

Thematic Teaching Materials of Connected Type Sultan Mahmud Badaruddin I Palembang Mosque Materials Mathematics for Class II Elementary School

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ABSTRACT

Connected type teaching materials are part of thematic learning which can be used as an alternative in facilitating mathematics learning. The material chosen is math material in grade II elementary school including multiplication, division, and simple plane shapes. The theme used in this study is the Great Mosque of Sultan Mahmud Badaruddin I Palembang which is well known to students. This research is a development research using the stages of development of Tessmer and Akker. The two major stages of this development research are: (1) Introduction, and (2) Formative Evaluation. Data collection with walkthroughs, documentation and tests. Data analysis was in the form of product analysis of teaching materials by looking at the results of tracing and documentation of the one to one stage, expert reviews and small groups, and analysis of test data obtained from the field test stage. Based on the results of product analysis, valid and practical teaching materials were obtained. Validity can be seen from the results of the assessment of content/content experts (according to the thematic approach of the connected type), construct experts (according to the characteristics of teaching materials), and language experts (according to PEUBI). Practically seen from the results of students' assessments in small group trials where students stated that the teaching materials provided were easy to understand. The potential effect is seen from the evaluation test results. The teaching materials compiled were declared valid after going through the one to one stage, expert review which had been revised according to expert advice. Practically illustrated from the results of small groups that have gone through the revision stage. The potential effect of this study is 86.1 and is included in the very good category.



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1. INTRODUCTION

Elementary School / Madrasah Ibtidaiyah (MI) is the first formal institution regulated in law and has a distinctive curriculum compared to other formal schools above it (Hidayat et al., 2019). The

curriculum used in elementary schools is tailored to the needs of elementary school students who on average are in the age range of 6-13 years. Where at that age, students develop their abilities and intelligence gradually, one of the main characteristics of student development at this stage is still seeing everything as a whole or holistic, where in the learning process is still very dependent on concrete objects and experiences experienced directly (Antari, 2015) and it is expected that through direct experience students can understand the concepts that they have discovered and then connected with other concepts they have understood (Ulfah, 2019). To instill concepts that are continuity in students, it is necessary to sort out teaching materials and a learning approach that is able to bridge these needs, namely with LKPD teaching materials designed using an integrated learning approach.

LKPD is one of the printed teaching materials that is very commonly used by students. Worksheets (LK) or assignment sheets (LT) are created to stimulate and support students in carrying out learning activities to achieve the desired understanding, skills, and attitudes. (Wandari et al., 2018) One method that teachers can adopt in the development of LKPD is through a mathematical approach based on local wisdom. The choice of integrated learning as part of LKPD that is developed is not without reason, integrated learning is a learning approach that involves several subjects to provide a meaningful learning experience for children. Integrated learning is an approach oriented to learning practices that suit children's needs (Taqiya et al., 2019). The integrated learning model or better known as the thematic learning model is a learning model with a system that can accommodate students (both individually and in groups) to actively examine, explore and discover scientific concepts independently, meaningfully and authentically through certain themes. (Ulfah, 2019). Themes in thematic learning can be taken from various things that are considered to support the understanding of students' concepts of a material, such as habits, food, culture or places close to students' lives.

Integrated learning has several models that are used according to the needs of learners. Fogarty (Suanah, 2019) explained that there are 10 integrated learning models, where the ten models are further divided into three types, namely first, inter-subjects (fragmented, connected and nested), the second type, between subjects (sequenced, shaved, webbed, and threatened), and the third type is student factors (immersed and networked). The connected model is one of the models used for inter-subjects or in one field of study, where in this model the relationship of abilities, thoughts and abilities to one material can be associated with concepts, skills and mastery of other materials or sub-materials. The choice of connected model is because this model allows integration between the material taught, and has an effect on improving student learning outcomes, especially in mathematics subject matter (Rohman et al., 2023).

