https://newjournal.lppmunindra.ac.id/index.php/jkpm/index
ISSN 2477-2682 (Electronic)
ISSN 2477-2348 (Print)

Jkpm
Jurnal Kajian
Pendidikan Matematika

Original Research

Development of PMRI-Based Student Worksheets in The Context of The Lubuklinggau Inpres Market to Improve Problem-Solving Ability

Aisyah Rahmawaty[1], Rani Refianti[2*)], & Khathibul Umam Zaid Nugroho[3]
[1, 2, 3]Universitas PGRI Silampari, Lubuklinggau, Indonesia

INFO ARTICLES

Article History:

Received: 14-05-2026
Revised: 22-06-2026
Approved: 22-06-2026
Publish Online: 30-06-2026

Key Words:

Development; Student Worksheets; PMRI; Problem-Solving; Plomp.

Abstract: This study aimed to develop PMRI-based Student Worksheets using the context of the Lubuklinggau Inpres Market on the topic of arithmetic sequences and series that were valid, practical and effective to improve students' problem-solving abilities. This research used the Plomp development model, which consisted of three stages: preliminary research, prototype stage, and assessment phase. Data were collected through questionnaires and tests, with the research subjects being 10th grade students of Azhariyah Islamic Senior High School, Lubuklinggau, Indonesia. The results of data analysis showed that the validity scores obtained from the validation of language experts were 0,94, media experts 0.73, first material experts 0,81 and second material experts 0,83, indicating that the developed worksheets were categorized highly valid. The teacher practicality score was 83,9%, while the student's practicality score was 90.3% indicating that the worksheets were categorized as very practical. Furthermore, the effectiveness test conducted with 30 students resulted in an N-Gain value of 57,17%, which was categorized as quite effective.

Correspondence Address: *PGRI Silampari University, Mayor Toha Street, Air Kuti Village, Lubuklinggau City, South Sumatra, Indonesia, Post Code 31626; e-mail: ranirefianti834@gmail.com

How to Cite (APA 6th Style): Rahmawaty, A., Refianti, R., & Nugroho, K.U.Z. (2026). Development of PMRI-Based Student Worksheets in The Context of The Lubuklinggau Inpres Market to Improve Problem-Solving Ability. *JKPM* (*Jurnal Kajian Pendidikan Matematika*), 11(2): 313-326. https://doi.org/10.30998/jkpm.v11i2.3583

Competing Interests Disclosures: The authors declare that they have no significant competing financial, professional or personal interests that might have influenced the performance or presentation of the work described in this manuscript.

INTRODUCTION

Problem-solving ability is one of the essential competencies that students must develop through mathematics learning because it enables them to analyze situations, make decisions, and solve problems encountered in everyday life (Purba & Rajagukguk, 2024). However, many students still experience difficulties in learning mathematics. Students often rely on memorizing formulas rather than understanding mathematical concepts and applying them to solve contextual problems. As a result, their learning outcomes in mathematics tend to be lower than those in other subjects (Rahmawaty et al., 2025). In addition, mathematics learning is often conducted through teacher-centered instruction, which limits students active participation in the learning process. The teaching materials used are also frequently considered less attractive and less relevant to students' daily experiences, causing students to continue experiencing difficulties in solving mathematical problems (Saryani et al., 2024). These conditions indicate the need for innovative and contextual learning materials that can support students' active involvement and improve their problem-solving abilities.

Based on an interview conducted with a tenth-grade mathematics teacher at Azhariyah Islamic High School Lubuklinggau on Tuesday, October 7, 2025, it was found that the teaching materials used in mathematics learning were primarily printed textbooks and PowerPoint presentations. These materials mainly functioned as instructional aids for the teacher, while students tended to listen to explanations and take notes without actively engaging in independent learning activities. The interview results also revealed that students experienced difficulties in solving problems related to arithmetic sequences and series. Most students tended to memorize the formula for determining the nth term and the sum of arithmetic series without fully understanding the underlying concept. Furthermore, students encountered difficulties in connecting mathematical concepts to real-life situations. r Additional information obtained during the preliminary study indicated that teachers still relied heavily on lecture and discussion methods, contextual student worksheets related to students' daily lives were not yet available, and students' generally lacked of enthusiasm and motivation when learning mathematics. Consequently, students tended to be passive during lessons and experienced difficulties in applying mathematical concepts to real-world situations.

These findings highlight a gap between the expected goals of mathematics learning and the actual learning in the classroom. Students need learning materials that not only present mathematical concepts but also facilitate meaningful learning experiences through contextual situations. Therefore, the development of contextual teaching materials that encourage active learning and support problem-solving skills is necessary, particularly for the topic of arithmetic sequences and series.

The learning process in school requires appropriate teaching materials (Putri et al., 2023). One of the teaching materials that can support meaningful learning is the Student Worksheets. According to Fitriani et al (2024), Student Worksheets are teaching materials in the form of printed sheets containing summaries of materials and task instructions designed based on the intended learning outcomes, which play an important role in encouraging student engagement. However, the effectiveness of student worksheets depends on their ability to connect mathematical concepts with students' daily life. Therefore, contextual worksheets are needed to help students understand mathematical concepts more meaningfully and improve their ability to solve problem. Previous studies have also shown that PMRI-based worksheets can support students' active engagement and facilitate meaningful mathematics learning through contextual situations (Mu'tashimah et al., 2020).

