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The Effectiveness of Project-Based Learning Model and Assessment of Learning Outcomes Against Portfolio

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Abstract

A total of 25% of 38 teacher in SMP Negeri 10 Semarang conducted a portfolio assessment. Observation results obtained attitudes and low process skills. Learning achievement of new motion system material is 44% complete Minimum Mastery Criteria (KKM) 75%. Alternative learning models used to overcome these problems are project-based learning (PjBL) with portfolio assessment. The purpose of this study was to analyze the completeness of attitude, science process skills, improvement of learning achievement, and differences in learning achievement of students in the material of the motion system with PjBL models using portfolio assessment. The design of this study was Pretest and posttest control group design. Completeness of attitudes, skills, learning achievements were analyzed by the proportion of one party. Improved learning achievement with the N gain test. Anava 1 way is used to see the difference between the two learning achievement scores of Experiment Groups 1, 2 and Control. Independent t-test is used to see Learning Achievement Levels for Experiments Groups 1 and 2. The results showed that: (1) the attitudes of the experimental class students reached completeness asan 63 (72.79) with a percentage of 81.26%; (2) the science process skills of the experimental class students reached completeness ≥ 63 (70.83) with a percentage of 90.63%; (3) Learning achievement results are stated to be completed individually with a value of ≥ 71 (mean 79.28) and classical with ≥ 80% (84.38%); Learning achievement in the motion system material with PjBL model using portfolio assessment increases with N-gain of 0.65 (moderate); (4) F count > F table (6,699> 3,094), so Ho is rejected, so there is significant differences between experimental class 1, experimental class 2, and control; (5) the value of t count < t table (1.165 <1.998) then Ho is accepted, which means that there is no significant difference between the experimental group 1 and experiment 2.

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INTRODUCTION

Authentic Assessment is a preliminary assessment of the immediate and direct measure (Mueller, 2006). So the assessment is not resting on a cognitive assessment test alone, but rather with activities that can be viewed directly (the ability of arguing, debating, skill experiment and others). Wiggins (2005), declares that there are tasks that cannot be done in class/outside school hours, so teachers can use authentic assessment to assess the results of the study are based on an assessment of assignments or projects.

From the results of the question form distributed to 40 teachers SMP Negeri 10 Semarang obtained information that 25% of 38 teachers ever do an assessment portfolio as much as 1-2 times in one semester. Thus 85% of guru 38 replied that the judgment is often done by the teacher in the field is the daily Repeats. Teachers in the field doing more assessments on aspects of cognitive knowledge only. This is because the model used in General ekspositori model, so simply use assessment tests daily repeats.

Careful observations during this process skills and attitudes acquired low. The attitude of hard work the students are still low, e.g. collect even perfunctory tasks exactly as his friend. Many of the tasks given by the teacher only as has waived the obligation. Skill in asking to lower, there are still many who simply asks, if the teacher asked questions. Attitudes and skills that also followed a low learning achievement, the visible results of Deuteronomy on the material system of daily motion (in the lesson 2017/2018), that amounted to 56% did not complete with KKM (Minimum Mastery Criteria) 71.

Low learning outcomes students caused by using a model of learning and assessment techniques teachers used. A teaching style that used teachers are teacher oriented. The learning is generally merely the transfer of product knowledge. The assessment of the extent of cognitive assessment still used as daily repeats and homework assignments in the form of questions. Different teachers who have been familiar with the assessment of the three domains at once analytical study on process, then the teacher will prepare a number of approaches to teaching that spur activity and creativity. Approaches such as: (1) self esteem appoach (awareness of self-esteem), (2) creative approach i.e. with problem solving, (3) value clarification and moral development approach, and (4) the inquiry approach (Halima & Koswara, 2008).

Alternative learning models are used to solve the problem above is a project-based learning (PjBL)-oriented products (group work). Mahanal (2009), mention the models generally have a PjBL manual steps: planning, implementation, and creating or processing. One type of authentic assessment that can be used to model learning to improve the learning results of PjBL is the assessment portfolio (Kemendikbud, 2013). Hack (1994) suggested that the portfolio is a collection of work, as well as tangible evidence of the results of learning (Jamaris, 2006) which means that shows the efforts, progress and achievement in one or more fields. Glencoe (1999) portfolio is a collection of work that collected representative during a certain period. The collection must contain the participation in choosing the material, the selection criteria, the criteria for determining the value of and evidence of self reflection.