Mathematics is a subject that has a high enough complexity for some people, obstacles in learning mathematics are often considered normal and natural, with the argument of some people that mathematics is indeed difficult to master. It is explained that, A mathematical knowledge is built in a chain that begins by defining an object that involves only various calculation operations (Radiusman, 2020). The hardest part of maths is instilling basic concepts that become the foundation of understanding for the material to be taught. Concepts in mathematics lessons become important because it is the purpose of learning mathematics, to achieve these goals, carried out. The breakthrough in the learning process is the application of integrated and integrated learning on several problems according to student needs, and as a way to facilitate introducing mathematics in everyday life (Suanah, 2019).

Several studies on connected type integrated learning have been conducted and show that integrated learning can be further developed, such as (Taqiya et al., 2019) and (Rohman et al., 2023). One of the important things in integrated learning is the selection of themes, themes can be adjusted to the environment of students, so as to help students better understand the subject matter taught. Themes have meanings from various basic concepts so that the basic concepts that students learn are not only partial. Thus, learning provides complete meaning to learners as reflected in the various themes available (Nahak et al., 2019). In this study the theme chosen was the Sultan Mahmud Badaruddin I Palembang Grand Mosque or Palembang Grand Mosque, a historical mosque in the city of Palembang. The material presented in teaching materials in the form of LKPD is inter mathematics subjects,

covering the basis of multiplication, the basis of dividing. The selection of this theme is carried out on the basis of students getting to know the mosque, so that it can help them understand the material taught.

2. METHODS

This research refers to the development research method proposed by Martin Tessmer in 1993. This method combines the concepts of research and development to create a systematic approach in developing a prototype (Martin Tessmer, 1993). In this study, the authors used additions at the Preliminary stage (Akker, 1999) adopted from several previous studies. This Preliminary stage becomes one of the most important parts in the development process, the goal is to find and collect the initial data needed to design and develop the prototype to be made. Dalam tahap ini, peneliti akan melakukan survei dan wawancara dengan pihak terkait, mengumpulkan data primer dan sekunder, serta melakukan analisis kebutuhan pengguna (Akker, 1999). The results of this Preliminary stage will be a strong foundation to direct the next development process, so that the resulting prototype can meet the needs and expectations of users well (Antari et al., 2022). This research was conducted on class II students of MI Hijri 2 Palembang City totaling 24 students.

The development stage is comprehensively divided into two, namely preliminary and formative evaluation. Preliminary is carried out to collect preliminary information related to the prototype developed, both expert tests and literature reviews. After preliminary, continued with the formative evaluation stage divided into two, namely self evaluation and prototyping which in its implementation is divided into expert review and one-to-one stages, small groups and field tests. (Martin Tessmer, 1993). The following is an explanation of the formative evaluation stage:

