

## **Development Of Teaching Materials With Dayak Kanayatn Traditional Tool Context On Mathematical Connection Ability In Class V Students Of SD Negeri 06 Ngabang**

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### **ABSTRACT**

This study aims to develop and assess the quality of mathematics teaching materials with the context of traditional Dayak Kanayatn tools on the ability of students' mathematical connections on valid, practical, and effective two dimensional figure. The type of research used is Research & Development (R&D) research with reference to the 4-D model, namely Define, Design, Development, and Disseminate. The test subjects in this study were grade V students of SD Negeri 06 Ngabang with a total of 22 students. Based on the results of limited trials conducted, it was found that 1) the results of the validation of teaching materials were 76.97% in the valid category, 2) the results of practicality based on observations of the implementation of teaching materials developed showed that teaching materials with very practical categories, 3) the results of the effectiveness of the materials teaching is 73.33% with the effective category. So it can be concluded that at the limited trial stage a mathematics teaching material is carried out in the context of the traditional Dayak Kanayatn tool that has met the criteria of validity, effectiveness, and effectiveness of the ability of mathematical connections

**Keywords:** development, teaching materials, traditional tools, mathematical connections

### **INTRODUCTION**

Education is a very important thing in human life. Therefore, improvements are made to achieve better education. To support the creation of better education, we need a media that can provide knowledge information accompanied by ease of interaction in accordance with the mindset of students which is useful for developing independent learning skills in accordance with student interests.

Education in practice cannot be separated from cultural values, especially in maintaining and preserving one's own culture. The purpose of education is to preserve and enhance the culture itself. This means that education and culture have a very close relationship. According to Liliweri (Septian, 2002: 108) Culture is the accumulation of all beliefs and beliefs, norms, institutional activities, and communication patterns of a group of people.

An example of this research is the Dayak Kanayatn ethnic group which has a culture that is quite unique, especially in traditional tools. The traditional tools of the Dayak Kanayatn tribe of the Landak District are tools used in daily life or in certain traditional ceremonies of the Dayak community with various kinds of uses which are at the same time a symbol of an area. This unique culture should be able to be raised and developed as teaching material in learning mathematics in schools.

The traditional dayak kanayatn tools have previously been studied by the mathematical concept by Tandililing Edy (2013). Tandililing explained the traditional tools of the Dayak Kanayatn which contained mathematical concepts including, Tanggoi, mat, shield, nyiro ', and many others. Almost all of these traditional tools have geometrical concepts, especially for school students, that is, building space and getting up flat, therefore the results of the research must be applied at school, so that mathematics learning has a local wisdom context and in this case is related to the culture of Dayak Kanayatn culture.

To realize a better education the government seeks to make improvements including by improving the 1994 Curriculum to the 2004 Curriculum and finally to the Education Unit Level Curriculum (KTSP) 2006 and until now the government rolled out the 2013 Curriculum with the aim of bettering education in Indonesia.

However, curriculum improvements made will not be able to realize output or better results if it is not supported by adequate teaching materials. One important problem that is often faced by teachers in learning activities is to choose or determine the right teaching materials in helping students achieve competence. Therefore it is important for a teacher to be able to float teaching materials in supporting the effectiveness and efficiency of learning. So that things that become the goal in learning can be achieved properly. In addition, teachers can adjust teaching materials to the characteristics and problems that are being faced by their students.

With the availability of teaching materials that are in accordance with the characteristics and problems of students, the teacher is more focused in carrying out his role as a facilitator who guides and directs students in learning. As explained by the Ministry of National Education (2008: 6) that the function of teaching materials in learning is a) Guidelines for teachers who will direct all their activities in the learning process, as well as being the substance of competencies that should be taught to students; b) Guidelines for students who will direct all their activities in the learning process, as well as being a substance of competencies that should be learned / mastered; and c) Tools for evaluating the achievement / mastery of learning outcomes.

So the purpose of developing teaching materials in this research is to increase the active role of students in learning, so students can achieve the competencies that must be achieved and possessed in mathematics, namely competence in mathematical connection abilities. In this case the learning material is never associated with real life situations or daily lives of students, even though there are many things related to mathematics in their daily lives, therefore for students mathematics is an abstract thing. This has an impact on the learning process that causes a lack of mathematical connection for these students.

Based on the 2013 curriculum (Ministry of Education and Culture, 2014), the purpose of learning mathematics is "that students understand mathematical concepts, explain the interrelationships of concepts and apply concepts or algorithms flexibly, accurately, efficiently, and precisely in problem solving.". 83

Based on the learning objectives above, one aspect emphasized by the National Board of Mathematics Teaching (Minarni, 2012) is the ability of students' mathematical connections and mathematics learning that is prepared so students can solve future problems by connecting Problems with mathematical concepts and other scientific fields, so what what has been learned in school is beneficial in life.

