



## Development of Student Worksheet on Rectangular Based on Yogyakarta Culture for Grade VII of Junior High School Students

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### Abstract

This research aims to develop and quality teaching materials for mathematics student worksheets based on Yogyakarta culture in rectangular materials for grade VII of junior high school students that can be valid, practical, and effective. This research is a development that refers to 3D development models, namely: define, design, and develop. The result shows that (1) there are the development of teaching materials for math worksheets (LKS) based on Yogyakarta culture on rectangular material fulfills the criteria of validity, practicality, and effectiveness; (2) based on the validity aspect of the math worksheets teaching materials, valid criteria were obtained which were reviewed from the material experts' assessment and it was obtained that the value is 3.1 and the results of the material experts' assessment by mathematics lectures and teachers obtained valid criteria with an average of 3.00; (3) based on the practical aspect of math worksheets teaching materials, students' responses were very practical with an average value 3.27; (4) based on the aspect of effectiveness by comparing the average value of students work and the Minimum Mastery Criteria (KKM) set by the school, the result of student value was more than the KKM. After using mathematics LKS teaching materials, 100% scored above the Minimum Mastery Criteria with an average of 88.57. The teaching materials for math worksheets based on Yogyakarta culture meet the criteria of validity, practicality, and effectiveness to improve the learning achievement of grade VII at SMP IT Masjid Syuhada.

Keywords: development of mathematics worksheet, rectangular, Yogyakarta culture

### INTRODUCTION

In the current era, the development of teaching material or teaching aid is considered necessary in the education unit. Teaching material such as worksheet is one of the indicators that can help the success of teaching and learning processes in the school. The availability of teaching materials is one of the factors that affect the quality of the learning process. Teachers' existence of self-made teaching materials will significantly facilitate teachers in carrying out the classroom's learning process to achieve the learning objectives effectively. While many teaching materials such as students' worksheets are readily available on the internet, many may not fit with their culture. Therefore, educators or teachers must produce a design such as

learning strategies, media, learning tools, and other educational equipment suitable for their learners. Of course, for the design to be tested and qualified, a research process is generally called development research (Yuli & Siswanto, 2019).

Student Worksheet (or *Lembar Kegiatan Siswa and shorten as LKS*) is a printed teaching material in the form of sheets of paper containing materials, summaries, and instructions for the implementation of learning tasks that students must do, both theoretical and practical that refers to the core competencies and basic competencies that students must achieve; and its use depends on other teaching materials. Teaching materials being developed must be relevant to learners' characteristics, then before developing

teaching materials, the researchers should make observations first. LKS can also be used as teaching materials, which can greatly support the role of teachers as educators (Laksana et al., 2020).

Based on the observations, researchers need to develop a culturally-based worksheet that is significantly related to students. The culturally-based worksheet may help students know more about their culture or a culture that students are not yet known, and this is in line with Budiyanto (2017) which states that schools transmit culture.

This research was done at SMP IT Masjid Syuhada, a junior high school based on religion. This research aims to determine how a form of learning related to culture can be accepted in schools based on Islam and investigate how feasible cultural-based LKS can be used in learning.

Besides, in the current pandemic, the learning process becomes hampered, thus calling for teachers to be more creative in carrying out the teaching and learning process, one of which is developing teaching materials. The learning process should also create an atmosphere of active, creative, fun student learning and be able to learn mathematics easily (Wijayanti & Retnawati, 2017). This research is aligned with Disnawati & Nahak (2019), who stated that integrating cultural products in mathematics learning known as ethnomathematics is one of the innovations to create meaningful and contextual learning for students.

SMP IT Masjid Syuhada uses the 2013 curriculum or known as K-13, so that learning must be contextual and related to the environment or in this case associated with culture. Based on observations, mathematics teachers at SMP IT Masjid Syuhada have not used student worksheets (LKS) based on Yogyakarta culture, so this becomes a reference for researchers to develop LKS based on Yogyakarta culture. The researchers observed that the lack of student initiative in finding other learning resources thus motivates teachers to be innovative in designing of

learning resources in the learning process. In addition, it is found that in learning situations, only about 50% of students can learn independently using teaching materials in the form of LKS. In comparison, 50% of other students need special assistance from teachers. Therefore, the effectiveness of an LKS needs to be improved by putting the culture in the context of LKS.

Savanti (2019) states that Yogyakarta has been named the 5th ASEAN City of Culture from 2018 to 2020. It means that Yogyakarta culture becomes an attraction among ASEAN. Therefore, there is a need to sustain Yogyakarta culture and cultivate every local community or immigrant.

Accordingly, schools should strive to foster students' love for local cultures such as the adoption of several culture-based schools and the implementation of school activities such as participating in commemorating regional activities, extracurricular events held (karawitan, dance, gamelan, and others), and providing facilities to support cultural activities (Kintoko & Jana, 2019). The use of culturally based LKS may serve this purpose.