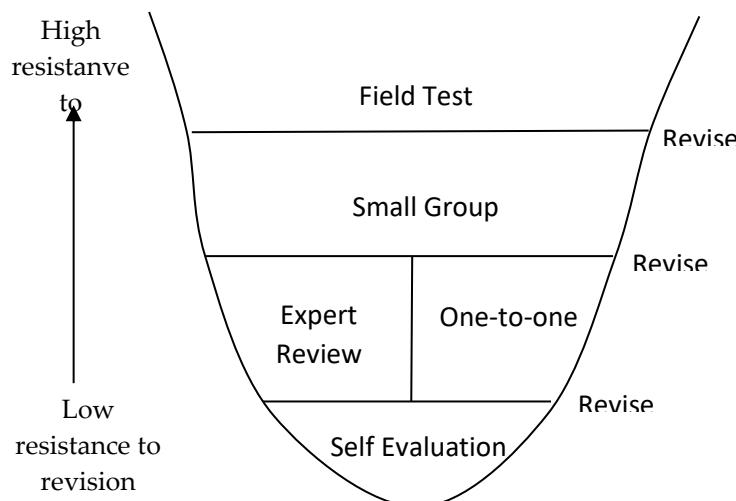


Figure 1. Formative Evaluation

Preliminary stage, this stage is divided into two important parts, namely analysis and design. At the time of student analysis, the characteristics of students will be identified, their level of ability, and learning needs will be identified. In addition, curriculum analysis is carried out, which will study the applicable curriculum content and competencies that must be achieved by students. Analysis of devices or materials is used to evaluate the availability and suitability of devices or materials to be used in the development of connected model thematic LKPD. Next is the design stage, researchers will use the results of student analysis and curriculum analysis to design LKPD that suits the needs of students. Making LKPD with a connected thematic learning model will focus on effective learning, teaching strategies, and learning steps that can increase student understanding and participation. In addition,

the design will also take into account components such as learning objectives, learning materials, learning activities, assessments, and resources needed.

Formative Evaluation stage, Formative Evaluation stage, is divided into two parts, namely Self Evaluation and Prototyping. Self Evaluation or called self-evaluation is a self-assessment of the initial product of the resulting LKPD, it is needed to see whether all the thematic characteristics of the expected connected model appear in the LKPD made. Henceforth, the results of self-evaluation will be referred to as Prototype 1. After obtaining prototype 1, before the LKPD product can be used, the prototyping stage will be carried out. Prototyping, in the prototyping process, there are 4 steps, namely expert reviews, one to one, small group and field test. Expert reviews, this step is carried out to provide validation of prototype 1 made, expert reviews are carried out by three validators with different expertise, namely content validators, concept / construct validators, and language. The assessment of content validators is based on aspects of content suitability to learning tools, namely core competencies, indicators, material suitability with connected thematic learning models.. The assessment of the concept/construct validator is based on the suitability aspect of the preparation of LKPD both appearance and characteristics. The assessment of language validators is based on aspects of language suitability used in accordance with PUEBI. As proof of documentation of the assessment of expert experts, it is available on the validation sheet. All advice from experts at this stage was used to revise prototype 1. LKPD can be said to be valid, if it has gone through this stage to completion.

This expert reviews step is carried out in tandem with one to one steps, when one to one is done, prototype 1 that has been made will be read and done by 1-3 students who are not research subjects, the students selected are those who are academically at high, medium and low levels, the goal is to see how far prototype 1 can be read and understood by students. This stage is carried out simultaneously to obtain accurate validation and readability data, so that the results of these two steps can be revised so that prototype 2 is produced.

Prototype 2 produced after the revised results will be tested to small groups, consisting of 4-6 students, the aim is to see the practicality of LKPD learning thematic model connected made. The result of the improvement after this step, will then be referred to as prototype 3. Prototype 3 is the final instrument that will be tested in the field test step, a field test is carried out to see the potential effects obtained from the use of this connected thematic LKPD. At this stage, final test questions will also be given whose characters have been adjusted to the connected thematic model. The results of this final test will be converted into values. The results of each student's assessment will be used to see the potential effects of the LKPD developed.

Data collection techniques in this study are walkthrough, documentation and test. Walkthrough is a way to evaluate designs carried out by experts or experts and student responses in the form of suggestions and comments on designs that have been made so that they refer to improvements. Experts provide suggestions and input on the designs that have been made. Walkthrough is an important part of the study, the data obtained, is needed to see the extent to which improvements of the product will be made. Documentation is carried out as an important track record of the research process that has been carried out, documentation can be in the form of images, videos or writing. Documentation data is analyzed descriptively to determine the disadvantages and advantages of the LKPD made (Deda & Maifa, 2021). Test, test is a data collection technique in the form of giving a number of questions or assignments and other tools given to research subjects. In this study, the test given was in the form of a post test. After learning using the connected model thematic LKPD, tests were carried out to obtain data related to student learning outcomes to see the potential effects on the thematic LKPD of the connected model that had been made.

