The implementation of portfolio assessment by the educators on the mathematics learning process in senior high school

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Abstract. Portfolio assessment can shows the development of the ability of learners in a period through the work so that can be seen progress monitored learning of each learner. The purpose of research to describe and know the implementation of portfolio assessment on the mathematics learning process with the Senior High school math teacher class X as the subject because of the importance of applying the assessment for the progress of learning outcomes of learners. This research includes descriptive qualitative research type. Techniques of data collecting is done by observation method, interview and documentation. Data collection then validated using triangulation technique that is observation technique, interview and documentation. Data analysis technique is done by data reduction, data presentation and conclusion. The results showed that the steps taken by teachers in applying portfolio assessment obtained focused on learning outcomes. Student learning outcomes include homework and daily tests. Based on the results of research can be concluded that the implementation of portfolio assessment is the form of learning results are scored. Teachers have not yet implemented other portfolio assessment techniques such as student work.

1. Introduction

Assessment is the process of information collecting and processing to measure the achievement of learning outcomes of learners. Assessment is an important part of education [1]. For educators, are collecting information about learners learning and information about the learning process. For learner, the assessment is the process of information them about the progress of learning. Assessment has become an important key to the improvement of the quality of education [2]. The quality of education can be reached by improving the quality of learning and assessment system [3].

Assessment by the educator is an assessment conducted by educators/teacher of a subject that aims to measure the comprehension of the learners. Assessment can be done by educators by making assessment instruments including test and assessment formats. Permendikbud No 23 Tahun 2016 has set the provisions made by educators in assessing the learning outcomes of learners. The provisions of the educator in conducting the assessment of the learners on the knowledge and skills aspects of the form and usefulness of the assessment, assessment mechanism, assessment procedures, assessment instruments performed [4].

Assessment in the curriculum 2013 requires educators to conduct authentic assessments that include attitudinal assessment, knowledge and skills [4]. In mathematics subjects, the authentic assessment used is the assessment of knowledge and skills [5]. Assessment as a form of implementation of Basic Competence 3 and Competence 4 in the curriculum. In this study, focused on
portfolio assessment. Portfolio assessment is one of the techniques in the execution of skill assessments contained in authentic assessment [6].

Portfolio assessment is an assessment of a collection of work of learners in a semester or a year that shows the effort, development and achievement of learning with certain criteria that are considered good work [7]. Pandey asserts that portfolio assessment is the collection and evaluation of a carefully chosen selection of learners' work [8]. The number and types of selections included in a portfolio may vary, but are typically agreed upon by the educator and learners for the purpose of representing what that learners has learned.

The assessments done by the educators are in accordance with the assessment standards set by the government. It is contained in assessment standard of Kurikulum 2013. The procedure of assessing the skills aspect is done through the stages: a) planning the assessment; c) developing assessment instruments; c) executing the assessment; d) utilizing the assessment results; and e) reporting the assessment results in the form of numbers with a scale of 0-100 and description [4].

The purpose of this research is to describe the application of portfolio assessment on the learning process of mathematics. Portfolio assessment is one of the authentic assessments that not only to measure what the learners know, but rather to emphasize what the learners do [6]. While in school, educators rarely do the assessment with non-test [9]. The results of research conducted by Sukmawati showed that there are differences in the assessment technique of mathematics learning with portfolio techniques with written techniques to learners' learning outcomes. The better the application of portfolio assessment techniques conducted by educators will be the better results of learning mathematics learners [10]. On the other hand educators have done portfolio assessment on the learning process of mathematics but not fully implemented because educators have not clearly understood the portfolio assessment [11]. In relation to the valuation function that is very important for educators and learners it has become a teacher's skill to be able to do a good assessment according to what assessment standards on the Kurikulum 2013.

