

Development of student worksheets (LKPD) based on an open ended approach with a local wisdom context

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Abstrak

Kemampuan yang mendapatkan perhatian yang cukup besar dari bidang pendidikan yaitu kemampuan berfikir kreatif. Penelitian ini bertujuan untuk menghasilkan bahan ajar berupa lembar kerja peserta didik matematika berbasis pendekatan *open ended* dengan konteks kearifan lokal yang valid dan praktis. Metode penelitian yang digunakan yaitu metode penelitian pengembangan yang mempunyai 2 tahapan yakni menggunakan model *formative evaluation* dari Tessmer (1998). Tahapan yang pertama adalah tahap *preliminary* (tahap persiapan dan pendesainan) dan tahapan yang kedua adalah tahap *formative evaluation* (*self evaluation, expert review, one-to-one, small group, dan field test*). Sampel dalam penelitian adalah peserta didik kelas VIII berjumlah 23 peserta didik. Pengumpulan data dilakukan menggunakan lembar validasi, angket, wawancara, dan dokumentasi. Hasil penelitian berupa lembar kerja peserta didik matematika berbasis pendekatan *open ended* dengan konteks kearifan lokal yang valid berdasarkan komentar dan saran yang diberikan validator dan dinyatakan valid oleh para tim ahli pada tahap *expert review* dan menghasilkan LKPD matematika berbasis pendekatan *open ended* dengan konteks kearifan lokal yang praktis menurut perhitungan angket respon siswa di tahap *one-to-one, small group, dan field test*. Hasil validasi oleh para ahli menunjukkan tingkat kevalidan sebesar 85,9, sementara tingkat kepraktisan uji coba mencapai 82,2.

Kata kunci: lembar kerja peserta didik, pendekatan *open ended*, kearifan lokal

Abstract

The ability that receives considerable attention from the field of education is the ability to think creatively. This research aims to produce teaching materials in the form of worksheets for mathematics students based on an open ended approach with a valid and practical local wisdom context. The research method used is the development research method which has 2 stages, namely using the formative evaluation model from Tessmer (1998). The first stage is the preliminary stage (preparation and design stage) and the second stage is the formative evaluation stage (self evaluation, expert review, one-to-one, small group, and field test). The sample in the study was 23 students in grade VIII. Data collection was carried out using validation sheets, questionnaires, interviews, and documentation. The results of the research are in the form of worksheets for mathematics students based on the open ended approach with a valid local wisdom context based on the comments and suggestions provided by the validator and declared valid by the expert team at the expert review stage and produce a mathematical LKPD based on an open ended approach with a practical local wisdom context according to the calculation of the student response questionnaire in the one-to-one phase, small group, and field test. The results of validation by experts showed a validity rate of 85.9, while the practicality level of the trial reached 82.2.

Keywords: Student Worksheets, Open Ended Approach, Local Wisdom

The challenges of the 21st century demand that the world of education focus not only on academic achievement, but also on the development of high-level thinking skills (Pare & Sihotang, 2023). Education needs to equip students with the ability to solve problems, make decisions, and adapt in various situations (Mardiyati & Yuniawati, 2015). Creative thinking skills are one of the important foundations in creating a meaningful and innovative learning process (Pratiwi et al., 2024). One of the abilities that has received considerable attention from the field of education is the ability to think creatively (Fajriah & Asiskawati, 2015). This can be seen from the efforts of policy-making to include creative thinking skills in education contained in the current curriculum in Indonesia, namely the 2013 curriculum (Rahayu & Malang, 2014). According to Permendikbud Number 103 of 2014 concerning learning process



standards, the development of creative thinking skills is one of the main goals of mathematics education in Indonesia. The importance of the ability to think creatively is implied in the core competence of mathematics that students are expected to have the ability to understand and apply knowledge based on their curiosity about science, technology, art, culture related to phenomena and apparent events. This is in accordance with the content of Permendikbud Number 21 of 2016, namely the purpose of education in Indonesia is to develop the abilities and potential of students to have a knowledgeable, creative, and independent personality. In connection with the above problems, teaching materials are needed that are in accordance with the needs of students, both in the level of difficulty and with the learning style of the students.

