

# Elementary School Teacher Ability in Using Application Technology for Mathematics Learning Assessment in the 2013 Curriculum

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**Abstract:** The background of this study was the lack of teachers ability in using application of mathematics learning assessment in the 2013 curriculum. The purpose of this study was to improve teachers knowledge and skills to use the application technology of mathematics learning assessment in the 2013 curriculum. The method used in the activities was the pattern of preventive implementation, planning stage, program implementation, observation and evaluation, and reflection. The research results showed that teachers ability is still in the sufficient category thus further training is needed. The implication of this study is as a foundation for the development of further training hence teachers can use the mathematics learning assessment application in the 2013 curriculum well.

**Keywords:** elementary school, teacher ability, assessment, technology, mathematics learning

## I. INTRODUCTION

Minister of Education and Culture Regulation No. 67 of 2013 concerning the Basic Framework and Structure of the Elementary School Curriculum requires all elementary schools in Indonesia to implement the 2013 curriculum [1],[2]. Starting from the learning process until the assessment of learning outcomes. Assessment in the 2013 curriculum is known as authentic assessment. Authentic assessment is also called contextual assessment. Authentic assessment is an assessment conducted thoroughly in assessing the learning process during the process until the learning output comes out [3],[4].

Authentic assessment is an assessment conducted to measure student learning outcomes starting from the realm of attitudes, knowledge, and skills [5],[6]. Authentic assessment is an assessment of student enthusiasm, process and learning outcomes as a whole in the learning process [7],[8]. The combination of these three components will produce student's competency, style, and learning outcomes and find out instructional impacts of learning.

Authentic assessment has a close relationship with scientific approaches in learning the 2013 curriculum [9],[10]. Authentic assessment can describe the process and student learning outcomes starting from observing, asking, reasoning, trying and building networks.

Authentic assessment is different from traditional assessment [11],[12]. In traditional assessment, students can choose the response available, while in authentic assessment, students must work on a task or project thus the assessment can be done [13]. Traditional assessment

concentrates on the ability to think and understand, and the focus is on the teacher. Meanwhile, authentic assessment directs on measuring the ability to think of construction and application, and the focus is on the student. Therefore authentic assessment is very suitable to apply to the 2013 curriculum in elementary schools in Indonesia.

Elementary school is the first formal level of education in Indonesia [14]. The characteristic of learning in elementary school is that learning is carried out in an integrated thematic way, except for mathematics learning. Learning mathematics in elementary school is done separately. This is because learning mathematics has different characteristics from other learning. One of the dissimilarities of mathematics learning with others is the mathematics learning assessment system.

Mathematics learning is related to daily life which is applicable for elementary school students [15]. Learning mathematics in elementary schools makes daily life an object of learning problems in schools [16]. It is not only about learning the concept of mathematics, but also requires the development of thinking skills such as the ability to think critically, logically, systematically, and analytically [17],[18]. Also, learning mathematics in elementary schools is expected to develop students 'attitudes in utilizing mathematics in students' real lives [19],[20]. Therefore, a thorough assessment is needed thus every ability developed by the teacher of elementary school students in learning mathematics can be fully assessed to improve the quality of mathematics learning.

To maximize overall mathematics learning assessment, application technology of mathematics learning assessment in the 2013 curriculum for elementary students has been developed. It is an application developed from Microsoft Excel to assist teachers in assessing each of the core competencies and basic competencies developed by the government. This application will make it easier for teachers to make authentic assessments of mathematics learning in elementary schools.

However, this application has not been fully mastered by teachers. Based on the analysis of researchers' interviews with the teachers, it shows that teachers are unable to use the application technology of mathematics learning assessment in the 2013 curriculum for elementary school students. This is due to a lack of teacher knowledge in using the application. Furthermore, based on the distribution of questionnaires to teachers it can be found that 87% of teachers do not use this application.

This proves that teachers are still not optimally using the mathematics learning application in the 2013 curriculum for elementary school students. Based on this problem, the researcher is interested in finding more detail about the ability of teachers to use mathematics learning applications in the 2013 curriculum for elementary school students. Furthermore, researchers will provide training to teachers to maximize the use of mathematics learning application technology in the 2013 curriculum for elementary school students.

## II. METHOD

This training consists of two stages. The first phase is developing teacher knowledge about the authentic assessment of mathematics learning in the 2013 curriculum for elementary school students. Furthermore, teachers are trained to use authentic assessment technology in mathematics learning in the 2013 curriculum.

Researcher carries out three stages of evaluation. The first evaluation is the initial evaluation to determine the initial ability of the teachers. Next, the process evaluation aims to see teachers' understanding of the training activity. Last, the final evaluation to find out the overall understanding of the teacher and determine the success of the training provided.

