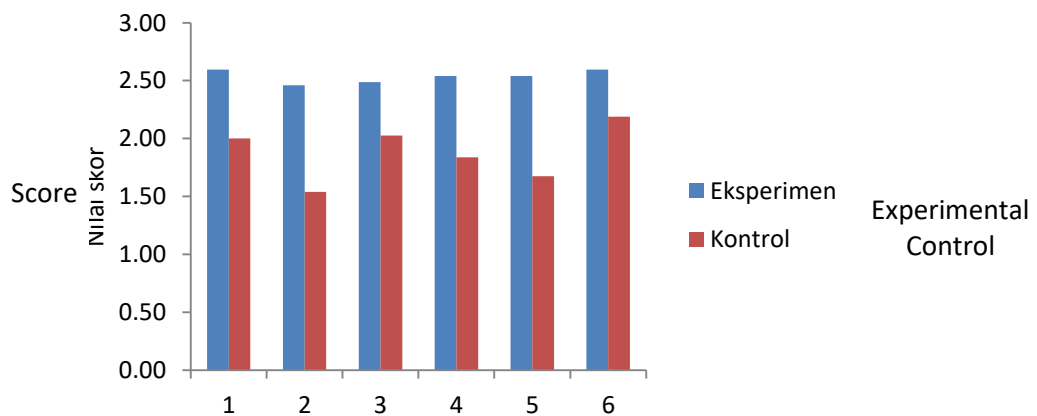


Figure 3. Graph showing the growth of entrepreneurship attitude in the observation 2

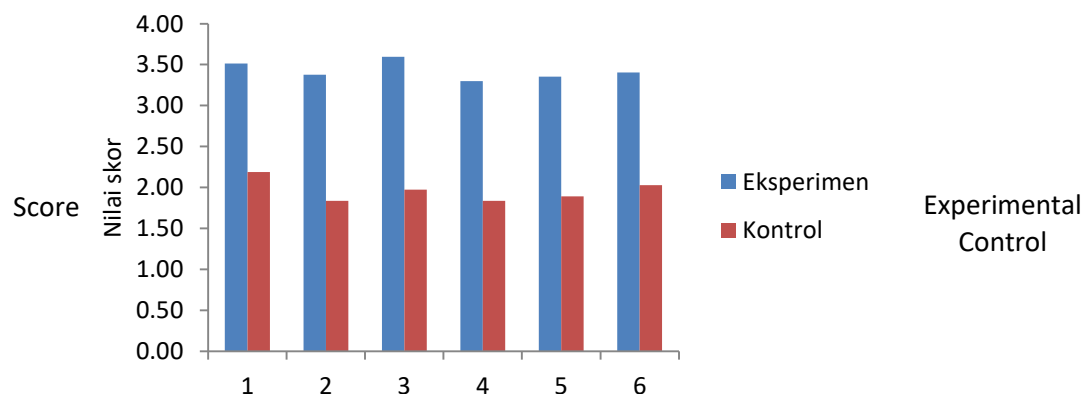


Figure 4. Graph showing the growth of entrepreneurship attitude in the observation 2

Explanation:

1. Self-Confidence

4. Leadersh

- | | |
|-----------------------------|--------------------|
| 2. Task and Result-Oriented | 5. Originality |
| 3. Risk Taker | 6. Future-Oriented |

The differences between the two classes are in aspects 2, 3, and 6 that are task-oriented and results, risk-takers, and future-oriented. The difference occurs because the experimental class in the learning process is required to create entrepreneurial products by utilizing the culture around the school environment (ethnosains). Analysis of aspects of entrepreneurial attitude can be seen images 2, 3 and 4. The products made are salted eggs, pickled mangoes, and salted fish. Aspects of task-oriented and experimental class results are better because the products made by students are planned with the LKS. Sehingga the students experimental class orientation tasks and results better than the control class. As for the aspect of risk taker and oriented to the future seen in the learning process brave students in making decisions in the group and students are able to make the product well.

Students in the experimental class possess a task-oriented soul, results, risk-takers, and future-orientation are better than the control class. In line with the research of Priyatno (2016) and Khoerunnisa (2016), a study that developed a chemistry learning program with the aim of measuring attitudes of student entrepreneurship. Rohayati research (2015) stated that the contribution of project learning to student entrepreneur attitude is proved by the difference of observation result between the two experimental classes and based on descriptive analysis of entrepreneurship questionnaire data, the average of experimental class I is 25,60 included in very good category. Class experiment II of 23.96 included in either category. The results of the study show that task-oriented growth and outcomes, risk-takers, and future-oriented are evident from project-based presentations and lessons learned.

Influence of Sex on Student Entrepreneur Attitudes

The influence of sex on entrepreneur attitude was obtained from the questionnaire analysis by using different test of t-test using three stages: group statistics, independent sample test, and t-test test independent sample test (Sukestiyarno, 2013). Questionnaire was obtained by using purposive sampling method that is questionnaire spread not directly by way of drawing. Questionnaires are disseminated in the experimental class, which aims to determine the effect of sex on entrepreneurial attitudes after being given treatment or application of the PjBL model is charged with ethnosciences. Table test results of different t-test for group statistics analysis known the average attitudes of entrepreneur who analyzed from the questionnaire, male students of 84.67. While the average attitude of entrepreneurship of female students is 81.6. The results show that the average attitudes of entrepreneurship of male students and female students are different. In order to see the difference statistically it will be continued with the second analysis result that is independent sample test.

The first stage, the test results of the test bedat-test independent samples F test with the population variance of both samples equal to 0.003 with P value or probability value of 0.957. So Ho's conclusion is accepted because the probability value is $0.957 > 0.05$ (α) means that the variance of entrepreneurship attitude of male students is not different from the variance of entrepreneurship attitude of female students of experimental class, the second stage of analysis is the analysis of different test result of t-test independent samples test Assuming the population variance of the two samples is different. Results t arithmetic shows 1.825 with probability value of 0.079. The value of P value is $0.079 > 0.05$ (α). This indicates the attitude of entrepreneurship among students is not dominant to male students but also to female students. The analysis result of each aspect also shows that there is no significant difference of gender influence to student entrepreneur attitude. This indicates the attitude of entrepreneurship among students in class XI MIPA 3 SMA N 1 Krangkeng not dominant to male students but also to female students. The analysis result of each aspect also shows that there is no significant difference of gender influence to student entrepreneur attitude. This happens because of equal treatment of both male and female students and the second factor of observation is that all classes of XI MIPA get entrepreneurship

subjects or entrepreneurship subjects are compulsory subjects for XI MIPA students in SMA N 1 Krangkeng.

In line with Narendra's (2012) study on the relationship between gender variables, student job variables and parent job variables, to student entrepreneurial interest in the Lubin School of Business, Pace University of New York. Result of research indicate there is influence between job, job of parent to entrepreneur interest of student. Variable sex of the result is no effect on student entrepreneurship attitude. Damayanti's research (2013) states that there is no influence of sex on attitudes

CONCLUSION

The result of the research proves that the application of PjBL model containing etnosains can cultivate entrepreneurial attitude in all aspects in the experimental class and the confidence aspect in the control class. Gender does not affect student entrepreneur attitude, evidenced by different test result t-test no difference of value between male and female gender. The value of n-gain experimental class is 0.51 with medium criterion, while the control class is 0.13 with medium criterion. Psychomotor learning result of experiment class 3,45 with very good criterion, for control class 3,10 with good criterion.

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