LKPD (Student Worksheet) is one of the teaching materials that can be developed by teachers to become facilitators in teaching and learning activities (Widjajanti, 2008). The preparation of LKPD can be developed according to the situation or conditions of the learning activities to be carried out (Amali et al., 2019). The objectives of LKPD include presenting teaching materials that make it easier for students to understand the material provided, presenting tasks for students to master the material provided, training learning independence, and making it easier for educators to give assignments (Prastowo, 2012). The use of LKPD will open up opportunities for students to be active and creative in the learning process. In developing LKPD, teachers need to use the right approach to make students active and foster critical thinking, one of the approaches to mathematics learning that can develop students' creative thinking skills is the mathematics-based learning approach *open-ended* (Yanti et al, 2019). Approach *Open Ended* is one of the approaches that encourages students to find more than one solution to solve the problem (Munahefi et al, 2019). Approach *Open Ended* It has several advantages, namely, students actively participate in learning and often express ideas, students have more opportunities to make comprehensive use of mathematical knowledge and skills, students with low abilities can respond to problems in their own way, students are intrinsically motivated to provide evidence or explanations, and, students have a lot of experience to find something in answering problems (Darmayasa and Hutaauruk, 2018).

The LKPD to be used should be made as attractive as possible and can lead to real problems according to the students' experience (Azhari & Aryani, 2024). This can be done by using real contexts in daily life, such as local wisdom in each region. According to Mumu & Aninam (2018) Learning mathematics by raising local culture is one of the creative learning concepts that produces fun and meaningful learning because of the real context that is used as knowledge. There are several research studies that have been studied. From research Maretha & Suparman (2022) Development of LKPD with an approach *Open Ended* ethnomathematics-based for grade VII students. His research produces LKPD with an approach *Open Ended* based on ethnomathematics that is valid, practical and has a potential effect on creative thinking in mathematics. Then, Saputri's (2022) research on the development of LKPD based on local wisdom with the PMRI approach for grade IV elementary school students. His research produces LKPD based on local wisdom with a PMRI approach that is valid, practical, and has potential effects. Based on the background description above, the researcher will raise a research entitled "Development of Student Worksheets (LKPD) with the Context of Local Wisdom".

METHOD

This type of research is *Research and Development*. The subject of the location research that will be used in this study is SMP N 4 Rambang. In development research, the focus is on two stages, namely the first *preliminary stage* (preparation stage) and the second stage of *formative evaluation* (*self evaluation, expert review, one-to-one, small group and field test*)

The following is an image that contains the flow of the *formative evaluation design*.



Figure 3.1. Formative Evaluation Research Design Flow (Tessmer, 1998)

1. Preliminary Stage

In the *preliminary* stage, the researcher carried out preparation and design. In the preparation stage, identification was carried out which consisted of identifying the curriculum applied in the school where this research took place, identifying the materials to be used, and identifying the needs of students. At the design stage, the researcher collects information from various sources related to the material to be used and designs teaching materials in the form of a mathematical LKPD based on an *open ended* approach with the context of local wisdom to be made.

Sec. 2. Formative Evaluation Stage

This stage consists of the *formative evaluation stage* (*self evaluation, expert review* and *one-one, small group, field test*). In the *self-evaluation stage*, the researcher reviewed the observed errors by asking for suggestions and comments with the supervisor. Comments and suggestions on

3. Self-evaluation stage

This will result in *prototype I*. Then at the *expert review stage*, researchers involved expert experts to see and assess aspects of the content, design, language, and characteristics of the *open ended* approach of the LKPD that has been made. Along with the *expert review stage*, a one-to-one trial was also carried out for 6 students with different abilities, namely high, medium, and low abilities. The aspects assessed at this stage are ease of use, attractiveness, effectiveness, and effectiveness as well as errors seen in LKPD teaching materials. Then an interview was conducted regarding comments and suggestions on the *one-to-one questionnaire*. The result of the *one-to-one revision* is in the form of *prototype II*. Furthermore, the *small group* of 10 students to assess practical aspects consisting of ease of use, attractiveness of appearance, applicability, and effectiveness. The results of this questionnaire contain data with comments and suggestions which are then interviewed to produce *prototype III*. The following criteria for measuring the validity and practicality of the product are as follows:

Table 2.1 Validation Result Score Categories

Score	Category
$80 < x \leq 100$	Highly Valid
$60 < x \leq 80$	Valid
$40 < x \leq 60$	Quite Valid
$20 < x \leq 40$	Less Valid
$0 < x \leq 20$	Invalid

(Modified from Tampubolon 2014)

Validation results = $x \times 100$

The practicality questionnaire data obtained from the questionnaire was analyzed in a quantitative descriptive manner using a likette scale.

