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THE EFFECTIVENESS OF USING ETHNOMATEMATICS-BASED STUDENT WORKSHEETS (LKS) IN MATHEMATICS LEARNING AT SMPN 1 DENPINA

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Abstract
One of the ways teachers design a learning environment is to use the right media in teaching a concept so that the concept is easily accepted and understood by students. Therefore, the author offers a solution to use the media or learning resources that exist in the environment of the students in this case ethnomathematics. There has been a lot of research from UKI Toraja that the culture of the Toraja people is rich in ethnomathematics. Therefore the author was inspired to use this in mathematics learning. In this study ethnomathematics will be packaged in student Worksheets. This is considered very appropriate because LKS, which contains instructions for the stages of solving a problem, will challenge students to solve it or find a concept in an interesting way because it uses media in Toraja culture, which is inseparable from the lives of students at SMP 1 Denpina or it can be said that the students are familiar with it. LKS which is based on Ethnomathematics, apart from being a learning medium that helps teachers convey messages to students, the use of ethnomathematics in learning is one way to maintain the local wisdom of the Toraja people so that the younger generation who are currently in the digital era still understand and even maintain the culture they have. This study aims to apply ethnomathematics-based student worksheets in mathematics learning in Schools. The research method used is a quantitative research method. Where in the stages, the author will design student worksheets based on ethnomathematics, then test its validity after it is used in the learning process and during the learning process, student activities will be observed to see the level of student activity during learning using LKS developed by the author. After the learning process is complete, students will be tested using a learning outcomes test. From the results of the study, it was found that the use of ethnomathematics-based LKS in grade VII students of SMPN I was effective, this can be seen from the learning outcomes and activities of the students studied meeting the effective criteria.

Keywords : Ethnomathematics, Media, and Worksheets.

INTRODUCTION

A teacher is required to be able to design or manage learning that can make students able to learn optimally. Therefore, a teacher must have reliable pedagogic competence in maximizing all elements that can support a meaningful learning process, which can make students learn optimally. According to Hurit et al (2021) learning is a thought process and changes through several stages of practice repeatedly. In that thought process, the teacher designs a learning environment that can allow students to learn to the maximum. The environment in this case can be those objects that allow the individual to gain experiences or knowledge. This is important to pay attention to because the environment designed by the teacher in managing learning greatly affects a person's learning activities.

Based on the explanation above, one of the ways teachers design a learning environment is to use the right media in teaching a concept so that the concept is easily accepted and understood by students. This is in line with Sundayana's opinion [2] which states that the media as a tool or the like that can be used as a messenger in a learning activity. One of the subject matter that really needs learning media in teaching it is mathematics. As is known that mathematics is an abstract science so that there are various kinds of problems or obstacles experienced by teachers and students in teaching and learning abstract concepts. Teachers have difficulty how to teach mathematics which has a character that is difficult for students to understand so most students consider it a very scary scourge as a result of the many formulas that they must know or master. And furthermore, on the part of the students, they are lazy to study this subject because it is considered something boring.

The above problems are also experienced by students and teachers at SMPN 1 Denpina, this is marked by the achievement of learning mathematics at the school. Most of them have not been able to achieve minimal completion before remidial. From this problem, one way to minimize designing interesting learning, one of which is the use of learning media in this case student worksheets (LKS) based on ethnomathematics. This is considered very appropriate because ethnomathematics in Toraja society is an inseparable part of the lives of students at SMP 1 Denpina or it can be said that the students are familiar with it. LKS which is based on ethnomathematics, apart from being a learning medium that helps teachers convey messages to students, the use of ethnomathematics in learning is one way to maintain the local wisdom of the Toraja people so that the younger generation who are currently in the digital era still understand and even maintain their culture.

Furthermore, according to Remme' and Yusem [3] in One of the forms of ethnomamatics in Toraja society is the discovery of various geometric concepts in Toraja carving such as geometry such as circles, squares, squares, triangles, rhombuses, symmetry, reflections, parallel lines, right angles and so on. Based on the background above, the author is interested in researching whether the results of research on ethnomathematics in Toraja society are effectively used in mathematics learning in grade VII students of SMPN 1 Denpina?

