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The implementation of authentic assessment in mathematics learning

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Abstract. In learning evaluation, a comprehensive assessment is needed. Assessment that can reveal all the potential possessed by students. Authentic assessment has three assessment domains, namely cognitive, effective, and psychomotor. But only a few teachers apply authentic judgment in the evaluation of learning, especially in mathematics. This study aims to reveal the obstacles faced when applying authentic assessment in learning mathematics and describing how authentic assessment can be implemented in mathematics learning. Data in this study were collected through observation, documentation, and interviews with research subjects, namely a grade VII teachers, a deputy headmaster of the curriculum, and some seventh-grade students of Islamic junior high school 1 Country Mataram. Then the data is analyzed by data reduction techniques, data presentation, and conclusion drawing (verification). The results showed that the teacher's constraints in the application of authentic assessment were (1) the lack of learning books that are in accordance with authentic assessment, (2) the authentic assessment stages are too complicated, (3) many aspects must be assessed so that it takes longer, and (4) teacher's lack of knowledge about authentic assessment. For teachers to conduct authentic assessments professionally, it is necessary to attend training related to authentic assessments to enhance teachers' insights on authentic assessments and books pertaining to authentic assessment need to be provided.

1. Introduction

Assessment of learning results is an essential component in learning activities. Efforts in improving the quality of learning can be reached through an increase in the quality of the assessment system. According to Mardapi (2017), the quality of learning can be seen from the results of his judgment. Learning was conducted can be evaluated by assessing so that it can already know the success of the learning process. To be able to find out the success of the learning process with the actual conditions, it may take a good judgment.

A proper assessment system will encourage educators to determine a good teaching strategy and motivate learners to learn a better [1]. Assessment activities should be able to provide information to teachers to upgrade to teach and help learners reach the development of his studies optimally. The implication is an activity assessment should be used as a way or technique to educate following the principle of pedagogical. Teachers must realize the progress of learning learners is one of the indicators its success in learning.

Authentic assessment is a form of assessment that asks students to apply concepts or theories in the real world [1]. A general definition of authentic assessment given by Torrance [2]

“Authentic Assessment is a generic term to describe a wide range of new approaches to assessment. Basic implications of that term seem to be is that assessment tasks designed for students should be more practical, realistic and challenging than what people would call a traditional paper and test ”.

Authentic assessment assessing learners with an emphasis on what it should be judged, both process as well as the results of the assessment with various instruments adapted to the demands of the real



competence in the standards of Competence or core competencies, and Basic Competence [3]. another opinion stated the Authentic assessments require students to be active performers with acquired knowledge. Traditional tests tend to reveal only whether the student can recognize, recall or "plug in" what was learned out of context [4]. According to Adisusilo and Kunandar [3], and Adisusilo [5], has four main characteristics of authentic assessment, namely (1) can be used for formative or summative (2) Measuring skills and performance, rather than considering the fact (3) sustainable and integrated (4) can be used as feedback. While according to Herrington & Herrington [6] the essential characteristics of the authentic assessment has been grouped into four categories: context, the student's role, authentic activity, and indicators. From these characteristics, can be seen the difference between traditional assessment with the authentic assessment, such as expressed by Wiggins [7]:

Table 1. The difference between the traditional assessment of authentic assessment

Authentic Assessment	Traditional Assessment
Direct examination of the student's performance on a task worthy of intellectual	Depending on the item's indirect or proxy
Requires students to become an effective player with the knowledge gained	Disclose only whether students can recognize, recall or "put" what is studied out of context
Serve students with complete tasks	Conventional tests are normally limited to questions that are written with a pencil and paper
Attend whether students can make answer, show, or a product that is refined, thorough and responsive	Conventional tests usually only ask students to choose a correct response or write regardless of the reason
Achieve validity and reliability by emphasizing and standardizing criteria proper to print various products	Traditional testing standardize "item" objective and one "correct" answer to each
"Test the validity" should be depending on whether these tests simulate "real-world" capability	Test validity is determined by matching the items to the curriculum content
It involves challenges to poor structured that helps students practice for Professional displays complex ambiguity	The traditional test is more like a practice, assess the elements of the static and too often any of the activities

Authentic assessment has strong relevance to the scientific approach to learning in accordance with the demands of the 2013 curriculum. Because this kind of assessment is able to describe an increase in student learning outcomes, both in order to observe, reasoning, try, and so on. Authentic assessment tends to focus on complex and contextual tasks, allowing students to demonstrate their competencies which include attitudes, knowledge, and skills. In its implementation, the learning process with the 2013 curriculum still faces several obstacles, including (1) Training and outreach have not been able to provide a good and comprehensive understanding of the 2013 Curriculum (2) Teachers have difficulty managing time in planning learning, designing process of learning, planning attitude assessment, and sort out knowledge by skills in preparation of assessment instruments (3) Time limitations in the

implementation of learning, difficulties related to learning devices, and difficulties activating students (4) Scoring systems that are complicated and require a long time to prepare reports (Retnawati, 2015). So that many schools have not received the 2013 curriculum, only a few have implemented the 2013 curriculum.