Data analysis techniques carried out after the data collection process is complete are; 1. Product Analysis, The developed product is analyzed using walkthrough results and documents obtained during the formative evaluation stage. The results of this product analysis are to show that the LKPD developed is valid and practical and 2. Analysis of test result data, test result data is used to measure student learning outcomes as seen from the scores obtained by students in doing test questions. Then the percentage results to determine the ability of students to understand the material in the thematic

LKPD connected model. The scores or grades obtained by students are converted into grades in the range 0-100. Each question has a different score according to the difficulty of the question. After knowing the final score of each student, the learning outcomes of students are categorized as Table 1 (Arikunto, 2018). This study is said to have a potential effect if the average score is 80 and 75% of learners are in the good category.

Table 1. Student Learning Outcomes Assessment Categories

| Value | Frequency | Category |
|--------|-----------|-----------|
| 80-100 | 0 | Very Good |
| 66-79 | 0 | Good |
| 56-65 | 0 | Enough |
| 40-55 | 0 | Less |
| 30-39 | 0 | Fail |

3. FINDING AND DISCUSSION

A teaching material is said to be good if it meets the criteria of strong theoretical validity and practical internal consistency (Akker, 1999). First of all, LKPD is developed with reference to strong theoretical rationales, especially using the thematic approach of the connected model as a foundation for LKPD development. The validity of LKPD uses the syntax of thematic learning connected model, namely: planning stage, implementation stage and evaluation stage. (Ngalimun, 2017). In the second aspect, to declare valid if there is internal consistency. Internal consistency in LKPD based on thematic learning connected model is in the form of questions contained in LKPD and related evaluation questions, for example there are questions in LKPD that are the same as questions in evaluation questions.

According to Neiveen (Rahim & Wahyuni, 2019), validity is tested by involving assessments from experts in construct, content (content), and language, and ensuring that the LKPD can be understood by students at the one-to-one stage. Meanwhile, the practicality of the developed LKPD is seen through the small group stage, where students can work and feel happy learning using the LKPD that has been developed. Meanwhile, according to (Akker, 1999) practicality is related to two things, namely practitioners' expert assessment of the ability to apply the developed product and easy use by its users. The first aspect of the validity of teaching materials lies in the theoretical basis, thematic learning syntax, connected models, themes used, and mathematics subject matter. The validity of LKPD can be achieved by using the theme of Sultan Mahmud Badaruddin I Grand Mosque in connected model thematic learning as a starting point for mathematics learning..

The results of expert validation on prototype 1 that have been carried out, experts provide input in the nature of improvements to the initial LKPD product, these suggestions are implemented to be implemented to produce valid LKPD products. One of the suggestions from content experts is that the integration of material has not been clearly seen, the introduction of concepts needs to be emphasized for each learning activity. Affirmation of absolute concepts is done because it aims to facilitate understanding in learners. In addition, the advice from construct experts is the need for more simplified stages and structures of LKPD to fit the thematic learning syntax of the connected model. In addition, the choice of words in sentences must also be more varied so that the story and description of the problem are not monotonous and boring. The results of research validation can be seen in Table 2. For the results of product revisions, based on suggestions from validators, can be seen in Figure 2.

Table 2. Results of construct, content and language validation after repair

| Validation | Result |
|------------|--|
| Construct | Structuring the LKPD developed is appropriate, orderly and systematic. In accordance with the syntax of thematic learning connected model, the theme is interesting because it is a theme known in the city of Palembang and is right for material division, multiplication and simple flat builds |
| Content | The material is developed according to the applicable curriculum and suggests using one story for one problem topic. |
| Language | Writing is PUEBI compliant |