Based on the characteristics of the model portfolio assessment with PjBL and the problems that have been identified, then the PjBL model with assessment portfolios are expected to improve the attitude, skills, science and the achievements of the process of learning the material motion system in SMP Negeri 10 Semarang. Research objectives are: (1) analyzing the mastery attitude of the learners on the material system of motion with models using portfolio assessment PjBL; (2) analyze the science process skills mastery students on the material system of motion with models using portfolio assessment PjBL; (3) analyze the results of the mastery study on the material system of motion with models using portfolio assessment PjBL; (4) analyzing the results of a study on the improvement of the material

motion system with models using portfolio assessment PBP; and (5) analyze whether there is a difference in the results of study on material system of motion between learners who use PjBL with assessment portfolios, PjBL with the ekspositori model, and UH.

METHODS

Design methods used Pretes-Posttest Control Group Design (Sugiyono, 2013:112). This research population is grade VIII in SMP N 10 Semarang semester 1 academic year 2018/2019 totalling 300 men. Cluster random sampling technique with the retrieved class VIII E (32 students) to experimental class 1, class VIII A (32 students) for class 2 and class VIII experiment B (32 students) to the control class.

Free variables in this study is a model of PjBL with assessment portfolios. Bound variables in this study was the attitude of students, science process skills, and learning outcomes.

Mastery of the attitude, skills, results of the study were analyzed with the test of proportion one sides. The increase in the results of the study with an N-test gains. Anava a road used to see the difference of two average Learning Outcomes, Experiment Group and control. Independent t-test is used to see the average results of the Study Group of Experiments 1 and 2.

RESULTS AND DISCUSSION

Student Attitude

The results of testing experimental class 1 and experiment 2 equally shows t count > t table (4.469 > 2.039) and (3.671 > 2.039) then Ho is rejected, so that H1 is accepted which means that the average value of the attitude of the learners group experiment 1 and experiment 2 each of the 63 (table 4.2) namely 72.79 and 71, 22. More calculations are presented in table 1.

Table 1. Test mastery attitude of student

No	Class	Mean ($\bar{x}$)	Mastery (≥63)	t_{table}	t_{count}	Accepted H_0
1	Experiment 1	72,79	81,26%	2,039	4,469	t < 2,039
2	Experiment 2	71,22	75,01%	2,039	3,671	t < 2,039

Science Process Skill

Test Result class experiment 1 and experiment 2 equally shows t calculate > t table (5.193 > 2.039) and (4.604 > 2.039) then H0 is rejected, so that H1 is accepted which means that the average value of the science process skills of the Group experiment 1 and experiment 2 each 63, i.e. 70.83 and 70.96. More analysis results are presented in table 2.

Table 2. Test Science Process Skill of student

No	**Class**	Mastery (≥63)	Mean ($\bar{x}$)	t_{table}	t_{count}	Accepted H_0
1	Experiment 1	90,63%	70,83	2,039	5,193	t < 2,039
2	Experiment 2	84,38%	70,96	2,039	4,604	t < 2,039

Learning Outcome

a. The average Difference one sample Test

This test using the proportion of one party with the help of SPSS 15, which aims to see the mastery of individual learners. Result analysis class experiment 1 showed t count > t table

(5.193 > 2.039), whereas a class experiment 2 compute t count > t table (4.604 > 2.039) then H0 is rejected, so that H1 is accepted which means that the average value of the posttest experimental class 1 and Experiment 2 71 respectively, namely 79.28 and 76.56. Meanwhile, the results of the analysis of the control class obtained t conut <t table (2.000 < 2.039) then H0 is accepted, so that the H1 denied which means that the average value of control class posttest 71, namely < 70.22.

Table 3. Mean One Sample Test

No	Class	Mean ($\bar{x}$)	t_{table}	t_{count}	Accepted H_0	Conclusion
1	Experiment 1	79,28	2,039	4,915	t < 2,039	H_0 rejected
2	Experiment 2	76,56	2,039	3,448	t < 2,039	H_0 rejected
3	Control	70,22	-2,039	-0,379	-t > -2,039	H_0 accepted

b. Test N gain normalized

Test N gains used to pretest-posttest results increasing between a group of experiments of applying model PjBL with assessment portfolios. The results of the analysis of the experimental group showed a gain of normalized 1, experiment 2, and the control of entry categories are because the value N each normalized gain is 0.65; 061; and 0.53.

c. One Way Anova Test.

