AKSIOMA: Jurnal Program Studi Pendidikan Matematika
Volume 13, No. 2, 2024, 684-698

ISSN 2089-8703 (Print)
ISSN 2442-5419 (Online)

DOI: https://doi.org/10.24127/ajpm.v13i2.8754

DEVELOPMENT OF LEARNER WORKSHEET (LKPD) USING RME APPROACH BASED ON MANDAILING CULTURE TO IMPROVE STUDENT LITERACY

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Received 13 September 2023; Received in revised form 16 November 2023; Accepted 25 June 2024

Abstract

The purpose of this research is to develop a valid, practical, and effective Learner Worksheet (LKPD) in improving students' literacy skills. This study used the research and development method with the ADDIE (Analysis, Design, Development, Implementation) development model. Data collection instruments included validation sheets, learner and teacher response questionnaires, activity observation sheets, motivation questionnaires, and literacy tests. This study involved Grade VII students and mathematics teachers in a private junior high school in Padangsimpuan.Based on the Realistic Mathematics Education (RME) approach and local culture, LKPDs were developed that showed a high level of validity in terms of media, materials, and language. Positive responses from students and teachers indicate the practicality of the LKPD. The effectiveness of the LKPD can be seen in the improvement of students' literacy skills as evidenced by observations, motivation questionnaires, and literacy tests.

***Keywords**:* Literacy skills; LKPD; Mandiling culture; RME approach.

Abstrak

Tujuan penelitian ini adalah untuk mengembangkan Lembar Kerja Peserta Didik (LKPD) yang valid, praktis, dan efektif dalam meningkatkan kemampuan literasi siswa. Penelitian ini menggunakan metode Research and Development dengan model pengembangan ADDIE (Analysis, Design, Development, Implementation). Instrumen pengumpulan data meliputi lembar validasi, angket respon peserta didik dan guru, lembar observasi aktivitas, angket motivasi, serta tes kemampuan literasi. Penelitian ini melibatkan siswa kelas VII dan guru matematika di sebuah SMP Swasta di Padangsimpuan, menghasilkan LKPD berbasis pendekatan Realistic Mathematics Education (RME) dan budaya lokal yang menunjukkan tingkat kevalidan tinggi dalam aspek media, materi, dan bahasa. Respon positif dari peserta didik dan guru menunjukkan praktikalitas LKPD. Efektivitas LKPD terlihat dari peningkatan kemampuan literasi siswa, sebagaimana dibuktikan melalui observasi, angket motivasi, dan tes literasi.

***Kata kunci**: Budaya Mandailing; kemampuan literasi; LKPD; pendekatan RME.*

INTRODUCTION

Mathematics contributes to developing human thought in various fields, thus supporting technological progress (Nasution, 2022). This aligns with the value placed on literacy, one of the skills needed to learn mathematics. Literacy skills are not only involved but also play an important role in mathematics education in the twenty-first century, as shown Anwar (2018). Mathematical literacy, according to, is the capacity to generate, use, and interpret mathematics in a variety of contexts, including mathematical reasoning employing mathematical

ISSN 2089-8703 (Print)
ISSN 2442-5419 (Online)

DOI: https://doi.org/10.24127/ajpm.v13i2.8754

concepts, methods, facts, and instruments to describe, explain, and forecast occurrences. The ability to produce, apply, and interpret mathematics in a variety of settings, as well as to use mathematical reasoning to describe, explain, and forecast phenomena using mathematical concepts, procedures, facts, and instruments, is known as mathematical literacy. Because of the importance of this literacy, the objectives of teaching mathematics in schools are outlined in the Content Standards (SI) for teaching mathematics (Buyung & Dwijanto, 2017; Heriyadi & Prahmana, 2020). In practice, however, children still have relatively poor mathematical literacy skills. According to the 2019 findings from the Program for International Student Assessment (PISA) conducted by the OECD (2019), which evaluates students' mathematical literacy, only about 1% of Indonesian students are capable of mathematically modeling complex problems.