Mathematical problem solving is a student activity that builds students' mathematical connections, this happens because in solving mathematical problems students must have the ability to find the connection of concepts or theorems used to determine the solution of a problem, this ability is said to be a mathematical connection. NCTM (2000: 64) formulates that when students are able to connect mathematical ideas, their understanding of mathematics becomes deeper and more durable. Students can see that mathematical connections play an important role in topics in mathematics, in contexts that connect mathematics and other subjects, and in their lives. Through learning that emphasizes the connectedness of ideas in mathematics, students not only learn mathematics but also learn to use mathematics.

In this research, the writer takes the context with the traditional tools of the Dayak Kanaytn tribe so that students can better know the relationship of mathematics with other things, for example the traditional tools of the Dayak Kanaytn. But in reality, in learning, students still find it difficult to connect the material they learn with the prerequisite material that they have mastered. The concepts that have been learned do not last long in students' memories, consequently their connection skills are not optimal. According to Afifah (Badjeber and Fatimah, 2017: 2), if students have been able to observe the relationship between concepts, principles or procedures correctly and are able to provide arguments to explain this, students will gain a deeper understanding and also increase their confidence. Therefore, for students to be more optimal in learning mathematics, they must be given the opportunity to better understand and use these relationships.

In this study the authors took the material to build a flat with sub rectangular and circular material where this material is one of the material that will be discussed in learning in class V odd semester. There are several things students must master in rectangular and circular material, namely: students must know the meaning, properties of rectangles and circles, and students must be able to solve problems around the area and area of rectangles and circles. Rectangular and circle material is only used as a research sample to test the teaching material developed in the field.

One of the traditional Dayak kanaytn tools related to teaching materials in the material is flat and the writer will use in this research is galakng whose function is as a decoration that is commonly used when dancing. It can be seen from its shape which resembles a circle. Galakng is usually made of woven rattan, the second one is Sake '(mat), which functions as a base for drying rice or it can also be used as a cushion for dayak people. Sake '(mat) is made from forest pandanus leaves which usually have small thorns on the sides, then the leaves are dried and thrown away the thorns first, after which they are woven. Seen from the

shape Sake '(mat) is shaped like a rectangle, then the pattern found on Sake' (mat) resembles the shape of a diamond.

Based on the description of the facts of the problem following the study of the theory, the purpose of this study is to produce mathematics teaching materials for elementary students in accordance with the problems in mathematics learning and can be applied when teaching and learning, the authors are interested in raising the title of the research "Development of Materials Teaching With the Context of Traditional Dayak Kanayatn Tools on Mathematical Connection Capabilities in Grade V Students of Ngabang 06 Public Elementary School."

## RESEARCH METHOD

This type of research is a research development, namely m, engem, develop mathematical teaching materials. The research method used is research and development (research & development) which will be tested at school to see whether the teaching material is appropriate or not. In the development and evaluation stages, trials of products that have been developed are carried out. The intended trial includes an expert and practitioner test that aims to explore suggestions and assessments of the developed teaching materials, test the practicality of teaching materials by teachers and students, and field trials. This research was conducted at 06 Ngabang Public Elementary School in November 2019. The subject of the trial was limited to class V (five) A.

Based on the results of expert and practitioner tests and practicality tests, teaching materials developed were then revised for the purposes of field trials. The results of field trials in the study were made as a basis for evaluation and improvement of teaching materials so that the final product was produced.

The development model used was adapted from the Teaching Model (1974) with reference to the 4-D model, namely Define, Design, Development and Disseminate (deployment). The steps of development research can be seen in Figure 1.1 below:



**Figure 1.** 4-D Development Model



**Figure 2.** Research Procedur (Yuliza, 2018: 31)

But in this study only reached the third stage, namely the development stage (development) because of limited time, cost and energy.

## RESULTS AND DISCUSSION

### Result

Development of teaching materials with the context of traditional Dayak Kanayatn tools on mathematical connection capabilities in flat build material in class V students at SD Negeri 06 Ngabang using this type of research & development, the researchers took a limited trial subject in class V (five) A.

The first stage in this research includes student analysis and needs analysis, so that conclusions can be drawn about what problems are found and how the solutions are. The second stage is designing, starting from designing a research instrument sheet or questionnaire, to designing teaching materials. The third stage is validation, the implementation of the trial run to the improvement of the final product.

Development of teaching materials with the context of traditional Dayak Kanayatn tools on students' mathematical connection abilities. Where the ability of this mathematical connection was chosen because it is in accordance with the problems experienced by students, namely difficulty understanding if given mathematical examples associated with everyday life. This teaching material consists of cover, preface, introduction, table of contents, core competencies (KI), basic competencies (KD), title of learning material, material, summary material, sample questions and solutions, practice questions, answer keys, bibliography, Writer biography.