One approach that emphasizes contextual learning is Indonesian Realistic Mathematics Education (PMRI), which is an adaptation of the Realistic Mathematics Education (RME) developed in the Indonesian educational context. PMRI emphasizes the use of meaningful real-world contexts, allowing students to understand mathematical concepts through contextual problems and real-life experiences (Zulkardi, 2002). According to Refianti et al (2022), Indonesian Realistic Mathematics Education connects mathematics with human activities encountered in daily life. Mathematics learning should be related to students' surrounding environment so that learning becomes more relevant and meaningful, enjoyable, and able to attract students' attention (Adha et al., 2025). Furthermore, Nugroho et al (2019), stated that contextual learning can improve students'

understanding abilities compared to conventional learning. These findings suggest that PMRI-based learning materials have the potential to address students' difficulties in understanding mathematical concepts and solving problems. Similar findings were reported by Tabrani et al. (2023), who found that the PMRI approach positively contributed to the development of students' mathematical problem-solving abilities.

Students will find it easier to understand mathematics when learning begins with their immediate surroundings (Nugroho et al., 2021). In line with this, Adha & Refianti (2020) stated that mathematics learning becomes more meaningful and enjoyable when connected to real-world contexts or situations relevant to the students' environments. One of the mathematics topics taught in tenth grade high school that has many applications in daily life is arithmetic sequences and series. However, the current implementation of mathematics learning, particularly on arithmetic sequences and series, indicates the need for more contextual and meaningful teaching materials.

One of the local context found in the Lubuklinggau area is the Lubuklinggau Inpres Market. In addition, the market context is relevant to the topic of arithmetic sequences and series because various market activities and object arrangements can be represented through arithmetic patterns. In this material, students learn about sequences with a constant difference and the total or sum of a sequence. Examples that can be found in the market include the arrangement of avocados, parking spaces, and watermelon slices. These contextual situations are consistent with the prnciples of PMRI, which emphasize the use of meaningful real-world contexts as a foundation for developing mathematical understanding. However, the research school has not yet developed contextual worksheets that connect arithmetic sequences and series material to real-life situation found in Lubuklinggau Inpres Market.

Problem-solving skills are essential for developing high-quality individuals. Developing students' problem-solving abilities is one of the primary goals of mathematics education because it enables learners to apply mathematical knowledge in various situations and real-world context (Laurens et al., 2018). Problem-solving ability consists of the ability to understand problems, solve them, and interpret the obtained solutions (Nugroho et al., 2023). Mathematical problem-solving ability involves reasoning, decision-making, interpreting, organizing, and evaluating efforts to solve a problem or find its solution (Mentari et al., 2022). This is consistent with the findings of Susanti & Nurfitriyanti (2018), who reported that learning through the Realistic Mathematics Education approach significantly improved students' mathematical problem-solving performance. In line with Polya (2004), problem-solving ability refers to students' ability to design a solution strategy based on a given problem, implement the solution plan, and review the results of the problem-solving process. However, students' problem-solving abilities at the research school are still relatively low because students tend to depend on teachers' explanations and are not yet accustomed to exploring problem-solving strategies independently. This condition further emphasizes the need for learning materials that actively engage students in problem-solving activities through meaningful context.

Based on the explanation above, problems identified, the limited availability of contextual learning mateials, and the potential benefits of PMRI in supporting meaningful mathematics learning, this study aimed to develop PMRI-based student worksheets using the context of the Lubuklinggau Inpres Market to improve students' problem-solving abilities in arithmetic sequences and series. The developed worksheets are expected to provide an alternative contextual teaching material that support meaningful mathematics learning and improve students' problem-solving skills.

METHOD

The method used in this study was Research and Development (R&D). Research and development is a type of research that focuses on development, expansion, and in-depth exploration of a theory. This study employed the Plomp development model, which consists of three stages: the preliminary research stage, the prototype stage, and the assessment phase.

The preliminary research stage aimed to identify and analyze the main problems underlying the importance of this development. During this stage, several activities were conducted, including curriculum analysis, students analysis, and content analysis.

The next stage was the prototype stage, in which the product design and development process was carried out. This stage consisted of several sub-stages, namely self-evaluation with the supervisor, expert review by language, media, and material validators, one-to-one evaluation involving three students, and a small group evaluation involving six students.

The final stage was the assessment phase, which is the last phase in Plomp's development model. During this phase, the PMRI-based student worksheets using the context of the Lubuklinggau Inpres Market developed in the previous stage were evaluated. The assessment phase included a field test conducted in a large-group trial. The stages of Plomp's development are presented in Figure 1., adapted from Latif (2021).