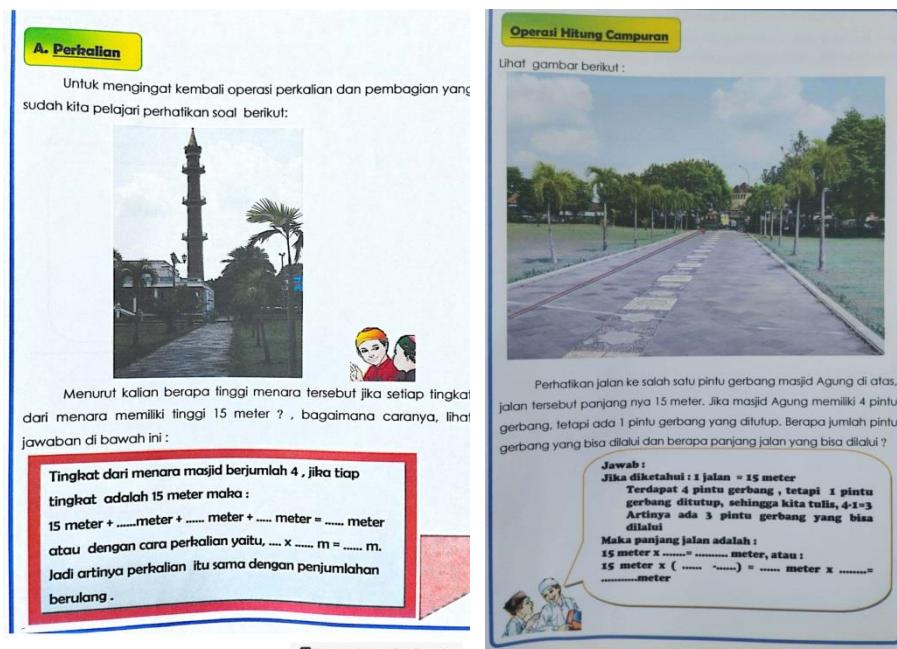
**Figure 2.** Improvement of Validation Results

Figure 2 above shows that the LKPD developed has the theme of the Sultan Mahmud Badaruddin I Palembang Grand Mosque and is in the form of a story as the starting point for the emergence of independent learning. In the one to one stage, LKPD is given to three grade II students who are not research subjects. Students who work one to one provide input about the LKPD developed. From the results of documentation and work on LKPD, it is known that students are able to understand and understand what material is delivered in LKPD, students remember the material of addition, subtraction, mixed calculation operations, recognize the form of multiplication and division and build simple flats. The theme of the Sultan Mahmud Badaruddin I Palembang Grand Mosque in figure 2 contains multiplication material as repeated addition and mixed calculation operations, where the theme acts as an introduction to each material presented, and the theme also acts as a liaison of each material.

After the LKPD was declared valid by experts and could be read properly by students, improvements were made to prototype 1. The results of the LKPD improvement will then be referred to as prototype 2. Prototype 2 is continued to the small group stage, where each group is 5 people. Small groups are carried out on a group of students outside the research subject. From the results of the small group, it can be seen that prototype 2 is understood by students, students are able to do all parts of LKPD on time with only minimal improvement. The improvement that appears only to writing errors not to the understanding of the material in the theme.

The last part of the formative evaluation step is the field test. Field trials are conducted on grade II students to collect data and information about the effectiveness of a program or learning activity. This field test aims to obtain an overview of the extent to which the use of thematic LKPD connected models helps learners achieve the expected learning objectives. The field test was conducted for two days. With evaluation tools in the form of LKPD and post test. On the first day, the test was in the form of practice questions contained in the LKPD that had been made, from a total of 24 students who participated in the connected model thematic LKPD trial, the results showed that 50% of students were in the good criteria and 50% were in the very good criteria. This indicates that most students have reached a good or excellent level of understanding of the material taught. The test on the second day was a post test, the results of field trials showed that 86.1% of students achieved a very good criterion level. In this case, 14 learners achieved the criterion level very well, while 10 learners were in the good criteria. The average score obtained from this trial was 80.

