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Mathematics literacy task on number pattern using Bengkulu context for junior high school students

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Abstract
Mathematical literacy has an important role in solving students' real-life problems in supporting literacy skills, teachers can use real contexts as outlined in tasks in-class learning. The Bengkulu context can be used because it is closely related to the environment and students' daily live. This study aims to produce math literacy tasks in the Bengkulu context which are valid and potential impact on student literacy. The research employed a development design with a formative evaluative model using stages of self-evaluation, expert reviews, one-to-one, small group, and field tests. The subjects of the research were students in the eighth grade of a Junior High School in Bengkulu City. Data were collected through questionnaires, documentation, tests, and interviews. This study produced four mathematical literacy tasks with the Bengkulu context that met the criteria of being valid and having a potential impact. Mathematical tasks that are designed with the context can improve students' mathematical literacy activities. The use of tasks with context can be a learning resource that strengthens the introduction of students' local culture.

Keywords: Bengkulu Context, Development Research, Junior High School, Mathematics Literacy Task

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Learning mathematics in the 21st century demands the development of aspects of creativity, critical thinking, collaboration, and communication. According to the Council of Teachers of Mathematics (NCTM), one of the objectives of learning mathematics is to learn to communicate, reason, solve problems, relate, and represent ideas (NCTM, 2000). In learning mathematics, according to the OECD (2013), students are required to apply mathematical reasoning, use concepts, procedures, and facts, and predict phenomena. In Indonesia, the government has specifically emphasized that the goals of learning mathematics are listed in the Merdeka curriculum; including using reasoning, solving problems, communicating ideas and symbols, associating material with life, and an attitude of appreciating the usefulness of mathematics (Kemendikbud, 2014).

International survey data on the results of students in Indonesia are unsatisfactory and below average. The performance of students in Indonesia in the PISA survey was low from 2000 to 2018 (Zulkardi & Putri, 2020). We can see that the average score of Indonesian students is still below the international average score (Puspendik-Kemendikbud, 2019; OECD, 2015; OECD, 2019b); only 1% at levels 5 and 6 of the OECD average of 11%, while 28% are between levels 2-4 of the OECD average of 76%. The rest are below level 1 (OECD, 2019a). The Indonesian government has also conducted periodic evaluations which have used a minimum competency assessment since 2021. The results of the evaluations involving 56,913 schools with 1,825,638 student respondents showed that students' achievement at the minimum competency limit for numeracy skills was less than 50% (Pusmendik-Kemendikbud, 2022). As a comparison, data from previous research related to mathematical literacy in learning mathematics deserves to be studied. Students' literacy skills are below the standard (Rakhmawati & Mustadi, 2022), and student literacy is at the middle level in terms of problem-solving ability (Muslimah & Pujiastuti, 2020). Likewise, mathematical literacy for understanding indicators is low, and for other process indicators, it is also very low (Sari & Wijaya, 2017).

Mathematical literacy is one of the indicators of international education standards (Holenstein, Bruckmaier & Grob, 2021), also one of the goals of PISA (Wijaya, Heuvel-Panhuizen, & Doorman, 2015) and demands of the 21st century (Drew, 2012). In Indonesia, the focus of educational evaluation through a minimum competency assessment is mathematical literacy. Literacy is the ability to identify, understand, interpret, create, communicate, and calculate using printed and written materials related to various contexts (UNESCO in Montoya, 2018). Mathematical literacy is the ability to solve mathematical problems in different situations encountered in real life (OECD, 2001). Mathematical communication skills involve reading, understanding, writing (Larasaty et al., 2018), speaking about mathematics (Atsnan, Gazali, & Nareki, 2018), and intellectual and solving complex problems (Jailani et al., 2020). Mathematical literacy is defined in terms of an individual's understanding of the role of mathematics and his capacity to engage in this discipline in a way that meets his needs (Wong, 2005). The importance of literacy skills to be developed and students' mastery is still low, the Government of Indonesia has fixed the curriculum, learning achievement targets, and international-based evaluation. However, in terms of the availability of teaching materials to support the government's program in developing student literacy, it is still lacking.