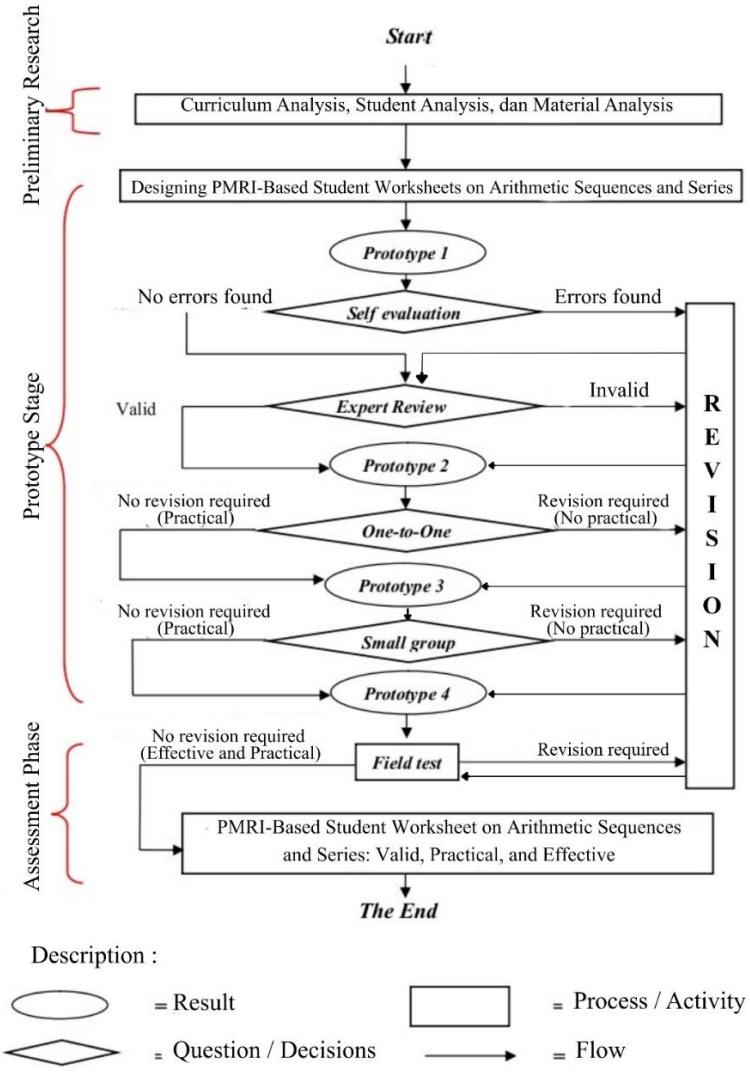

Figure 1. Stages of Development of the PMRI Student Worksheet

Preliminary research

The first stage of Plomp's development model is the preliminary research stage. The preliminary research stage aimed to identify and analyze the main problems underlying the importance of this development process. According to Hisni et al. (2022), the preliminary research stage consists of three components, namely curriculum analysis, student analysis, and content analysis.

Prototype stage

At this stage, the PMRI-based student worksheet were developed. The prototype stage consisted of several sub-stages, namely self-evaluation, expert review, one-to-one evaluation, and small group evaluation. The students worksheets were designed using the *Canva* application. The following section explains each sub-stages of the prototype stage:

Self evaluation

At this stage, the researcher conducted a self-evaluation of Prototype I together with the supervising lecturer. During this proscess, the languageused in the PMRI-based student worksheets was reviewed, and the layout design was improved to make the worksheet more attractive and engaging.

Expert review

At this stage, the validation process was carried out by four validators consisting of one language expert, one media expert, and two material experts. Each validator provided with a validity questionnaire according to their area of experties. The questionnaire used a 4-point Likert scale. The following Table 1. presents the conversion of Aiken's V scores. Based on Table 1., it can be concluded that PMRI-based Student Worksheets is declared valid if the average score obtained is $V \geq 60$.

Table 1. Value Conversion Guidelines *Aiken's V*

Interval	Category
$0{,}80 < V \leq 0{,}100$	Very Valid
$0{,}60 < V \leq 0{,}80$	Valid
$0{,}40 < V \leq 0{,}60$	Fairly Valid
$0{,}20 < V \leq 0{,}40$	Less Valid
$0 < V \leq 0{,}20$	Very Invalid

Source: Saryani et al. (2024)

One-to-one evaluation

The one-to-one evaluation stage involved three students with different levels academic ability consisting of one high-ability student, one medium-ability student, and one low-ability student. This stage aims to evaluate the readability, clarity of instructions, ease of use, and students' initial responses to the student worksheets.

Small group evaluation

The small-group evaluation stage involved six students with different levels of academic ability, consisting of two high-ability students, two medium-ability students, and two low-ability students. This satge aimed to evaluate the practicality of the student worksheets on a broader scale compared to the one-to-one evaluation. In addition, students were given a practicality questionnaire to assess the developed student worksheets. Based on Table 2., the PMRI-based Student Worksheets are considered practical if the average score obtained reaches $P \geq 61\%$.

Table 2. Practicality Score Average Converion Guidelines

Interval	Category
$81\% - 100\%$	Very Practical
$61\% - 80\%$	Practical
$41\% - 60\%$	Quiet Practical
$21\% - 40\%$	Less Practical
$0\% - 20\%$	Impractical

Source: Fitriani et al. (2024)

Assessment phase

At this stage, the PMRI-based student worksheets were evaluated is to determine their effectiveness as mathematics teaching materials. The evaluation was conducted through a field test involving teacher and students. Teacher were given a practicality questionnaire to assess the practicality of the developed student worksheets, while students were given a posttest to measure the improvements in their problem-solving abilities after using the PMRI-based student worksheets.