One of the efforts that teachers can make is to choose the right learning model and make learning media interesting and easily understood by students. Educators can enhance students' mathematical literacy by innovating teaching methods in mathematics and creating new learning tools (Budiono & Wardono, 2014). Realistic Mathematics Education (RME) is an instructional strategy that has been shown to effectively boost students' mathematical literacy skills, according to numerous studies indicating positive outcomes from lessons employing the RME approach (Budiono & Wardono, 2014; Kusuma, Wardono, & Winarti, 2016; Lestari, Prahmana, & Wiyanti, 2016; Mangelep & Kaunang, 2018; Wardono & Kurniasih, 2015). Furthermore Wijaya (2012) states that the advantages of the RME approach emphasize learning by doing, and students are first introduced to real problems. Therefore, learning using the RME approach effectively improves students' mathematical literacy skills.

Furthermore, for learning media, one of them is the Learner Worksheet (LKPD). So far, the effectiveness of using LKPD is still far from expectations; this can be seen from the questions designed on LKPD that do not pay attention to the character of students, such as socio-culture and students' initial abilities, when a material is so far from the cultural scheme they have, of course the material is difficult to understand (Hasibuan & Hasibuan, 2020) .

Although the RME approach has been shown to be effective in improving students' mathematical literacy, there are still limitations in the research on the integration of local culture, such as Mandailing culture, in the development of LKPD. This is because in culture-based learning, the learning environment will be fun where teachers and students will play an active role based on the culture they know in order to achieve effective learning outcomes (Fujiati, 2014). This culture-based learning is expected to show positive results according to research findings by (Kalifah & Nugraheni, 2021; Matondang, 2020; Suwito & Trapsilasiwi, 2016) .

This gap is important given the importance of cultural context in enhancing relevance and student engagement. This research innovates by developing LKPDs that are not only aligned with the curriculum, but also integrated with Mandailing cultural values, making a new contribution to the field of mathematics education in hopes of more effectively increasing student understanding and motivation.

ISSN 2089-8703 (Print)
ISSN 2442-5419 (Online)

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RESEARCH METHODS

Type of Research

The research methodology employed is Research and Development (R&D). This approach focuses on creating or validating educational and learning products, aiming to innovate and improve educational tools and methodologies. This research uses qualitative and quantitative approaches containing experimental and survey methods. The development model researchers use is ADDIE research and development (Analysis, design, According to Sugiyono (2017), development involves the processes of researching, designing, creating, and validating the effectiveness of the developed products. The ADDIE design model is in Figure 1.

Figure 1. ADDIE model for developing products

According to Fitriyah & Ghofur (2021), the ADDIE development model encompasses the phases of analysis, design, development, implementation, and evaluation. The Design stage is very important because it is where the LKPD concept is designed in detail, including the selection of materials and teaching methods to be used. The design and development stages are followed by validation to ensure the quality and effectiveness of the LKPD. This validation involves experts in materials and learning methods with the aim of checking the suitability of the materials with the curriculum and the ease of use by students and teachers. more details of each stage can be found in the following description:

1. Analysis

In the analysis stage, the focus is on determining what learners need to learn. This involves conducting a needs assessment, identifying existing problems, and performing a task analysis. The outcomes of this stage are detailed profiles of potential learners, identification of gaps, identification specific needs, and detailed profiles of possible learners. In this data analysis activity, the LKPD available to students still needs to be more interesting, so students become bored with learning.

2. Development

Product manufacturing and testing activities. In this activity, the solution is to make LKPDs using the Mandailing culture-based RME approach.

3. Implementation

Activities using the product. After validating and revising the product, the next step is to use it, whether it is feasible or not.

4. Evaluation

Activities to assess whether each step of the activity and the product that has been made follow the specifications or not. LKPD that has been made, namely LKPD using the Mandailing culture-based RME approach after validation and revision, then find out how the results on students' abilities will be on the LKPD that has been made.