Table 2.2 Questionnaire Score Categories

Score	Category
$80 < x \leq 100$	Very practical
$60 < x \leq 80$	Practical
$40 < x \leq 60$	Quite practical
$20 < x \leq 40$	Less practical
$0 < x \leq 20$	Impractical

(Modified from Tampubolon 2014)

RESULTS AND DISCUSSION

1. Preliminary Stage

This stage is in the form of preparation and design. Preparations were made by analyzing the curriculum used by the school, it was found that SMP N 4 Rambang applied the 2013 curriculum in its learning. The results of the analysis of the participants were found to be difficult. students' ability to find something (concept understanding) is still lacking, especially in functional materials. In its implementation in the learning process, students often lack understanding of things related to functions and find it difficult to distinguish between relationships and functions. In this material, there are also still difficulties so that the learning process has not gone well, students are also less active in learning.

Next, the researcher carried out the design process of teaching materials. The teaching material that will be developed is LKPD. The LKPD design stages are as follows:

- 1) Preparation of LKPD needs.
- 2) Collection of references
- 3) Preparation of LKPD based on *the steps of the open ended approach*
- 4) LKPD Structure

2. Formative Evaluation Stage

At this stage, the researcher conducts 5 stages, namely: *self evaluation, expert review, one-toone, small group, and field test*. At the *self-evaluation stage*, the researcher asked for suggestions and comments from the supervisor regarding the product developed as *propotype I*. then the researcher conducted *an expert review of the potype I* to 4 experts, namely 3 mathematics education lecturers and 1 mathematics teacher at the school where the research was conducted.

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The following are the results of the analysis of the questionnaire sheet at the *expert review stage*:

Table 3.1 Validation Sheet Recapitulation

No	Validation aspects	Validator				Aspect average	Category
		V1	V2	V3	V4		
1	Content	80	84,4	86,6	91,1	85,5	Highly Valid
2	Design	80	82,5	90	85	84,3	Highly Valid
3	Language	80	85	90	90	86,2	Highly Valid
4	<i>Open ended approach</i>	85	80	90	100	88,7	Highly Valid
5	Local Wisdom	70	80	100	80	82,5	Highly Valid
6	Facts of LKPD	80	80	93,3	100	88,3	Highly Valid
Validator's average score		79,1	81,9	91,6	91,0	85,9	Highly Valid
Category						Highly Valid	Highly Valid

Thus, it can be concluded from the results of the questionnaire that the LKPD products that have been developed are considered valid by experts. After the LKPD product has been valid, the researcher conducts the next stage, namely *one-to-one* to 5 students with different ability levels (low, medium, and high). This stage is carried out in conjunction with the *expert review stage* by looking at the practicality including, ease of use, attractiveness of appearance, applicability, and effectiveness and errors seen in LKPD teaching materials. At this stage, students are given a mathematics LKPD based on *an open ended approach* with the context of local wisdom. Furthermore, students are asked to read one by one the LKPD sheets that have been given and work on the LKPD. Furthermore, the researcher provides a questionnaire sheet that must be filled out by students. The following is the result sheet of the students' analysis.

Table 4.7 Recapitulation of *One-to-One* Questionnaire Results

No	Name	Aspects/Questions																	Score	value
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17		
1	AN	4	5	5	4	4	4	3	4	5	4	4	4	3	4	4	4	5	70	82,3
2	DW	4	4	4	4	5	4	5	4	4	4	3	3	3	4	4	4	5	68	80
3	RFP	3	3	5	4	3	3	4	3	4	5	4	5	5	4	3	4	3	65	76,4
4	GA	4	3	5	4	3	3	4	4	4	5	5	3	3	4	4	4	5	67	78,8
5	AO	4	4	3	5	4	4	5	3	3	4	3	3	3	4	3	4	5	64	75,2
6	MAF	4	3	5	4	3	4	4	3	4	5	4	4	3	4	5	4	4	67	78,8
																			Flat	78,6

Based on the results of the *one-to-one*, *small group* and *field test* questionnaire assessments, namely with a score of 78.6 in the *one-to-one* stage, 80.2 in the *small group* stage, and 82.2 in the *field test* stage, the level of practicality of the mathematics LKPD based on the *open ended* approach with the context of local wisdom is very practical.

CONCLUSION

The mathematical LKPD based on an *open ended* approach with the context of local wisdom of the developed blocks is classified as very valid quantitatively with an average score of 85.9. The valid criteria in this study were obtained from the results of the assessment of the validation sheet by experts at the *expert review* stage in terms of content, construction, language and *open ended* characteristics. The mathematical LKPD based on an *open ended* approach with the context of local wisdom developed is classified as very practical quantitatively with an average score of 78.6 in the *one-to-one* stage, 80.2 in the *small group* stage, and 82.2 in the *field test* stage and qualitatively based on the interview results. The practical criteria in this study are seen from the results of the questionnaire and the results of the interviews given. The results of questionnaires and interviews with students stated that the LKPD developed was easy to understand both in terms of use and the material presented.

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