



DEVELOPMENT OF ETHNOMATHEMATICS-BASED MATHEMATICS LEARNING MODULE (BUGIS CULTURAL TRADITIONAL)

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ABSTRACT

The purpose of this study was to determine the process of developing ethnomathematics-based teaching materials. The reference to the ADDIE development module consists of several phases namely Analysis, Design, Development, Implementation, and Evaluation. The product being developed is in the form of teaching materials, namely modules based on ethnomathematics on quadrilateral material which was tested on 24 class VII SMP Negeri Polebising No. 5 Selayar Island. The instruments used in this study were expert validation sheets, student response questionnaires, teacher response questionnaires, and learning achievement tests. The limited trial carried out, an ethnomathematics-based module on quadrilateral material in class VII SMP Negeri Polebunging No. 5 Selayar Island has met the criteria of validity, practicality and effectiveness.

Keywords: Bugis cultural traditional; ethnomathematics module

1. INTRODUCTION

Education is meant to improve the quality of the generation of a nation which plays an important role for the progress of a country (Qadir et al., 2022). Indonesia as one of the countries in the world makes education a means of progress. Education is closely related to learning (Finariyati et al., 2020). Learning is a process of a person's efforts to be able to achieve a change in behavior within him (Arifin, 2017). These changes can also be in the form of changes in student competencies or skills after learning (Nurhasanah & Sobandi, 2016). One important component in the world of education is the curriculum.

Mathematics is a field of education that is included in the curriculum for all levels of education, starting from the kindergarten level which is taught informally, elementary school to university (Nurulaeni & Rahma, 2022; Savrilia et al., 2020; Susanto, 2013). Mathematics in the world of education, especially in Indonesia, is often not well understood by students and becomes a science that seems to be separate from human life. This often leads to the notion that mathematics is a science that is very difficult, confusing, boring, uninteresting, even useless (Kholil & Zulfiani, 2020; Pramusastrri et al., 2023; Utari et al., 2019). Meanwhile competence in learning mathematics is something that is fundamental and sustainable and is something that is very important to find a solution to a problem. Besides that, culture, tradition, or problems faced by students everyday are the forerunners of mathematics. One that can bridge the gap between culture and mathematics education is Ethnomatematics (Fajriyah, 2018; Lestari, 2019; Rizky & Faizah, 2022).

Ethnomatematics is a form of mathematics that is influenced or based on culture. Through the application of ethnomatematics in education, especially mathematics education, it is expected that students can master mathematical skills which are targeted not to leave their cultural values (Annisa, 2019).

In the revised 2013 curriculum, cultural elements have not been part of the emphasized capacity. mentions one of the objectives of developing teaching materials, that is providing teaching materials that are in accordance with the demands of the curriculum by taking into account the needs of students, that is teaching materials that are in accordance with the characteristics or social environment of students. Teaching materials that can be developed in the learning process are modules.

With the module on ethnomatematics-based mathematics learning, students are expected to know many things about local culture in the archipelago and students can also know that culture has a relationship with mathematics. Therefore the development of ethnomatematics-based mathematics learning modules is very important (Indriyanti & Susilowati, 2010).

Based on the results of pre-research conducted by the author at SMP Negeri Polebung No. 5 Selayar Islands that for mathematics subjects using textbooks as learning media the mathematics educator concerned only asks students in class VII to duplicate (copy) mathematics textbooks. There are still many grade VII students who find it difficult to understand mathematics because the books used do not make it easier for students to understand the lesson. In addition to textbooks, the teaching materials used in the mathematics learning process are LKPD. As for the problems that occurred in class VII students from the results of interviews conducted with the educators concerned, they

said that they were still difficult to understand learning mathematics, especially on the subject of area and perimeter of a quadrilateral.

Therefore the author is interested because the development of modules is developed to minimize difficulties that are understood by students, with the development of ethnomathematics-based mathematics learning modules that contain detailed and clear mathematical material that does not deviate from the competencies to be achieved so that students can learn and easily understand them. . One of the objectives of developing teaching materials is to provide teaching materials that are in accordance with the demands of the curriculum by taking into account the needs of students, namely teaching materials that are in accordance with the characteristics and place or social environment of students. Thus the developed module will assist students in discovering new things so that they will gain more knowledge, activities in facilitating students to always be active in discovering the concepts being studied so that educators can realize the role of facilitator to increase motivation to learn mathematics students who are supported by the enthusiasm and efforts of educators, so that the teaching of mathematics which has so far received less optimal attention from students will later be more cared for by students, so that the objectives of learning mathematics are achieved optimally, find concepts, and involve actively in the learning process and facilitate understanding of mathematical concepts. Based on these problems, the researcher is interested in conducting research with the title "Development of an Ethnomatematics-Based Mathematics Learning Module on the Subject of Area and Circumference of Quadrilateral Class VII SMP Negeri Polebunging No. 5 Selayar Islands".