Research Procedure

This development research activity uses level 4 development, namely research that creates new things that are creative and tested with the

ISSN 2089-8703 (Print)
ISSN 2442-5419 (Online)

DOI: https://doi.org/10.24127/ajpm.v13i2.8754

ADDIE model using The One-Shot Case Study. The one-shot case study method was chosen in this study because it allows researchers to observe the effectiveness of the Mandailing culture-based LKPD with RME approach in one application. This is relevant given the limited time and resources and the need to get an initial picture of the impact of using LKPD on students' literacy skills. This method is efficient for evaluating educational innovations in real-world settings without the need for complex experimental designs or lengthy replication. In this case, making LKPD using the Mandailing culture-based RME approach.

Data Collection Technique

In this study, data collection techniques include 1) observation as one of the primary methods using a Likert scale questionnaire for validation from material experts, media experts, teachers and students; 2) interviews to explore students' opinions, aspirations, hopes, achievements, desires, beliefs, etc. as a result of learning, which were conducted not only as part of the preliminary study but also throughout the research process to gain an in-depth understanding of the learning dynamics; 3) documentation to document the research activities.

Research Instruments

The research instruments used: 1) The team used interviews to obtain sources, namely mathematics teachers and students regarding mathematics subject matter, to see students' aspirations, motivation, activation, and learning outcomes; 2) Product validation questionnaires contain media expert test sheets, material expert test sheets, and language expert test sheets; 3) Practicality test questionnaires to determine the level of ease in using LKPD products. Teachers and students filled in this questionnaire and test; 4) student activity observation sheets, motivation questionnaires, and student literacy tests to determine the effectiveness of LKPD.

Data Analysis Technique

Data analysis was carried out to see the value of each aspect, namely in terms of LKPD feasibility analysis, LKPD practicality, and effectiveness analysis.

1. LKPD Feasibility Validation Analysis

The data analyzed were suggestions and criticisms from experts, teachers, and student responses. The data analysis techniques are as follows:

a. Collection of all data obtained in each aspect of the LKPD indicator assessment
b. Calculating the average score in each indicator of the assessment aspect using the formula:

$$\bar{x} = \frac{\sum x}{n}$$

Description:
$\bar{x}$ = average score
Σx = total number of scores from raters
n = number of validators

The results are then converted to the validity data score obtained and then to the criteria (Riyani, Maizora, & Hanifah, 2017).

Table 1. Validation test score conversion

Interval Score Assessment	Criteria
3 ≤scores < 4	Very Valid
2 ≤scores <3	Valid
1 ≤scores <2	Less Valid
0≤scores <1	Not Valid

ISSN 2089-8703 (Print)
ISSN 2442-5419 (Online)

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2. Practicality Analysis of LKPD

Teachers and students filled in data for practicality analysis, the results of the questionnaire scores were filled in through the equation (1), with "n" is total number.

$$\% p = \frac{\text{score obtained}}{\sum n} \times 100\% \quad (1)$$

After obtaining the interpretation of the product developed, the conversion is then carried out in the following Table 2 (Arikunto, 2017).

Table 2. Conversion of practicality test

Percentage	Criteria
0,00% – 20 %	Very low/ impractical practicality
20,1% – 40 %	Low practicality / less practical
40,1% – 60%	Moderate practicality / moderately practical
60,1% – 80 %	High practicability/ practical
80,1% – 100 %	Very high practicality / very practical

3. Effectiveness Analysis of LKPD

Data analysis for effectiveness (activity, motivation, learning outcomes) are:

1) Student activity

Student activity observation data after being obtained is percentage by descriptive techniques:

$$P = \frac{f}{N} \times 100\% \quad (2)$$

Description:
P = percentage of activity
F = frequency of activity
N = number of students

The criteria for knowing the success rate of learning activities can be seen in Table 3.