In supporting literacy skills, it is necessary to present literacy in every lesson in class. One solution is solving learning resource problems, such as developing learning resources with the PISA Framework problem (Kohar, Zulkardi, & Darmawijoyo, 2014; Stacey et al, 2015). Teaching materials that focus on and familiarize students with important literacy are used. Several studies have proven the impact of tasks on classroom learning, such as research conducted by Clarke and Roche (2018), which found that math tasks provide experience, thereby creating learning potential. Tasks develop thinking, reasoning, communication, and creativity (Paredes et al., 2020), provide basic mathematical thinking activities (Antonijević, 2016), present challenges for students in the classroom (Papadopoulos, 2020), enrich students' proficiency in mathematics (Hatisaru, 2020). Teachers help students expand their knowledge by using tasks and involving higher-order thinking (NCTM, 2000). Challenging Math tasks to impact students' mathematical literacy skills (Oktiningrum et al., 2016; Hwang & Ham, 2021; Oktiningrum & Wardhani, 2020). The results of the study found how the characteristics of certain tasks affect the reasoning process (Maj-Tatsis & Tatsis, 2019). A good task is a means to bring challenging math problems to class (Papadopoulos, 2020). That is, the task cannot be known for completion directly but requires a strategy to complete it.

In addition, real contexts need to be presented in developing student literacy to bridge students in solving mathematical problems. Context can lead to meaningful learning when students actively demonstrate the usefulness of specific ideas and skills by asking questions, explaining, and justifying reasons (Widjaja, 2013; Sullivan, Zevenbergen & Mousley, 2003). Relevant literature shows the relationship between context and the improvement of students' literacy skills. Research conducted by Wijaya, Budiarto, and Wijayanti (2021) found that learning mathematics with realistic problems effectively increases mathematical literacy. Learning effects that emphasize real-world contexts and modeling can significantly increase literacy (Kaiser & Willander, 2005), the relationship between mathematical literacy, mathematical knowledge, and mathematical problems (Kolar & Hodnik, 2020). In other research, the students' mathematical literacy level uses a cultural context (Murdy & Ekawati, 2021) and mathematical literacy skills (Rizki & Priatna, 2019). The ability of students' mathematical literacy with the realistic mathematics education learning model with ethnomathematics achieves classical genius and minimum submission criteria (Kurniati & Mariani, 2020). Students' mathematical reasoning ability is very low; the reason is that they are not used to working on reasoning questions, they lack mastery of concepts, and it is difficult to understand questions (Vebrian, et, al, 2021). Furthermore, Susanta, Sumardi, and Zulkardi (2022) stated that the emphasis on context issues, especially local contexts, has a very close relationship with facilitating students' literacy skills in important learning to be linked to teaching materials. Understanding mathematics is shaped by its experience in various contexts which can enrich children's knowledge in rich and meaningful ways. Other research proves that task-using context can motivate students to complete tasks (Clarke & Roche, 2018). One of the factors that cause students' interest in good tasks is the use of contexts that students like (Nyman, 2016).

Mathematical literacy includes how students are able to know and use the basis of mathematics to solve problems in real-life contexts (Nurkamilah, Nugraha, & Sunendar, 2018). Mathematical literacy includes how students are able to know and use the basis of mathematics to solve problems in real-life contexts (Nurkamilah, Nugraha, & Sunendar, 2018). It is important to develop mathematical literacy through mathematical tasks in the form of problem-solving and investigation. This requires the need to present a real context in mathematical tasks to provide experiences for students. The real context that we mean here is a familiar context that is known by students. The real-world context in math tasks can relate to real experiences for students, provide a learning stimulus, and increase students' strategic competence and adaptive reasoning (Berisha & Bytyqi, 2020; Kilpatrick, Swafford, & Findell, 2001). By presenting real contexts on tasks such as the student environment, customs, history, and something more familiar to students, it is possible to have an impact on student competence. Mathematical problems can be embedded in various contexts (Wijaya et al., 2018). With the task and selection of specific contexts in the problem of supporting the implementation of the new curriculum in Indonesia, namely the *merdeka* curriculum.

