

INTEGRATION OF PROJECT BASED LEARNING (PjBL) AND PICTURE AND PICTURE (PaP) LEARNING MODELS ON PROCESS SKILLS, CRITICAL THINKING AND LEARNING OUTCOMES OF CLASS X IPA STUDENTS AT SMA MUHAMADIYAH MASOHI AND SMA NEGERI 15 CENTRAL MALUKU

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ABSTRACT

Project based learning (PjBL) is a learning model that uses problems as a first step in collecting and integrating new knowledge based on real experience, Picture and picture (PaP) is a model using media in the form of images so that students are more focused and learning conditions pleasant. Integration between these two learning models to complement each other's strengths and cover each other's weaknesses so that what is expected after the learning process can be achieved, Integration of project based learning (PjBL) and Picture and Picture (PaP) learning models as independent variables, process skills, critical thinking and learning outcomes as the dependent variable. The aim of the study was to determine the effect of the integration of Project Based Learning (PjBL) and Picture and Picture (PaP) learning models on the ability of processing skills, critical thinking and learning outcomes of class X IPA SMA Muhamadiyah Masohi and SMA Negeri 15 Maluku Tengah. The research method is Quasi Experiment with 2 control classes (lecture method), 2 experimental classes (PjBL & PaP integration). The results showed that there was an increase in learning outcomes (87.08), process skills (85.14) critical thinking (84.20) students of class X IPA SMAN 15 Maluku Tengah, increased learning outcomes (83.10), process skills (83.93), critical thinking (80.00) class X IPA SMA Muhamadiyah Masohi. The LSD test shows that there is an effect of integration of PjBL & PaP on process skills with critical thinking (0.020) Class X IPA 2 SMA Muhamadiyah Masohi, there is an effect of integration of PjBL & PaP on process skills with learning outcomes (0.014), and on learning outcomes with critical thinking (0.030). The conclusion is that there is an influence of the integration of Project Based Learning (PjBL) and Picture and Picture (PaP) learning models on the ability of processing skills, critical thinking and learning outcomes of class X IPA SMA Muhamadiyah Masohi and SMA Negeri 15 Maluku Tengah.

Keywords: *integration, PjBL, PaP, process skills, critical thinking.*

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INTRODUCTION

Education is a conscious and planned effort to create a learning atmosphere and learning process so that students actively develop their potential to have religious spiritual strength, self-control, personality, intelligence, noble character, and the skills needed by themselves, society, nation and state. In other words, through education one acquires provisions to become fully human in accordance with the expectations of society. Building a complete human being according to the expectations of the community is closely related to improving the quality of education itself, thus the government is building a higher quality education, including through developing and improving curriculum and evaluation systems, improving educational facilities, developing and procuring teaching materials, developing learning models, developing learning media, as well as training for teachers and other education personnel.

Biology is one of the subjects that emphasizes giving direct experience, so that it can help students to gain a deeper understanding of the concepts of the material being studied. Students are encouraged to be active in the learning process which in turn has a positive impact on processing skills, critical thinking and increasing cognitive abilities, namely children's learning outcomes (Sutrisno et al, 2019). The learning model is one of the important elements in learning biology, accuracy in choosing a learning model. According to Surya et al, (2018) the low creativity and learning outcomes of students are due to the lack of a place to express and argue according to the creativity of each child. Therefore, teachers need to create innovative learning activities that are fun and encourage children to be able to express their ideas. Roziqin et al, (2018) stated that one of the learning models that can increase students' interest in learning and science process skills is the PjBL (Project Based Learning) project learning model.

The PjBL learning model directs students to be more active in learning and the teacher will become a facilitator. As a facilitator, the teacher is more inclined to the initial preparation before learning such as media, learning tools and other things that are needed in learning so that learning can be effective and on target (Apriliani & Panggayuh, 2018). In addition to the project based learning (PjBL) learning model which demands activeness students, the Picture and picture learning model is also an active learning model which in the process involves images that are paired or sequenced, showing pictures providing information and explaining (Saleh, 2013). Several previous studies stated that the application of Picture and Picture (PaP) learning has a positive effect on students in learning (Saleh, 2013)

The teacher-centered learning model (teacher centered) must be abandoned and replaced with an active and independent learning model based on modern cognitive principles, so as to foster the active and creative role of students (student centered). Teachers are no longer the main source of learning that has dominant power over students. Project based learning (PjBL) and Picture and picture (PaP) models are two learning models that both require students to be active and creative in learning and in the learning process, so as to improve process skills, improve critical thinking and further improve learning outcomes. Especially in biology. The results of observations on class X science students at SMA Muhammadiyah Masohi and class X science students at SMA Negeri 15 Maluku Tengah found that some students were less active in the learning process so that process skills and critical thinking were not well honed, as well as their biology learning outcomes were still relatively low. Specifically on concepts related to plants. Therefore it is necessary to develop a learning model that can improve process skills, critical thinking and improve student learning outcomes.