Based on preliminary observations at Islamic Middle School 1 in Mataram, information was obtained that the school had implemented the 2013 curriculum in learning in all subjects, including in Mathematics and using an authentic assessment model in measuring student learning outcomes. Teacher assessment is based on the learning process and uses various instruments to assess both aspects of attitudes, knowledge, and skills. However, since authentic assessments have been carried out until now, it remains unknown how far authentic tests have been applied. Therefore research relating to the application of authentic assessments in Islamic Middle School 1 in Mataram needs to be evaluation and studied as a reference for other schools that wish to apply authentic assessment.

2. Research Method

In this study, researchers used descriptive analysis with a qualitative approach. Researchers chose a qualitative approach type descriptive analysis because the data to be collected is data that is descriptive analysis in which the researcher will analyze the ongoing phenomena and describe them in the form of words that are presented systematically, accurately and openly about the nature and characteristics of the object under study. Researchers as human instruments function to select informants as data sources. Data sources used in this study are grouped into two groups, namely primary sources and secondary sources. The primary source consists of deputy headmaster of the curriculum, Mathematics Teachers and some grade VII students of Islamic junior high school 1 Mataram, and secondary data is obtained through education staff from Islamic junior high school 1 Mataram State. Data from research sources is collected through interviews, observation, and documentation. Then the received information is analyzed by Data Reduction, Data Display and Conclusion/verification technique. To ensure the validity of the data obtained in the study, researchers conducted more careful and continuous observations, triangulated data and used reference.

3. Result and Discussion

In the learning process students are not only required to understand the material but can formulate problems, determine solutions and interpret learning outcomes achieved even students are expected to take real action as a form of acquisition / understanding of the material in learning. So the assessment of the learning process must be able to assess these various aspects. When assessing, a teacher must conduct an assessment by the principles of assessment, namely valid, objective, fair, integrated, open, comprehensive and sustainable, systematic, referenced criteria, and responsible [8]. Authentic assessment assesses cognitive, psychomotor, and affective aspects in Mathematics, these three aspects are assessed. As expressed by the teacher of Mathematic class VII:

"Various ways that can be used in the authentic assessment. An example of taking measurements is to use measurements that contain several items to identify those related to student attitudes. To answer cognitive questions or knowledge ordinary students are given the task of answering the existing practice questions in the book or others that I made myself as an alternative or a tool to find out the students' abilities in the questions or exercises that have been given, and I use portfolios assessment to assess aspects psychomotor of the students".

3.1. Cognitive aspects assessment

Cognitive assessment of students is done by educators to find out how far students understand learning material; teachers always use various ways to assess students' knowledge. Assessment of aspects of knowledge generally uses tests, as well as grade VII mathematics teachers at Islamic junior high school 1 Mataram. As revealed in the interview about knowledge assessment he said:

"Knowledge assessment is an assessment related to students' ability to understand the material. Usually to assess my students' ability to use tests, both written and oral examinations. For written tests, I usually use descriptions and short multiple choice questions for oral tests. I typically ask questions during discussion or when learning takes place or by calling students one by one to work on issues".

The same thing was expressed by class VII student named Rihanna Jihan who said:

"Usually we are given time by teacher to read the material and discuss it with a friend next to me first, and then we are given questions, and students will be appointed one by one to answer questions from the teacher".

This opinion was also strengthened by a class VII student named BQ Anggita Arsyah who said:

"The teacher always holds discussions during the learning process and asks several questions related to the material being taught. And usually at the end or at the beginning of the lesson, the teacher provides tests about the stuff that has been shown and collected in the form of answers.

3.2. *Psychomotor Aspect Assessment*

Assessment of students' skills in mathematics learning is carried out by giving assignments and project portfolios, both in groups and individually. Portfolio assessment is taken from each student's assignments collected for one semester or within a certain time limit. The highest value of task collection is the final value of the skills that students have. And other assessment techniques used by teachers to assess psychomotor aspects are by field practice. The teacher uses this technique to assess students' skills in applying their knowledge to the real world.