There have been many studies related to the use of tasks with context that support this research. Several previous studies have focused on the use of context in mathematical problems, such as research by Mahmudah and Putra (2021), on the use of traditional game objects, culture (and questions using the local context (Jannah, Putri, & Zulkardi, 2019). Another study was conducted by Zulkardi et al. (2020) on the use of tasks in the context of covid-19. Other studies focus on mathematical tasks in the Malawi context (Kazima, Jakobsen, & Kasoka, 2016), Open-ended tasks (Zaslavsky, 1995); higher-order thinking math tasks in Indonesian culture (Oktiningrum & Wardhani, 2020), and learning with task-centered approach (Boston & Smith, 2011). Other research developed the task using PISA Framework (JUMPISA), Asian Game Contexts (Putri & Zulkardi, 2020; Pratiwi, Putri, & Zulkardi, 2019); task using COVID-19 context (Zulkardi et al., 2020). The research shows that there have been discussions on math tasks, but in this study, we focus on the Bengkulu context. This is important because it is better known as a real-world environment for students, especially in Bengkulu. So that it can be used as a solution as a learning resource in the form of teaching materials with real context to support student literacy

METHODS

This study used a development research design. This is in accordance with the research objective of developing valid mathematics tasks in the Bengkulu context and having a potential impact on students' mathematical literacy. The mathematical topic that is the focus of task development in this study is pattern material. The task developed consists of four tasks that aim to develop students' mathematical literacy skills. Tasks are structured as problem-solving tasks that are designed sequentially to explore students' levels of mathematical thinking, namely knowing, applying, and reasoning levels. We associate each task with the context of Bengkulu, namely culture and special food. tourism, and Bengkulu history in order to bridge students for mathematical modeling in problem-solving.

The research adapted the formative evaluation model (Plomp & Nieven, 2007) based on the research objective, namely task development. The research step consists of the evaluation stage consists of self-evaluation, expert reviews, one-to-one, small group, and field tests (Tessmer, 1993; Van den Akker, 2013; Zulkardi, 2006). Research products were reviewed by four assessors, who were two postgraduate lecturers at Bengkulu University, one lecturer at the Fatmawati Bengkulu State Islamic University, and a practicing high school teacher in Bengkulu City. The product evaluation stage involved the target of development, students in the eighth grade of a junior high school in Bengkulu City. The selection was based on age, ranging from 15-16 years old, similar to the target of the PISA international survey and the minimum competency assessment target in Indonesia. In the one-to-one stage, 6 students from junior high school 6 Bengkulu City were involved to assess how to respond to the task. The study also involved 12 students in eighth grade from Junior High School 11 Bengkulu City for a small group test to measure responses about the ease of use of the task. At the field test stage, we involved 44 grade 8 students to see the potential impact of the developed task.

To collect data at each stage of the study, we used documentation in the initial product analysis, questionnaires for validity data, interviews, and analysis of student answers in determining the potential effects. Data was collected through research procedures and the data was then cross-checked. To describe the research, data were analyzed by descriptive qualitative. Product validity used the Aiken index and potential effect with descriptive statistics. Analysis of the potential impact of task literacy was based on the literacy component in Table 1 (Rizki & Priatna, 2019; Steen, 2001).

Table 1. Indicators of student activity components of mathematical literacy

Math literacy competence	Achievement Indicator
Mathematics Thinking and Reasoning	Applying deductive and inductive thinking in solving problems
Mathematical Argumentation	Having a feeling for heuristics in solving problems
Modeling	Being able to interpret mathematical models in real contexts
Problem-solving	Being able to determine the required settlement strategy
Representation	Stating problems with pictures, graphs, diagrams, number lines
Symbols	Using symbolic, formal, and technical language and operations.
Tools and Technology	Using tools and technology to solve problems
Communication	Conveying in writing, concrete, pictures, graphs, and algebraic models

RESULT AND DISCUSSION

Task Development Results

The results of the development research are in the form of four mathematical tasks for pattern material using the Bengkulu context. The tasks that we compiled generally had the following characteristics, (1) the level of students' thinking on the task started from the knowing, applying, and reasoning levels, meaning that to get a higher level of thinking one had to start from a lower level. (2) questions start from easy to complex levels so that the work is more structured. (3) real problems in the task using the Bengkulu context which is equipped with a mathematical illustration. The objectives, context, level of thinking, and task indicators we developed are summarized in Table 2.

