

The Effect of Implementation of Performance Assessment, Portfolio Assessment and Written Assessments Toward the Improving of Basic Physics II Learning Achievement

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Abstract

This study aims to determine: 1. Is the implementation of performance Assessment , portfolio assessment , and a written assessments affect the improvement of Basic Physics learning achievement . 2. Is there has a distinction for the students who are given a performance evaluation with student given portfolio assessment in gaining learning achievement for Basic Physics II 3. Is there has a distinction in learning outcomes Physics II for the students who are given a performance appraisal with students given a written assessment, and 4. Is there has a distinction in learning outcomes Physics II for the students who are given the portfolio assessment with students given a written assessment. The method used in this study is an experimental method with a model design ANOVA analysis of 3 x 1. The population in this study is the students from the second semester of the Department of Physics 2012/2013 Academic Year with the number of 125 students. The samples were taken at random from the 75 student population, and established in three classes each class is 25 students.

From the results we get that there are 77.1 percent ($R^2 = 0.771$) in influencing for the performance assessment, portfolio assessment, and a written assessment to increase learning outcomes in Basic Physics II. There are differences in Basic Physics II learning outcomes for the students are given a performance appraisal with a mean score of 84.4 higher than students who were given a portfolio assessment with a mean score of 71 and a value of $t_{hit} (A1-A2) = 5.57, > t_{tab} (\alpha = 0.05) = 1.84$. There are differences in Basic Physics II learning outcomes for the students are given a performance appraisal with a mean score of 71 is higher than students who were given a written assessment with a mean score of 51 results $t_{hit} (A1 - A3) = 13.636, > t_{tab} (\alpha = 0.05) = 1, 84$. There are differences in learning outcomes Basic Physics II for the students are given a portfolio assessment with a mean score of 84.4 higher than students who were given a written assessment with a mean score of 51 results $t_{hit} (A2 - A3) = 8.068, > t_{tab} (\alpha = 0.05) = 1.84$

Keywords: Influence, performance assessment, portfolio assessment, written assessment, Basic Physics II

1. Introduction

The learning process which is carried out on formal education including on campus will always be followed by a process of knowing the progress of learning achieved by students. Process to determine student learning outcomes of information, commonly called assessment can be done in various ways that can affect the success of student learning. Proper assessment on the appropriate materials will give an edge to measure student or college student learning outcomes. From the point of view of the principle of assessment, there are several ways of learning outcomes assessment have their respective advantages. Performance assessment is one form of assessment is considered relatively accurate measure of student or college student learning outcomes . Performance assessment will provide the opportunity for a student or college students to demonstrate their learning ability in its totality from the beginning to the end finish that can be evaluated by others in this case the teacher or lecturer.

Physics which have characteristic features of science which requires a learning phase behavior assessment requires knowledge skills, attitudes and psychomotor. Performance assessment to be a good alternative assessment to be carried out in learning physics. As a science, physics requires reasoning is high enough to be understood, whereby people who have a high intelligence influence learning outcomes physics. Intelligence as the ability to adjust to the environment or to learn from experience. Where humans live and interact in a complex environment for which he requires the ability to adapt to the environment (Dalyono M, 2007:183).

Prominent trait in student learning behavior is likely to seriously learn if it will be assessed. Therefore, to assess student learning success is not enough merely observed only during the learning process but it needs to be tested. The test results will be used as one of the main parameter to refer to the process or further action. If the assessment process is unable to reveal the actual learning outcome, it can be caused further activity will not maximum. That's why the assessment of a learning process be important, including lecturing on campus.

Assessment is part of an evaluation process or procedure which has to be passed to obtain information about the study participants, ranging from primary education to higher education. Assessment is defined as a formal

attempt to determine the position or status of students associated with the specified educational variables. Can also be said that the assessment is a procedure that can be used to obtain information about a person's achievement or performance (BSNP, 2007:3).