Mathematical Definitions

According to Ruseffendi in (Siagian:2016) says that "The word mathematics comes from the Latin word mathematika which was originally taken from the Greek word mathematike which means to study. The word has the origin of the word mathema which means knowledge or science (knowledge, science). The word mathematike is also related to another word that is almost the same, namely mathein or mathenein which means to learn (think). So, based on the origin of the word, then the word mathematics means science obtained by thinking (reasoning)". From this opinion it can be understood that mathematics has characteristics that emphasize the activities that proceed to be able to understand it. In the process activity, a person is asked to reason or think about how a mathematical conclusion is obtained. This is important because mathematical science is structured from elements that cannot be defined, some that can be defined, axioms, and postulates that must be proven to be true.

Student Worksheet (LKS)

Student Worksheets are one of the learning resources or media that can be used by teachers to convey messages to students. This LKS aims to make it easier for students to conduct experiments sequentially. The provision of an experimental procedure in this LKS is in accordance with the guided inquiry method, which is to direct students to find or apply their own ideas but still under the guidance of the teacher. In LKS there are also questions that aim to help students achieve the desired competencies. The many components of content and questions in LKS aim to make students work in groups optimally (Astuti 2013:90)

From the above opinion, student worksheets are very important in the learning process because they can help students and teachers. Therefore, looking at the current mathematical problems, it would be more appropriate if the teacher designed an LKS that makes learning not monotonous but makes

learning challenging and it will make students motivated in learning so that it will have an impact on the learning outcomes obtained by students. Student worksheets will provide an opportunity for students to find for themselves the concepts they will learn because through the research carried out with the help of the steps in the student worksheet, the knowledge gained will be more meaningful and will last a long time in the student's memory.

Furthermore, according to (Madjid 2012) Student Worksheets are usually instructions, steps to complete a task. A task ordered in the Student Worksheet must be clear of the basic competence to be achieved. Student Worksheets can be used for any subject including mathematics. The tasks of an activity sheet will not be able to be done by the learner properly if it is not equipped with other books or other references related to the material of the task.

The use of Student Worksheets in the mathematics learning process is intended so that each student is invited to learn to find mathematical concepts independently or in groups. With the help of ethnomathematics-based LKS, it is hoped that the problems of mathematics learning in schools can be minimized.

Ethnomatics

According to Supriadi in Wahyun, et al said that culture-based learning is a learning approach model that prioritizes the activities of students with various cultural backgrounds owned, integrated in the learning process of certain fields of study, and in the assessment of learning outcomes can use various embodiments of assessment. Furthermore, it is said that the process of creating meaning through a culture-based learning process has several components, namely meaningful, interactive tasks, explanations and contextual application of knowledge, and the use of various learning resources.

Furthermore, Shirley in (Marsigit et al 2018:23) is of the view that currently the field of ethnomathematics, namely mathematics that grows and develops in society and is in accordance with local culture, can be used as a center for learning processes and teaching methods, although it is still relatively new in the world of education. It goes on to say that Ethnomathematics serves to express the relationship between culture and mathematics. Thus, ethnomathematics is a science used to understand how mathematics is adapted from a culture.

From the opinions of the two opinions above, it can provide an illustration that the use of ethnomathematics in mathematics learning strongly supports the process approach to understanding a mathematical concept because it prioritizes student activity. In addition, ethnomamatics in mathematics learning is a way for teachers to use contextual learning approaches. Where in the contesttual approach students will be invited to relate what they learned to the real world of the students themselves.

Effectiveness

Effective according to the big dictionary Indonesian, means that there is an effect (consequently, its influence, its impression, bringing results or being successful in terms of effort, action. Referring to this, it can be understood that something is said to be effective if it is able to have a positive influence, maybe so far the thing done has an unexpected result but, with a treatment or action, the result is as expected, the treatment or action is called effective.

From the definition above, if it is interpreted that in learning activities, a model, method, approach, strategy, learning resources, learning media and even all learning tools are said to be effective if they are able to provide good results or provide influence and succeed in order to bring changes in learning.

Furthermore, Halima and Will One of the indicators of learning effectiveness is the achievement of a learning goal. Learning objectives are achieved to the maximum, so it can be said that learning achieves its effectiveness. On the other hand, active student engagement demonstrates learning

efficiency. The teaching and learning process is said to be effective if the learning can achieve the expected goals and students can absorb the subject matter and practice it.Based on the opinions above, the effectiveness referred to in this study refers to the effectiveness indicators above, namely the achievement of learning objectives and student activities. The achievement of tu juan learning in this case the learning outcomes of students who achieved even surpassed KKM at SMPN 1 Denpina School.