Table 2. Purpose, context, level of thinking, and task indicators

Task	Learning objectives	Context	Thinking Levels	Indicator
Task 1	Students can find pattern relationships from the problem of blocks arrangement on traditional house stairs	Culture	Knowing, Applying, Reasoning	Finding the relationship of a pattern
Task 2	Students can relate the height of the cake to the slice	Typical food	Reasoning	Associating information with patterns
Task 3	Students can predict the number of the nth term of a pattern from the problem of Bengkulu tourist spots	Tourism	Knowing, Applying, Reasoning	Predict the nth number of a pattern
Task 4	Students can predict the number of a pattern through the Bengkulu Marlborough fort problem	History	Reasoning	Predict the nth number of a pattern

The tasks we compiled were obtained based on the results of each development stage. At the preliminary stage, the results obtained are the basic concept of the task, namely the indicators for each task that are adapted to the pattern material, the selection of mathematical abilities at each level of thinking, and the selection of the Bengkulu context that is appropriate to the problem pattern. The selected contexts are Bengkulu culture, tourism, special food, and history (Figure 1).

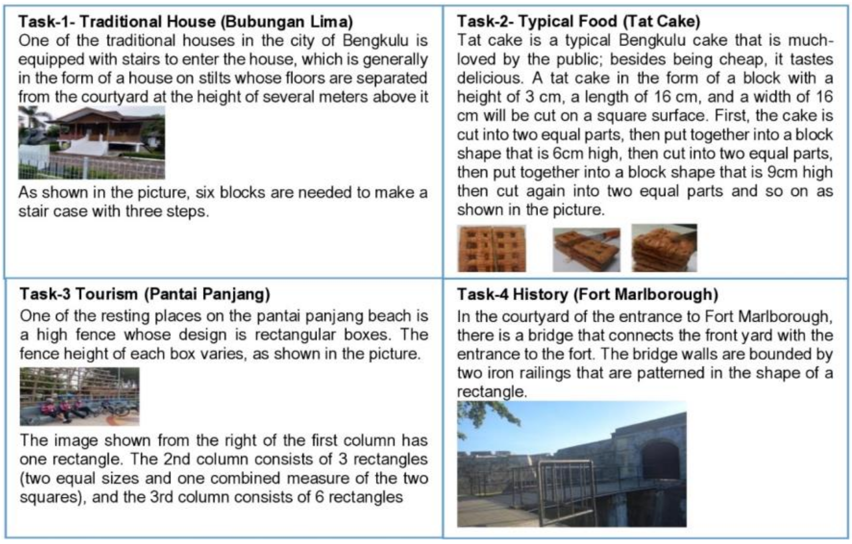


Figure 1. The Bengkulu context for product (translated from Bahasa Indonesia)

Furthermore, the results of expert reviews by four experts and one-one tests on students show several suggestions and improvements to the product task. The response of expert reviews generally shows that based on the aspects of the content, construction, and language used in the task, it is feasible. Assessment based on student responses in the one-one test relates to how the solution is resolved, presenting information, symbols, and presenting the context of the task. A summary of expert one-to-one assessments is shown in Table 3.