## **METHOD**

The research and development method (R&D) is a research method used to produce a particular product by testing its effectiveness (Sugiyono, 2015). This study was conducted at SMP IT Masjid Syuhada Yogyakarta grade VII in academic year 2020/2021. Development research design uses 3D development research design by modifying the 4D (Four-D) development research design developed by Thiagarajan (1974). In Mulyatiningsih (2012), Thiagarajan stated that 4D development research stages include defining, designing, developing, and disseminating. In this case, the form of 3D design is used in research into three stages: defining, designing, and developing.

1. The defining stage. The researchers conduct curriculum analysis, student analysis, material analysis, and objective

formulation to know the initial needs in the process of making LKS.

2. The designing stage. The researchers make an initial product of LKS based on Yogyakarta culture and validate the LKS to the validator to achieve the design stage.
3. The developing stage. The researchers make LKS as a whole and then tested or valued them by material experts and teaching materials experts. The suggestion will be reflected in the revisions LKS will be applied to the user or learners.

In this study, there are three kinds of data analysis according to the data collected: validity data analysis, practicality data analysis, and effectiveness data analysis. The steps in analyzing the product criteria developed are (1) analysis of the validity of assessment instruments, including analysis of assessment sheets for material experts, analysis of assessment sheets for teaching materials experts, analysis of student response questionnaire sheets, and analysis of test instruments. The items or test questions were validated by an expert lecturer (validator); (2) Practicality analysis was done by using student response questionnaire; (3) Analysis of the effectiveness of the laboratory was conducted using test instruments for students.

## RESULTS AND DISCUSSIONS

### 1. Need Analysis

In this research, a need analysis was done to identify the problems that exist in the classroom before the LKS is developed. Based on the results of an interview at the school with a math teacher, the researchers found the following problems.

- a. The absence of LKS based on Yogyakarta culture in mathematics learning in schools.
- b. The lack of independence of students in learning, so that as many as 50% of students are still entirely dependent on teachers.

Based on the interview findings, the researchers concluded the need for LKS that can stimulate students to learn independently and facilitate the introduction of the culture of Yogyakarta.

### 2. Product design and research design

Teaching materials were developed in the design using Ms. Word 2016 and CorelDraw 2018 for cover design and LKS content. The material covered in this culture-based LKS is a rectangle that specifically discusses square, rectangular, and rhombus for grade VII junior high school students. This LKS is also equipped with *KI*, *KD*, learning objectives, instructions for use, table of contents, materials, and library list. The research design was also considered successful after the instrument used to assess the product has been validated by expert lecturers.

### 3. Expert Assessment Results

Table 1. Expert Assessment of Teaching Materials

No.	Aspect	Average	Criteria
1	Presentation	3	Valid
2	Languages	3	Valid
3	Graphic	3	Valid
Score Number		9	Valid
Overall Average		3	Valid

The above results show that LKS is valid as teaching material for a culturally-based topic such as shapes in mathematics. Nevertheless, it is noteworthy to know that the researchers do not include the dissemination stage, as this study is a case study.

Table 2. Expert Assessment of Materials

No	Aspect	Average	Criteria
1	Content eligibility	3.19	Valid
2	Servings	3.45	Valid
3	Integration of Yogyakarta culture learning model	3.00	Valid
Score Number		9.64	Valid
Average Overall		3.21	Valid

The results show that the LKS is valid after assessed by material experts who have qualified as expert validators.

#### 4. Practicality and Effectivity

The practicality analysis was taken from student response to the questionnaire, which obtained an average score of 3.27 (maximum 4.00), which consider LKS very practical.

Table 3. Student Response Questionnaire Analysis Results

No	Aspect	Average	Criteria
1	Practical	3.04	Practical
2	Presentation	3.27	Very Practical
3	Benefits	3.51	Very Practical
Score Number		9.92	Very Practical
Average Overall		3.27	Very Practical

LKS developed is said to be effective refers to an average score of 88.57—above the Minimum Mastery Criteria (KKM) score set by the school of 75.

#### CONCLUSION

Based on the results of research and discussions that have been conducted, it can be concluded that LKS teaching materials can be said to be valid, practical, and effective based on the assessment of material experts, teaching materials experts, student response questionnaires, and student test results. Based on the validity aspect of teaching materials, the developed LKS mathematics obtained valid criteria from the assessment results of material experts and obtained an average of 3.21 as well as the results of expert assessment of teaching materials and obtained an average of 3.00. Furthermore, based on the practical aspects of practical mathematics, LKS teaching materials used in review from the questionnaire student response to the use of teaching materials LKS mathematics obtained very practical criteria with an average of 3.27. In addition, based on

the effectiveness aspects reviewed from the comparison between the post-test results of students after learning with the LKS and KKM scores applied by the school, the average student score is 88.57, and the school's KKM is 75.

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