Calculate the validity analysis of the average score from all aspects assessed using the Aiken's V Formulas (1). (Azwar, 2015).

$$v = \frac{\sum s}{n\,(c-1)} \quad (1)$$

Information:

v = v aiken validity index
s = $r - lo$
r = the number of givin by the validator
lo = lowest assessment number
n = number of raters
c = highest assessment number

Calculate the practical analysis of teacher and students using the Formulas (2) (Lestari et al., 2017)

$$P = \frac{\textit{total score resulting from data collection}}{\textit{Maximum Score}} \times 100\% \quad (2)$$

The effectiveness of the LKPD developed is calculated using the following N-Gain Formula (3) (Wahab et al., 2021)

$$\textit{Normal gain} = \frac{\textit{Skor Posttest - Skor Pretest}}{\textit{Skor Ideal - Skor Pretest}} \quad (3)$$

The N-gain values obtained are then interpreted based on the Table 3.

Table 3. Interpretation of the Average N-Gain Score

Value (g)	Criteria
$(g) \geq 0{,}7$	High
$0{,}3 \leq (g) < 0{,}7$	Medium
$(g) < 0{,}3$	Low

Source: Wahab et al. (2021)

After determining the criteria for the N-Gain score, interpret the effectiveness of the N-Gain score based on the following Table 4.

Table 4. Interpretation of the N-Gain Score

Percentage (%)	Interpretation
> 75	Effective
$56 - 75$	Quite Effective
$40 - 55$	Less Effective
< 40	Ineffective

Source: Putri & Pahlevi (2023)

It can be concluded that a development product can be considered effective if the N-Gain Score obtained is > 75.

RESULTS

This study resulted in the development of PMRI-based student worksheets using the context of the Lubuklinggau Inpres Market through the Plomp (2013) development model. The development was carried out up to the assessment phase. The Plomp development model consists of three phases: preliminary research, the prototype stage, and the assessment phase. The purpose of this development was to produce PMRI-based student worksheets that meet the criteria of validity, practicality, and effectiveness. The following sections describe the phases of the Plomp development model:

Preliminary research phase

Preliminary research is the first stage of Plomp's development model. This stage consists of three components, namely curriculum analysis, student analysis, and content analysis.

Curriculum analysis

The interview discussed the curriculum, the learning resources used, and issues related to mathematics instruction, particularly on arithmetic sequences and series material. Based on the interview results, several findings were obtained: (1) The curriculum used at Azhariyah Islamic Senior High School Lubuklinggau is the Merdeka Curriculum. (2) The teaching materials used by teachers are printed books and PowerPoint presentations, but there are no contextual worksheets related to students' daily lives. (3) One of the learning problems identified is that printed books remain the primary learning source, causing students to mainly listen to and take notes from the teacher's explanations.

Students analysis

Based on interviews conducted with the teacher and three students, it was found that students had different levels of learning ability. Most students also experienced difficulties in solving the problems given by the teacher because the learning material had not yet been connected to real-life contexts in the students' surroundings.

Content analysis

Based on interviews conducted with the teacher and three students, the researcher selected arithmetic sequences and series as the material used in this study.

Prototype stage

The prototype stage in the development of PMRI-based student worksheets using the context of the Lubuklinggau Inpres Market consisted of several sub-stages that were carried out sequentially. These sub-stages are explained in more detail below:

Self-evaluation

The PMRI-based student worksheets were designed under the guidance of the supervising lecturers. The design process utilized the premium version of the *Canva* application (version 2.354.0). One example of the worksheet design is the front cover, which was created using the Canva application. The front cover of the PMRI-based student worksheet includes the worksheet title, a description of the material, the author's name, information regarding the approach and context used, class information, the logo of the research institution (PGRI Silampari University) and the *Tut Wuri Handayani* logo, a section for students to write their names and attendance numbers, and is accompanied by images that support the context of the Lubuklinggau Inpres Market. The initial design of the PMRI-based student worksheets can be seen in Figure 2.