Learning outcomes

Learning outcomes are a value or score obtained by students to provide an overview of the extent to which students have understood the material that has been delivered in certain learning activities. Basically, learning outcomes are generally divided into three domains, namely the cognitive, affective and psychomotor domains.

Student activities

According to Dierich (There are 8 indicators that need to be considered in student activity, namely:

1. Viewing (visual) activities: reading, looking at pictures, observing experiments, demonstrations, exhibitions, observing others working, or playing
2. Oral (oral) activities: bringing up a fact or principle, connecting an event, asking questions, giving advice, expressing opinions, interviewing, discussing.
3. Listening activities: listening to the presentation of material, listening to a conversation or group discussion, listening to a play of a musical instrument, listening to a radio broadcast.
4. Writing activities: writing stories, writing reports, writing essays, sketching or summarizing, taking tests, filling out questionnaires.
5. Drawing activities: drawing, making graphs, diagrams, maps, patterns, and so on.
6. Metric activities: conducting experiments, selecting tools, carrying out exhibitions, creating models, organizing games (simulations), dancing, gardening.
7. Mental activities: pondering, remembering, solving problems, analyzing factors, finding relationships, making decisions.
8. Emotional activities: interest, discernment, courage, calm, and so on

In this study, the authors examined student activities in viewing activities, oral activities, writing activities, listening activities, and mental activities. Of the five activities studied for student activities, appropriate indicators were determined, namely, Paying attention to the teacher who is teaching, daring to argue, listening to the opinions of friends in discussions, writing lesson summaries and thinking quickly and precisely.

RESEARCH METHODS

The type of research used is quantitative research. The research design was designed by means of samples being treated by teaching them using ethnomathematics-based LKS that had been developed by the author, after completing several LKS according to the subject matter, they were tested using a learning outcomes test.

Population and Samples

1. Population
   The population of this study was all students of SMPN 1 Denpina which consisted of two classes, namely class VIIa and VIIb.
2. Samples
   The population in this study was at the same time a sample (saturated sample).

Research Instruments

The instruments used in this study were learning outcome tests and student activity observation sheets. This learning outcomes test aims to determine the level of student ability after being given treatment. This test analyzed what kind of learning outcomes from the average group of students were to determine that the LKS developed by the author was effectively used in mathematics learning at SMPN 1 Denpina. Student activity observation sheet**.** Student activity observation sheets are used to see how the activities of students of SMPN 1 Denpina if they use ethnomathematics-based LKS. This observation sheet was developed from 5 indicators of learning activity and further made into 10 items of statement as developed. The data collection techniques used in this study are test and observation techniques.

Data Analysis Techniques

The effectiveness of using ethnomathematics-based LKS can be measured from the test results and the level of student activity in learning.

1. Learning outcomes data

   From the results of the analysis of learning outcomes, it can be used to answer the effectiveness of the use of LKS in the learning process. The average results of learning outcomes were then analyzed by comparing the KKM scores set by the school. If the average learning outcomes obtained by students after studying using LKS Minimum completion criteria set by the school, it can be said that the LKS is effective at SMPN 1 Denpina.

Table Minimum Completion Criteria for Mathematics Subjects at SMPN 1 Denpina.

Class	KKM
VII	65
VIII	68

2. Student activities

Mirdanda 2019 [12] states that learning activities are learning activities. Students who study can be sure to have learning activities. Learning activities are efforts made to form oneself through activities that are carried out physically.Based on the student activity observation sheet, the student activity score is obtained through the following equation:

$$skor\ aktivitas\ siswa = \frac{jumlah\ skor\ perolehan\ siswa}{skor\ maksimum} \text{ x } 100$$

Furthermore, the percentage score of student activity is referred into the student activity category according to Purwanto in Merry [10] as follows:

Table: Student Activity Categories

Score (%)	Category
81-100	Excellent
61-80	Good
41-60	Good enough
21-40	Less
0-20	Very lacking

Furthermore, if the average student learning outcomes are greater or equal to KKM and student activities are at least in the good category, it can be concluded that ethnomathematics-based Student Worksheets (LKS) are said to be effective in mathematics learning.

