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ANALYSIS OF THE NEEDS FOR DEVELOPING E-MODULES WITH FLIPPING BOOKS AS ETHNOMATHEMATICS-BASED TEACHING MATERIALS

Fitri Oktaria Pirma*[1], Caswita[2]
[1,2)] Lampung University

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ABSTRACT

This research is research on the development of teaching materials in the form of e-modules based on ethnomathematics. This type is a qualitative descriptive research. The research data collection instruments were form of teacher needs analysis interview sheets, and student needs analysis questionnaires. The teaching material developed is the form of an e-module using a Flipping book. The research subjects consisted of a teacher and 28 grade VIII junior high school students. The results of the needs analysis obtained that 78.6% of students answered that they had textbooks or other guidelines but 61% of students answered that they did not look for learning materials anymore only from school books, as many as 75% of students wanted to learn using teaching materials other than textbooks or worksheets, then as much as 82% answered that the learning media used by teachers didn't contain culture in mathematical concepts, and 71% of students thought that it was necessary to use media e-modules based on ethnomathematics to learn mathematical concepts in culture. These results indicate that it needed to develop teaching materials e-modules based on ethnomathematics.

Corresponding Author:

Fitri Oktaria Pirma,
Departement of Mathematics Education,
Universitas Lampung, Indonesia
Email: fitrioktaria9@gmail.com
Phone Number : 082278304679

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1. INTRODUCTION

Mathematics is one of the fields of science that has an important role in education. The importance of mathematics can be seen from mathematics learning which is one of the compulsory subjects at every level of education in Indonesia as stated in the Law of the Republic of Indonesia Number 20 of 2003 concerning the National Education System article 37 explicitly emphasizes that mathematics learning is one of the compulsory subjects for

students starting from elementary school to high school. This is because learning mathematics is needed in everyday life. Mathematics develops calculating, measuring, and problem-solving skills. All of these abilities aim to enable students to play an active role, in learning mathematics and in everyday life (Rizal et al., 2021). The importance of learning mathematics results in the need for effective and fun learning activities so that the expected learning objectives can be achieved. Efforts to achieve these learning objectives are to create fun learning and in accordance with the learning needs of students, one of which is the use of media. The media used in learning are usually textbooks or teaching materials. Many teaching materials are made not based on student characteristics that contain only a few concepts conveyed in them. Conventional and monotonous mathematics learning often causes students to become bored and uninterested so that innovation is needed in the learning process.

Choosing the form of teaching materials used by students can be seen from the learning conditions of students to be achieved and the disadvantages and advantages of the media to be used. A module is a form of teaching material that is commonly used by students. Currently the module form no longer has to be printed. Electronic module, which means digital or electronic form, is one of the most sought-after alternative forms of books because of several advantages that can cover the shortcomings of the print module, including: namely: 1) Can display the material more attractively. 2) Have interactive features with users, so that users can engage in media. This can reduce the saturation of users. 3) Can be carried anywhere without requiring large space. Because the modules developed can be operated on laptops, PCs, and smartphones. The format of internative electronic modules is now diverse, such as .exe, .epub or swf which has long been known to the public. This flipping book-based interactive electronic module is designed to support classroom learning, namely in mathematics subjects (Aulia et al., 2016). Electronic modules are teaching materials in the form of modules in electronic form that aim to increase student motivation and interest, e-modules that contain the display of images, videos, audio and animation so that they can be used by students independently at home or school.

Flipping book means a book or module that has a flip effect (rotating or flipping), causing animation as if turning the actual book sheet. Using flipping books is very easy, as well as reading other digital books that have been widely used such as digital books in pdf format. The only difference is how to read which can be done by flipping every corner of the sheet before and after with the help of a mouse or certain buttons. The flipping book to be designed uses Flip PDF Professional software.

Flip PDF professional is an interactive media that can easily add various types of aninative media to the flipbook. With just drag, drop or click, we can insert youtube videos, hyperlinks, animatic text, images, audio and flash into the flipbook. The features provided are very diverse, so that during development, the content of flipping books can be adjusted. The combination of text, images, audio, video makes making interactive digital books easier and provides interesting results (Aulia et al., 2016).

