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PORTFOLIO ASSESSMENT IN LEARNING PHYSICS-BASED GUIDED INQUIRY

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This research aims to improve learning outcomes through the implementation of portfolio assessment in learning, which physics-based on guided inquiry, and secondly to describe the students' response to the model is done in two cycles of learning. The location of this research is SMPN 33 Makassar City Class VII C sample of a population of 4 classes. Indicators used in this study were firstly) improving student learning outcomes based cognitive competence, competence affective, psychomotor competency and secondly) students' response to the application portfolio assessment. Data were collected through observation, tests, questionnaires and interviews, and then analyzed descriptively. The results showed that ; The application portfolio assessment in this physics-based inquiry guided learning can improve student learning outcomes. This was due to an increase in the acquisition of student learning outcomes on cognitive competencies with good qualification at cycle I and II; an increase in the acquisition of student learning outcomes in affective competencies with good qualification cycle I and II; an increase in student learning outcomes in psychomotor competency with good qualification cycle I and II. In addition. The response of students to the application of portfolio assessment in this physics-based learning guided inquiry is very positive.

Keywords: portfolio, learning physics, guided inquiry

Introduction

According to the laws of the Republic of Indonesia number 20 of 2003 that the national education serves to develop the ability and character development and civilization of the nation's dignity in the context of the intellectual life of the nation it is aimed at developing students' potentials in order to become a man of faith and fear of God Almighty, morals noble, healthy, knowledgeable, skilled, creative, independent, and become citizens of a democratic and accountable. In addition, every student at any educational institution is entitled to 1) receive religious education in relation with their religion and taught by educators who co-religionists; 2) to be educated students in related with their talents, interests, and abilities; 3) to get the cost of education for those whose parents cannot afford education expenses; 4) to complete the educational program in accordance with the learning pace of each and do not deviate from the provisions stipulated deadline (The Law No.20 of 2003).

Based on the results of preliminary observations have been conducted by researchers (at 2013) on learning physics, it was found that the majority of teachers of physics still apply conventional measure which student learning outcomes

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assessed by the ability of students in mastering the material tested in the form of objective tests and without giving feedback of the results of such tests. The reaction of students to teacher assessment applied is that students tend to learn solely oriented toward mastery of the material in cognitive and less attention to the affective and psychomotor aspects.

This can be seen when the student was given a question about a specific tool, usability and how to use it, students cannot be explained carefully and cannot use it properly. Against laboratory instruments, students do not pay attention to how to treat these tools properly, and even some students who use the tools of the laboratory as a toy (Krulik, S., & Rudnick, J. A. 1995).

Supriyono (2006) states that the cognitive mastery of the material pose a negative view of learning physics. Based on the results of student responses through the questionnaire responses were given, most students (almost 75% of 32 students) considers that a physics lesson is a lesson that is identical with formulas and calculations that no implementation in everyday life, therefore the physics lesson a lesson that is not interesting, not fun, even hated.This negative perspective then further compounded by learning model used tend nuanced lecture. Student Activity Sheet (SAS) is given to the student teacher explained only through lectures and rarely facilitate students with an experiment to train the thinking of students, so that a physics lesson to be boring). Impact of conventional learning the nuances can be seen from the results of student learning in physics is still very low, where the classical completeness achieved by students in the 1st half of less than 70% with an average grade of 6.50 (Supriyadi, 2003).

To achieve learningautcome not only focused on the development of cognitive aspects but also oriented towards affective and psychomotor aspects it would need to develop an assessment towards achieving that goal. Based on initial observations obtained information that teachers have difficulty in interpreting the intended depth of basic competencies in competency-based curriculum and there are no clear criteria with the level of achievement of competence, making it difficult in the ratings. The main problem facing the teacher is in integrating assessment into learning demanded by competency-based curriculum, which has been regarded teachers as a separate activity (AnasYasin, 2004).

Pranata (2004) stated that the assessment of the portfolio was able to appreciate the students as individuals who are dynamic, actively construct knowledge in accordance with specific experience. In addition, the portfolio assessment considers that assessment is an integral part of learning, so that learning is conducted by supplying demanding tasks meaningful learning activities and apply what is learned in a real context. Therafore, Portfolio assessment can demonstrate the ability of students to take advantage of a variety of learning resources as well as the creation of their own understanding about something themes. Additionally portfolio assessment can also help students in reflection, self-evaluation, and specify learning

goals. Thus the portfolio assessment can thoroughly assess student learning both cognitive, affective, and psychomotor.

Much of the research on portfolio provides convincing evidence on the effectiveness and implementation of the authenticity of the portfolio in the teaching of physics in the first years. Rivard (in Santyasa, 2003) states that the writing tasks such as making summaries, formulating an explanation, and analyze physical phenomena can improve student learning. In addition, he also stated that 90% of students were tasked to formulate explanations of natural phenomena everyday in a written report can improve learning physics. The students were classified at the level of average and below average grade stated that by writing to make them think about what they are learning, rather than simply memorize material for an exam. The students are using everyday language to explain scientific concepts in a particular topic can increase their interest in the topic. Using a portfolio can also correct the attitude of the students in learning physics.