Assessment is an important component in education. Efforts to improve the quality of education can be reached by improving the quality of learning and quality assessment. Both are inter-related, a good learning system will produce a good quality of study. Quality learning can be seen from the assessment (Djemari Mardapi, 2007:5). Assessment is a process to determine whether the processes and outcomes of a program of activities in accordance with the objectives or criteria have been established. Assessment can be done correctly if the available data relating to the object of assessment. To obtain the data, we need necessary assessment tools in the form of measurement. Assessment and measurement are two interrelated activities (Sarwiji Kelvin, 2011:7).

Popham stated there are four purposes of assessment, namely: 1) diagnose the strengths and weaknesses of students, 2) monitor the progress of learners, 3) gives the value (grade) of students, and 4) determine the effectiveness of their lessons educators. Simplification Popham opinion, formulate 3 assessment objectives, namely to: 1) diagnosing the knowledge and skills of students, 2) monitor learners' progress related to the learning objectives, and 3) provide data to provide value to learners (W. James Popham, 1995 : 141). Assessment in the process of learning can also function as follows: (a) to determine whether the teaching purposes accomplished or not, in this case the specific instructional objectives. Through this function, it can determine the level of mastery of teaching that should be mastered by students. Or in other words it can be seen that the learning outcomes achieved by the students. (b) To determine the effectiveness of the teaching-learning process has been conducted by the teacher. With this function the teacher can determine the success or failure he taught. The low learning outcomes achieved by students is not solely due to the ability of students but could be due to less successful teachers teach. Through assessment, it means that assessing the ability of teachers themselves and the results can be used as ingredients in improving his teaching, for the next teaching action (Nana Sudjana, 2007: 111).

Based on the description of some opinions about the assessment, It can be made a conclusion that the assessment is a process used to obtain data on student learning outcomes through a series of valid and reliable measures to assess student learning outcomes. Assessment made should be conducted in an objective, honest, fair, transparent and accountable both for students and for schools and society.

Performance appraisals are often interchangeable with the authentic assessment. Basic understanding is assessment (assessment), which require students to demonstrate the performance not to choose or answer the number of possible answers are already available. For example, in the assessment of performance (Performance Assessment), students were asked to explain in detail in its own way on the completion of the application of Newton's law by using a pulley. Through this way, the students are expected to demonstrate mastery of solving a physics problem and a way to learn the correct result. Performance appraisal is not required students to answer multiple choice questions on the answer sheet, performance appraisal supporters will ask students to demonstrate that students can perform certain tasks, such as writing an essay, do an experiment, interpret the answers to a problem, played a song, or painting a picture. This suggests that there has been a movement left the paper and pencil test towards performance assessment, which allows students to show what students can do if faced with the situation of real problems (Muhamad Nur and Ibrahim, 2003:5).

Performance assessment also allows teachers to observe achievement, mental habits, ways of working and behavior in the real world where the value of the conventional test could be wrong and the ways in which outside observers do not realize that a 'test (test)' is underway. Test performance can include observation and giving value to the student at the time of the dialogue in a foreign language, doing science experiments, composing composition, presenting the show, working with other groups of students in the planning of the student attitude survey or the use of equipment. (Kubiszyn, T. and Gary Borich, 1998:163). On the assessment of the performance there will be an important attention in terms of its score. When a performance appraisal will be given a score to infer the level of achievement of the performance test participants, then used two approaches, namely: analytic method and holistic method. Holistic method is used when the score only give a single score or value (single branch) based on an overall assessment of the results of the performance test participants. The analytic method scorer (rater) give assessment on different aspects related to the performance being assessed (Setiadi Day, 2008: 10).

Based on the above description, it can be concluded that the performance assessment requires students to perform cognitive skills but also must be accompanied by skills associated with mastery of the concepts learned. Therefore, in assessing student performance criteria need to be developed that can be agreed in advance. Overarching criteria called rubrics, thus the performance appraisal form is the main task (task) is defined as a rubric and assessment criteria.