Table 3. Learning activity criteria

Criteria	Success rate	%
Seldom	Unsuccessful	1 – 25
Occasionally	Less successful	26 – 50
To a Considerable Degree	Successful	51 – 75
Almost Always	Very successful	76 – 100

2) Studets' Motivation

Motivation questionnaire data was analyzed using the percentage technique as follows:

$$Percentage = \frac{\sum x_i}{\sum x_n} \quad (3)$$

The results obtained were interpreted using the criteria:

Table 4. Criteria of motivation's score

Criteria	Range Percentage
Very low	0 - 20
Low	21 - 40
Medium	41 - 60
High	61 - 80
Very high	81 - 100

3) Leraning outcomes

Data on learning outcomes obtained from tests were analyzed with descriptive statistics. Descriptive statistics are carried out to calculate the average, standard deviation, and percentage (Sugiyono, 2017) . In this research, data analysis will be carried out to describe the percentage of overall student completion with a percentage of scores ≥ 70.

RESULTS AND DISCUSSION

Description of Research Results

Based on the research results that researchers obtained based on the ADDIE stages are as follows:

a. Analysis

This stage is done by identifying problems and needs. The findings from

ISSN 2089-8703 (Print)
ISSN 2442-5419 (Online)

DOI: https://doi.org/10.24127/ajpm.v13i2.8754

the researcher's interview with the mathematics teacher indicate that the problem that hinders students' potential at private junior high school in Padangsimpuan is the need for more interest of students in mathematics lessons, even though mathematics plays a role in various disciplines in developing human. This aligns with the importance of literacy skills, one of the abilities involved in learning mathematics. As revealed (Heriyadi & Prahmana, 2020) literacy skills are not only involved but also play an important role in learning mathematics in the 21st century today. Especially SPLDV material, because this material is very important for everyday life. There is no learning media available that supports the learning process on SPLDV material. After obtaining the interview results, the researcher analyzed the needs in accordance with the problems that hinder the learning process, namely the lack of learning tools that support the SPLDV material. After knowing the learning device will be developed, the researcher begins to carry out the design stage.

b. Design

This design stage is also known as the blueprint stage. The LKPD design begins with determining the LKPD cover that can attract students' attention to read it. The LKPD cover is designed with A4 size, consisting of the title of the LKPD, the submaterial's material to be discussed, the layout, and the name of the LKPD designer. For the Design to look more attractive, images related to SPLDV material and the selection of bright cover colors are used. The content design of the LKPD is also designed to be interesting by planning the content in the presentation of the material and equipped with images related to mathematics. The contents of the LKPD using the mandailing culture-based RME approach are also designed with an A4 size consisting of 19 pages. The blueprint design that has been designed is then evaluated through consultation with the supervisor to find out the shortcomings. Based on the results of the consultation, input was obtained, including the selection of more attractive colors and the addition of an assessment rubric. After going through the design stage, further development can be carried out.

c. Develop

The development stage is realizing the blueprint made into a product. The development includes typing the contents in the LKPD, inserting images related to the material, and providing attractive colors on each page. The process of making this LKPD uses the application of Microsoft Word. Then, the researchers searched and collected data from various relevant sources to enrich the material used in the LKPD. At this stage, pages were also developed with color variations to make the LKPD look more attractive.

Furthermore, the LKPD include images and content related to everyday life, making it easier for students to grasp the material. Editing and layout arrangements on LKPD are also developed by designing an appropriate placement layout to make it look beautiful and attract the attention of students reading LKPD based on Mandailing culture.

Furthermore, the LKPD enters the evaluation stage; this stage is carried out to determine whether the LKPD is valid for use. At this stage, the researcher uses a validation sheet instrument consisting of 10 statement items that will be given to experts when assessing

ISSN 2089-8703 (Print)
ISSN 2442-5419 (Online)

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the LKPD using the Mandailing culture-based RME approach developed. The validation sheet is first validated by instrument experts to be used as a valid research instrument. After the instrument validation sheet is revised according to the validator's suggestions and input, the media expert validation sheet, material, language, and response questionnaire can be used. Furthermore, the LKPD is validated by media, material, and language experts. After validation, the researchers then began to carry out the implementation stage. Based on the correction notes from all validators, the following are the results of revisions to the LKPD.