Technological advances make students vulnerable to forgetting the culture in Indonesia. Students tend to prefer learning through electronic media such as the internet and gadgets that mostly access foreign cultures. Education and culture according to (Yulia & Muchlian, 2019) are things that cannot be separated in everyday life. In Indonesia, the curriculum is adapted to contexts such as culture and life. The need for an attitude of respecting and combining cultural knowledge with life practices, so that people are inseparable from the original culture of Indonesia which is full of noble values. One way to teach culture to students is through mathematics learning (Purwoko et al., 2020).

Ethnomathematics is a form of learning approach that links local culture in mathematics learning. Ethnomathematics in this study focuses on the Lampung Traditional House and also traditional Lampung cakes. Lampung Traditional House and Lampung traditional cake can be connected in mathematics material build flat side room. So it is expected that students can learn mathematical concepts and cultural values that can name good character in students.

Research related to the development of ethnomathematics-based teaching materials has been carried out by many previous researchers. His research (Rudyanto et al., 2019) shows that the development of ethnomathematics-based learning tools can provide solutions for mathematics teachers to innovate mathematics learning. Similarly (Purwoko et al., 2020) shows that teaching materials such as electronic-based modules need to be developed because students do not always learn to use teaching materials in general, it is hoped that by using fun teaching materials such as electronic modules, students are able to change their opinions and views that mathematics is a difficult but fun subject. Meanwhile, the quadrilateral material can be arranged by applying ethnomathematics to it, namely the cultural products of Central Java.

Based on the above problems, a new breakthrough is needed to make it easier for students to understand mathematical material by linking the material learned at school and ethnomathematics and utilizing technology in the learning process. Therefore, researchers conducted a research analysis of the needs of developing ethnomathematics-based mathematics e-modules with FlippingBook.

2. METHOD

This study uses qualitative descriptive method which aims to analyze the need for ethnomathematics-based e-modules. Qualitative descriptive research describes, describes, explains, explains, and answers in more detail the problem to be studied by studying an individual, an individual, or an event. The descriptive approach is used based on the consideration that the problems to be studied are ongoing now which aims to analyze the phenomena that occur in the field (Afriliziana et al., 2021).

This research was conducted at SMPN 3 Tulang Bawang Barat with the subjects in this study being grade VIII students as many as 28 students. Data collection techniques in this study used questionnaires and interviews. Data analysis using Analysis Interactive from Miles & Huberman (Emzir, 2014), analysis consists of three lines of activities that occur simultaneously, namely: data reduction, data presentation, conclusion drawing / verification. The stages of data analysis in this study are

as follows; (1) record all findings of the phenomenon through an interview with a grade VIII mathematics teacher of SMPN 3 Tulang Bawang Barat. This is done to determine the analysis of teaching material needs to be developed in the form of e-modules based on Lampung cultural ethnomathematics, (2) after collecting data, then the data is reduced by analysis that sharpens, classifies, directs, discards unnecessary, and organizes data in such a way that final conclusions can be drawn and verified, (3) describe data that has been classified with attention to focus and purpose research, (4) make a final analysis in the form of a research report.

3. RESULTS AND DISCUSSION

The needs analysis refers to the conditions that exist in the school, namely at SMPN 3 Tulang Bawang Barat. This analysis is needed to find out whether the media really needs to be developed or not. Needs analysis is carried out in two stages, namely the distribution of

questionnaires to students to find out whether students want to learn using electronic module teaching materials or not and an interview with a mathematics teacher. From the distribution of questionnaires to 28 respondents, data on the results of student response questionnaires were obtained which are described below:

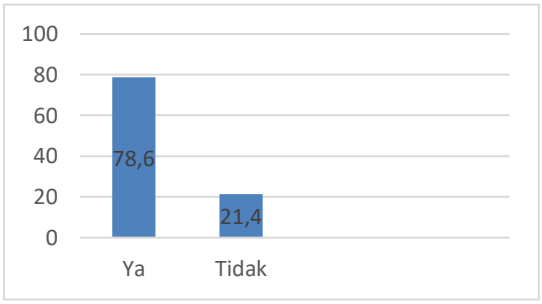

Figure 1. Student Response to Question 1

Based on figure 1. The results of the questionnaire that has been given to grade VIII students to the first question is "Do you have textbooks or other handbooks to study at school?". Figure 1 shows that 78.6% of students answered that they had textbooks or other manuals such as printed books and students answered that they did not have manuals or other manuals for learning as many as 21.4%.