METHOD

This research is an experiment (quasi-experiment). Quasi-experimental study was conducted to determine the effect of the Integration of Project based learning (PjBL) and Picture and Picture (PaP) Learning Models on Process Skills, Critical Thinking and Learning Outcomes of class X IPA students at SMA Muhammadiyah Masohi and students of class X IPA at SMA Negeri 15 Maluku Tengah. The population in this study were all students of class X at SMA Muhammadiyah Masohi and students of class X Science in SMA Negeri 15 Maluku. The sample used in this study were students of class X IPA, respectively 26 students in class X IPA₂ (control class) and 26 students in class X IPA₁ (experimental class) SMA Muhammadiyah Masohi and 26 students in class X IPA₄ (control class) and class X IPA₂ (experimental class) SMA Negeri 15 Maluku Tengah. The independent variable is the Learning Model, namely the Integration of the Project Based Learning (PjBL) and Picture and Picture (PaP) Learning Model (X). The dependent variable is process skills (Y1), critical thinking (Y2) and learning outcomes (Y3). The instrument of this research is an observation sheet to measure process skills ability. Test questions to measure critical thinking skills Test questions (pre test and post test) to measure learning outcomes. The research design contained 1 independent variable, namely the learning model (X) and 3 dependent variables, namely process skills (Y1), critical thinking (Y2) and learning outcomes (Y3), so that in general there were 4 classes used, namely class X IPA₁ as an experimental class at SMA Muhammadiyah Masohi.

Data collection technique was an observation sheet to measure the ability of the test process skills to find out the learning outcomes which consisted of the initial test and the final test, and questions to assess critical thinking skills. Data analysis techniques test instruments this research was conducted using SPSS 20 statistics Anova followed by the LSD.

DISCUSSION RESULT

The results of the research in the control class using the lecture method with the experimental class using the integration of Project based learning (PjBL) and Picture and picture (PaP) learning models on process skills, critical thinking and learning outcomes of class X IPA students at SMA Muhammadiyah Masohi and SMA Negeri 15 Maluku Tengah in the material kingdom plantae can be seen in the table below:

Table 1. Results of the control and experimental class

SMA Muhammdiyah Masohi	
Variable	Mean ± std
Lecture (class X IPA 2)	
Post Test	76,76 ± 6,44
Process Skills	75,45 ± 5,01
Critical thinking	72,88 ± 1,63
Integration of PjBL and PaP (class X IPA 1)	
Post Test	83,10 ± 6,50
Process Skills	83,93 ± 5,68
Critical thinking	80,00 ± 3,69
SMA Negeri 15 Maluku Tengah	
Lecture (class X IPA 4)	
Post Test	79,78 ± 4,94
Process Skills	77,61 ± 4,23
Critical thinking	76,15 ± 3,52
Integration of PjBL and PaP (class X IPA 2)	
Post Test	87,08 ± 4,64
Process Skills	85,14 ± 5,32
Critical thinking	84,20 ± 4,72

The mean value in the control class taught by the lecture method has a value below the experimental class. At SMA Negeri 15 Maluku Tengah, the mean value is above SMA Muhamadiyah Masohi. With a mean value of learning outcomes of 79.78 with a standard deviation of ± 4.94, process skills with a mean value of 77.61 with a standard deviation of 4.23. Followed by the learning outcomes of SMA Muhamadiyah Masohi with a mean value of 76.76 with a standard deviation of ± 6.44. The value of critical thinking at SMA Negeri 15 Maluku Tengah with the lecture method is higher than SMA Muhamadiyah Masohi with a mean value of 76.15 with a standard deviation of ± 3.52. Then followed by SMA Muhamadiyah Masohi with a mean value of process skills 75.45 ± 5.10 and a mean value in critical thinking of 72.88 with a standard deviation of 1.63. The smaller the standard deviation value, the better the range between these values.

The results of the ANOVA test in SMA Muhamadiyah Masohi class X IPA 2 as the control class (Lectures) showed a value of 0.25 was not significant while in class X IPA 1 as the experimental class (Integration of Project based learning (PjBL) learning models and Picture and picture (PaP)) showed a significant value of 0.04, then continued with the LSD test. The results of the LSD follow-up test can be seen in the table below.

Table 2. LSD test of SMA Muhamdiayah and SMA Negeri 15 Maluku Tengah

Group SMA Muhamadiyah	Variable	Sig	Group SMA Negeri 15	Variabel	Sig
Lecture (class X IPA 2)	Post Test	Process Skills	Lecture (class X IPA 4)	Post Test	Process Skills
		0,965		0,128	Thinking Critical
	0,160	Skills process	Berpikir Kritis	0,149	
Integration (class X IPA1)	Post Test	Process Skills	Integration (class X IPA2)	Post Test	Process Skills
		0,623		0,014*	Thinking Critical
	0,063	Skills process	Berpikir Kritis	0,849	
	Skills process	Berpikir Kritis			
		0,020*			

*sig

Based on the results of the study, at SMA Negeri 15 Maluku Tengah there was an increase in the value of process skills, critical thinking and learning outcomes in classes taught using the integration of project based learning (PjBL) and picture and picture (PaP) learning models. This is in line with the opinion (Sudjana, 2017) that the success of a learning process can be measured by learning outcomes by carrying out learning outcomes tests so that the success rate of the teaching process and mastery of the material can be measured. Another study conducted by Tari Rizda Utami (2018) states that the ability of students' science skills in applying the Project Based Learning (PjBL) learning model is better than the science process skills of students obtained with conventional learning models. Research of Muhiddin Palennari (2016) which states that learning strategies affect the improvement of students' critical thinking skills.

CONCLUSION

1. SMA Muhamadiyah Masohi which is taught by integrating project based learning (PjBL) and picture and picture (PaP) learning models has a significant value of 0.020 compared to that taught by the lecture method.
2. SMA Negeri 15 Maluku Tengah which is taught by integrating project based learning (PjBL) and picture and picture (PaP) learning models has a significant value of 0.014 in the learning outcomes variable with process skills and a significant value of 0.030 in the learning outcomes variable and critical thinking, whereas in the lecture method the significant value is only on the learning outcomes variable with critical thinking.

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