



ASSESSMENT OF MATHEMATICS LEARNING BASED ON BANYUMASAN ART CULTURE

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Abstract.

Learning assessment based on local wisdom is essential in interpreting cultural diversity. This Science and Technology for the Community (IbM) activity aims to socialize ethnomathematics-based mathematics learning assessments, especially Banyumasan art culture. The target of this activity is UMP elementary school teachers in general and UMP elementary mathematics teachers in particular, totaling 22 people. The methods and strategies used in implementing this IbM are starting with a pretest to determine the initial ability of participants, given treatment through book review, discussion, question and answer, simulation and ending with posttest and reflection. This activity results in the increasing insight of UMP elementary school teachers on ethnomathematics-based learning assessment, especially Banyumasan art with an average gain of as much as possible. 17.85. The participants' responses to the implementation of this activity were adding insight (59%), valid (19%), welcoming positively and expressing pleasure (22%).

Keywords: Assessment, Banyumasan, Culture, Art, Mathematics

INTRODUCTION

Implementing the independent curriculum has implications for several changes in various lines (Baharudin, MR, 2021). including learning assessment models (Indarta, Y, Jalinus, W & Waskito, 2022). The independent curriculum (KM) in addition to recommending teachers to conduct integrated assessments (Alawi D, Sumpena, A, & Supiana, 2022) also requires the use of assessments that are increasingly functional, fair, proportional, valid, reliable, simple, informative and reflective (Achmad GH, Ratnasari, Amin A & Yuliani, 2022). The independent curriculum focuses more on essential material and developing student competencies in its phases (Okta D, Priantini, Suarni K, & Ketut I. 2022). The learning process in KM becomes more profound, meaningful, unhurried, and fun (Fitriyah CZ & Wardani RP. 2022)

Assessment for the independent curriculum includes assessment of learning, assessment as learning, and assessment for learning, but the proportion emphasizes assessment as learning (Purnawanto AT. 2022). The reasons for using this assessment are, (1) focusing more on essential material and developing student competencies in its phases, (2) students can choose subjects according to their interests, talents, and aspirations. In addition, Kurniati, P at.al (2022) claims that teachers also teach according to students' achievement and development stage. Schools also have the authority to develop and manage learning curricula by the characteristics of educational units and students, (3) learning through project activities provides wider opportunities for students to actively explore actual issues such as environmental, health, and other issues to support the development of character and competence of the Pancasila Student Profile.

The purpose of this IbM is (1) to socialize the concept of mathematics learning assessment based on Banyumasan art culture (2) to encourage teachers to explore assessment materials from Banyumasan art, especially Ketoprak, Calung Banyumasan and Kenthongan. The teachers at SD UMP are pioneers of change in advancing Muhammadiyah's charitable efforts by constantly updating innovative learning. UMP Elementary School as an inseparable part of UMP is always consistent with its superior, modern and Islamic vision to be an example in implementing education and learning. In developing learning innovations based on local wisdom, teachers need new insights in learning assessments based on the applicable curriculum (Wafiqni, N.& Nurani, S, 2018). Furthermore, Dega, AT., (2022) explained that the independent curriculum policy based on local wisdom has implications for several changes, especially in learning assessment. This policy is a problem for teachers, especially elementary school teachers because they face students whose way of thinking has only reached the level of concrete thinking. In addition, elementary school teachers face thematic learning challenges that must assemble various indicators on different lesson content (Natawijaya, IN & Dantes, N, 2015). The preliminary study results stated that UMP Elementary School teachers experienced many obstacles in determining integration, determining assessment functions, compiling fair, proportional, valid, reliable assessments, and simple, informative, reflective and based assessments based on local wisdom. In addition, specifically for mathematics material, teachers must also be able to explore deeply from the culture chosen as teaching material (Widodo, A (2020) and learning assessment.

For this reason, it is necessary to conduct training and assessment assistance on the Banyumas culture-based independent curriculum by teacher needs. The problem is implementing the independent curriculum assessment based on Banyumasan Culture. For this reason, it is essential to apply science and technology to assist teachers in analyzing and solving problems in implementing learning assessments based on local wisdom (banyumasan culture).

