Learning Device Development with Cooperative Model Of Productive Creative Type To Improve Students' Motivation

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Abstract. This study aims to produce mathematical learning tools with a productive creative type cooperative model to increase motivation and mathematical ability of students of class VIII SMP that are valid, practical, and effective. This type of research is development research. This research develops learning tools including Learning Implementation Plan (RPP), Student Worksheet (LKPD), and Learning Outcomes Test (THB) by using the ADDIE development model (Analysis, Design, Development, Implementation, and Evaluation). The research subjects were students of class VIII MTs. NW Lepak. Data analysis was performed by converting the total actual scores obtained into five scale qualitative data. From the results of expert validation, teacher assessment scores, student assessments, and learning achievement tests show that the learning tools developed are valid, effective, and practical.

1. Introduction

Various efforts have been made by the government to improve the quality of education including by making improvements from the KTSP curriculum to the 2013 Curriculum. The 2013 curriculum is considered to stimulate creativity and autonomy in the education sector because the curriculum and learning process will be provided in the form of finished products (completely-built up products) [1]. In addition, the existence of the 2013 curriculum is considered to be able to spur the development of student competencies towards more analysis and the demands of teachers to be more creative and innovative in learning because teachers are considered capable of all things that can help students develop[2]. The Curriculum 2013, which is to create productive, creative, innovative, through strengthening affective attitudes, skills, and integrated knowledge for Indonesians[3].

The success of the 2013 Curriculum implementation is determined by the ability of the teacher as a facilitator in organizing learning activities that make it easier for students to learn. Teachers are required to be more creative, innovative, and able to adjust various components in the learning system. One of these components is a learning device that must meet the effectiveness of learning mathematics[4]. Teacher learning device is a manual used in the process of learning in the classroom [5][6]. In learning, the existence of a device is very important to support the achievement of the expected goals. Learning tools that can be prepared by teachers include the syllabus, Learning Implementation Plan (RPP), textbooks, Student Worksheets (LKPD), and assessment sheets.
Based on observations and interviews conducted at MTs. NW Lepak dated March 19, 2019, it can be seen that the learning tools used by some teachers are taken from the internet and the teacher will reprint for one school year without being modified or adjusted to the needs of students. In the process of learning activities in the LKPD yarn class is used not much different from the books, not even color and interesting. This will certainly have an impact on students' motivation when learning, especially in math subjects which are often regarded as difficult and frightening subjects[7]. Talk about learning difficulties Khairunissak et all [8] explained that students with learning difficulties can be seen by the phenomenon of decreased student performance and enthusiasm.

One of the success of the learning process is determined by the enthusiasm and motivation of student learning. Motivation is one thing that is very important in improving learning achievement. To improve achievement, we must first create an environment where students feel motivated to achieve [9][10]. Lestari [11] expressing learning motivation is a power, encouragement or strength both coming from oneself or from outside that encourages students to learn. Students who have high motivation to learn mathematics will be seen from learning, they will be serious in learning the material provided, and are actively involved when the lesson takes place. One way to increase student motivation in learning especially learning mathematics is to use appropriate learning models or methods[12].

One of the models that teachers can use in the learning process is the cooperative model of productive creative type. The productive creative learning model is a learning model with teaching material presentation that encourages students to develop productive creative ideas. The productive creative learning strategy has several characteristics that distinguish it from other strategies, one of which is that the students are encouraged to find/self-contract the concepts being examined through the interpretation conducted in various ways such as observation, discussion or experiment. The creative-productive learning Model is a learning model that is developed in reference to the various learning approaches that are assumed to be able to improve processes and outcomes Learning students.[13], [14]. While the interview results about the need for learning devices at the mathematics teacher at MTs NW Lepak showed that learning device development is indispensable. Based on these things, researchers see the need to develop learning devices using a cooperative learning method of productive creative type. The resulting learning device is expected to improve students’ motivation.