Aiken argued that the test is a tool used to assess the one's behavior or performance (Lewis R. Aiken, 1979:474). Test is a systematic procedure that is made in the form of standardized tasks and given to an

individual or group to work with, answered or responded, either in the form of written, oral and actions (Farouk Muhammad and Djaali, 2005:32). The written test is also known as pencil and paper test, a test in which the test executor filed a grain questions in writing and give candidates a written answer anyway (Djaali and Muldjono Praise, 2008:11).

The written test is a test in which the questions and answers in the form of written materials. In answering the questions students do not always have to respond in the form of writing as the answer but can also in the form of coloring, marking, describe graphs, diagrams and so forth. Appraisers written test is commonly used measurement techniques and are included in the verbal test group (Salim Ainun, and Th. E. Nuraeni, 2008:2).

Based on the description above it can be concluded that the test can be done by many different types, specifically in the study made a written form of essay tests to measure student learning outcomes. Written test is a test where the questions given to students in writing. In answer the learners do not always respond in the form of writing an answer but can also be in other forms such as marking, coloring, drawing, and so forth.

The teaching process is a conscious activity to make students learn. Conscious process implies that teaching is a planned process to achieve the teaching objective (goal directed). Thus, the results in the context of learning is the acquisition of the learning process of students in accordance with the purpose of teaching (ends are being attained). The purpose of teaching be a potential learning outcomes to be achieved by the children through their learning activities. Therefore, achievement test as a tool to measure learning outcomes should measure what is learned in the learning process according to the instructional objectives set forth in the applicable curriculum, because the purpose of teaching is expected ability possessed by the students after completing their learning experiences (Sudjana, 1996 : 3).

Based on the various definitions can be concluded that the study results is the level of student mastery of the subject matter as a result of a change in behavior after participating in the learning process by teaching objectives to be achieved. The learning outcomes will be measured by a test.

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2. Methods

This research includes experimental research groups, beginning with the design of both the instrument design implementation lecture lectures, lecture materials and primary learning outcomes assessment instruments. The design of the course and the materials prepared with the involvement of experts, expert advice on the completion of the trial continued with the use of the material in the restricted group on campus. The trial results continue to be refined and tested on groups of subject in school Basic Physics II method used in this study is the method of factorial design experiment with 3 x 1. The dependent variable is the result of learning Physics II students. Treatment factors are (1) performance evaluation, (2) Portfolio Assessment, and Rating written test. Model design problems in this study can be described as shown in Table 1. as follows:

Table 1. Implementation research design

Group	Treatment Types	Learning outcomes
A	Performance Assesment	Ya
B	Portfolio Assesment	Yb
C	Written Assesment	Yc

Description: A. Performance Assessment, B. Portfolio Assessment , C.Written assessment

1.1 Variable definition

1.1.1 Conceptual Definition.

Learning outcomes in this study is limited in terms of their academic achievement in the subject of Basic Physics II. Which the Basic Physics II as the founder of the original concept to understand the physics concept further. Basic Physics I study results are obtained student learning outcomes assessment of the application of learning to learn the course material or material in theory and practicum Physics II, which is limited to the subject matter-wave optics, and electricity.

1.1.2 Operational Definition

1.1.3 Learning outcomes is the final test score of the experimental implementation of the Basic Physics II course, students who demonstrate competence in the field of study of the symptoms of the wave, the wave properties and electrical-magnetic, the second semester of 2012/2013 student of Physics Department, the sample in the study. Basic Physics II study result is a score that indicates the ability

of students to solve the problems of the Waves, and Electric-Magnetic.

1.1.4 Population and Sample

1.1.5 The population in this study were students of the Department of Physics, State UNIMA Education Program. Number of students of Physics Department of Physics Education Study Program the second semester of academic year 2012/2013 amounted to about 125 students spread over 4 classes. The samples collected by random sampling, which is taken as many as 75 students of the total population and are divided into 3 classes. Each class of 25 people and obtain treatment assessment study every different class.

