

## Development of Mathematics Teaching Materials Based on Character Education in The New Normal Era

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### ABSTRACT

*The purpose of this research is to design appropriate character education based on mathematics teaching materials to help students learning and training math skills. This research uses Research and Development method adapted in ADDIE model development. The subjects of this study were students of class VIII at Al-Ihsan Kalikejambon Islamic Junior High School in the academic year 2020/2021. The data collection techniques are interviews and questionnaires. The researcher designed teaching material in the form of teaching materials based on character education. The results of this study shows that (1) Validation of character education based on mathematics teaching materials developed by expert assessments obtained a percentage of 80.4% with a fairly valid category. (2) The practicality of character education based on mathematics teaching materials by the assessment of math teachers obtains a percentage of 83.63% with a very practical category. (3) The response of students to teach materials based on character education gets a percentage of 82.94% with a very practical category. Based on the results of the above, the researcher concluded that character education based on mathematics teaching materials is declared valid and practical based on the assessment of experts and learners, so that character education based on mathematics teaching materials is eligible for use in mathematics learning.*

**Keywords:** *Development; Teaching Materials; Character Education.*

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### INTRODUCTION

Education is an agent of change that is expected to be able to improve the character of the Indonesian (Verdianingsih & Firmansyah, 2018). During this time, education often focuses on the assessment of material mastery and numbers on the exam sheet which forgets crucial points such as character education, learning independence, public speaking, and so on. So that some many moral declines and problems that arise, such as lack of manners, cell tape between friends, juvenile delinquency, and others. In addition, learning in the new normal era only focuses on the delivery of material solely because of the lack of media, teaching materials, and lesson hours that tend to be shorter. This is following the results of preliminary studies through interviews with the math teacher of class VIII at Al-Ihsan Kalikejambon Islamic Junior High School in March 2021.

The character of education is the basis of the process of character building of a nation that does not ignore the values of noble character (Verdianingsih & Firmansyah, 2019). The importance of characters education will affect the achievement of a nation's national education goals because it is a process of activities that lead to improving the quality of education and ethical development that always teaches, guides, and nurtures every human being so that people can have interesting intellectual competencies, characters, and skills. Some of the values of character education that can be appreciated in a character education include religion, nationalism, intelligence, responsibility, discipline, independence, and honesty.

Character education is the process of instilling certain characters while giving seeds so that students can grow their distinctive character while living. Therefore, in this pandemic, teachers are not only someone who leads students to achieve certain goals or competencies but also obligated to prepare many

things that are not fixated on the delivery of materials alone but also instill the values of character education to students. Therefore, it takes teaching materials that can back up the needs, both in the form of interactive media, digital books, audiovisuals, video, and tasks that can be used as assistance in teaching and learning activities to facilitate delivery to learners.

Prastowo (2013) said that teaching materials are all materials (whether information, tools or texts) that are systematically arranged that display the full figure of competence that students will master and be used in the learning process with the aim of planning and reviewing the implementation of learning. Broadly speaking, teaching materials include knowledge, skills, and attitudes or values that students must learn both in the online and offline learning process.

Based on the problems outlined, it is necessary to develop valid and practical character education based on mathematics teaching materials to facilitate mathematical learning and change the character patterns of learners. The development of character education based on mathematics teaching materials is expected to increase awareness of good behavior and creativity. Then the results of its development are expected to meet the feasibility of aspects of content quality, material conformity, and character values such as honesty, discipline, critical thinking, and creativity.

This is following research conducted by Muldani et al. (2019) on The Development of Teaching Materials Oriented to Strengthen Character Education in Senior High School Mathematics Learning in Sequence and Series Materials. The results of the study showed that mathematics textbooks oriented strengthening character education in Sequence and Series materials are very valid. This research is also supported by research conducted by Rachmawati (2013) namely on The Development of Character-Based on Mathematics Teaching Materials Grade 2 Semester I in State Islamic Elementary School II Malang. The results showed that the validation results of the teaching materials include the feasibility of the content, the components of presentation, the attractiveness of the teaching materials, the language, and the graphing can be concluded valid.