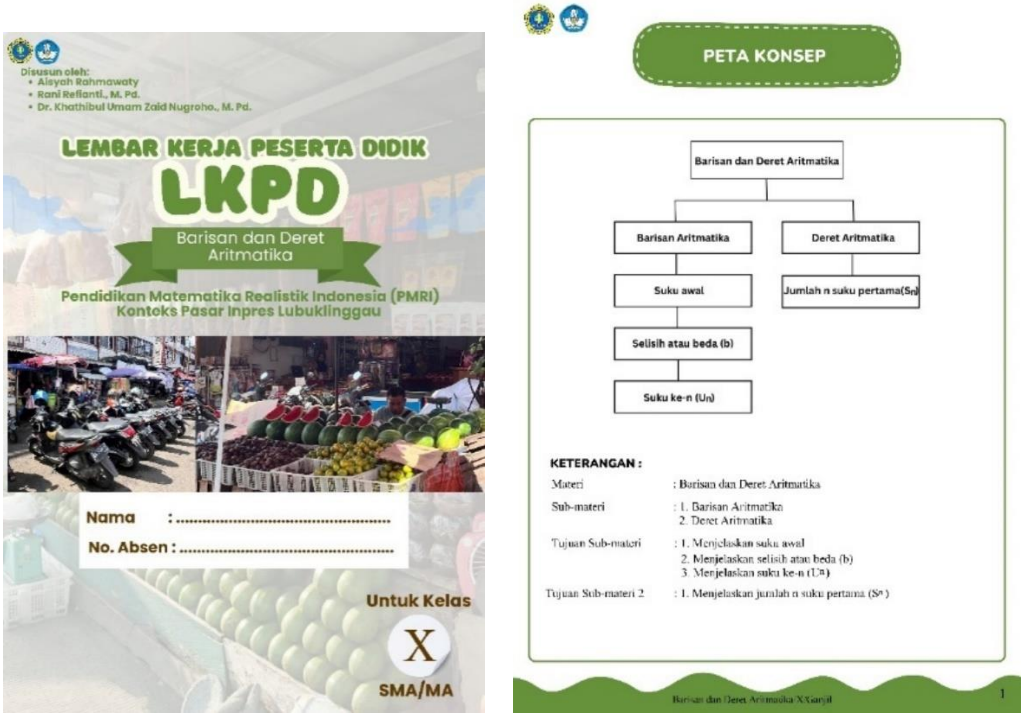

Figure 2. Student Worksheets Cover Page

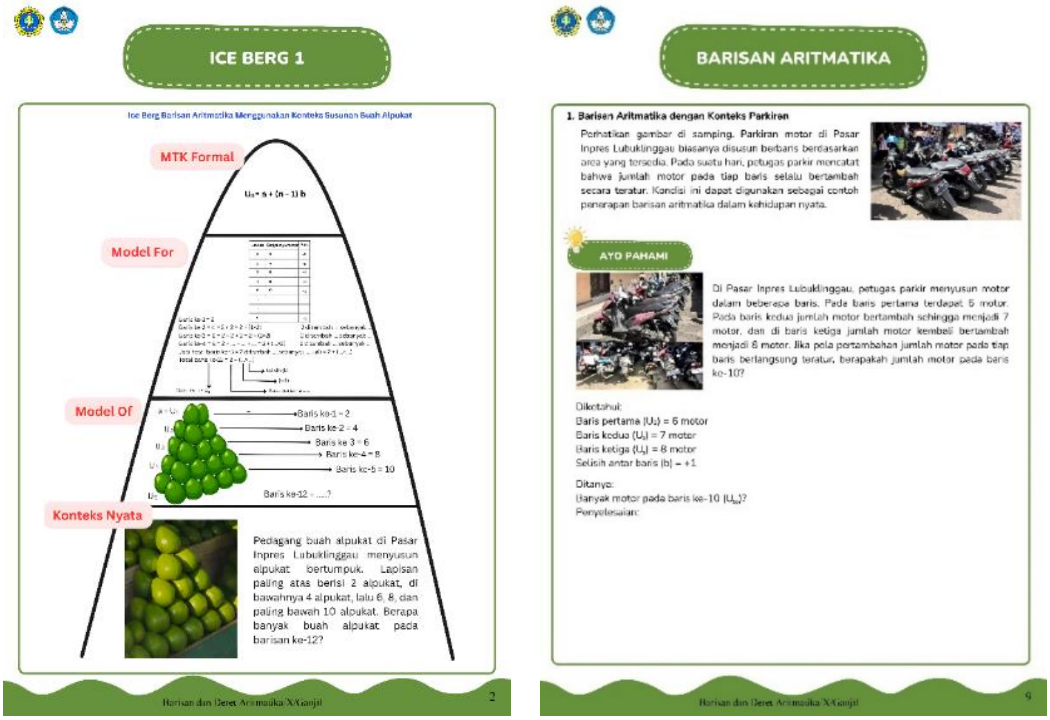

Figure 3. Student Worksheets Content Page

Figure 4. Content and Cover Page

Expert review

The validation process was conducted to gather suggestions, feedback, and comments regarding the student worksheets developed by the researcher in order to produce a valid product. The validation involved four experts: one language expert, one media expert, and two material experts.

Table 5. Assessment Results of All Validator

No	Validator	Number of Question Item	Score Obtained	*Average Score*	Category
1	Linguist	13	50	0,94	Very Valid
2	Media Expert	25	80	0,73	Valid
3	Material Expert 1	24	83	0,81	Very Valid
4	Material Expert 2	24	84	0,83	Very Valid

Source: processed from validity data, 2026

Based on the result of the assessment (Table 5.), the worksheets obtained a high validity rate. The validation results from the language expert was 0,94, media expert 0,73, the first material expert 0,81, and the second material expert 0,83, indicating that the developed worksheets were highly valid.

One-to-one evaluation

The one-to-one evaluation stage involved three students with different levels of academic ability, namely one high-ability student, one medium-ability student, and one low-ability student. During this stage, students were asked to complete a one-to-one evaluation questionnaire. The purpose of this evaluation was to determine the readability, clarity of instructions, ease of use, and students' initial responses to the developed worksheets.

Small group evaluation

In this stage, the practicality of the PMRI-based student worksheets was assessed by students using a practicality questionnaire. The questionnaire was administered to six students with varying academic abilities. Based on the result of the assessment, the worksheets obtained a practicality rate of 90,3%. The teacher's practicality assessment was conducted during the field test stage.

Assessment phase

In the assessment phase, students learned using the worksheets that had been developed. Following that, a post-test was administered to compare the students' problem-solving ability before and after using the PMRI-based student worksheets. During this phase, teachers also evaluated the practicality of the worksheets. The following Table 6. presents a summary of the practicality assessments conducted by teacher and students.