1.2 Data Collection Techniques

Stage One: Preparation of lesson plans and achievement test preparation. Preparation of lesson plans follow the curriculum of the Department of Physical Education Physics in particular Prodi. Achievement test begins with the manufacture of the lattice problem, formulated on the curriculum panelists then tested to ensure it can be used as a test tool for testing. Trial results continue to test the validity and reliability matter. Test result data will be recommended that the questions will be instrument to measure the student learning outcomes at the course Basic Physics II.

Phase II Implementation of lectures by following the lesson plan prepared in stage I. Implementation of the use of learning and assessment course. Observations made during the lecture student activities. Student activity sheets are also conducted feasibility studies through trials. The trial is intended to determine whether the observation instrument worthy student activity measuring instrument or not.

1.1. Data Analysis Techniques

Phase analysis of the data in this study were divided into 3 stages according to the research phase. Phase I to analyze the effect of the application form to the improvement of learning outcomes assessment basic physics done using Analysis of Variance (ANOVA). Before the test is done to test the hypothesis that pre-requisite test for normality and homogeneity test as a pre-requisite inferential statistical analysis. Phase II, the implementation of learning activities, it will be carried out due diligence materials. Is teaching materials and lesson plans used are made in accordance or not. In Phase II testing was made by using empirical testing and test experts in the field. Phase III Writing books. Books written used for lectures and distributed to several faculties and universities that provide college Physics.

3. Results and Discussion

1.1. Results

In the section of this chapter will explain the two kinds of analysis, ie analysis of descriptive statistics and inferential statistical analysis. Both the results of this analysis are based on the measurement data on student learning outcomes Physics II course in the second semester, both groups were given a performance assessment, portfolio assessment and written assessment tests.

Recapitulation of learning outcome score Physics II students are presented as Table .2.

Table 2. Summary Description of Research Data

Statistic	A	B	C
Sample	25	25	25
Maximum value	95	90	70
Minimum value	60	55	40
Range	35	35	30
Mean	84.8	71	51

1.2. Pre-requisite test

Test for normality in this study using Lilliefors test, the purpose of this test to determine whether the sample comes from a normally distributed population. Homogeneity test in this study using the F test

1.3. Hypothesis Testing Statistics

Based on the results of the research data is then continued with the following stages:

$$\begin{aligned}
 \text{a. } RJK(A) &= \frac{JK(A)}{db(A)} = 19628,7/2 = 7564,83; \quad RJK(D) = \frac{JK(D)}{db(D)} = 5530/71 = 77,88; \\
 \text{b. } F &= \frac{RJK(A)}{RJK(D)} = 7564,83/77,88 = 97,13
 \end{aligned}$$

Table 3. Anova table

Varian source	JK	db	RJK	Fcount.	F _{tab 0,05}	F _{tab 0,01}
Between	15129,7	2	7564,83	97,13	3,13	4,82
In	5530	71	77,88			
Total	19628,7	73				

Based on the calculation results obtained that the price calculated F is greater than F table this means that there are differences in average student results given group performance assessment, portfolio assessment and a written assessment.

Assessment of the effect used $R^2 = 15129.7 / 19628.7 = 0.771$

The above results also show that there are significant by 77.1 percent from form factor assessment of learning outcomes Basic Physics II students.

Further analysis of the test results by using the Dunnet t obtained.