Table 3. Suggestions from experts and students

Validation	Suggestion
Expert Reviews	Sort the questions based on the level of students' thinking, for example, the stage of making a picture, until you find a similar pattern
	Provide an introduction with a description of each selected Bengkulu context
	Ambiguous question (the interpretation of the question is not clear)
	Create a picture illustration of the problem so that students can easily understand it
	Make questions that guide students to proceed to the completion
	Associate each task with literacy components: mathematics thinking and reasoning, mathematical argumentation, modeling, problem-solving, representation, symbols, tools and technology, and communication.
Students	I don't understand the question (regarding what the question is asking) I need clarification about the meaning of questions like in task 1; how many blocks are required for the 4th step? (Does the previous step also count?) I find it difficult to understand the meaning of the questions (such as in task 3, and I don't understand the meaning of the rectangular column of the problem.)

Based on the suggestions from the expert reviews and one-to-one stages, improvements were made at each step according to the suggestions called prototype 2. The results of expert reviews and responses from the one-to-one test are used as a reference for revising the task. In the following, we present the tasks before and after the revision based on expert reviews and one-to-one tests.

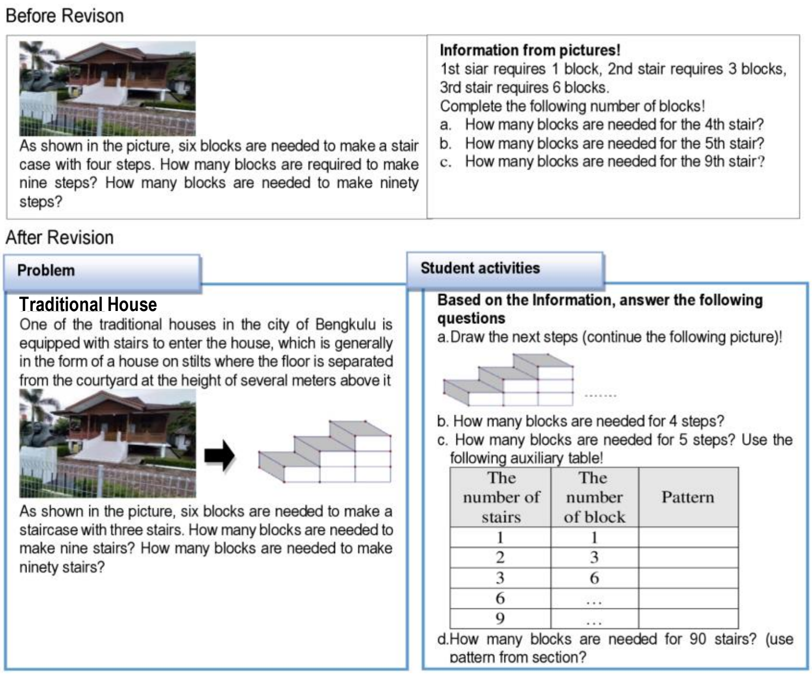


Figure 2. Task-1 Before and After Revision (translated from Bahasa Indonesia)

Before Revision

One of the resting places on the long beach is a high fence whose design is in the form of rectangular boxes. The fence height of each box varies, as shown in the picture.

The picture shown from the right of the first column has one rectangle. The 2nd column consists of 3 rectangles, and the 3rd column consists of 6 rectangles.

Based on the information, complete the following questions

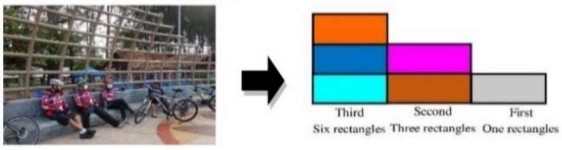
a. Draw an illustration of the fence up to the 4th and 5th columns from the right?
b. Find the number of rectangles in the 4th and 5th columns?
c. Determine the number of the 8th rectangle using the pattern and use the table by sorting from the 1st column.
d. Can determine the number of rectangles in the 20th column?
e. How many rectangles from column 1 to column 20?

After Revision

Problems

Tourism (Pantai Panjang)

In one of the resting places on the long beach, there is a high fence designed in the form of rectangular boxes. The fence height of each box varies, as shown in the picture!

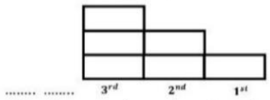


The image shown from the right of the first column has one rectangle. The 2nd column consists of 3 rectangles (two equal sizes and one combined measure of the two squares), and the 3rd column consists of 6 rectangles.