1) Media aspect revision results

The score of the media validation assessment results obtained from the three validators is 3.53, so the LKPD is in a very valid category for use. However, revisions are still needed for several parts according to the validator's suggestions. The results of the revision of LKPD using the RME approach based on Mandailing culture can be seen in Figure 2 and 3.

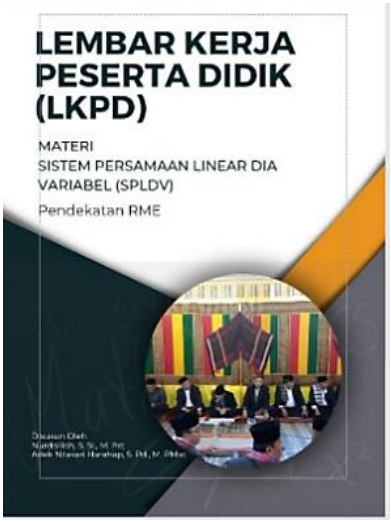

Figure 2. Cover before revision

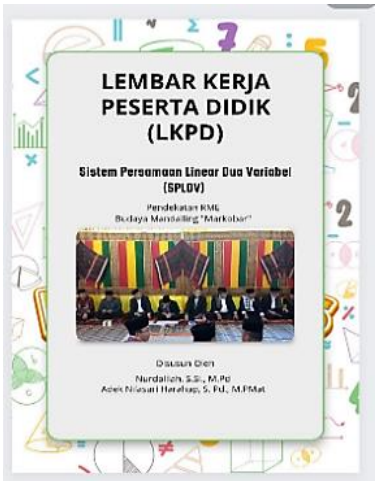

Figure 3. Cover after revision

2) Material aspect validation results

The score of the media validation assessment results obtained from the three validators is 3.53, so the LKPD is in the category of very valid for use but still requires revision in certain parts.

3) Linguist validation results

The score of the media validation assessment results obtained from the three validators is 3.80, so the LKPD is in a very valid category for use. However, revisions are still needed according to the suggestions and input from the validator.

d. Implementation

Implementation, also called application, is carried out after the development stage. At this stage, the developed LKPD are tested to determine the reactions and feedback from both students and teachers towards the material. This trial was carried out to determine the practicality and effectiveness of the LKPD using the Mandailing culture-based RME approach at private junior high school in Padangsimpuan to 24 seventh-grade students and mathematics teachers. At this stage, the researchers distributed the LKPD to each learner and teacher to

ISSN 2089-8703 (Print)
ISSN 2442-5419 (Online)

DOI: https://doi.org/10.24127/ajpm.v13i2.8754

read; then, the researchers distributed questionnaires to both students and teachers to collect more detailed feedback and insights. The questionnaire has 10 statement items for students and 10 statement items for teachers. For activity and motivation, questionnaires were given to students consisting of 6 observed activities and 4 indicators for motivation consisting of 4 rating scales, namely 4 (strongly agree), 3 (agree), 2 (disagree), and 1 (disagree). Furthermore, giving students a literacy skills test of 5 essay questions.

After the implementation stage was completed, the researchers proceeded to the evaluation stage, which included improving the LKPD obtained from the results of teacher and student questionnaires. Based on the evaluation stage, researchers obtained the results that the LKPD did not need to be revised; this was because the responses of teachers and students were very positive towards the LKPD developed by researchers.

Presentation of Data

a. LKPD validation results

LKPD designed and validated by a team of experts, aims to guide students in the learning process. This is in accordance with the theory put forward (Ariati et al., 2022a); one of the key functions of teaching materials is to serve as a guide for students, directing all their activities during the learning process and providing the substance of competence they need to achieve.