Using the 95% confidence level, α = 5%, df-1 (number of data-group 1) or 3-1 = 2, and df-2 (n-3) or 96-3 = 93, the results obtained for the F table of 3.094. One way anova analysis results are presented in table 4.

Table 4. One Way Anova Test

Nilai_Postest_Tiga_Kelas

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	1384,146	2	692,073	6,699	,002
Within Groups	9607,813	93	103,310		
Total	10991,958	95			

Based on table 4 because F count > count table (6.699 > 3.094), Ho is rejected, so there is a difference between the average value of the posttest experimental class 1, class 2, and control experiments.

d. Test Two Different average

Hypothesis test used in this study is the test t the two parties. The calculation result is obtained a value of 1.165 t count, whereas the t table of 1.998. Because, the value of t count = 1.165 lies in the area of reception of Ho -1.998 < t < 1.998, then H_0 is accepted, which means that there is no difference in average postestt between experimental group 1 and experiment 2.

Table 5. Different Mean PostTest

No	**Class**	Mean	t_{table}	t_{count}	Accepted H_0	**Conclussion**
1	Experiment 1	8,030	2,00	6,478	-1,998 < t < 1,998	H_0 rejected
2	Experiment 2	6,822				

The Attitude Of Students

Learning motion system with model portfolio assessment PjBL declared effective against the attitude of the learners. PjBL models can also improve the attitude of responsibility in completing the project especially when given a project in the form of the creation of tissue culture, communicative in conveying the results presentation, curiosity by asking questions, and diligently by following the lesson well (Yahya, 2014). According to Wibowo & Suhandi (2013), PjBL models able to stimulate learners in stimulating scientific attitude in the form of creative thinking ability in the form of asking, to guess because of an incident, to guess the result of an incident, improve the output.

PjBL-based model portfolios developed learning activities used to decent on learners at junior or MTs because it was able to increase the scientific attitude and scientific literacy learners (Wijayanti & Basyar, 2016). Learners look enthusiastic while performing the activities of the project with assessment portfolio system motion. The process of learning the system motion observed during the scientific attitudes during the learning process. The assessment is assisted by four (4) observer teacher praktikan PPL who happened to attended practice field experience in junior high Country 10. The scientific attitude observed include six (6) indicator assessment. These indicators are polite, inquisitive, responsibility, communicative, critical thinking, and cooperation.

First, the manners. Teacher observation when describing the motion of a system of material students are already visible on the task (focus) of learning and not many own, listening to the teacher's explanation, and responsive when asked. Yahya (2014) agreed that the learners will be more orderly in following lessons. Artini et al. (2013), reported that the PjBL model effect on emotional intelligence, including suave, good-natured, and always respectful.

Second, is the inquisitive. Learners to reveal the questions when practical bone or when a teacher gives apersepsi on early learning with many questions from learners. Learners class PjBL with the assessment portfolio asks for some concept of motion system that often confuses learners, for example, the difference of true, false ribs, and a drifts, the difference Shin and calf bone bone bone, the difference anatomically, and the difference of ligaments and joints, and so on. Curiosity needs to be grown as initial capital to encourage learners to become an astronomer. One of them by applying a model of PjBL with assessment portfolios. According to Mutakinati et al. (2018), model PjBL reported critical power can train the learners.

Third, the responsibility is characterized by the ability of the students in completing assignments on time, complete LPPD, correct, and complete. Responsibility is the behaviour of learners to carry out duties and obligations, which are supposed to do. Responsibility was already apparent on themselves as learners able to finish well making concept maps on a sheet of A4 paper size to Folio about motion systems and paper clippings HVS A4 size about abnormalities and diseases of the bone and muscles taken from the internet, newspapers, magazines, and books. The same is also conveyed by the Blessed et al. (2017), generally improving the scientific attitude including the value of responsibility in its readiness to provide responses or behaviors in science that recognized the truth. . Creation of concept maps is apparently already previously reported can improve analytical thinking ability of students (Intany et al., 2016).