METHOD

The implementation of IbM is carried out through the BETOR SIME strategy (book review, brainstorming, simulation, evaluation) and lecture methods, question and answer dissemination and mentoring. While the implementation of IbM is presented in 3 stages, namely the preparation stage, the implementation stage and the final stage. In the preparation stage, the activities carried out include preparing a banyumas culture-based assessment guidebook, coordination with partners, training contracts, determining the implementation schedule based on mutual agreement between the implementing party and partners, forming a whatsapp group counseling and mentoring Banyumas culture-based KM assessment, internal consolidation including the distribution of materials and mentoring tasks to perfect the manual schedule of mentoring, and sharing schedule. At the implementation stage, material sharing was carried out on: basic concepts of learning assessment, various learning assessment techniques, and ethnomathematics-based assessment, The activities carried out at this stage were the excavation of mathematics teaching materials through book review with the title ethnomathematics-based learning assessment, continued with discussion, question and answer and ended with a simulation of the results of assessment development. In the final stage, calculations are carried out on evaluation to explore the abilities obtained from the training results, reflection on

training by trainees to explore responses and follow-up plans (RTL) to make plans in implementing ethnomathematical KM assessments in learning. More systematically the methods of implementing IbM can be presented in Table 1 below:

Table 1. Stages, Strategies and Methods of IbM Implementation.

Stages	Strategies and Methods
Stage 1. Preparation	Prepare handbooks, coordinate with partners Book review Presentation of the big concept of independent curriculum assessment based on Banyumas Arts culture Brainstorming Discussion and question and answer about the strategy for developing KM assessment based on Banyumas Arts culture
Stage 2. Implementation	Simulation Practice and assistance in conducting KM assessment simulations based on Art culture NAB
Stage 3. Final stage	Evaluation, reflection and RTL -Test of the ability to understand the concept of KM assessment based on Banyumas Art culture -Dissemination of open questionnaires of participants' responses to IbM

RESULTS AND DISCUSSION

Ethnomathematics-based learning assessment is an approach in mathematics learning that allows students to learn mathematics through the context of culture and everyday life. This assessment aims to measure students' skills in solving mathematical problems related to culture or daily life. This assessment model is feasible to use to measure students' skills. This model can improve students' skills in solving math problems and can also increase students' interest in learning mathematics. Ethnomathematics-based learning assessment is carried out by observing and assessing student performance in solving mathematical problems related to student culture.

Ethnomathematics-based test instruments are tools used to measure students' understanding of mathematical concepts taught through an ethnomathematical approach. This test instrument measures students' understanding of mathematical concepts related to culture or everyday life. Ethnomathematics-based test instruments can be written tests, oral tests, or practicum tests that involve students in solving mathematical problems related to culture or daily life. Ethnomathematics-based test instruments must be carefully designed to measure students' understanding of mathematical concepts taught through an ethnomathematical approach. Tests should cover mathematical concepts related to everyday culture and be designed with language that students can easily understand.

In addition, ethnomathematics-based test instruments must be tested first to ensure that the test can measure students' understanding accurately. Tests should also be tested to ensure reliability and validity in measuring students' understanding of mathematical concepts taught through an ethnomathematical approach. In ethnomathematics learning, ethnomathematics-based test instruments are essential to measure students' understanding of mathematical concepts taught through an ethnomathematical approach. A good test instrument can help teachers evaluate the effectiveness of mathematics learning. Ethnomathematics-based test instruments can measure students' mathematical abilities related to their culture (Kusno & Makhful, 2022).

The ethnomathematics-based learning assessment guidebook is well prepared as material for book review. The following are the steps for preparing ethnomathematics-based learning assessments, namely (1) Determining specific and measurable learning indicators, (2) Determining the cultural context that will be used as a basis for ethnomathematics learning, (3) Determining the learning material to be taught, (4) Determining the type of assessment to be used, such as written tests, presentations, or projects, (5) Determining clear and measurable assessment criteria, (6) Determine the assessment instrument to be used, such as rubrics or grading scales, (7) Create questions or assignments that are appropriate to the cultural context and learning materials, (8) Conduct assessment trials to ensure their validity and reliability, (9) Provide feedback to students after the assessment is carried out, (10) Analyze the results of the assessment and evaluate the effectiveness of ethnomathematics learning that has been carried out. For example, 1) the learning indicators solve everyday problems related to the rules of multiplication enumeration, 2) the cultural context used is wayang kulit banyumasan, 3) the material is the concept of multiplication enumeration rules, 4) the assessment used is a written description test, 5) the assessment criteria are using rubrics with a scale of 1-5, 6) The assessment instruments used are: Step (a) Understand the problem with a maximum score of 2, (b) Determine the problem-solving strategy with a maximum score of 3, (c) carry out problem solving with a maximum score of 4, and (d) re-check the results of problem solving with a maximum score of 1, and 7) The questions used for assessment are as follows:



Figure 1. Semar

In the shadow puppet show, there is a Semar character who has the ability to transform into various forms. If Semar can transform into 5 different shapes, and each shape has 3 different moves, how many combinations of moves is Semar likely to perform? Describe the steps taken to resolve this issue.