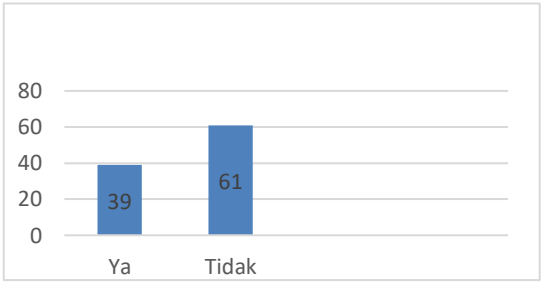

Figure 2. Student Response to Question 2

Based on diagram 2 which illustrates the results of the questionnaire that has been given to grade VIII students on the second question, namely "Are you looking for learning materials other than books from school to study?", as many as 39% of students answered that they were looking for learning materials again other than books provided by the school and 61% of students answered that they were not looking for learning materials anymore only from school books to study.

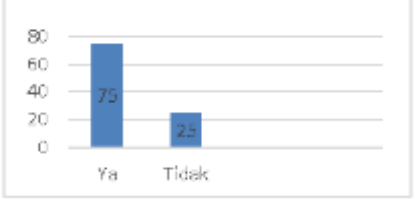

Figure 3. Student Response to Question 3

In figure 3. describing students' responses to the question "Do you want to learn using teaching materials other than textbooks or LKS?", as many as 75% of students want to learn using teaching materials other than textbooks or LKS and as many as 25% of students do

not want to learn using teaching materials other than textbooks or LKS. This shows that students want other teaching materials besides textbooks or LKS so that they are able to understand learning materials both individually and in groups.

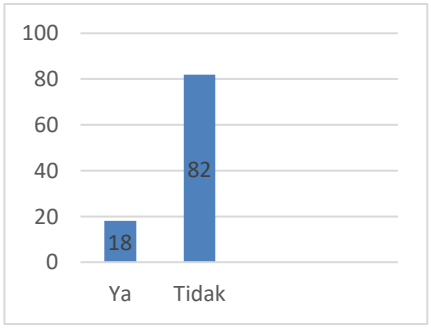

Figure 4. Student Response to Question 4

Based on figure 4. The results of the questionnaire on the fourth question were "Does the learning media used by teachers already contain culture in their mathematical concepts?", in the opinion of grade VIII students as many as 18% of students said the learning media used by teachers already contained culture in their mathematical concepts and 82% answered that the learning media used by teachers did not contain culture in mathematical concepts.

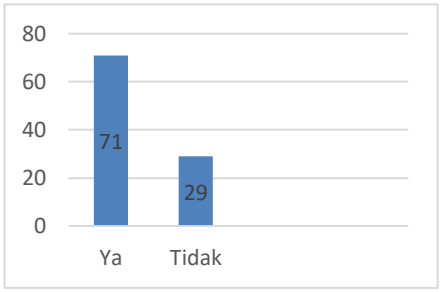

Figure 5. Student Response to Question 3

Based on figure 5. Regarding students' responses to the question "Do you think it is necessary to use learning media in the form of e-modules to learn mathematical concepts in culture?", as many as 71% of students thought that the use of learning media in the form of ethnomathematics-based electronic modules was needed to learn mathematical concepts in culture and as many as 29% answered unnecessary.

The results of observations and interviews with teachers stated that the curriculum used was the 2013 curriculum, the teaching materials used were government package books and LKS. The package book is a compulsory book that must be used in schools in Indonesia. The existence of the 2013 curriculum-based government package book in schools is very helpful for teachers in the learning process. All the material contained in it is so complete and contains a lot of problem solving which really helps students to improve problem solving skills. However, the 2013 curriculum turned out to be able to cause problems, namely the unpreparedness of students for teaching materials or package books based on the 2013 curriculum. Students still find it difficult with abstract problems in the textbook that must be solved by students and the level is too high for students to make it difficult to understand. The learning process at school is adjusted to the level of student development. Because learning activities that are not in accordance with the level of student development make learning activities ineffective. In practice, teachers often use only one textbook. Meanwhile,

it is known that textbooks do not discuss widely and deeply, so they cannot help develop students' ideas and concepts fully.