Fourth, communicative. After doing a project activity, learners are required to perform a presentation in front of the class. presentation activities in the model of PjBL will certainly provide a space of freedom learners in exposing the research results, ask questions, and support the opinion of other learners. This is corroborated by Suwono (2012), PjBL models enhance the capabilities of students in research projects communicate the results.

The fifth is the ability of critical thinking. The critical attitude of the learners on learning portfolio assessment with observable PjBL from answers the learners ability in analyzing answers

LPPD is in compliance with the reality seen and observed by the learners. Besides being able to infer from the interview about an abnormality or disease of the muscles and bones. According to Husamah (2015), Anthony, et al., (2015), Ancient et al. (2015); Anazifa & Djukri (2017), PjBL is effective in developing the high level thinking skills on learners. Husamah (2015), reveals that the PjBL can also menstimulus the ability of metacognition.

The sixth is cooperation. This attitude is reflected in the complete kegiata are compact. Learners in turn demonstrate the workings of the muscle between the synergistic and antagonistic. Learning PjBL demanding learners in order to share the task of carrying tools and tools and materials for bone identification, it is necessary a good cooperation when the Division of tasks in each group. According to Jamilah (2015), PjBL model provides an opportunity for the learner group work so woke up the attitude of cooperation to work on tasks ranging from project planning, teaching, and presentation together.

Science Process Skills

Information obtained from table 2 is a model of effective portfolio assessment with PjBL against science process skills of learners. Analysis of the science process skills mastery students class experiments in motion system material with PjBL model using the assessment portfolio gained 90.63% has exceeded 63 (good) with an average of 70.83, while class 2 experiment with PjBL model using the UH gained 84.38% has exceeded 63 (good) with average 70.96. From the average thus better experimental class 2 but from the aspect of mastery better experimental class 1. This is due to the model of the PjBL combined portfolio will provide more motivation and improving life skills. It is supported by Hasnunidah (2007) in the study of his case that the implementation of the portfolio can increase students ' motivation of 20.23% and to improve the life skills of students which includes awareness of the potential, skills dig information, spoken and written communication skills and proficiency in cooperation of 58.50%. Project sheet for motion systems developed material declared valid to support learning. If the instruments were valid then the decent portfolio assessment instruments are used and in accordance with the demands of the Curriculum assessment of 2013 (Hidayati, 2016).

Science process skills in this study consists of six (6) observational aspects, namely: (1) preparing tools and materials, (2) observe, (3), (4) classifies the carrying out of the project, (5) predicted, and (6) concluded. First, prepare the tools and materials. This skill is identical to the work in the laboratory. In one of the stages there PjBL syntax called design a plan for the project (Kristanti et al., 2016). This step is the planning phase before undertaking projects designed by preparing tools and materials needed so that project activities running properly. The value of the responsibility of the students in preparing tools and materials after either Model PjBL earns an average score of 90.32 (Rodliyatin, et al., 2017).

Second, the observed. Learning motion system theme has been done ask learners to observe human skeleton parts of skull bone to tolang members motion of the bottom. To be able to conduct research in the field, teachers need to provide learning devices in the form of a sheet or Project is categorized as Learners (LPPD) (Deviani et al., 2016). Learners look busy observe with preservation of cardiac muscle, skeletal, and smooth in a microscope. Rodliyatin, et al. (2017); Violet Gibbs (2016), reveals the learning learning activities for use with PjBL models utilize the environment belongs to the very high and increasing the motivation of learning to the learners to learn.

Third, classify. Ability grouping is also charged in a motion system material. A simple example in which learners are asked to classify parts of the skull bone, sternum, vertebral column, pelvic bones, and bones of the limbs. Learners feel excited and interested in learning about the human skeleton model PjBL using assessment portfolio. Rachmawati et al. (2017), teacher or teachers should prepare adequate and learning resources for learners and experimental

tools to be able to do the observation of the human skeleton.