These results show an increase from day one to day two in student achievement levels. On the first day, 50% of students were in the good criteria, while on the second day, the percentage of students who achieved the excellent criteria level increased to 86.1%. In addition, the average score obtained also reflects an increase in students' understanding of learning material. The results of the recapitulation can be seen in the following table 3:

Table 3. Recapitulation of Field Test Results

| Value | Frequency | Learning Outcomes Category |
|--------|-----------|----------------------------|
| 80-100 | 14 | Very Good |
| 66-79 | 10 | Good |
| 56-65 | 0 | Enough |
| 40-55 | 0 | Less |
| 30-39 | 0 | Fail |

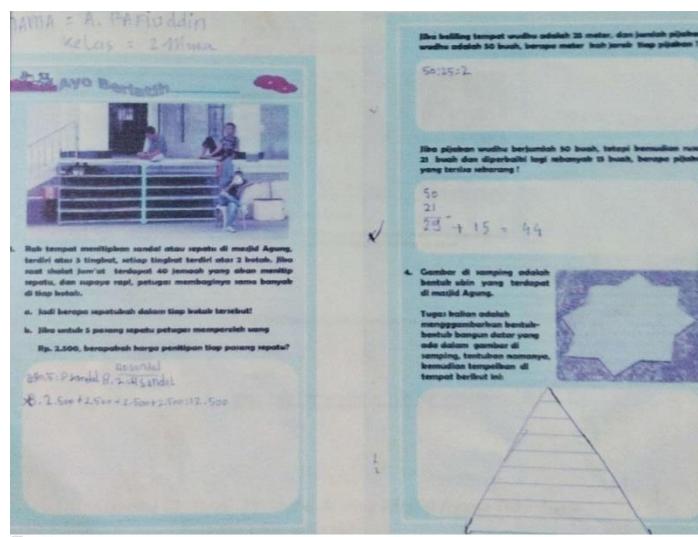


Figure 4. Examples of student work

Based on the data contained in Table 3, it can be seen that the application of LKPD (Student Worksheets) with connected model thematic learning on mathematics material in grade II elementary school, has a significant potential effect on student learning outcomes, connected model thematic learning uses themes that are known to students and close to everyday life, namely the theme of the Sultan Mahmud Badaruddin I Palembang Grand Mosque is able to increase learning motivation and involvement learners in mathematics learning. With problems integrated in the themes presented, learners are challenged to think critically, find creative solutions, and discuss with classmates. . This provides an opportunity for learners to deepen their understanding of mathematical material, while

developing logical thinking and problem-solving skills. Better learning outcomes can be achieved through this approach, thus having a positive impact on the mathematics skills of students in grade II elementary school.

In general, the results of this study provide positive evidence. LKPD that has been developed successfully meets the criteria of valid, practical, and has a significant potential effect on student learning outcomes. The validity of the LKPD shows that this learning instrument can accurately measure and evaluate students' understanding of learning material. In addition, the practicality of LKPD allows its use easily by teachers without the need for complicated preparation or special tools. More importantly, this LKPD has a positive impact on student learning outcomes. By using this LKPD, learners can improve their understanding, develop critical thinking skills, and achieve better learning achievements. The results of this study provide strong support for the use of thematic LKPD connected models as effective learning aids and have the potential to improve student learning outcomes.

4. CONCLUSION

The LKPD development process involves identifying mathematical concepts relevant to the theme of Sultan Mahmud Badaruddin 1 Palembang Grand Mosque. These concepts are then integrated into learning activities that follow the thematic approach of the connected model. In this LKPD, students are invited to understand mathematical concepts through exploration and application in the context of mosques, such as measurement, geometry, and data analysis related to mosque buildings. The developed LKPD also considers practicality in its use. Learning materials are presented clearly and structured, equipped with instructions that make it easier for students to follow each activity. In addition, this LKPD can be used flexibly, both in face-to-face learning and distance learning. Through the use of LKPD, it is hoped that students can get a more immersive and meaningful learning experience. They can relate mathematical concepts to the real world and gain a better understanding. In addition, fun and interactive learning can also motivate students to learn more enthusiastically and actively.

Overall, the development of LKPD products with a thematic learning approach connected model on the theme of the Sultan Mahmud Badaruddin 1 Palembang Grand Mosque has produced products that are valid, practical, and have the potential to improve student learning outcomes in mathematical concepts. Every stage passed in this study, reinforces the results of this research as expected.

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