THE EFFECT OF PROJECT BASED LEARNING MODEL TO STUDENT CREATIVITY IMPROVEMENT ON WASTE RECYCLING PRODUCT MATERIAL

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ABSTRACT

This study aims to determine the effect of *project based learning* models to increase students' creativity in wasterecycling products of class X. The sample of this research is students at class X. X.1as a experimental class with 30 students and class X.2 asa control class with 30 students. Data obtained from the documentation, students activity sheets, product creativity assessment sheets, and students creativity questionnaire. The data analysis used is the result of prerequisite test data and hypothesis test which includes *independent sample t- test* and *paired sample t- test*. The results show that Ha of both hypothesis tests are accepted. This means that *Project Based Learning* model influences students' creativity in making waste recycling products at class X.

Keywords :*project based learning, student creativity increasing, waste recycling product*

INTRODUCTION

The creativity of students, need to be developed in the educational process. One of them is on the Biology lessons should focus on student learning *(student center).* Students should have the ability to investigate and solve problems so as to improve the creativity of the students in the learning process (Munandar, 2014). Based on observations and interviews in one of the high schools at Palembang, the creativity of the class X students is still very low in generating creations or products from waste recycling. It is shown that in the teacher's room there is no product resulting from waste recycling in the previous at class X.

Although in the classroom there is the creation of students, there is only students' creations that are not produced from the Biology learning process. Students' creations products are only a picture and a pot of flower on the wall. The resulting product is useless and there is no element of renewal. The products were monotonous. The students' creation was not made variably because the results are uniform. The result of the product creation of students is not enough to overcome the problems that exist in human life and does not lead to the concept of Biology learning.

Another problem is in the learning process, the teacher was appropriatless for using instructional media and teachers also do not apply a project-based learning model in the learning activities. Based on these problems, appropriate learning model is needed to improve the creativity of students in learning activities, especially in the utilization of waste into products. One of the learning model that can solve the problem that is *project based learning* model .

RESEARCH METHOD

This research is quasi experimental design with non-equivalent control group design. The sampling of this research is using purposive technique sampling. This is based on the certain considerations that the Biology teacher asks to conduct research on class X1 and X2 better than the class X3 and X4.

RESULT AND DISCUSSION

The initial questionnaire of the first stage of the students on the dominant dimension of control class creativity presented in Table 1 is the flexibility dimension with 73,75%.

This indicates that the class has the ability to provide various statements in solving a problem (able to provide various ways to cope with environmental problems). Based on the preliminary data showed that the most dominant creative dimension is the dimension of originality d ith a percentage of 68,75%. This shows that the experimental class is able to give new (unique) thinking from others with 68,75% percentage.The most dominant dimension of creativity in each sample of research but it can be concluded that the two samples of the study were in the creative category as indicated by the average percentage of experimental class achievement (65,20%) and control class (69,84%).

Table 1. The Ability of Student's Creativity

| No | Creativity Dimention | Preliminary | | | |
| | | Control Class | | Experimental Class | |
		Achievement	Category	Achievement	Category
1	*Fluency*	68,66 %	Creative	63,83 %	Creative
2	*Originalitas*	70,62 %	Creative	68,75 %	Creative
3	*Flexibelity*	73,75 %	Creative	64,16 %	Creative
4	*Elaboration*	65,55 %	Creative	64,16 %	Creative
	Average	69,84 %	Creative	65,20 %	Creative

All indicators of achievement experimental class with the application of project based learning model higher than the control class with conventional learning. Capability capabilities are presented in Table 2.

Table 2. The Student's Creativity

| No | Creativity Dimention | Control Class | | Experimental Class | |
		Achievement	Category	Achievement	Category
1	*Fluency*	74,33	Creative	77	Creative
2	*Originalitas*	70,62	Creative	82,08	Very Creative
3	*Flexibelity*	73,54	Creative	81,45	Very Creative
4	*Elaboration*	63,88	Creative	85,27	Very Creative
	Average	71,25	Creative	80,93	Very Creative

The product assessment of the students is appropiate to the product assessment rubric consisting of three stages such as product planning stage, implementation, and product result. The percentage of achievement of students' product creativity based on project stages covering the three steps as presented in Figure 1. The elaboration result of a product assessment made by the students in the control group in the planning of the percentage result was lower than the experimental group, the control group obtained only 69,04% in "creative" category while the experimental class achieved 98,80% in "very creative" category by the difference very much different by 27%. This is because in the control group to make a product does not match the theme of the project given the teacher is to make biological products from waste recycling and designing products less linking solutions to overcome environmental problems.