"Before I gave the assignment, I always tell what aspects were assessed in the assignments my mother gave me, so students would be more active and serious in carrying out their tasks. Usually, I give assignments to students both individually and in groups".

Some of the students interviewed also said that the assessment conducted by the teacher was very open, they were told what was assessed in the task they would do, so they could be more active and display the best in each task work process.

3.3. *Assessment of Affective Aspects*

Attitude assessment can be a reference for teachers to know the characteristics that exist in each student. Assessment of attitude aspects can also help students to form good personalities. Mathematical teacher reveals

"Attitude assessment is an assessment that is often applied in schools, but in this authentic assessment is to assess students' attitudes in more detail and use various techniques in assessing such as self-assessment, assessment between friends, observations, and journals. And with this attitude assessment, can trigger students to always behave politely, both to teachers and friends in school, so they will be used to still being right in society".

The same thing is stated by the Deputy Headmaster of the curriculum which says:

"In my opinion, the attitude assessment especially for Islamic Secondary Schools has been done for a long time because this is a religious school, the main thing is the attitude problem. So, what is more about seeing the situation, character, personality, the attitude of students is more dominant".

Assessment of the learning process in school cannot be separated from the obstacles in its implementation, as well as the implementation of authentic assessments in Mathematics subjects in class VII. Teachers as implementers of the assessment have difficulty in applying authentic judgments by the mathematics teacher's statement which says that:

"For the application of authentic assessment, there are still many obstacles faced because this assessment is still new. As for some things that prevent me from applying authentic assessment to mathematics subjects, there are many stages of complex planning that must be planned so that I am still confused in the application, so many aspects which must be assessed so that it takes a long time to make judgments. The obstacles experienced by students are too many tasks that must be done from each subject so that they are often late in completing their assignments".

The same thing was also expressed by deputy headmaster of the curriculum section who said:

"The first obstacle is for teachers; usually when there are no books, the book is mandatory, if there are no books, children cannot learn. Secondly, there are still some teachers and mothers who are still unfamiliar with the 2013 curriculum".

Class VII students named Lalu Ichwantiar reinforced this opinion

"The assignment is too much; we have not finished working on the Math assignment again, we have other assignments. That is what makes us bored".

In line with Lalu Ichwantiar's opinion, Rihanna Jihan said:

"Every day we are always given assignments from Sis, sometimes I feel challenged in doing assignments, but I also feel bored and a little tired because there are so many tasks".

The teacher takes specific actions or efforts to minimize the obstacles faced in the application of authentic assessments so that the assessment in the learning process can run smoothly. As expressed by the Deputy Headmaster of the curriculum related to solutions to overcome these obstacles he said:

"For the book that we propose related to its procurement must be complete, the solution given to the teacher is that the school provides a kind of training which basically can add insight from the training so that knowledge increases about this 2013 curriculum".

In line with the opinion above the mathematics teacher also said:

"Efforts are being made to overcome obstacles in applying authentic judgments by participating in training related to the 2013 curriculum, subject teacher discussions, and independent learning by browsing the internet. About student learning burden that is too much I try to give too many tasks, but learning goals and objectives must be achieved".

In addition to the obstacles faced in authentic assessment, of course, there are benefits felt by the teacher. As revealed by the curriculum:

"The first advantage is that I feel pleased because it was helped by the 2013 curriculum, some assessment instruments exist and it makes children more active, varied, just a lot of deck".

In line with deputy headmaster of the curriculum opinion, the mathematics teacher also said:

"The benefits felt by the mother lie in the ease of knowing and analyzing changes that occur in students, both changes in aspects of attitudes, knowledge, and skills of students. Because in this assessment system, every element is considered to have assessment methods or techniques".

4. Conclusion

The implementation of authentic assessment on mathematics subjects is possible; this evidence can be done quite well by the Mathematics teacher in Islamic junior high school 1st Mataram. In general, teachers have succeeded in applying aspects that exist in authentic assessment, namely cognitive, affective and psychomotor aspects. In carrying out authentic assessments, the teacher also uses various assessment instruments available in authentic assessment. Teacher assessment is not only based on results but based on the learning process. Assessment is carried out not only from the teacher but also from the student himself.

Constraints faced in the implementation of authentic assessments in mathematics subjects is the lack of books, authentic assessment is quite complicated, there is still a lack of teacher's knowledge of authentic assessment. The solution is related to the complete proposed book for procurement, because of the teacher's lack of knowledge about the 2013 curriculum there is training related to the 2013 curriculum to add insight from the training so that knowledge increases about the 2013 curriculum.

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