2. METHODS

This type of research is Research and Development (R&D). The model in this development research uses the ADDIE development design which consists of five stages, namely Analysis, Design, Development, Implementation, and Evaluation (Mulyatiningsih & Nuryanto, 2014). This research took place at SMP Negeri Polebunging No. 5 Selayar Islands. The data collection instruments used in this study were validation sheets, observation sheets on the ability of educators to manage learning, observation sheets of student activities, educator response questionnaires, student response questionnaires, and learning achievement tests. The data that has been collected is analyzed quantitatively and directed to the validity, practicality and effectiveness of ethnomathematics-based learning modules. Data from trials in class are used to explain the effectiveness and practicality of learning modules.

3. RESULTS AND DISCUSSION

The ethnomathematics-based learning module developed in this study refers to the ADDIE development model which consists of 5 stages as follows:

Analysis

The analysis phase is the initial stage in developing the module. At this stage several activities were carried out, namely needs analysis activities, curriculum analysis, and student character analysis

Design

The presentation of the modules is arranged based on the order of the cover, preface, table of contents, concept map, glossary, introduction, learning activities, formative test (evaluation), and bibliography.

Development

At this stage expert validation was carried out by two lecturer validators from the Faculty of Tarbiyah and Teacher Training. The following is a summary of the validation results on research instruments:

Table 1. Validation Results

Validation Sheet	Overall Average Score	Rating
Module	0,94	Very High
RPP	0,93	Very High
Learning Outcome Test	0,88	Very High
Educator Response Questionnaire	0,85	Very High
Student Response Questionnaire	0,89	Very High
Observation sheet of Educator's activities in the Implementation of Learning	0,92	Very High
Student Activity Observation Sheet	0,86	Very High
Average Total Instrument Validity	0,89	Very High

The results of the validator's assessment are in the "very high" this indicates that modules, learning implementation plans (RPP), learning achievement tests (THB), student response questionnaires, educator response questionnaires, observation sheets of student activities, observation sheets of educator activities in the implementation of learning are feasible for use in research.

Implementation

Table 2. Description of Completeness of Achievement of Learning Outcomes Tests

Score	Category	Frequency	Percentage
<75	Not Completed	4	20,8%
75	Complete	20	83,3%

It was seen that the average percentage of students' responses to the implementation of learning with ethnomathematics-based modules as a whole had a value of 89.5% with a very positive category, while for the educator's response a value of 90.8% was obtained with positive category.

From student response questionnaires, student activities and learning achievement tests. The results of the data analysis of the effectiveness components, namely the average student response questionnaire is 89.5% are in the "Very Positive" category, the average percentage of student activity is 73.3% in the "Good" category, and the percentage of student learning completeness is in the high category and achieves classical completeness, namely 83.3% of students complete classic.

Evaluation

The evaluation stage is the last stage of the ADDIE module development model. Evaluation is a process to see whether the learning system being built is successful, according to initial expectations or not. In this study, researchers used essay questions that were used to measure students' understanding after learning using an ethnomathematics-based module. This evaluation is used to measure the level of effectiveness of the module by looking at the scores obtained by students. In the module that has been developed, a summative test is also available in the form of multiple choice which is included with the answer key, so that students can find out whether their answer is right or wrong.

The modules developed using the ADDIE development model are the analysis stage, design stage, development stage, implementation stage, and evaluation stage to produce ethnomathematics based modules on the subject matter of area and circumference. valid, practical, and effective quadrilaterals.

Valid criteria are seen based on the results of validating learning devices in the form of modules with an average of 0.94, student responses with an average 0.89, educator response with an average of 0.85, educator activity in learning implementation with an average of 0.92, learning implementation plans with an average of 0.93, learning

achievement tests with an average of 0.88, and student activities with an average of 0.86. Each of these validity instruments is in the "very high" category, thus the teaching materials and supporting instruments meet the valid criteria. Practical criteria are seen based on the results of an analysis of the responses of educators with an average percentage of 90.8% and the results of an analysis of educator activities in the implementation of learning with an average percentage of 3.72, each of the results of the analysis is in the "very good" category. Thus the developed module meets practical criteria. Effective criteria are seen based on 3 indicators, namely student activity with an average percentage of 73.3% is in the "good" category, student response analysis with an average of 89.5% is in the "very positive" category, and learning completeness students are at a high percentage and achieve classical completeness, namely 83.3% of students complete classically. Thus, the developed module meets the criteria of effectiveness.

Ethnomatematics in learning can help students improve their abilities. Ethnomatematics facilitates students in constructing mathematical concepts with their own knowledge (Richardo, 2016) and strengthens student character education (Agustin et al., 2019). Ethnomatematics can be applied to various materials, such as geometry (Nursyeli & Puspitasari, 2021; Pratiwi & Pujiastuti, 2020), aljebra (Jabali et al., 2020), probability (Lahur & Wewe, 2021), and number patterns (Disnawati & Nahak, 2019) and at various levels, elementary school (Dewi & Agustika, 2022), junior high school (Dimpudus & Ding, 2019), senior high school (Suprana & Farida, 2019), university students (Nisrina et al., 2021). Therefore, ethnomatematics is an alternative in learning mathematics.

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