Learners are expected to steer their own learning activities and grasp the core competencies they need to learn or acquire mastery over. Validation is divided into three categories, namely media experts, material experts, and linguists.

Table 5. Results of media expert LKPD validation

No	Assessment Criteria	Validator 1				Validator 2				Validator 3			
		1	2	3	4	1	2	3	4	1	2	3	4
1	The suitability of the indicators with the KD has been determined.			√					√				√
2	The suitability of the material with the indicators that have been formulated.		√					√					√
3	The LKPD presented has instructions for use.				√				√			√	
4	Presentation of material in young LKPDs is understood and contains Mandailing culture.			√				√					√
5	LKPD can motivate students to find more information about SPLDV material.				√				√				√

Table 6. LKPD validation results of material experts

No	Assessment Criteria	Validator 1				Validator 2				Validator 3			
		1	2	3	4	1	2	3	4	1	2	3	4
1	Suitability of the cover with the topic of discussion.				√				√				√
2	The suitability of the size of the image presented in the LKPD.		√					√					√
3	The color display on the LKPD is interesting.			√					√			√	
4	The images used in the LKPD are clear.			√				√					√
5	The design of the LKPD display is interesting.				√				√				√

ISSN 2089-8703 (Print)
ISSN 2442-5419 (Online)

DOI: https://doi.org/10.24127/ajpm.v13i2.8754

Table 7. LKPD validation results of linguists

No	Assessment Criteria	Validator 1				Validator 2				Validator 3			
		1	2	3	4	1	2	3	4	1	2	3	4
1	The suitability of the indicators with the KD has been determined.				√				√				√
2	The suitability of the material with the indicators that have been formulated.			√					√				√
3	The LKPD presented has instructions for use.				√				√			√	
4	The presentation of material in LKPD is easy to understand.			√					√				√
5	LKPD can motivate students to find more information about SPLDV material.				√				√				√

b. Results of the LPKD Trial to test the practicality of the LPKD

1) Results of Learner Response

This LKPD trial was conducted on 24 students. Researchers distributed the revised LKPD were evaluated to assess student reactions. The outcomes of the students' feedback are presented in Table 8.

Table 8. Results of Learners' Response to LKPD

No	Statement	Student's Respons			
		1	2	3	4
1	The appearance of the cover makes me interested in reading the LKPD.	0	0	2	22
2	The color selection on the LKPD cover attracted my attention.	0	0	0	24
3	The LKPD display is not boring.	0	0	4	20
4	LKPD using an RME approach based on Mandailing culture motivates me to learn the material presented.	0	0	4	20
5	The language used is simple, making it easier for me to understand the material.	0	0	2	22
6	The LKPD concept presented is following my level of understanding.	0	1	1	22
7	The instructions given in the LKPD are very clear.	0	0	6	18
8	Using LKPD can make it easier for me to understand SPLDV material.	0	0	6	18
9	Learning using LKPD can help me learn in groups.	0	0	2	22
10	LKPD using the RME approach increases my learning motivation towards Mandailing culture.	0	0	0	24

2) Math Teacher Response Results

The trials carried out not only looked at the responses of students but also the responses of teachers, especially those who teach math subjects. The results can be seen in Table 9.

ISSN 2089-8703 (Print)
ISSN 2442-5419 (Online)

DOI: https://doi.org/10.24127/ajpm.v13i2.8754

Table 9. Results of Teacher Response to LKPD

No	Statement	Teacher's Response			
		1	2	3	4
1	Materials/study topics are following the basic competencies.	0	0	0	1
2	Learning indicators are following the basic competencies in the K13 syllabus.	0	0	0	1
3	The discussion/study description is presented systematically.	0	0	0	1
4	Learning steps invite and guide students to discover the concepts/principles studied.	0	0	1	0
5	The study material/discussion topics follow the students' train of thought.	0	0	1	0
6	The presentation of SPLDV rate material in LKPD is easy to understand.	0	0	0	1
7	Ease of understanding the language used.	0	0	0	1
8	The LKPD cover using the RME approach based on Mandailing culture by the topic of SPLDV material.	0	0	0	1
9	The images used in the LKPD are based on the material presented.	0	0	0	1
10	The font size 12-14 is clear and easy to read.	0	0	1	0