Table 6. Student Worksheets Practicality Questionnaire Results

No	Response Assessment	Maximum Value	Value Obtained
1	Teacher	56	47
2	Small Group Students	312	282
	Amount	368	329
	Product Feasibility Results	89,4%	
	Criteria	Very Practical	

Source: processed from practicality data, 2026

The following Table 7. are the results of the N-Gain Score calculation to determine the effectiveness of the PMRI-based student worksheets that were developed.

Table 7. Test Results Obtained

	Pretest	*Posttest*	*% N-Gain Score*
Total ($\sum xi$)	1327	2283	
Average	44,23	76,1	57,17%
Category		Quite Effective	

Source: processed from research data, 2026

Table 7. shows that the obtained N-Gain Score was 57,17% which fall into the "Quite Effective" category. Therefore, it can be concluded that the PMRI-based student worksheets using the context of the Lubuklinggau Inpres Market are suitable for use in mathematics learning activities in the classroom.

DISCUSSION

The results of this study indicate that the developed PMRI-based student worksheets using the context of the Lubuklinggau Inpres Market met the criteria of validity, practicality, and effectiveness in improving students' problem-solving abilities in arithmetic sequences and series. The validity results showed that the developed worksheets were categorized as highly valid based on the assessment of language experts, media experts, and material experts. This finding is consistent with previous studies conducted by Putri et al. (2023), Purba & Rajagukguk (2024), and Fitriani et al. (2024), which reported that RME or PMRI-based worksheets were categorized as valid and suitable for use in mathematics learning activities. The validity of the developed worksheets was influenced by the suitability of the material, the use of understandable language, and the presentation of attractive and systematic worksheet designs. In addition, the use of contextual problems related to students' daily lives helped students understand mathematical concepts more meaningfully and concretely.

The practicality results demonstrated that the PMRI-based student worksheets were categorized as very practical based on the responses of students and teachers. Students stated that the worksheets were easy to use, attractive, and helpful in understanding arithmetic sequences and series material. This finding is supported by previous studies conducted by Putri et al. (2023), Meldawati et al. (2024), and Fitriani et al. (2024), which found that RME or PMRI-based learning materials were categorized as highly practical and were able to support students' independent learning activities. The attractive worksheet design and the integration of contextual situations from the Lubuklinggau Inpres Market

increased students' interest during the learning activities. Furthermore, contextual learning activities encouraged students to become more active and motivated in mathematics learning.

The effectiveness results indicated that the developed PMRI-based student worksheets were categorized as quite effective based on the N-Gain score obtained from the pretest and posttest results. The improvement in students' scores showed that the developed worksheets were able to improve students' problem-solving abilities in arithmetic sequences and series. This research also supported by Laurens et al. (2018), who found that learning materials developed using realistic mathematics principles contributed positively to students cognitive achievemnt and problem-solving performance. Through the PMRI approach, students were encouraged to connect mathematical concepts with real-life situations around them, making the learning process more meaningful. This finding is in line with Marella & Fiangga (2023), who stated that contextual PMRI learning can help students discover arithmetic sequence and series concepts through real-life context and gradually construct mathematical formulas. In addition, Purba & Rajagukguk (2024) found that RME-based worksheets could improve students' mathematical problem-solving abilities, while Malikah (2023) emphasized that students' problem-solving abilities develop through learning activities that guide students to understand problems, plan solutions, and re-examine the results based on Polya's theory. Therefore, the developed PMRI-based student worksheets can be used as an alternative teaching material to support mathematics learning, especially in arithmetic sequences and series material.

The findings of this study contribute to the growing body of evidence supporting the implementation of PMRI-based learning materials in mathematics education. Unlike previous studies that generally applied PMRI in broader learning contexts, this study specifically integrated the Lubuklinggau Inpres Market as a local context for learning arithmetic sequences and series. The use of familiar real-life situations enabled students to connect mathematical concepts with their daily experiences, thereby supporting the development of problem-solving abilities. This finding reinforces the principle of PMRI that mathematics should be meaningful and closely related to students' realities.

Despite the positive findings, this study has several limitations. First, the research was conducted in only one school with a limited number of participants, which may restrict the generalizability of the findings. Second, the effectiveness evaluation was limited to arithmetic swquences and series material. Therefore, the results may not fully represent the effectiveness of PMRI-based student worksheets in other mathematical topics or educational settings.

Future studies are recommended to implement PMRI-based student worksheets in different schools, grade levels, and mathematical topics to obtain broader evidence regarding their effectiveness. Further research may also investigate the long-term impact of PMRI-baed worksheets on students' problem-solving abilities, critical thinking skills, and learning motivation through larger-scale experimental studies.

CONCLUSION

Based on the results of this study, the developed PMRI-based student worksheets using the context of the Lubuklinggau Inpres Market were categorized as valid, practical, and effective for improving students' problem-solving abilities in arithmetic sequences and series material. The validity results indicated that the worksheets had appropriate content, clear language, systematic presentation, and an attractive design that supported the learning process. Therefore, the PMRI-based student worksheets using the context of the Lubuklinggau Inpres Market are recommended for use in mathematics learning activities, particularly for arithmetic sequences and series material.

This study also implies that integrating local context into PMRI-based learning materials can support meaningful mathematics learning by helping students connect mathematical concepts with their daily experiences. Therefore, mathematics teachers are encouraged to utilize contextual learning materials that are closely related to students' environments in order to enhance students' engagement and problem-solving abilities.