Based on all the problems that were uncovered then it is necessary Implementing a new assessment perspectives that portfolio assessment is applied in teaching physics as an effort to improve the basic competencies of students. In a competency-based curriculum, portfolio assessment to be one of the obligation to do the teacher in the classroom. According Budimansyah, D (2002) portfolio is a record or a collection of student work is documented properly and regularly. Portfolios can be shaped tasks undertaken students, the students' answers to the teacher, notes the observation of the teacher, the teacher notes of interviews with students, student activity reports, and essays that made the students. Surapranata and Hatta (2004), the portfolio is defined as a collection of works or documents the students systematically arranged and organized that were taken during the learning process, is used by teachers and students to assess and monitor the development of knowledge, skills and attitudes of students in certain subjects.

One model of learning which to implement the portfolio assessment is inquiry guided learning model. Amien, M. (1979) explains that this model provides the same opportunities that portfolio assessment of learning, action-oriented student-centered classroom and allow students to learn to use a variety of learning resources not only makes the teacher as the only source of learning. Through this model also students will be actively involved in the mental process through observation, measurement, and the inquiry to draw any conclusions.

In guided Inquiry learning model the teacher is a facilitator of learning and the learning environment manager. Guided in this study was defined that the lesson plan, preparation of reports, and data recording instruments provided by the teacher. It is intended that the learning process is effective and efficient, so it will be able to: 1) increase the intellectual potential of students, 2) increase the intrinsic motivation of students to learn, 3) directing students toward the mindset of inductive or investigation, and 4) increasing term memory long. Meanwhile, when the learning

takes place, the teacher's role as a supervisor is to give clues as necessary (Rustaman, N. Y. 2004).

Based on the things that have been described above, the purpose of this study can be formulated as follows 1) to assess the implementation of portfolio assessment in learning physics-based inquiry guided can improve student learning outcomes, 2) to determine the students' response to the implementation of portfolio assessment in learning physics based guided inquiry.

Research Methods

This research is a class action involving 32 students of class VII C State Junior High School 33 Makassar academic year 2013/2014. Basic considerations for determining the location of the research is not maximized portfolio assessment is implemented in schools to improve learning outcomes based guided inquiry. This study was conducted in two cycles of learning, which each cycle consists of four stages, namely: (1) planning the action, (2) action, (3) observation and evaluation, and (4) reflection. Each cycle takes place in four times the learning and one final test implementation of the action.

Teachers provide an overview of the portfolio assessment and indicators that will serve as student portfolios. Indicators for cognitive competencies, namely in the form of reports on the work on SAS, homework, report summarizing the results of a topic or concept that the students will learn, reports the results of lab activities/ experiments and papers. Indicators for affective competencies, namely the cooperation of students in a group, the enthusiasm of the students asked, presenting the results of the group discussions, the enthusiasm of the students in answering questions. Indicators for psychomotor competency is stringing tools and experimental materials, using tools and materials experimentation, and communication students. For the portfolio in the form of paper arranged in groups to take a topic or title associated with the application of the concept of motion and force.

Learning steps inquiry guided to do is 1) motivation and engaging students on the concept of the problem, 2) directing students conduct experiments that led to the SAS, 3) guide the students discuss in groups, 4) guiding students to make conclusions. Moreover, The data collected are 1) the data students' response to the model that is implemented, collected by questionnaire and interview, 2) data of student learning which includes cognitive competence, competency affective, and competence psychomotor, collected Worksheets students (SAS), practical reports, quizzes, homework, and test (daily test) and observation sheets. Student response data were analyzed descriptively with the criterion of success is minimal student response categorized as positive. Student learning outcomes data were analyzed descriptively, with success criteria increased student learning outcomes from the first cycle to the second cycle.

Research Results

This classroom action research carried out by the number of students as many as 32 people. The material that students are studying in the pack in two learning cycle, and each cycle be broken down into four sessions. Each meeting held once a week, with an allocation of 3 hours face lessons. At the beginning of the learning process, teachers are collaborating with researchers convey that learning activities in the classroom are implemented using portfolio assessment through guided learning model inquiry. Teachers expressed about the valuation model that will be implemented during the learning process includes three aspects of the assessment in accordance with the demands of the competency-based curriculum, namely competency assessments of cognitive, affective, and psychomotor using portfolio assessment.

Based on the evaluation and analysis in accordance with the indicators set, the obtained results on the cycle I as follows.

TABLE 1: RESULTS OF LEARNING AND STUDENT RESPONSE CYCLE I

No.	*Indicator*	*Result*
1	Cognitive competencies	76,8
	Standard Deviation(SD)	7,2
	Category	good
2	affective competencies	74,2
	Standard Deviation (SD)	8,4
	Category	good
3	Psychomotor competency	73,4
	Standard Deviation (SD)	8,0
	Category	good
4	Student response to the Portfolio Assessment	80,4
	Standard Deviation (SD)	5,1
	Category	Very positive

After learning of physics in the first cycle through the model inquiry guided, then the learning is done in the second cycle to determine whether there is an increase in student learning outcomes and how the students' response to the application portfolio assessment in the physics teaching.