2. Method
This study is descriptive qualitative research used to determine the application of portfolio assessment conducted by educators [12]. Data were obtained by observation, interview and documentation. The subject of this research is the teacher of mathematics of class X of SMAN 1 Ngawi, East Java, Indonesia because this school is pilot projek Kurikulum 2013 in the regency. Determination of the subject done interviews to educator’s class X, XI and XII on the implementation of portfolio assessment on the mathematic learning process. Interview results show that educators more often perform skills assessment using portfolio techniques than with other techniques. Educators who more often do skills assessment with portfolio techniques is a educators of mathematics class X. Based on the results of interviews, researchers set the subject on this research is the educators of mathematics class X.

The results of interview, researchers conducted observations into the classroom on the process of learning mathematics took place using the help of digital cameras to record teaching activities. Researchers observe the learning process from educators prepare learners to follow the learning, educators to assess the learning outcomes of learners until the learning process ends. Based on the observation, the subjects were re-interviewed to validate the observed data in the class. Through interviews, researchers also ask about the constraints experienced by educators during the assessment of the portfolio. Then the researcher did method of instrument documentation and portfolio assessment result done by educator on learners learning outcome. Based on the data obtained through observation, interview and documentation then performed data analysis techniques with data reduction, data presentation and conclusion [9].

3. Results and Discussion
During the learning process, digital camera was being used to record all learning activities in the class. Stages of assessment conducted by educators are a) planning the assessment; B) developing
assessment instruments; C) executing the assessment; D) reporting the results of scoring in the form of numbers with a scale of 0-100 [4].

The result of observations at the stage of planning, educators set the purpose of assessment, made question appropriate with basic materials and competences tested and developing of the assessment instrument like a figure 1 and made assessment rubric like figure 2. Figure 1 shows the compulsory mathematics subjects that have been made by the educator in accordance with the material to be tested after the material of one Competency is completed. Educators conducted portfolio assessments by providing questions such as quiz/written test. In the stage of developing of the assessment instrument, educators tested the questions that had been made before they were tested to the learners. In addition to making a questions, the educators made a assessment rubric for the question tested.

![Figure 1. First Quiz](image1.png)

![Figure 2. Assessment Rubric](image2.png)

Based on the results of interview, educators made quiz questions in accordance with the subject that can be made for portfolio assessment. Before tested to the students, educators tried to test the questions by finishing it first. When it can be solved by the students and have been in accordance with the material and the lattice, then the questions are tested to the learners. The educators made a
assessment rubric for each question. This rubric became a reference for educators in providing value objectively.

The educators executed a portfolio assessment by giving a written test of quiz and then collected back and scored. Student’s work Sheets that had been scored became the assessment of the educator’s portfolio like Figure 3. After the material of one Basic Competency has been completed, then the educator provides questions/quizzes to check the ability of learners.

![Figure 3. Work Sheet of Student](image1)

![Figure 4. Second Quiz](image2)
Figure 5. Assessment Rubric

Figure 6. Learners Worksheet

Figure 4 shows the subject of the mathematics of choice given by the educator to measure the ability of the learner. In addition to making a problem, the educator also makes a rubric assessment for references providing score. This is shown in Figure 5. In the process of learning mathematics in the classroom, educators implementation of the assessment by providing questions to learners. Figure 6 is the result of the work of the learner who has been given score by the educator. Figures 3 and 6 are the work of learners gathered by educators. The worksheets of these learners as evidence that the educator has done a portfolio assessment.

This is certainly different from the definition of portfolio assessment in accordance with assessment standard of Kurikulum 2013. Portfolio assessment included in the authentic assessment is
not only to measure what is known by the learners but to emphasize measurements that have been made by them. Not just measuring knowledge but measuring the skills of learners in terms of work. The work intended in the Kurikulum 2013 is the performance/practice. Interview result showed is educators have difficulty in selecting material that can be used as portfolio assessment, long time need to did portfolio assessment and educator not understanding about kind of portfolio with other techniques besides of written test/quizz.

The results of the researcher’s documentation showed the same rubric assessment as the rubric assessment on skill aspects. This is because the form of tests on portfolio assessment conducted by educators is in the form of written test. Rubric is created like a column with a value of 1-100 scale in each correct answer. Rubric created a question with a total score of 25, so with 4 questions if combined to a total value of 100 [4].

4. References

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