## **METHOD**

This research was conducted in grade VIII Junior High School in the even semester. This research is an R&D study with the ADDIE model. This model involves the stages of model development with 5 phases, namely: Analysis Stage (analysis), Design Stage (design), Development Stage (development), Implementation Stage (implementation), and Evaluation Stage (evaluation). The analysis stage consists of the needs analysis stage and the material analysis stage. The needs analysis stage aims to know the needs and difficulties of students. The needs analysis is done by interviewing grade VIII students and giving questionnaires through google forms given to students to know the needs and difficulties of students. Then at the material analysis stage, the researcher determines the material that will be presented in teaching materials that are tailored to the basic competencies and indicators of competency achievement that will be achieved by students as well as the applicable curriculum in schools. In this case, the researcher presented the material Flat Face Three Dimensional Objects VIII grade Junior High School in the even semester.

At the design stage, the researcher designed LKPD based on character education based on data obtained from interviews and questionnaires at the analysis stage. At this stage, there are three stages, namely the collection of materials, the design process, and finishing. At the material collection stage, the researcher collects materials for teaching materials to be developed including materials, images, etc. At the design process stage, the researcher determines the size of the teaching material, the shape of the cover following the title, the background theme of the material flat face three-dimensional objects, and the color and typeface to be used. Cover design using Corel draw X7 application and teaching material/content design using Microsoft Word 2016. Furthermore, at the finishing stage, character education based on mathematics teaching materials that have been designed is stored in pdf form.

The development stage is the product realization stage. Before manufacture, the teaching material is validated. Validation is done based on expert assessment of the material. Furthermore, the suggestion from the validator will be used as a repair material before proceeding at the trial stage. Revisions are done can get good teaching materials and suitable with the needs of the target.

At the implementation stage, the researcher is trialing revised products to class VIII learners. At this stage, there is also a response from the teacher and the response of learners to teaching materials that have been used in math learning. The results of the learners' responses and responses will be used as evaluation materials at a later stage. The evaluation stage is carried out after character education based on

mathematics teaching materials has been validated and piloted in grade VIII students. Evaluation is carried out to assess teaching materials that have been used in learning.

## RESULT AND DISCUSSION

### Result

The results of the needs analysis through interviews conducted with math teachers and students of grade VIII at Al-Ihsan Kalikejambon Islamic Junior High School on March 4, 2021, obtained information from teachers that 2 factors cause problems in the classroom. First, the learning resources used are only in the form of LKS, resulting in students lacking enthusiasm during the learning. Second, students feel that material delivery is less applied in daily life. Teachers usually use learning methods such as: lectures, discussions, Q&A. However, it is considered less attractive to students' learning. In addition, the results of interviews with students have also obtained information that math lessons are sometimes boring. Based on what was found in the field, researcher felt the need to develop materials that could facilitate learning activities and activate learners.

At the material analysis stage, the researcher determines the material that corresponds to the applicable curriculum in the school, namely the 2013 curriculum as well as the indicators to be achieved. Therefore, the teaching materials that will be developed are teaching materials based on character education on the material of flat face three-dimensional objects for students of grade VIII Junior High School.


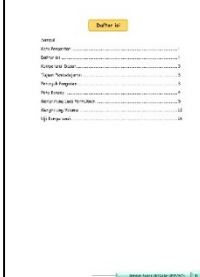
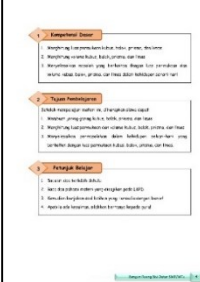
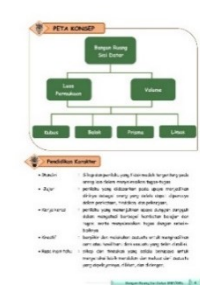
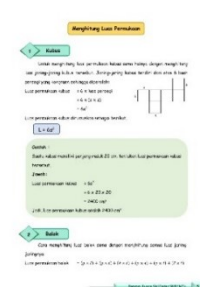
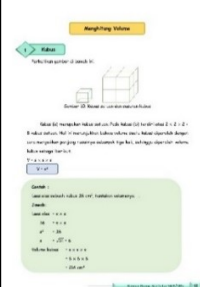
**Table 1.** Basic Competencies and Competency Achievement Indicators