The implementation assessment stage has a percentage with a margin that is not too far at 5,05%. The control group percentage of the scores reached 93.75 % in "very creative" category while the experimental group reached 98.80% in "very creative" category. Both groups have the same percentage of achievements in "very creative" category. The percentage in the final stage, namely assessment of results experimental class products have higher percentage than the control group. This is because the experimental class creates a product collaboratively by

developing the results of the observations they get so as to find a solution to the solution of the problem. Thisproject-based learning provides students with opportunities to work in groups to stimulate the creativity of ideas and solve problems (Solihah et al., 2013) .
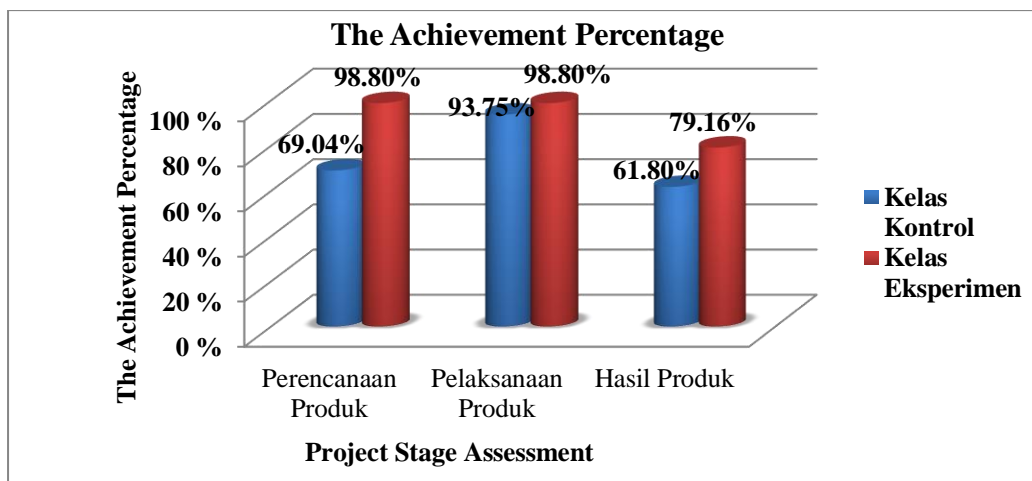

Figure 1. The Achievement Percentage of Students' Product Creativity Assessment Based on Project Stages

The calculation of normality test using *Kolmogorov Smirnov test* obtained significant value of early stage sketches on the control class get a significant of 0880 and the experimental class got a significant amount of 0.753. This is presented in Table 3. The data on students' ability scores answered the initial stage questionnaire of the control class as well as the experiments had significantly greater than the significant 0.05. D ata end stage of the ability of the self to answer the creativity questionnaire that the results of control class calculations get significant of 0.967 and the experimental class issignificant at 0.998. The final stage of the experimental and control class questionnaire data collection has normal distributed data with values greater than 0.05.

The result of *Paired Sample t-Test* in the experimental group obtained the sig value. *(2-tailed)* of 0,000 which is smaller than 0.05. H $_a$ received due to significance (0,000 <0.05) and H $_{0\ is}$ rejected.Therefore, the group using the model of *Project Based Learning* has an effect on the students' creativity improvement in making waste recycling product in X class SMA. P there is a control class, sig value.*(2-tailed)* of 0.765 which is greater than 0.05, this causes the H 0 to be received and H a rejected. Therefore, groups of students who do not use Based Learning Project Model have no effect on improving students' creativity in making waste recycling products in grade X SMA. Project based learning is a learning model that can give students the freedom to plan learning activities, collaboratively implement projects in solving problems . I n the end, these activities produce work products that can be presented to others who may be recommended in solving the problem (Solihah et al., 2013).

CONCLUSION

Project Based Learning Model has an effect on increasing students' creativity in making waste recycled product at Class X SMA. This is because project-based learning provides students with opportunities to work in groups to stimulate the creativity of ideas and solve problems . This learning activity produces a product that collaboratively can develop the observation result that the students get so that they can find a solution to solve the problem.

ACKNOWLEDGMENT

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