Data Processing

a. Expert Team Validation Results

Table 10. Results of media validation data presentation by 3 validators

No	Assessment Criteria	Validation Score		
		V1	V 2	V3
1	Suitability of the cover with the topic of discussion.	4	4	4
2	The suitability of the size of the image presented in the LKPD.	2	3	4
3	The color display on the LKPD is interesting.	3	4	3
4	The images used in the LKPD are clear.	4	3	4
5	The design of the LKPD display is interesting.	4	4	4
Total score		**16**	**18**	**19**
The average of each validator		**3,2**	**3,6**	**3,8**
Average			**3,53**	

Table 11. Results of material validation data presentation by 3 validators

No	Assessment Criteria	Validation Score		
		V1	V2	V3
1	Suitability of the cover with the topic of discussion.	3	4	4
2	The suitability of the size of the image presented in the LKPD.	2	3	4
3	The color display on the LKPD is interesting.	4	4	3
4	The images used in the LKPD are clear.	3	3	4
5	The design of the LKPD display is interesting.	4	4	4
Total score		**16**	**18**	**19**
The average of each validator		**3,2**	**3,6**	**3,8**
Average			**3,53**	

ISSN 2089-8703 (Print)
ISSN 2442-5419 (Online)

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Table 12. Results of language validation data presentation by 3 validators

No	Assessment Criteria	Validation Score		
		V1	V2	V3
1	The suitability of the indicators with the KD has been determined.	4	4	4
2	The suitability of the material with the indicators that have been formulated.	3	4	4
3	The LKPD presented has instructions for use.	4	4	3
4	The presentation of material in LKPD is easy to understand.	3	4	4
5	LKPD can motivate students to find more information about SPLDV material.	4	4	4
Total score		**18**	**20**	**19**
The average of each validator		**3,6**	**4,0**	**3,8**
Average			**3,80**	

Based on the data above, the average value of the 3 validated aspects can be obtained as follows:

$$\bar{x} = \frac{\sum x}{n} = \frac{3{,}53 + 3{,}53 + 3{,}80}{3} = 3{,}62$$

The results obtained from the average validation value from 3 aspects consisting of media, material, and language aspects amounted to 3,62 (very valid). Hence, the LKPD using the Mandailing culture-based RME approach on SPLDV material is very valid for the learning process at private junior high school in Padangsimpuan

b. Practicality Results of LKPD Based on Student and Mathematics Teacher Responses

Based on the research results obtained from student responses to LKPD using the Mandailing culture-based RME approach, 24 students answered 10 statement items with 4 answer scales, namely 4 = strongly agree, 3 = agree, 2 = disagree, 1 = disagree. The results of the percentage of students' responses to LKPD using a culture-based RME approach obtained a percentage of strongly agreeing 88.33% and a table of 92.5% based on very practical criteria so that the LKPD that has been developed is very practical to use in Padangsidimpuan Campus Private Junior High School.

c. LKPD Effectiveness Results Based on Activity, Motivation, and Student Learning Outcomes

1) Student Activity

Student activity data is obtained from the observers' observations by filling out the student activity instruments provided. The results of observations by observers are shown in the Table 13.