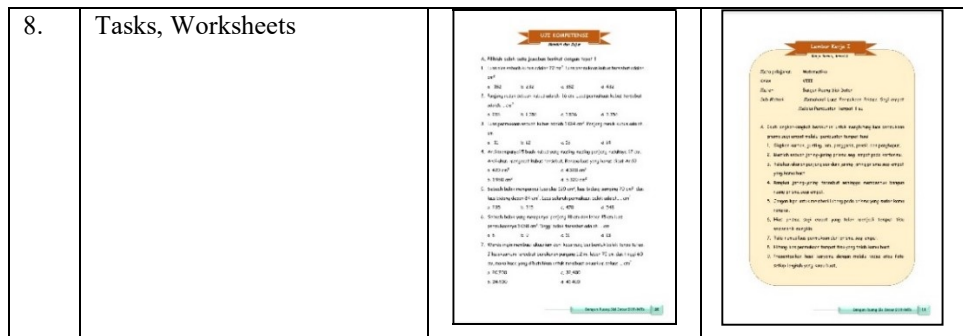
Basic Competencies	Competency Achievement Indicators
3.4. Calculating the surface area on the flat face three-dimensional objects (cubes, cuboids, prisms, pyramids)	<ul style="list-style-type: none"> <li>· Determining the surface area of cubes and cuboids by using props in the form of real objects</li> <li>· Determine the surface area of the prism obtained from the decrease in the beam surface area formula</li> <li>· Determining the surface area of pyramids with the conditions of size to be known</li> </ul>
4.4. Calculating volume on flat side room builds (cubes, cuboids, prisms, pyramids)	<ul style="list-style-type: none"> <li>· Determining the volume of cubes and cuboids through a specific pattern so that bias is applied to the volume of prisms and pyramids</li> <li>· Calculating the volume of irregular space builds by applying its basic geometry through the illustration shown</li> </ul>

At the design stage, the researcher designs teaching materials by drawing up a framework of making teaching materials consisting of: cover, acknowledgment, table of contents, basic competencies, learning objectives, task implementation instructions, mind mapping, material 1 (calculating surface area), material 2 (calculating volume), tasks and worksheets. Furthermore, the researcher determined the theme and color, and the size of the teaching material is using A4 paper. The complete design can be seen in table 2 below

**Table 2.** Teaching Materials Media Design

No	Information	Picture
1.	Cover	

2.	Acknowledgment		
3.	Table of Contents		
4.	Basic Competencies, Learning Objectives, Task Implementation Instructions		
5.	Mind Mapping		
6.	Material 1 : (Calculating Surface Area)		
7.	Material 2 : (Calculating Volume)		



The development stage is the product realization stage. At this stage, the researcher conduct an assessment of the teaching materials developed. Assessment of teaching materials is carried out by mathematics education lecturers and mathematics teachers. Here are the results of the assessment of teaching materials by mathematics education lecturers with the following value categories:

**Table 3.** Validation Results by Mathematics Lecturers

Assessment Indicator	Number of Values
LKPD components	16
Learning Materials	36
LKPD Based on Character Education	12
Presentation of LKPD	36
<b>Total</b>	<b>100</b>
<b>Percentage of Validan</b>	<b>80%</b>

Based on table 3, the percentage of validity is 80%. Then to find out the category of validity of teaching materials, the percentage value of the validity of teaching materials is adjusted to the table of validity as follows:

**Table 4.** Categories of Validan Teaching Materials

Average Total Validity	Percentage (%)	Category of Validation
80%	80 – 100	Valid, usable but revision required

Based on table 4, the teaching materials developed fall into the valid category, so teaching materials can be used but need revision. Furthermore, teaching materials are assessed by math teachers. Here are the results of assessments by math teachers.