Based on interviews, information was also obtained that the use of mathematics learning media is still lacking and there is no application of electronic-based teaching materials as learning media. Teachers only provide assignments and materials or just convey learning through printed books. This shows that there has been no innovation in electronic teaching materials developed such as e-modules. Because there is no teaching media innovation other than printed books, this has an impact on low student motivation in learning activities. Students feel bored due to monotonous learning. This can be seen from the decline in students' daily test results. The use of ICT in learning aims to improve their desired teaching methods and approaches to achieve effective learning activities as well as to meet the challenges of 21st century teaching skills (Ghavifekr & Rosdy, 2015). Teaching materials such as electronic modules need to be developed because students do not always learn to use teaching materials in general, it is hoped that by using fun teaching materials such as electronic modules, students are able to change their opinions and views that mathematics is a difficult but fun subject. It is hoped that mathematics teaching materials in the form of electronic modules can make students happy and enthusiastic to learn mathematics, and are also expected to increase their insight into the culture around them. Not only that, the learning method used is the question and answer method and discussion. The use of methods in mathematics learning must be adjusted to the material to be delivered in learning, the time needed, and the teacher's ability to master the method. Good mathematics learning requires the use of varied learning media.

Material analysis is carried out by examining the subject matter to be taught. The material analysis was also based on the results of an interview with a mathematics teacher of SMPN 3 Tulang Bawang Barat who supervised class VIII by selecting the appropriate material and systematically rearranging it. The material used is adjusted to the Syllabus, Learning Implementation Plan (RPP), and mathematics books written by the Indonesian Ministry of Education and Culture so that learning objectives are achieved. The results of the material analysis stated that the material to be taught for the even semester of class VIII is to build a flat side room. The material of building a flat side space can be arranged by applying ethnomathematics to it.

In the process of distributing the questionnaire, another fact was obtained that at first glance was not seen directly, namely the fact that students were still lacking in elements of manners and cultural elements, this could be seen from how they talked to their teachers, talked to people older than them. Learning models with ethnomathematics-based approaches have not been used in learning. D'Ambrosio illustrates that mathematics is very broad when connected in life that can be practiced among identifiable cultural groups, such as ethnic groups, working groups, children of a certain age and professional classes. Ethnomathematics is a field that studies the ways in which humans from different cultures understand, pronounce and use concepts from their cultures related to mathematics. So that in ethnomathematics it can be studied how people understand, express and use cultural concepts that are described mathematically (Hariastuti, 2017). Sirate explained that learning that is associated with culture and tradition will motivate students to obtain meaningful learning. Ethnomathematics is learning by integrating mathematical concepts and practices with cultural elements and traditions that can increase students' understanding. This is as according to (Himmatul & Rahayu, 2017) that students will more easily understand mathematical concepts through culture-based learning. Through the application of ethnomathematics in education, especially mathematics education, it is hoped that later

students can master targeted mathematical abilities without leaving their cultural values. Applying ethnomathematics as a learning model will greatly allow the material learned to be well understood.

Based on the above explanation and the field conditions, it is necessary to design an ethnomathematics-based mathematics E-Module teaching material to facilitate students during the mathematics learning process.

4. CONCLUSION

Based on the results of research and discussion, it can be concluded that the development of ethnomathematics-based e-modules is important to be carried out according to the needs of teachers and students of SMPN 3 Tulang Bawang Barat. Based on the results of a questionnaire conducted on 28 respondents or students of SMPN 3 Tulang Bawang Barat, 78.6% of students answered that they had textbooks or other handbooks such as printed books, but 61% of students answered that they did not look for learning materials anymore only from school books to study, as many as 75% of students wanted to learn using teaching materials other than textbooks or LKS, Then as many as 82% answered that the learning media used by teachers did not contain culture in mathematical concepts, and as many as 71% of students thought that the use of learning media in the form of ethnomathematics-based electronic modules was needed to learn mathematical concepts in culture.

Based on the results of an interview conducted with one of the educators at SMPN 3 Tulang Bawang Barat and the discussion above, it was concluded that the availability of package books in schools still poses problems for students. Students find it difficult with abstract problems in the textbook that must be solved by students and the level is too high for students to make it difficult to understand. So that teachers and students need teaching materials in the form of modules to support books at school. The conclusions obtained are: Students need a learning resource to be able to strengthen understanding Students are exposed to mathematics subjects and need learning resources that can be understood independently. So that what is suitable for use is ethnomathematics-based e-module teaching materials that can contain text, images, and videos.

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