Table 13. Data on observer observations of student activities

Activity Observed	Meeting						Average	Success Rate
	I		II		III			
	f	%	f	%	f	%		
Visual Activities	22	91,66	23	95,83	24	100	95,83	Very Successful
Oral Activities	4	16,66	5	20,83	5	20,83	19,44	No Successful
Writing Activities	22	91,66	24	100	24	100	97,22	Very Successful
Drawing Activities	16	66,66	18	75	20	83,33	74,99	Successful
Mental Activities	16	66,66	20	83,33	20	83,33	77,77	Very Successful
Motor Activities	4	16,66	3	12,50	2	8,33	12,49	No Successful

ISSN 2089-8703 (Print)
ISSN 2442-5419 (Online)

DOI: https://doi.org/10.24127/ajpm.v13i2.8754

Based on the Table 13, the average percentage of visual activities of 95.83%, writing activities of 97.22%, and mental activities of 77.77% is very successful. Oral activities of 19.44% and motor activities of 12.49% are at the level of success or failure.

2) Student Motivation

The results of observations of student learning motivation can be seen in the Table 14.

Table 14. Questionnaire data on student learning motivation

No	Indicators	Number of students who responded				Percentage (%)			
		1	2	3	4	1	2	3	4
1	Interest	0	0	2	22			8,33	91,67
2	Relevance	0	0	0	24				100
3	Expectation	0	0	2	22			8,33	91,67
4	Satisfaction	0	0	0	24				100
Percentage Strongly Agree					**95,835%**				
Percentage Agree					**4,165%**				
Disagree Percentage					**0%**				
Disagree Percentage					**0%**				

Based on the Table 14, the percentage of strongly agreeing is 95.835, which is very high.

3) Student Literacy Test Results

The result of literacy test data can be seen in Table 15.

Table 15. Student literacy test results

No	Students' Code	Score
1	MM1	75
2	MM2	80
3	MM3	80
4	MM4	85
5	MM5	85
6	MM6	85
7	MM7	80
8	MM8	85
9	MM9	75
10	MM10	70
11	MM11	90
12	MM12	75
13	MM13	85
14	MM14	90
15	MM15	80
16	MM16	80
17	MM17	85
18	MM18	90
19	MM19	80
20	MM20	85
21	MM21	85
22	MM22	85
23	MM23	80
24	MM24	75
Total		**1965**
Average		**81,875**

Based on the Table 15, the average score of students in classical is 81.875, with a pass percentage of 79.19% in high criteria. Thus, based on the percentage of activity, motivation, and test results of students' science literacy skills, it can be said that the developed LKPD is effectively used in Padangsidimpuan Private Junior High School. Referring to the research of (Ariati, Anzani, Juandi, & Hasanah, 2022b), which highlighted the effectiveness of the RME approach, these results show an increase in students' mathematical literacy skills. also supports this finding by empha-

ISSN 2089-8703 (Print)
ISSN 2442-5419 (Online)

DOI: https://doi.org/10.24127/ajpm.v13i2.8754

sizing the improvement of numeracy skills through RME. Follow-up studies by (Ralmugiz & Kusumawati, 2020; Yuliana, Usodo, & Riyadi, 2022) confirmed the effectiveness of RME in different student demographic contexts. These findings underscore the importance of the RME approach in improving mathematical literacy while making a significant contribution to the practice of school mathematics lerning.

CONCLUSIONS

The conclusion of this study shows that the LKPD developed based on the Mandailing culture-based RME approach is very valid, practical and effective in learning SPLDV at SMP Swasta Kampus Padangsidimpuan. The validity of the LKPD with an average score of 3.62 was confirmed through validation by a team of experts. The practicality is seen from the positive responses of students and mathematics teachers, with a percentage of 88.33% and 92.50%, respectively. The effectiveness of the LKPD was demonstrated through observations of learning activities, motivation, and student literacy test results, with 79.17% of students achieving the KKM. This confirms that the LKPD can effectively support the teaching and learning process of the SPLDV material.

ACKNOWLEDGMENTS

The researcher extends profound thanks to the Directorate General of Higher Education, Research, and Technology (Ditjen Diktiristek) within the Ministry of Education, Culture, Research, and Technology for the grant funds awarded in 2023 under the National Competitive Research category, specifically within the Beginner Lecturer Research scheme.

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