8) Ask experts to validate the questions. 9) Piloting to students, 10) making improvements if anything needs to be fixed.

Enumeration rules can be used to calculate the number of possible combinations of movements that Semar can perform in shadow puppet performances. Step 1: Determine how many different shapes can be turned into Semar. In this case, Semar can be transformed into 5 different forms. Step 2: Specify a different number of movements for each shape. Semar has 3 different moves for each move. Step 3: Calculate the total number of combinations. To do this, multiply the number of different shapes of Semar by the number of different Semar moves. In this case, the calculation is: 5 shapes x 3

movements = 15 possible combinations. Thus, Semar can perform 15 different movement combinations in shadow puppet performances. In this way, among puppet fans, mathematics will be more enjoyable.

As for some of the advantages of ethnomathematics-based test instruments, namely (1) Ethnomathematics-based test instruments can help students to understand mathematical concepts better because students can learn mathematics through cultural contexts and daily life, (2) Ethnomathematics-based test instruments can increase student interest in learning mathematics because students can see how mathematics can be applied in everyday life, (3) Ethnomathematics-based test instruments can improve students' skills in solving mathematical problems because students can learn mathematics through cultural contexts and daily life that are more meaningful to them, (4) Ethnomathematics-based test instruments can increase diversity in learning because students can learn mathematics through different cultural contexts, (5) Ethnomathematics-based test instruments can improve student understanding towards culture because students can learn mathematics through cultural contexts related to their daily lives. Ethnomathematics-based test instruments can benefit students in learning mathematics better and meaningfully.

While the disadvantages of ethnomathematics-based test instruments are: (1) To design a valid and reliable ethnomathematics-based test instrument can be a challenge because the test must include mathematical concepts related to culture or everyday life and must be designed with language that is easily understood by students, (2) To valaurate students' understanding of mathematical concepts taught through an ethnomathematical approach can be difficult because students can have Different understandings of the cultural context or daily life used in the test, (3) The use of ethnomathematics-based test instruments may not be widely used because the test must be adapted to the cultural context or daily life of students, which can vary by region, (4) Not all mathematical concepts can be taught through an ethnomathematical approach because some mathematical concepts may not be related to culture or life (5) The implementation of ethnomathematics-based test instruments can require considerable time and resources because tests must be adapted to the cultural context or daily life of students and must be tested first to ensure their validity and reliability.

The simulation results of Banyumasan art artifacts that can be developed into material in the preparation of assessments are as follows:

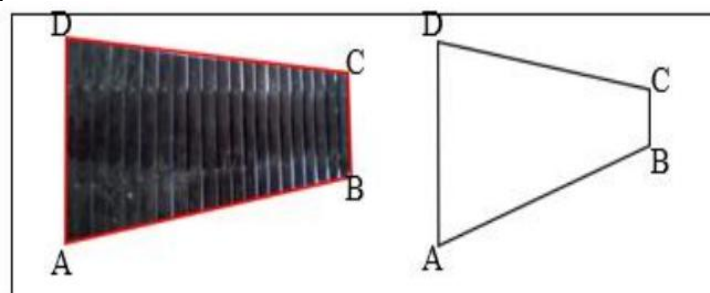


Figure 2. The Trapezoidal Concept in Xylophone



Figure 3. The concept of circle area in Kendang



Figure 4. The concept of a beheaded Cone on a Kenong

Furthermore, material mastery tests were carried out on ethnomathematics-based learning assessment abilities, especially on indicators of assessment principles, assessment results, assessment actors, assessment time, achievement of competencies, ethnomathematical concepts, functions and positions of ethnomathematics. The results can be seen in Figure 5 below:

