

The Development of PISA Questions and Activities Using Social Distancing Context During Pandemic

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Abstract

The emergence of this research is caused by the low mathematical literacy of students in Indonesia. This study aims to obtain valid, practical, and have potential effects of PISA type questions and activities using social distancing context during pandemic. This study is design research with the type of development studies which consist of two main stages, including preliminary design and formative evaluation. This study took a special research subject for grade IX junior high school students aged 14-16 years in the city of Palembang. Analysis of the results of this study was carried out qualitatively based on data in the field obtained in the form of interviews, photos and videos to see student activities in working on questions and activities. From this study, the results obtained include one type of activity and one evaluation question of the results of developing PISA type questions and activities with the context of social distancing during a pandemic that grade IX students can use to develop their mathematics literacy skills. In conclusion, PISA type questions and activities with the context of social distancing during the pandemic can be used for the learning process in the classroom to improve students' mathematical literacy.

Keywords: Design Research, Mathematics Literacy, Questions and Activities, PISA, COVID-19

Abstrak

Munculnya penelitian ini disebabkan oleh rendahnya literasi matematika siswa di Indonesia. Penelitian ini bertujuan untuk memperoleh valid, praktis, dan memiliki efek potensial dari soal dan aktivitas tipe PISA menggunakan konteks jaga jarak sosial selama pandemic. Penelitian ini termasuk *design research* tipe *development studies* yang terdiri dari tahapan utama, meliputi *preliminary design* dan *formative evaluation*. Penelitian ini mengambil subjek penelitian khusus siswa kelas IX SMP usia 14-16 tahun di Kota Palembang. Analisis hasil penelitian ini dilakukan secara kualitatif berdasarkan data di lapangan yang diperoleh berupa wawancara, foto dan video untuk melihat aktivitas siswa dalam mengerjakan soal dan kegiatan. Dari penelitian ini diperoleh hasil antara lain satu jenis kegiatan dan satu soal evaluasi hasil pengembangan soal bertipe PISA dan kegiatan dengan konteks *social distancing* saat pandemi yang dapat digunakan siswa kelas IX untuk mengembangkan keterampilan literasi matematika. Kesimpulannya, soal dan kegiatan bertipe PISA dengan konteks social distancing selama pandemi dapat digunakan untuk proses pembelajaran di kelas untuk meningkatkan literasi matematika siswa.

Kata kunci: Desain Riset, Literasi Matematika, Soal dan Aktivitas, PISA, COVID-19

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INTRODUCTION

Mathematical literacy is one of the essential skills to have in the 21st century (Stacey, 2011). Based on Sari and Wijaya (2017), mathematical literacy in PISA means an individual's capacity to employ, formulate and interpret mathematics using many variety contexts. Stacey (2011) argues that

mathematical literacy is needed in various fields of expertise and different age ranges. It includes reasoning mathematically and using mathematical concepts, procedures, facts and tools to describe, explain and predict phenomena.

Based on the results of PISA, especially for Indonesian students, it is stated that the mathematical literacy ability of school students in Indonesia is relatively low (Zulkardi, Meryansumayeka, Putri, Alwi, Nusantara, Ambarita, Maharani, & Puspitasari, 2020). The scores obtained in 2018 it was 379 (OECD, 2019). In Indonesia, around 1% of students scored at Level 5 or higher in mathematics (OECD, 2019). Based on this score, Indonesia was ranked 74th out of 79 participants from all over the world. This indicates that the ability of Indonesian students in reading, science, and mathematics is low because they are in the bottom 10 of the world's top 10.

There are various causes of the decline and low PISA scores, including the lack of facilities in the form of textbooks for solving mathematical problems in the real world (Zulkardi, Nusantara & Putri, 2020). Therefore, there is a lack of fulfillment in providing books, so it is better to develop various kinds of PISA questions and activities during the learning process, which is believed to improve mathematical literacy for students (Munayati, Zulkardi & Santoso, 2015). In addition, students who often find textbook questions will also affect their ability to answer math questions related to students' mathematical literacy skills (Sholihah & Shanti, 2017).

Another demand that educators must meet is to integrate learning with the surrounding environment and daily life. This is related to learning that uses contexts that are close to students (Magen & Nagar, 2016). Problems that can be used as the most immediate context include the case of COVID-19. The COVID-19 issue was caused by the Coronavirus that originated in the Wuhan area and spread to various parts of the world (Zulkardi et al., 2020). In addition, there is a need for education about the spread of the COVID-19 virus for children and how to prevent COVID-19 (Jamilah, Sukitman, Fauzi, 2021).