Based on the evaluation and analysis in accordance with the indicators set, the obtained results in thecycle II as follows.

Discussion

Cycle I

Rom the analysis of the data in the first cycle obtained an average score of cognitive competence of students at the end of the action amounted to 76.8 with good qualifications, the average score of 74.2 students affective competencies with good

TABLE 2: RESULTS OF LEARNING AND STUDENT RESPONSES CYCLE II

No	*Indikator*	*Hasil*
1	Cognitive competencies	82,4
	Standard Deviation (SD)	6,5
	Category	good
2	affective competencies	81,6
	Standard Deviation (SD)	6,3
	Category	good
3	Psychomotor competency	80,8
	Standard Deviation (SD)	7,2
	Category	good
4	Student response to the Portfolio Assessment	84,4
	Standard Deviation (SD)	5,1
	Category	Very positive

qualifications, and the average score of students psychomotor competency 73.4 with good qualifications. Based on the achievement of student learning outcomes in line with expectations on the competence of cognitive, affective and psychomotor obtained in the first cycle, this can be caused by several factors: 1) The existence of co-operation group members. Students who have a higher ability to work together with members of the group are already set, then enthusiastic in doing the tasks that must be done, either do a practicum or recorded data; 2) learning skills developed turned out to be mastered by students, so the scores obtained on psychomotor aspects to be better and increased; 3) The time learning students can understand the meaning of the instructions and SAS are provided, so that the scores obtained very satisfactory.

Cycle II

In the second cycle increased cognitive competence of students by 8.3% (from an average score of 76.8 cognitive students with good qualifications in the first cycle amounted to 82.4 while qualifying well in the second cycle), an increase affective competencies students by 17.4% (from an average score of 74.2 affective students with good qualifications in the first cycle amounted to 81.6 with good qualification at the second cycle), and an increase in psychomotor competence of students by 15.4% (from the average score of students psychomotor 73.4 with good qualification in the first cycle amounted to 80.8 with good qualification at the second cycle). Based on the results obtained in the first cycle and the second cycle, then the implementation of research actions carried out can be said to increase cognitive, affective, psychomotor aspects of students.

This is because knowledge is constructed in the minds of students, in this case the students seek meaning and will try to find a connection sequence in the events from the world of information they receive. Things that really support the success of the learning process is feeling happy to learn with portfolio assessment in the guided

inquiry learning. Feelings of students to models of assessment and applied learning is reflected in the responses given by the students. Students have a very positive response to the application portfolio assessment in the guided inquiry learning.

In relation with the application portfolio assessment in learning guided the inquiry provide vast opportunities to students for creativity in the classroom. Students have the opportunity to develop the attitudes and skills they are learning, so that the optimal control of processes that can help students in building physics concepts they learn. The balance between process and product are two sides support each other in learning science. Portfolio assessment through guided inquiry models also provides ample opportunity for students to build knowledge and thought the students themselves.

Guidedinquiry learning model is one that is designed to keep students actively involved in learning through his own mental processes by performing the activity of scientific-oriented activities (Syah, 1996). Successful implementation Inquiry guided models have been found. Sadia (1992) in his study of Junior High School students found that the activities of discovery-inquiry positive effect on the formation and development of self-concept and self-contained nature of students. In guidedinquiry learning model allows teachers can implement a portfolio assessment, because the phases of guided inquiry learning can be used as tools and materials of student portfolios.

From the above explanation and reflection that has been done, portfolio assessment in guided inquiry learning has several advantages. The advantages are as follows. 1) be a student-centered teaching. 2) With a portfolio assessment, allows teachers to view student activity. 3) Portfolio assessment allows teachers and students jointly responsible for designing the learning process and to evaluate the progress of learning according to the learning objectives.4) Portfolio assessment can help teachers to record and evaluate the students' skills and knowledge in line with expectations without compromising the creativity of students in the classroom. Portfolio assessment can also facilitate students to be more responsible for their work in the classroom and increase their participation in learning activities. 5) Through a portfolio assessment with guided inquirylearning model, the activities carried out during the learning process becomes more purposeful and systematic so that teachers be more effective in managing time and delivery of content.

In addition to having several advantages, there are certain things that would need to be considered in implementing portfolio assessment in inquiry guided learning. 1) assessment model and learning will be more suitable to be applied in the teaching of physics demanding lab activities, and in its implementation, this model will be effective if the students formed in small groups; 2) Teachers should be able to manage the allocation of available time well, because of the application portfolio assessment in inquiry guided learning takes relatively longer than the use of conventional ratings

Conclusion

Based on the results of data analysis can be summarized as follows. 1) The application of portfolio assessment in physics learning based guided inquiry can improve student learning outcomes. An increase in the acquisition of learning outcomes for cognitive competencies with good qualification in the first cycle and the second cycle, an increase of affective well-qualified competence in cycle I and II, increased psychomotor competence with good qualification cycle I and II; 2) The response of students to the application of portfolio assessment in physics learning based guided inquiryis very positive.

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