Student activities

Based on the Information, answer the following questions

a. Draw an illustration of the fence up to the 4th and 5th columns from the right. (continue the following image)



b. Determine the number of rectangles in the 4th and 5th columns based on figure a
c. Determine the number of rectangles in the 8th column using the pattern in the following table

Colomn	Calculation	Lots
1^{st}		
2^{nd}		
5^{th}		
8^{th}		

d. Can determine the number of rectangles in the 20th column without having to draw?
e. Berapa jumlah persegi panjang dari kolom 1 ke-20?

Figure 3. Task 3- Before and after revision (translated from Bahasa Indonesia)

Figure 2 and Figure 3 show that the focus of the task revision is based on the assessment suggestions, namely the level of students' thinking on the task. The experts' advice on the task must direct students to the stages of thinking, starting from the stages of drawing, using tables, and using patterns. Furthermore, task products that have gone through improvements based on expert reviews in terms of content, construction, and language aspects show that the task meets the eligibility criteria in terms of expert judgment. We also support this descriptive data through an analysis of the results of expert reviews on the four tasks we developed using the Aiken index. The results are presented Table 2.

Table 4. Expert validity product

Item	Content	Construct	Language	Criteria
Task 1	0.64	0.60	0.65	Valid
Task 2	0.66	0.62	0.70	Valid
Task 3	0.73	0.65	0.71	Valid
Task 4	0.70	0.63	0.74	Valid

Table 4 shows that the assessment of math tasks developed based on aspects of content, construction, and language meets the criteria. The results of the Aiken index analysis show a value of more than 0.5 (Aiken, 1980). Data from expert reviews are subjected to the Hoyt test to analyze the expert agreement. The results of the Hoyts test calculation obtained an average percentage of 86.50% with high criteria. The expert agreement is categorized as high, and product development is feasible. Next on prototype 2 was assessed in small groups of 12 students. The assessment focused on the ease of use of tasks in classroom learning. The results of the evaluation of the small group are shown in Table 5.

Table 5. Student assessment results

the ease of using the task	student responses
All tasks are understandable and easy to work on	33.33%
Can understand the task, and only a few can be done	58.33%
Understand the task but cannot solve it	8.33%
Do not understand the task.	0.00%

Based on Table 5 it can be seen that some students can understand the task and can complete some of it and there are no students who do not understand the task. This data shows that the student's response to the task can be said to be good.

Potential Effects of the Task

The last stage carried out was the field test, namely the use of tasks in learning in class. After the students completed the tasks given in a large-scale trial involving 44 students from the eighth grade of Junior High School, we used this data to measure the potential effect of the product. Each student was given a different task from the four tasks developed. Due to limited time for implementation, tasks were done individually, and the tasks arranged were equivalent so that each student only completed one of the tasks. The assessment was carried out with high criteria of applying completely and correctly, simply using incomplete/incorrectly, and low not applying inductive thinking. The results of observations of student activities in completing the tasks are shown in Table 6.

Table 6. Percentage of the subject's response to the task

Literacy component	High (%)	Moderate (%)	Low (%)
Mathematics Thinking and Reasoning	30.43	65.22	4.35
Mathematical Argumentation	28.26	67.39	4.35
Modeling	34.78	60.87	4.35
Problem-solving	15.22	73.91	10.87
Representation	58.70	39.13	2.17
Symbols	60.87	34.78	4.35
Tools and Technology	17.39	80.43	2.17
Communication	58.70	36.96	4.35

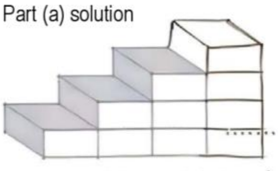
Based on Table 6, the ability of representation, symbols, and communication was used optimally by students in completing tasks. Meanwhile, mathematics thinking and reasoning, mathematical argumentation, modeling, and symbols have not fully supported students in completing tasks. In the data, it was found that problem-solving was the lowest ability used by students in the task. We present evidence of students' literacy activities in completing tasks as a potential impact on Figure 4.