EXTERNAL RESULTS ACHIEVED

Description of Learning Outcomes
Descriptively, the results of the study in terms of learning outcomes of grade VII students of SMPN I Denpina are as follows:

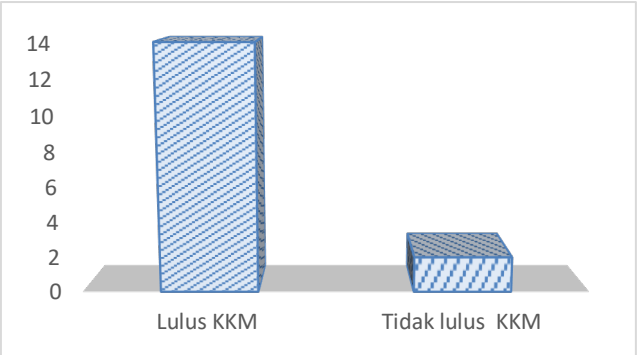
Table descriptive learning outcomes of Class VII SMPN I Denpina

No	Descriptive Learning Outcomes	Value
1	Top Value	88,6
2	Lowest Value	63,87
3	Average learning outcomes	80,11

From Table above, it can give an idea that the evaluation carried out after giving treatment that of the sixteen students who were sampled in this study, information was obtained that the highest score obtained was 88.6 and the lowest score was 63.87.

Furthermore, if viewed from the success of students graduating from KKM which has been set by the school, namely 65, then an overview of the number of students who have passed KKM can be seen in the following chart:

Figure 4.1: Overview of KKM Achievement by Grade VII Students of SMPN Denpina

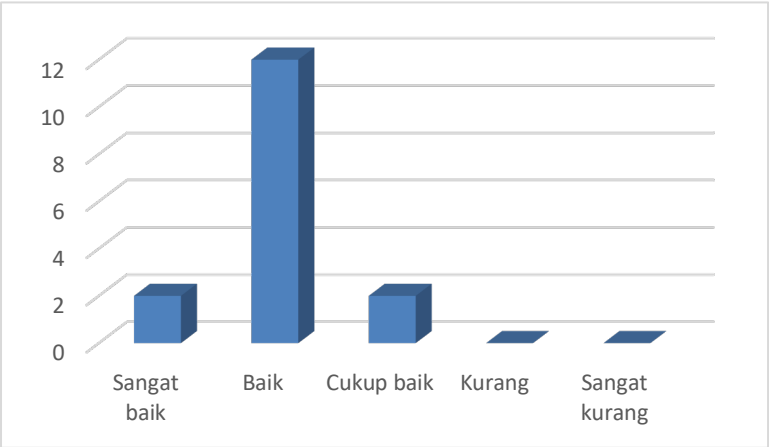


Based on the table and graph above, if viewed from the learning outcomes, it can be said that the use of ethnomathematics-based LKS at SMPN I Denpina is effective.

Student Activities

Measurement of student activity is carried out using an observation sheet consisting of 10 statement items. During the learning activities, the observatory observes all student activities. Measurement of each item of student activity, refers to the likert scale of 1-4. Furthermore, descriptively the results of observations from the result of research can give an idea that the evaluation carried out after giving treatment that from the sixteen students who were sampled in this study, information was obtained that the highest activity score obtained was 82.5 and the lowest score was 60. Furthermore, an overview of the number of students in each category of student activity can be seen in the following graph:

Figure : An Overview of Achievements in Each Category of Activity of Grade VII Students of SMPN I Denpina



Based the result research when viewed from learning activities where the average student activity is at a good cathegoti, it can be said that the use of ethnomathematics-based LKS at SMPN I Denpina is effective.

CONCLUSIONS AND SUGGESTIONS

Conclusion

Based on the results of the previously described research, it can be concluded that the use of ethnomathematics-based LKS at SMPN I Denpina is effective, this is because the two criteria that have been set to achieve effectiveness are met. From the average learning outcome, it is 80.11 and it is greater than the KKM score that has been determined by the school, which is 65. Furthermore, the activities of grade VII students of SMPN I Denpina when taught using ethnomathematics-based LKS obtained an average of 73.91 which was in the good category.

Suggestion

1. Teachers should design learning by paying attention to cultural aspects of students, because this is considered to help students in learning.
2. In order to make the learning process more efficient, the effectiveness of ethnomathematics-based mathematics student activity sheets (LKS) should be adjusted to the allocation of time.

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