**Table 5.** Validation Results by Mathematics Teacher

Rating Indicators	Number of Values
Teaching material components	16
Learning Materials	37
LKPD Based on Character Education	12
Presentation of LKPD	36
<b>Total</b>	<b>101</b>
<b>Percentage of Validity</b>	<b>80,8%</b>

Based on table 5, obtained the percentage of validity is 80.8%. Then to find out the category of validity of teaching materials, the percentage value of validity and teaching materials is adjusted to the table of validity as follows:

**Table 6.** Categories of Validity of teaching materials

Average Total Validity	Percentage (%)	Category of Validation
80,8%	80 – 100	Valid, usable but revision required

Based on table 6, the teaching materials developed fall into the valid category, can be used but need revision. Comments and suggestions given by mathematics education lecturers and practitioners will be used by the researcher to correct the shortcomings contained in the media of character education based on mathematics teaching materials in the new normal era to be more feasible and can be used as a learning medium. In addition to validity, teaching materials are also tested for practicality. The practicality assessment, in this case, was conducted by teachers at Al-Ihsan Kalikejambon Islamic Junior High School. The results of the practical assessment can be seen in table 7.

**Table 7. Practicality Assessment Results**

<b>Rating Indicators</b>	<b>Number of Values</b>
Ease of Use	20
Attraction	22
Learning Time Efficiency	4
<b>Total</b>	<b>46</b>
<b>Percentage of Validity</b>	<b>83,63%</b>

Based on table 7, the practicality percentage is 83.63%. Then to find out the category of the practicality of teaching materials, the percentage value of practicality of teaching materials is adjusted to the table of practicalities as follows:

**Table 8. Categories of Practicality of Teaching Materials**

<b>Average Total Validity</b>	<b>Percentage (%)</b>	<b>Practicality Category</b>
83,63%	81 – 100	Very practical

In the implementation stage, teaching materials that have been validated and revised are then tested in the application of online learning. After teaching materials are used in the teaching and learning process, the researcher provides a response questionnaire to find out the response from learners to the teaching materials developed. Here are the results of the recapitulation assessment of student response questionnaires.

**Table 9. Results of Recapitulation of Student Response Questionnaire**

<b>No.</b>	<b>Assessment Indicator</b>	<b>Number of Values</b>	<b>Percentage</b>
1	View Aspects	253	84,33%
2	Language Aspects	121	80,67%
3	Content Aspects	561	83,11%
4	User Response Aspects	247	82,33%
<b>Total</b>		<b>1182</b>	<b>82,94%</b>

The next step is the evaluation stage. Evaluation materials are obtained from the results of the student's response questionnaire after learning the material flat face three dimensional objects using character education based on mathematics teaching materials. Based on the results of the student's response, it is known that the response of learners is "Good" to the material developed.

## **Discussion**

Teaching materials based on character education are declared valid practical and get a positive response from students. This is because the character of education is needed in shaping the behavior patterns of learners in the new normal and future eras. Character education itself is a process of activities carried out with all the might and efforts consciously and planned to direct learners (Khan, 2010). Directing here is intended to lead to the formation of good behavior through learning using teaching materials based on character education. Such good behavior is shown in the results of the implementation of learning using teaching materials based on character education. The results showed that students had an improvement in the achievement of the desired character during the learning process. Although some aspects are lacking, namely the discipline aspect. But overall, the results of learning using teaching materials based on character educators can help students understanding mathematics and applying character education in it.

## CONCLUSION

Based on the results of this research and development, it can be concluded that; First, this Research and Development program designed character education based on mathematics teaching materials containing mathematical materials to facilitate the mathematics learners of grade VIII in the even semester students at Al-Ihsan Kalikejambon Islamic Junior High School. Second, validity based on validation results by both material experts obtained an average assessment score of teaching materials with a percentage of 80% and 80.8% with a valid category. Third, practicality based on the assessment of math teachers obtained an average score with a percentage of 83.63% with a very practical category. Fourth, the teaching materials received a positive response from students based on the results of the assessment of response questionnaires with a percentage of 82.95%. Based on these results, it can be concluded that the character education based on mathematics teaching materials developed are valid and feasible to be used in the teaching and learning process.

Furthermore, researchers want to provide some advice, especially for teachers and researchers in the future. Advice for teachers is expected to use teaching materials as a tool to convey the material of flat face three-dimensional objects. For further researchers, it can develop teaching material products with other materials, or develop other products with flat face three-dimensional objects materials.

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