Figure 4. Student activities work on tasks

We present several examples of student responses in completing tasks. One example of student responses in completing task 1 and task 3 is presented in Figure 5.

Task 1

Part (a) solution



Part (b) solution

$U_1 + U_2 + U_3 + U_4 = 1 + 2 + 3 + 4 = 10$

Part (d) solution

$\frac{n(n+1)}{2} = \frac{90(90+1)}{2} = 45 \cdot 91 = 4.095$

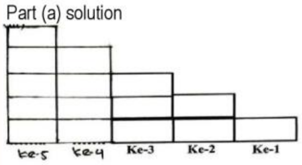
Part (c) solution

Banyak anak tangga	Banyak balok	Pola
1	1	1
2	3	1 + 2
3	6	1 + 2 + 3
4	10	1 + 2 + 3 + 4
5	15	1 + 2 + 3 + 4 + 5
6	21	1 + 2 + 3 + 4 + 5 + 6
9	45	1 + 2 + 3 + 4 + 5 + 6 + 7 + 8 + 9

Translate in English:
Part (c) solution
In the Table:
The first column number of the stair
The second column number of the block.
The third column pattern.

Task 3

Part (a) solution



Part (b) solution

Kolom ke-	Banyak persegi panjang
Ke-4	10
Ke-5	15

Part (c) solution

Kolom ke-	Perhitungan	Banyak Persegi panjang
Ke-1	1	1
Ke-2	1+2	3
Ke-3	1+2+3	6
Ke-4	1+2+3+4	10
Ke-5	1+2+3+4+5	15
Ke-8	1+2+3+4+5+6+7+8	36

Part (d) solution

dengan menggunakan rumus $U_n = \frac{n(n+1)}{2}$
Dapat, $U_{20} = \frac{20(20+1)}{2} = \frac{20(21)}{2} = \frac{420}{2} = 210$

Part (e) solution

Banyak Persegi Panjang 210

Translate In English:
Part (a) solution:
The fifth, fourth, third, second, and first.

Part (b) solution:
The first column, column to, fourth, fifth. The second column, the number of rectangles, 10, 15

Part (c) solution:
In the first column, column to, first, second, third, fourth, fifth. The second column, counting, the third column, the number of rectangles.

Part (d) solution:
By using formula $u_n = \frac{n(n+1)}{2}$ getting u_n

Part (e) solution:
The number of rectangles is 210

Figure 5. Example of student response on task-1 and task-3

The answer in Figure 5 indicates that the student can answer the task. It shows that the students can draw and continue drawing the next stair based on the pattern of the previous drawing (representational ability). Likewise, in question, part b, the students represented based on the pictures made previously in numbers. The students were also able to reason in determining the number of blocks in the next step by adding 1st to 2nd and so on. In answering the question at part c, the students answered correctly, which was done by paying attention to the previous pattern, namely adding 1 + 2 + 3 + …+ 9 = 45 (heuristic). In the final stage, it is hoped that the students will be able to use patterns to form special equations that represent existing patterns. The students answered the general equation for n(n+1)/2. This ability was obtained from students' inductive thinking abilities by observing existing patterns and data to make general conclusions. Through the object of rungs, students can understand the concept of a rectangular shape, and use inductive reasoning to find a pattern for adding a sequence of numbers to find the number of blocks on a particular rung. In contrast to task-1, in task-3 students had difficulty finding answers to question part (e) not only finding pattern relationships but analyzing many of all the rectangles referred to

Further, to explore student literacy activities, we conducted interviews. The following is one of the interview excerpts in developing information literacy activities.