Table 4. Summary Dunnet t test

	t-count	t-table		criteria
		$\alpha = 0,05:4$	$\alpha = 0,01:48$	
to (A ₁ - A ₂)	5.567212203	1,864	2,423	t-count>t-table
to (A ₁ - A ₃)	13.63563569			
to (A ₂ - A ₃)	8.068423483			

4. Discussion of Research Findings

In this study, statistical hypothesis to be test are as follows:

1. Ho: $\mu A_1 \leq \mu A_2$: Average learning outcomes Physics II students are given a performance appraisal is less than or equal average learning outcomes Physics II students are given a portfolio assessment HA: $\mu A_1 > \mu A_2$: Average learning outcomes Physics II students are given a performance appraisal is higher or equal to the average results of studying Physics II students are given a portfolio assessment. Based on the results of hypothesis testing shows that the value of $t_{hit} (A_1 - A_2) = 5.57, > t_{tab} (\alpha = 0.05) = 1.84$. It can be concluded that there are differences in learning outcomes Physics II students are given a performance assessment with learning outcomes Physics II students are given a portfolio assessment. Data based on calculations show the average results of studying Physics II students are given a performance appraisal is higher with an average score of 84.8 on the average results of studying Physics II students are given a portfolio assessment with an average score of 71. Therefore, in the lecture Physics II use performance appraisal form be the right choice for improving student learning outcomes, when compared with the appraiser portfolio.
2. Ho: $\mu A_1 \leq \mu A_3$: Average learning outcomes Physics II students are given a performance appraisal is less than or equal average learning outcomes Physics II students are given a written assessment
3. HA: $\mu A_1 \leq \mu A_3$: Average learning outcomes Physics II students are given a performance appraisal is higher or equal to the average results of studying Physics II students are given a written assessment.
4. Based on the results of hypothesis testing shows that the value of $t_{hit} (A_1 - A_3) = 13,636, > t_{tab} (\alpha = 0.05) = 1.84$. It can be concluded that there are differences in learning outcomes Physics II students are given a performance assessment with learning outcomes Physics II students are given a written assessment. Data analysis shows that the average achievement Physics II students are given a performance appraisal is higher with an average score of 84.8 on the average results of studying Physics II students are given a written assessment with an average score of 51. It is therefore very appropriate performance assessment to improve student learning outcomes for the course Physics II, when compared with a written assessment. Performance appraisal process has several advantages that are relevant to the planting of physics concepts, such as experimenting, observing, analyzing and reporting the results of the analysis.
5. Ho: $\mu A_2 \leq \mu A_3$: Average Basic Physics II study results of students who were given the portfolio valuation is less or equal the average learning outcomes Physics II students are given a written assessment HA: $\mu A_2 \leq \mu A_3$: Average Basic Physics II study results of students who were given the portfolio valuation is higher or equal to the average results of studying Physics II students are given a written assessment. Based on the results of hypothesis testing shows that the value of $t_{hit} (A_2 - A_3) = 8,068, > t_{tab} (\alpha = 0.05) = 1.84$ It can be concluded that there are differences in learning outcomes Physics II students are given a portfolio assessment with results studying Physics II students are given a written assessment. Data analysis

showed an average field of learning outcomes Physics II students are given a higher portfolio assessment with an average score of 71 from the average results of studying Physics II students are given a written assessment with an average score of 51. This research study shows that a written assessment has not been able to deliver maximum results assessing student learning success. Therefore, in the assessment process for Physics courses more appropriate assessment tests not written about the intellectual ability of students to maximize both in terms cognitive, affective and psychomotor.

5. Conclusions

1. There are significant performance evaluation techniques, portfolio assessment and a written assessment on learning outcomes of students of Physics Department of Physics II, it can be seen from the calculation of $R^2 = 0.77$ or 77%, influenced by the success of student learning assessment techniques.
2. There are differences in learning outcomes Physics II students are given the results of the performance assessment of learning outcomes FISITA II Elementary students who were given a portfolio assessment.
3. There are differences in learning outcomes Physics II students are given the results of the performance assessment of learning outcomes Physics II students are given a written assessment
4. There are differences in learning outcomes Physics II students are given the results of assessment of learning outcomes porofolio Physics II students are given a written assessment

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