2. Method

This research uses the type of research and development (Research and Development) with the intention of developing a math learning tool. Research and Development is a research aimed at developing products and knowing the quality of products that have been produced. The products are produced in the form of syllabus, Learning Implementation Plan (RPP), Student activity sheet (LKPD), and learning result test (THB) with model cooperative creative productive type. The research was conducted using a development research procedure referring to the ADDIE model. The ADDIE Model consists of five stages of development., namely: Analysis, Design, Development, Implementation, and Evaluation. According to the explanation of Endang[15], [16], then the stages implemented in the development of this research are as follows:

Analysis (Analysis)
This stage there are three types of analysis activities conducted by researchers, namely: first analysis needs to be done to know the basic problems encountered in the implementation of learning devices that exist in the school. Second curriculum analysis used in MTs NW Lepak. Thirdly, the student's characteristic analysis to know exactly the condition of the student to be tested.

Design
This stage will generate a learning tool with a cooperative model of productive creative type ranging from setting learning objectives, designing teaching learning activities, learning materials and arranging instrument assessment instruments the learning of syllabus, RPP, LKPD, and THB.
Development
The development stages include three phases, namely: first, development planning will produce products such as syllabus, RPP, LKPD, and test result (THB) and instruments used to measure the validity, practicality, and effectiveness of the product developed. Secondly, validation is done to know which products have been developed worthy or not to be implemented in learning activities. The validation will be in value by a member/validator consisting of three expert lecturers. Thirdly, revisions are done if the product has not reached valid criteria and if the product has reached valid criteria then the product has been developed ready to be tested.

Implementation
This implementation stage of the product that has been developed tested on the students. The implementation phase will generate the data used to measure the practicality and effectiveness of the product being developed. The subject of the research trials is the mathematics teacher MTs NW Lepak and the class VIII MTs NW Lepak which amounted to 25 people.

Evaluation
Evaluation phase, researchers get product assessments that have been developed to measure the practicality and effectiveness of learning devices in the form of syllabus, RPP, LKPD, and THB. In addition to measuring the achievement objectives of developed product development, also be revised to the product in accordance with the results of evaluation or needs that the product has not been fulfilled. This aims to make the resulting product really suitable and can be used by schools within a wider range.

The instruments required in this study are: (1) The Instrument for measuring validity is comprised of the syllabus validation sheet, RPP, LKPD and THB. (2) Instruments for measuring practicality consist of teacher response questionnaire and student response questionnaire. (3) The instrument for measuring effectiveness consists of the student motivation questionnaire, the study result test (THB) and the validity of the test instrument. Data analysis is conducted to obtain the results of the validity, practicality and effectiveness of the product being developed. (1) The analysis of validity products in the form of expert response score data is converted to five-scale qualitative data, with the formula reference adapted from Azwar [17] presented in the following table 1:

| Score Interval | Criteria        |
|----------------|-----------------|
| \((M_i + 1,50S_i) < X\) | Very Valid     |
| \((M_i + 0,50S_i) < X\) | Valid          |
| \(\leq (M_i + 1,50S_i)\) |               |
| \((M_i - 0,50S_i) < X\) | Fairly Valid   |
| \(\leq (M_i + 0,50S_i)\) |               |
| \((M_i - 1,50S_i) < X\) | Less Valid     |
| \(\leq (M_i - 0,50S_i)\) |               |
| \(X \leq (M_i - 1,50S_i)\) | Invalid       |

Description:
\(M_i = \text{Average ideal score} = \frac{1}{2} \text{ (maximum score ideal} + \text{minimum score ideal)}\)
\(S_i = \text{Ideal Standard deviation} = \frac{1}{6} \text{ (maximum score ideal} - \text{minimum score ideal)}\)
\(X = \text{Actual total Score}\)

(2) Practicality analysis consists of the teacher response poll data and student response data each analyzed for teacher response data converted into qualitative data of five scale as in table 1, while student response questionnaire using absolute assessment \(\geq 75\%\). (3) Analysis of the effectiveness of
products using student motivation questionnaire and student learning data in the form of THB results are calculated individually and classically. Students are considered individually if they score ≥ 65 with the understanding that the student has been able to complete, control competence, or achieve learning objectives. While the success of the class (the classical dictancy) is seen from the number of learners who are able to complete or achieve a minimum score of 65. In this case, the developed product is said to be effective when the percentage of classifications of classical, obtained ≥ 75%.