ACKNOWLEDGEMENT

The researcher would like to express sincere gratitude to the academic advisors for their guidance and support throughout the process of completing this research. Appreciation is also extended to the principal, teachers, and students of Azhariyah Islamic Senior High School Lubuklinggau for their assistance during the research process. In addition, the researcher would like to express heartfelt thanks to parents, family, and friends for their continuous support and encouragement in the completing this study.

REFERENCES

Adha, I., & Refianti, R. (2020). Pengembangan LKS Berbasis Konteks Lubuklinggau Ditinjau dari Segi Kevalidan dan Kepraktisan. *Edumatica Jurnal Pendidikan Matematika*, *10*(1), 35–43. https://doi.org/10.22437/edumatica.v10i01.7668

Adha, I., Refianti, R., Fauziah, A., Sukasno, S., & Luthfiana, M. (2025). Pelatihan Media Pembelajaran Menggunakan Konteks Wisata Lokal Bagi Guru Matematika. *JURNAL CEMERLANG: Pengabdian Pada Masyarakat*, *7*(2), 455–462. https://doi.org/10.31540/jpm.v7i2.3472

Andeswari, S., Sholeh, D. A., & Zakiyah, L. (2022). Pengembangan Lembar Kerja Peserta Didik (LKPD) Berbasis Problem Based Learning dalam Pembelajaran Matematika Kelas IV Sekolah Dasar. *Prima Magistra: Jurnal Ilmiah Kependidikan*, *3*(1), 48–61. https://doi.org/10.37478/jpm.v3i1.1313

Azwar, S. (2015). *Reabilitas dan Validitas* (Edisi ke-4). Yogyakarta: Pustaka Pelajar.

Fitriani, L., Refianti, R., Asri Purwasi, L., & Pendidikan Matematika, P. (2024). Pengembangan LKPD dengan Pendekatan PMRI pada Materi Persamaan Lingkaran Kelas XI. *FARABI Jurnal Matematika Dan Pendidikan Matematika*, *7*(2), 185–192. https://doi.org/10.47662/farabi.v7i2.810

Hisni, M., Ansori, H., & Sari, A. (2022). Pengembangan Lembar Kerja Peserta Didik Berbasis Etnomatematika Budaya Banjar Materi Bangun Ruang Sisi Datar. *Jurnal Mahasiswa Pendidikan Matematika*, *2*(1), 23–30. Retreived from http://jtam.ulm.ac.id/index.php/jurmadikta. https://doi.org/10.20527/jurmadikta.v2i1.1218

Latif, A. (2021). Pengembangan Rencana Pelaksanaan Pembelajaran dan Lembar Kerja Peserta Didik Matematika Berbasis Model Eliciting Activities (MEAs) untuk Meningkatkan Kemampuan Berpikir Kritis Peserta Didik SMP. *Universitas Jambi Repository,* 42-73. Retreived from https://repository.unja.ac.id/id/eprint/25954

Laurens, T., Batlolona, F. A., Batlolona, J. R., & Leasa, M. (2018). How Does Realistic Mathematics Education (RME) Improve Students ' Mathematics Cognitive Achievement? *EURASIA Journal of Mathematics, Science and Technology Education*, *14*(2), 569–578. https://doi.org/10.12973/ejmste/76959

Lestari, D. D., Ansori, I., & Karyadi, B. (2017). Penerapan Model PBM untuk Meningkatkan Kinerja dan Kemampuan Berpikir Kritis Siswa SMA. *Diklabio: Jurnal Pendidikan Dan Pembelajaran Biologi*, *1*(1), 46–54. https://doi.org/10.33369/diklabio.1.1.45-53

Malikah, S. (2023). Analisis Kemampuan Pemecahan Masalah Matematis Siswa pada Materi Barisan dan Deret Aritmatika Berdasarkan Teori Polya. *Primatika : Jurnal Pendidikan Matematika*, *12*(2), 89–98. https://doi.org/10.30872/primatika.v12i2.2579

Marella, S. D., & Fiangga, S. (2023). Pengembangan HLT Menggunakan Pendekatan PMRI pada Materi Barisan dan Deret Aritmetika Menggunakan Konteks Rumah Limasan. *Prosiding Seminar Naional Penelitian Dan Pengabdian Kepada Masyarakat*.

Meldawati, Saragih, S., & Murni, A. (2024). Pengembangan Perangkat Pembelajaran Daring dengan Pendekatan Pendidikan Matematika Realistik untuk Memfasilitasi Kemampuan Pemecahan Masalah Matematis. *AKSIOMA: Jurnal Program Studi Pendidikan Matematika*, *13*(1), 281. https://doi.org/10.24127/ajpm.v13i1.8161

Mentari, M., Kesumawati, N., & Hera, T. (2022). Pengaruh Pendekatan Pendidikan Matematika Realistik Indonesia (PMRI) Terhadap Kemampuan Pemecahan Masalah Matematis Berdasarkan Self-Esteem Siswa SD. *IRJE: Jurnal Fakultas Keguruan Dan Ilmu Pendidikan*, *3*(2), 1011–1019. https://doi.org/10.31004/jote.v4i1.5550