Fourth, implementing the project. Learning projects designed on the material system of motion in the form of identification of the human frame, the structure of bones, joints, muscles, muscular, and the workings of the disease and abnormalities in muscle and bone. The project is carried out in groups so as not to overload the learners. PjBL model making became more active, creative and manage to solve the problem with the good and true Retnoningsih et al. (2017). Fifth, predicted. These skills need to be drilled in order to predict the events related to science. For example, students are asked to make a research hypothesis. This is the hypothesis set out from the learners will be stimulated in order for the compelled conduct scientific investigations in a practical activity, experiment, or research, so that learners have the skill Science (Wijayanti, 2014). Sixth, concluded. The last stage is concluded activities in steps of scientific method. Of the conclusions will be obtained new knowledge. Knowledge gained through a series of scientific activities is expected to attach to strong in memory of learners.

Learning Outcome 3) based on table 3 reported about the results of the mastery study. It is reported that the model table PjBL with assessment portfolios effective against mastery the results of the study. Mastery results of classical experimental class 1 achieve success indicators specified at the beginning of research that is of 80% exceeded the value of the KKM (Minimum Mastery Criteria) 71. Show mastery analysis results of classical and experimental class 1 individual reach of 84.38% with an average of 79.28 ($t < 2.309$). Mastery of classical and experimental class 2 individual reach 71.88% with average 76.56 ($t < 2.309$). Mastery of classical and individual attain 43.75% with an average 70.22 ($-t > -2.039$). Data that is reporting that experimental class 1, prepared either individually or individually. Class experiments already completely individual but not completely classical, because achieving 71.88%. The control class hadn't either individually or classical.

Mastery is one of the reasons is the use of the PjBL model encourages students actively in the learning process. This is similar to the reported research (Rodliyatin, et al., 2017), the learning activities in the classroom for using models qualifies as a PjBL is very high.

Implementation of PjBL is also supported with assessment portfolios that include authentic assessment section 2013 of the curriculum. Previous studies reported that authentic assessment in the study of biological effect of positive results against the learning learners (Sugiyanto et al., 2015).

The value of gain normalized group experiments 1, 2, and control experiment of entry categories are because the value N each normalized gain is 0.65; 061; and 0.53. Experimental class 1 has the value N high gain most, though both in the category of being. PjBL model on subjects give impact on the results of the study are good learners (Hidayat, 2017). PjBL model can improve the performance of students of 18.75% (Mulyadi, 2015).

Table 3 reported that F count > F table (6.699 > 3.094), Ho is rejected, so there is a difference between the average value of the posttest experimental class 1, class 2, and control experiments. The average results of the experimental class 1 different learning significantly with the class of the control. The average results of the experimental class 2 different learning significantly with the class of the control. Table 4 illustrates that the value of the t count < table (1.165 < 1.998) then H_0 is accepted, which means that there is no difference in average postestt between experimental group 1 and experiment 2. Here can be explained because at the experimental class 1 using assessment portfolio. This type of assessment enables learners to always archive your academic documents to be studied at any time can be dipelajar, then it is not wrong if the application of the PjBL provide foundational knowledge (Muskania & Wilujeng, 2017).

Based on the discussion above, it can be concluded that as a whole the learning portfolio

assessment with PjBL effective against the attitude of the learners, science process skills, and learning to the learners. Learning portfolio assessment with PjBL demanding learners in order to be active in the process of inquiring into such scientific, surveying, try, menalar, and communicate. Thus, this model is appropriate if the basic competency Curriculum applied in 2013.

CONCLUSION

The attitude of the students class experiments reach mastery ≥ 63 (72.79) and percentage of 81.26% after learning of motion system with model portfolio assessment with PjBL so that learning is said to be effective. Process skills science class experiments reach mastery ≥ 63 (70.83) and percentage of 90.63% after learning of motion system with model portfolio assessment with PjBL so that learning is said to be effective. Learners learn the test results after learning of motion system with model portfolio assessment with PjBL completely individually with a value ≥ 71 (average 79.28) and classical of ≥ 80% (84.38%) so that learning is said to be effective. The results of a study on the material system of motion with PjBL model using portfolio assessment increases with N gain of 0.65 (medium). The results of a study on the material system of motion with models of PjBL is higher than the model ekspository. This is evidenced by the value F count > F table (6.699 > 3.094), Ho is rejected, so there is a difference between the average value of the posttest experimental class 1, class 2, and control experiments. The results of a study on the material system of motion with models using portfolio assessment PjBL is the same without the use of portfolio assessment. This is evidenced by the value t count < table (1.165 < 1.998) then H0 is accepted, which means that there is no significant difference in the average postestt between experimental group 1 and experiment 2.

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