3. Results And Discussion

3.1. Data Analysis of Validation Devices

The learning devices are developed validated by 3 experts in the field of mathematics. The validation results of learning devices in the form of syllabus, RPP, LKPD, and THB are presented in table 2 below.

| Validator | Syllabus Score | RPP Score | LKPD Score | THB Average Score |
|-----------|----------------|-----------|------------|-------------------|
| I         | 164            | 180       | 111        | 4.35              |
| II        | 139            | 120       | 103        | 4.39              |
| III       | 136            | 152       | 92         | 4.00              |
| Actual Total | 439         | 452       | 306        | 0.81              |
| Category  | Very Valid     | Valid     | Very Valid | Very Valid        |

Based on the results in table 2 above, it can be concluded that all devices are otherwise eligible to be valid. The devices that have been validated are then revised according to the suggestions provided by the validator.

3.2. Data Analysis of Practicality Devices

The practical Angket assessment of learning devices in the form of syllabus, RPP, and LKPD were given to teachers of grade VIII mathematics in MTs NW Lepak. The results of such poll analysis are presented in table 3 below.

| Learning tool | Score |
|---------------|-------|
| Syllabus      | 1     |
| RPP           | 2     |
| LKPD          | 2     |
| Silabus       | 37    |
| RPP           | 32    |
| LKPD          | 33    |

| Actual Total | 75   |
| Category     | Very practical |

3.3. Data Analysis of Effectiveness Devices

The effectiveness of the development of learning tools can be seen from the observation of the implementation of the learning activities of teacher and students which are assessed by the observer which in this case is carried out by mathematics teacher MTs NW Lepak. The analysis results are presented in table 5 below:

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| Meeting to | Scoring score |
|------------|---------------|
| Teacher Activity | 14 |
| Student activity  | 14 |
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The student motivation poll is given to students of class VIII MTs NW Lepak numbering as much as 25 people. This was carried out at the last meeting of field trials activities. The results of the motivation poll analysis of 12% students or 3 students have high motivation, 80% or 20 students have high motivation, and 8% or 2 students are very high motivation. So, it can be concluded that the average student answer score is in the high category which means the student motivation has increased. The Data of the study results test (THB) is obtained from the results of a student of grade VIII MTs NW Lepak numbering as much as 25 people. The THB has 8 questions to be answered by each student after using a learning tool development with a prolific creative type cooperative model to improve students’ mathematical motivation and ability. Based on the results of the students’ scores, there are 5 students not reaching 65 and is said to be incomplete, while the other 20 students have reached KKM and are said to be complete. The analysis results of THB students are presented in the following table 6:

**Table 5. Learning outcomes of Grade VIII students after administered THB**

| No | Aspects                          | Score | Description         |
|----|----------------------------------|-------|---------------------|
| 1  | Student Average value            | 71    | Above to KKM 65     |
| 2  | Classical dictancy percentage    | 80%   | Above to Provisions 75% |

The realibility data analysis is obtained from the THB which has been completed by the 25 students of class VIII MTs NW Lepak. Where, the realibility of the student test instruments is in the reliability category with the coefisien of 0.71.

4. Conclusion

Note that as a general principle, for large tables font sizes can be reduced to make the table fit on a page or fit to the width of the text. The final result of the product in the form of: 1) the syllabus consisting of 2 KD, 2) RPP which is made for each KD with the number of two meetings, 3) student Worksheets (LKPD) consisting of three parts, 4) study results test (THB) consists of 8 items with grid and answer key. Learning devices with cooperative models of productive creative types generated each one belongs to a category of valid, practical, and effective.

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