R : Why did you draw the fourth stairs with four blocks?
S : Because the 1st stair is one block, the 2nd is two blocks, and the 3rd is three blocks, the fourth stair only needs to add one block
R : How do you count the number of blocks in 4 stairs?
S : I counted the blocks from the drawings that have been made.
R : How can you count the next number of stairs?
S : If the two stairs are 1+2, if the stairs are 3, 1+2+3, if the stairs are four 1+2+3+4, and so on, sir
R : What if the stairs are 9
S : I just need to add 1+2+3+4+5+6+7+8+9
R : If there are more stairs, how do you count them?
S : Counts the sum of the numbers 1+2+3 and so on
R : How do you know how many blocks you need to build if you are building 90 stairs?
S : I use the formula for the addition of sequential numbers, namely n (n+1)/2

Based on the transcription above, we can see that the students have carried out a gradual process in completing the task. The students drew correctly based on an analysis of previous patterns. In this transcription, we also see that the students can use the information to form sequential patterns. However, the information obtained shows that the students did not find the general concept at part d but based on the existing patterns. The students found it so that it was concluded using the sum of sequential numbers. Based on the material previously obtained, the students use the formula n (n+1)/2. However, in general, in completing tasks, students can see existing patterns.

The results of this study indicate that the tasks designed have the potential to develop students' abilities, especially their mathematical literacy. These findings support the objectives of the Merdeka curriculum in Indonesia. For example, through the context of the traditional house story, students draw, make conjecture conjectures, and then can complete the task. This is the objective of the task, which requires students to use several strategies, such as looking for patterns to solve them (Yeo, 2007).

Nyman's research (2016) provides findings that tasks become interesting with appropriate content in class. In doing the task, the teacher increases the mathematical knowledge and capacity of students' mathematical didactic design (Pepin, 2015). Several other studies also prove that the use of tasks can have an impact on students' literacy skills. Research related to PISA-like mathematical tasks supports mathematical literacy in three mathematical processes (Dewantara, Zulkardi, & Darmawijoyo, 2015; Zulkardi, 2002). We found that the tasks developed support aspects of literacy in the process of students solving problems.

In this study, the use of context in tasks has an impact on students' literacy activities. Problems that are known by the students support mathematical modeling in completing tasks (See Fig 6 students draw by imagining real stairs). This is in accordance with the opinion of Zulkardi et al. (2020) who state that using context in mathematical problems is also a good method of attracting students to learn mathematics. The potential context provides mathematical decisions for finding solutions (Sullivan, Clarke, & Clarke, 2013). Realistic tasks will stimulate creativity and critical thinking. The analysis of student literacy activities shows that students have been creative in solving problems by paying attention to existing patterns. Through the activity of working on the task, students can develop literacy components. In learning, it is necessary to involve students by using context to explore mathematical ideas and support the development of students in thinking mathematically (Widjaja, 2013). The emphasis on illustrations from our context in the task can support student literacy activities. This aligns with the opinion of Hoogland et al. (2018), which states that pictures help students and provide visual information in understanding problems.

The results of this study prove that the use of teaching materials such as tasks is important to do in an effort to support students' literacy skills. This research also proves that the use of contexts that are close to students is important to present in teaching materials. Selecting the Bengkulu context as a problem in the task is very important for improving student literacy. This is the opinion of Zulkardi and Putri (2006) who states that contextual mathematical questions are mathematical problems that use various contexts to present situations that have been experienced in real life by children. Another opinion shows that using realistic contexts makes mathematics more meaningful and accessible to all students (Sullivan, Zevenbergen, & Mousley, 2003). The results of this study contribute to education, especially in literacy learning in the classroom, it is necessary to design tasks in a context that is close to students. By using well-designed tasks, teachers can help students improve their thinking skills as well as mathematical literacy.

CONCLUSION

This development research produced a collection of mathematical literacy tasks in the Bengkulu context that met valid criteria and had a potential impact on mathematical literacy skills. This task has fulfilled the validity aspects based on the content, construct, and language assessment results. While the potential effect can be seen from the good student responses in completing tasks using representations, symbols, and communication. However, the use of context in this task is limited to the Bengkulu context. Suggestions for further research are to expand the scope of the problem in the task. In closing, we realize that design tasks using local contexts have contributed to preparing learning resources to improve students' literacy skills in Indonesia, one of which is to face the PISA test.

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