Based on the results of the study, it is known that the results of the validation of mathematics teaching materials in the flat build material are in the valid category, meaning that the teaching material is feasible to use. The results of the validity can be seen in the following table:

**Table 1.** Expert validation results

No.	Expert	Percentage	Information
1	Expert Materi 1	77,33%	Valid
2	Expert Materi II	76,67%	Valid
3	Expert Materi III	79,33%	Valid
4	Expert Media I	76,96%	Valid
5	Expert Media II	77,37%	Valid
6	Expert Media III	74,15%	Valid
<b>Summary</b>		<b>76.97 %</b>	<b>Valid</b>

So it can be concluded that the assessment of the three validators about the teaching material is in the valid category and shows that this teaching material is suitable for use as a learning medium in school. This mathematics teaching material as a learning media bridges the learning process. This means that teaching materials improve the quality of learning. This is in accordance with Latuheru (Hamdani, 2011: 8) stating that learning media are materials, tools or techniques used in teaching and learning activities with the intention that the educational communication interaction process between teachers and students can take place in an efficient and efficient manner.

Based on the results of the study note the results of the practicality of this mathematics teaching material in the category of very practical. Practicality is obtained through the student response questionnaire and teacher response questionnaire. For the results of the response we can see in the following table:

**Table 2.** Results Questionnaire Student and Teacher Responses

Questionnaire	Mean	Criteria
Student 1	94,54 %	Very Practical
Student 2	96,36 %	Very Practical
Student 3	92,72 %	Very Practical
Teacher	94,67 %	Very Practical

So it can be concluded that the assessment falls into the category of very practical.

Based on the results of the study, it is known that teaching materials in the context of traditional Dayak kanayatn tools are effective against mathematical connection capabilities in flat build material. This can be seen from the results of the posttest given to students, almost all students can answer questions well with an average value of 73.33 with a minimum completeness criteria value (KKM) 61. This shows that this teaching material can indirectly help student learning processes and have an influence on student learning outcomes. This is consistent with previous research, namely Syaprilyantiwi's research (2017: 65), which states that mathematics teaching materials greatly affect learning outcomes on students' mathematical connection abilities. Teaching material in the flat build material can be used as one of the references while helping students understand the flat build material during the learning process.

Means students are able to connect or connect ideas or ideas related to daily life and produce one or several of these solutions. This is in line with previous research, namely Roskaputri (2018: 54) which states that the mathematics teaching material used at the time of the study was effective on the ability of mathematical connections. The results of the study also showed that mathematics teaching materials were appropriate to be used as teaching materials in schools which were shown from the aspects of validity, practicality and effectiveness. This is consistent with Nieveen's opinion (Haviz, 2013: 32) which states that the quality of the results of development research is influenced by several criteria, namely validity, practicality, and effectiveness.

Teaching materials are made using the Ms. application. Word, and this teaching material is made to resemble a booklet. Images of color composition are also considered during the process of making teaching materials to make it look interesting. This is in accordance with the opinion of Daling (2017: 65). easy to understand. The pictures or illustrations in the booklet media are adjusted to the discussion of the material. This teaching material contains the material to be learned, which is a flat shape with rectangular and circular sub material.

## **CONCLUSION AND SUGGESTION**

### **Conclusion**

Based on the results of the study it can be concluded that the development of teaching materials in the context of traditional Dayak Kanayatn tools on the ability of mathematical connections in flat build material in class V students of SDN 06 Ngabang, must pay attention to several aspects related to the feasibility of teaching materials to be tested. In order to obtain the appropriate criteria, it must go through steps according to the development procedure. In this research that is referring to the development model according to Thiagajar (1974) which suggests research and development steps abbreviated as 4-D which is an extension of Define, Design, Development, and Dessemination (Dissemination) , but in this study due to limited time, cost, energy, and the subject of this study only reached the third stage, namely the Development stage (Development) did not reach the Dessemination stage.

Therefore the results that can be concluded from this study are; 1) Teaching materials with the context of traditional Dayak Kanayatn tools obtained a valid category on the ability of mathematical connections in the material of flat shapes in grade V students of SD Negeri 06 Ngabang; 2) Teaching materials in the context of traditional Dayak Kanayatn tools obtained practical categories on the ability of mathematical connections in flat build material in grade V students of SD Negeri 06 Ngabang; 3) Teaching materials in the context of traditional Dayak Kanayatn tools obtained an effective category on the ability of mathematical connections in the material of flat shapes in grade V students of SD Negeri 06 Ngabang.

#### Suggestion

Based on research conducted, researchers have several suggestions, among others; 1) Teaching materials in the context of the traditional Dayak Kanayatn tools developed in this study can be continued by the researcher to the extent of dissemination or dissemination in other classes, by other teachers and on a wider scale; 2) If other researchers continue this research to the stages of dissemination, they can continue this research not only within the scope of the Ngabang area, but also other regions; 3) If other researchers are going to research this mathematics teaching material, the title should be changed and clarified even more; 4) Teaching materials in the context of traditional Dayak Kanayatn tools developed for students can be useful and can be used for learning at home.

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