## III. RESULT AND DISCUSSION

The implementation of training activity on the use of mathematics learning application in the 2013 curriculum for elementary school students consists of two general stages. The first stage provides information about the assessment of mathematics learning in the 2013 curriculum and subsequently regarding the use of the mathematics learning assessment application in the 2013 curriculum for elementary school students. The description is as follows:

The first stage is giving information to elementary school teachers about the assessment of mathematics learning in the 2013 curriculum. Before the workshop held, teachers are given a question to find out their initial ability regarding the assessment of mathematics learning

for elementary school students. The result shows that teachers get an average value of 72.58.

Assessment of learning mathematics is not only limited to knowledge but also related to affective and psychomotor assessment [21]. Therefore, in the training phase, information on the assessment of mathematics learning is carried out in two meetings with Koto Anau teachers in the Pesisir Selatan district. The first meeting discusses cognitive assessment of mathematics learning in elementary schools. The teacher is given material about cognitive assessment definition and techniques. This needs to be understood to carry out the assessment well [22]. Cognitive assessment is an assessment made to students that include factual, conceptual and procedural knowledge [23],[24]. Mathematical learning assessment techniques consist of oral tests (in the form of multiple-choice, stuffing, right-wrong, pairing, and description), oral tests (consisting of quizzes, questions and answers, etc.), and assignments (consisting of a list of tasks performed individually or groups at school, outside of school, and at home) [25]. In this training, the teacher is trained in how to make an assessment of mathematics learning for elementary school students. The purpose is teachers can perform mathematical learning assessments according to predetermined standards to see the achievement level of mathematics learning goals. At the end of the activity, the teacher is given questions related to cognitive assessment in mathematics learning. The results show that the teacher gets an average score of 75.87.

The second meeting, the teacher is given training on attitude assessment and skills assessment in mathematics learning. The teacher is given information about affective and psychomotor assessment techniques. Affective assessment is an assessment related to emotions such as feelings, values, appreciation, motivation, and attitude [26]. There are five main categories of affective assessment namely acceptance, response, appreciation, organizing, and characterization based on values or internalizing values [27]. Affective assessment techniques consist of primary assessment (teacher observation) and supporting assessment (self-assessment and peer-to-peer assessment) [28]. While the psychomotor assessment is related to one's skills [29]. Psychomotor assessments include motion, manipulating, communicating and creating [30]. Psychomotor assessment techniques consist of work assessment (measuring learning outcomes in the form of process and / or outcome skills), project appraisal (Knowing students' ability to apply their knowledge through completing a task in a certain time) and portfolio (Records of authentic assessment that strengthen progress and quality of student work) [31]. All three assessments can be carried out optimally if in learning models are used that enhance student activity and creativity [32]. After understanding the assessment, the teacher is given an evaluation of the process by getting an average score of 78.73. This proves that teachers already have good knowledge about the assessment of mathematics learning in the 2013 curriculum in elementary schools.

The next training is to guide teachers to use mathematics learning applications in the 2013 curriculum for elementary school students. In this workshop, the

teacher is taught how to operate an existing application. Teachers are directed to understand each tool and its function in the application. The teacher is guided in how to do cognitive, affective and psychomotor assessments in learning mathematics using the application. Teachers are also taught to process daily test data, midterm data, and final exam data. They are directed on how to do a description of students' attitude assessments in mathematics learning. In the final stage, the teacher is instructed to make a final report card for elementary school students. This application is very helpful for teachers in authentic assessment because it requires teacher skills in conducting the assessment process. The teachers have to do the assessment correctly [33]. Authentic assessment functions to help students develop, improve learning methods, measure students' readiness (attitude, mentality, and material), and provide guidance to students in improving their competence [34].

Moreover, the authentic assessment provides information that can help educators in carrying out better education [35]. The assessment also serves as a basis for making decisions regarding the sustainability of studies and evaluations of learning programs [36]. Therefore using this application can help teachers in authentic assessments.

At the end of the activity, a final evaluation is held to see the success of the training provided. In the final evaluation, the teacher gets an average score of 81.73. This proves the average increase from the initial score of 72.58 to 80.73. An increase in the average score shows that elementary school teachers have sufficient knowledge and skills in implementing and using the mathematics learning assessment application in the 2013 curriculum. These results also ascertain that elementary school teachers are ready to perform the 2013 curriculum to the maximum.

#### IV. CONCLUSION

Based on the training given to teachers on learning assessment and the use of mathematics learning assessment applications in the 2013 curriculum, teachers' knowledge and abilities are still in the sufficient category thus further training needs to be held.

#### ACKNOWLEDGMENT

We are very grateful for Univeristas Negeri Padang for providing financial assistance in this research and thank you Universitas Samudra for granting collaboration permission for this research.

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