Mu'tashimah, A., Putri, A. D., & Ramury, F. (2020). Lilin sebagai Konteks Materi Tabung pada LKPD Berbasis PMRI. *JKPM (Jurnal Kajian Pendidikan Matematika)*, *6*(1), 83–98. https://doi.org/10.30998/jkpm.v6i1.7776

Nugroho, K. U. Z., Izwanto, E., Widada, W., Alias, N., Anggoro, A. F. D., Herawaty, D., Jumri, R., & Anggoro, S. D. T. (2023). Relationship among Self-Efficacy, Mathematical Concepts Understanding, Creative Thinking Skills, Mathematical Problem-Solving Skills, and Mathematics Learning Outcomes. *Edumatika : Jurnal Riset Pendidikan Matematika*, *6*(2), 118–132. https://doi.org/10.32939/ejrpm.v6i2.3169

Nugroho, K. U. Z., Widada, W., & Herawaty, D. (2019). Pemahaman Konsep Matematika melalui Media Youtube dengan Pendekatan Etnomatematika. *Jurnal Pendidikan Matematika Raflesia*, *04*(01), 96–106. https://doi.org/10.33369/jpmr.v4i1.8953

Nugroho, K. U. Z., Widada, W., Herawaty, D., Tuzzahra, R., Panduwinata, B., & Sospolita, N. (2021). Abstraction Ability of Students About Fractions Through Local Cultural Approaches. *Proceedings of the International Conference on Educational Sciences and Teacher Profession (ICETeP 2020)*, *532*, 480–485. https://doi.org/10.2991/assehr.k.210227.082

Plomp, T., & Nieveen, N. (Eds.). (2013). *Educational Design Research: Introduction and Ilustrative Cases*. SLO - Netherlands Institute for Curriculum Development.

Polya, G. (2004). *How to Solve It: A New Aspect of Mathematical Method* (Reprint ed). Princeton University Press. Retreived from https://openlibrary.org/books/OL18289060M/How_to_solve_it

Purba, N. P., & Rajagukguk, W. (2024). Pengembangan LKPD Berbasis RME (Realistic Mathematics Education) untuk Meningkatkan Kemampuan Pemecahan Masalah Matematis Siswa Kelas VIII SMP pada Materi Lingkaran. *SAKOLA: Journal of Sains Cooperative Learning and Law*, *1*(2), 483–496. https://doi.org/10.57235/sakola.v1i2.3356

Putri, F. N., & Pahlevi, T. (2023). Developing Microsoft Access Based- E-Siska Learning Media for Vocational High School Students. *Jurnal Pendidikan Administrasi Perkantoran (JPAP)*, 11(3), 147-159. Retreived from https://journal.unesa.ac.id/index.php/jpap/article/view/31168

Putri, G. D., Cesaria, A., & Fitri, D. Y. (2023). Pengembangan E-LKPD Berbasis Realistic Mathematics Education pada Materi Barisan dan Deret. *RANGE: Jurnal Pendidikan Matematika*, *5*(1), 143–157. Retreived from https://ojs.fkip.ummetro.ac.id/index.php/matematika/article/view/6319

Rahmawaty, A., Refianti, R., & Nugroho, K. U. Z. (2025). Systematic Literature Review: LKPD Menggunaka Model Problem Based Learning pada Materi Barisan dan Deret Aritmatika. *Proceeding of Silampari Conference of Life Science and Technology*, 1, 261-270.

Refianti, R., Fauziah, A., Luthfiana, M., & Yanto, Y. (2022). Workshop Pembelajaran Menggunakan PMRI Guna Dituangkan Dalam Bentuk LKS. *Jurnal PKM Linggau*, *2*(2), 32–36. https://doi.org/10.55526/pkml.v2i2.291

Saryani, R., Fitriyana, N., & Elly, A. (2024). Development of Problem-Based Learnıng-Based Modules on Sequence and Series Material for Grade XI at SMA Negeri Semangus. *Jurnal Pendidikan Matematika (JPM)*, *10*(2), 147–159. https://doi.org/10.33474/jpm.v10i2.22097

Susanti, S., & Nurfitriyanti, M. (2018). Pengaruh Model Realistic Mathematic Education (RME) terhadap Kemampuan Pemecahan Masalah Matematika. *JKPM (Jurnal Kajian Pendidikan Matematika)*, *03*(02), 129–136. http://dx.doi.org/10.30998/jkpm.v3i2.2260

Tabrani, M. B., Devianti, V., & Junedi, B. (2023). Penerapan Pendekatan Pendidikan Matematika Realistik Indonesia terhadap Kemampuan Pemecahan Masalah Matematis. *JKPM (Jurnal Kajian Pendidikan Matematika)*, *8*(2), 333–342. http://dx.doi.org/10.30998/jkpm.v8i2.16448

Wahab, A., Junaedi, & Azhar, M. (2021). Efektivitas Pembelajaran Statistika Pendidikan

Menggunakan Uji Peningkatan N-Gain di PGMI. *Jurnal Basicedu*, *5*(2), 1039–1045. https://doi.org/10.31004/basicedu.v5i2.845

Zulkardi. (2002). Developing A Learning Environment On Realistic Mathematics Education For Indonesian Student Teacher [University of Twente, Enschede, The Netherlands]. In *Thesis University of Twente, Enschede. - With refs. - With summary in Ducth ISBN 90 365 18 45 8*. https://doi.org/10.3990/1.9789036518451