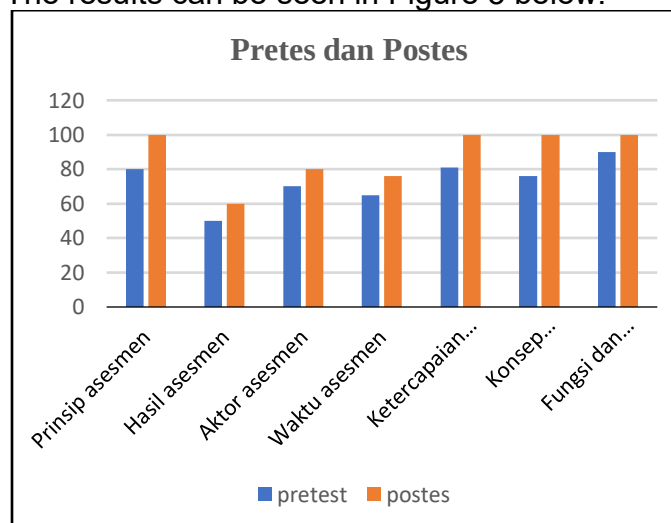


Figure 5 Preetest and posttest

After pretest and posttest are carried out, they are completed in indicators of assessment principles, achievement of competence, ethnomathematical concepts, functions and positions of ethnomathematics, while for indicators of assessment results, assessment actors, assessment time, still need development. Overall, each indicator's ability increased with an average Gain of 17.85 from the initial ability after participating in IbM activities.

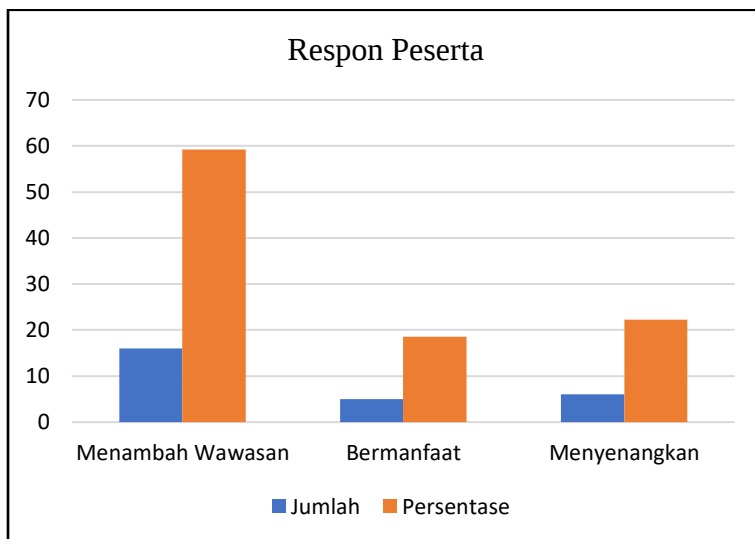


Figure 6. Participant Response to IbM Activities in Number and Percentage

There were 59% of participants stated that this activity added insight to participants with a variety of narratives as follows: adding learning insights, increasing knowledge about the independent curriculum, increasing knowledge about the assessment of students., fun and fun adding insight to scientists, increasing our knowledge as teachers especially for mathematics maple, thank God it can add knowledge, increase knowledge about methods learning, adding insight related to the independent curriculum, adding insight into the assessment of the independent curriculum and ethnomathematics, adding insight into the application of mathematics in life, adding new insights, adding insight to teachers can improve pedagogic abilities, thank God adding knowledge and insight into mathematics, significantly adding insight, beneficial for increasing knowledge of teacher competence, Alhamdulillah can increase knowledge about the independent curriculum

19% of participants stated that this activity was helpful by providing the following narrative: instrumental, thank you, beneficial knowledge, beneficial, very useful for UMP elementary school teachers, helpful, in learning assessment materials for the independent curriculum of culture-based learning. There were 22% of participants welcomed positively and expressed their feelings of pleasure with this activity and gave the following comments: happy and understand mathematics learning with cultural media that has been presented to teachers and employees of SD UMP, happy to participate in this activity, overall the event is packaged interestingly, the material can also be inspiring, especially for teaching and learning activities at SD UMP, The method shared is very good, maa syaa Allah calm discussion, this devotion event is perfect, suitable for concepts in everyday life.

CONCLUSION

The assessment of mathematics learning based on Banyumas art culture is an alternative assessment that accommodates the richness of Banyumas art culture as a context in developing mathematics content. Ethnomathematics-based learning assessment is a form of assessment in contextual learning based on local wisdom. Using ethnomathematics-based assessment can stimulate students to develop their experiences into meaningful knowledge. Through lbM activities, participants' understanding and ability can be improved in developing ethnomathematics-based learning assessments.

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