Selection in the learning model is also an essential aspect. Since home learning has only been implemented during COVID-19, there is a need for a learning method that requires students to be more active independently to provide experiences and conduct experiments that can allow students to find principles for themselves, especially during the pandemic. Based on Tohir & Mashari (2020), one type of suitable learning method is to use the inquiry learning method. This is evident from the results of his research, which states that the Inquiry Based Learning (IBL) model can increase independence learning and learning outcomes in terms of cognitive, affective, and psychomotor aspects.

Piaget (2002) defines the IBL model as an education that prepares situations for students to conduct experiments independently. The IBL model is a series of learning activities that involve all students' abilities maximally so that they can search and investigate systematically, critically, logically, and analytically so that students can formulate their own findings with confidence. Several stages of IBL model include orientation, formulating problems, making hypotheses, looking for data, proving hypotheses, and making conclusions which based on these learning stages are very suitable to be carried

out in supporting independent learning for students, especially which demands students to become more independent (Rahayu, 2018), which is in accordance with the demands of learning in the current pandemic.

Understanding students' concepts are essential be considered one of the requirements in solving various kinds of math problems related to everyday life (Machaba, 2016). Therefore, understanding important concepts are made meaningfully in the learning process.

In previous studies, there have been studies on PISA development, such as the development of PISA questions made by Efriani, Putri & Hapizah (2019) using the context of Sailing, using Asian Games context (Putri & Zulkardi, 2018), and so on. Then, there are developing PISA questions use all of the content in PISA, such as the development of PISA questions relating change and relationship and quantity in the context of COVID-19 (Nusantara, Zulkardi & Putri, 2021), using uncertainty and data content (Saputri, Turidho, Zulkardi, Darmawijoyo & Somakim, 2020), shape and space (Mahardita, 2021), uncertainty and data using COVID-19 context (Zulkardi et al., 2020), quantity using COVID-19 context (Sepriliani, Zulkardi, Putri, Samsuryadi, Alwi, Meryansumayeka, Jayanti, Nusantara, Sistyawati, Tanjung, Aprilisa & Pratiwi, 2022). However, no one has developed questions and activities using IBL model from social distancing during a pandemic to be studied, especially on shape and space content. Therefore, the researchers aims to conduct research in this study as a contribution of ideas from problems to improve mathematical literacy that can be used by students aged 14-16 years and develop questions and activities that have valid, practice and potential effect. This research, it is hoped that in the future it can be an alternative to be used in classroom learning, especially in supporting students when learning online so that students become more independent in learning.

METHODS

This design research is a development study with two main stages, including the preliminary and formative evaluation stages (Bakker, 2018). In the preliminary stage, the first thing the researchers did was make preparations to review some of the literature related to the research. After that, the researchers designed questions and activities, grids, question cards, and scoring guidelines that matched the characteristics of the PISA questions.

Qualitative validation in this study was carried out on an expert review activity with master's colleagues and junior high school mathematics teachers and was led by experts in the development of PISA. In addition, there is a one-to-one validation stage for heterogeneous students on three students, each of whom has low, medium, and high abilities who are not included in the field test stage. This study also uses the IBL model as an implementation of activities and learning in the classroom at the time of the research. Then it was tested on 12 junior high school students with high, medium, and low skills online (via zoom meeting) so that the practicality of the questions obtained could be obtained. After that, a trial was conducted on students in one class, as many as 12 junior high school students in

the field test, to see the potential effect on PISA type questions and activities with shape and space content using the context of social distancing during a pandemic (Bakker et al., 2020).

Data collection techniques used are walkthrough, observation, interviews, and test. The walkthrough technique is used to see whether or not the questions and activities made by researchers against experts are based on the content, constructs, and language used from suggestions and comments obtained by expert reviews via FGD. Observation in the study aims to observe and know the characteristics and needs of these students and when the trial took place. Interviews conducted to support data collected during the prototype development process. Furthermore, students' answers were analyzed to see the potential effects based on mathematical literacy abilities that emerged from the questions being worked on.

This study involved four experts who assisted in the validation process of developing questions and activities in this study. Some of them provide input on content, constructs and language in order to create valid questions and activities in this research. However, while validating from the expert's qualitative validation by review experts through three ways including mail reviews, panel reviews, and one-to-one reviews, the researchers also conducted one-to-one on students who had been selected to be tested in later development. Next, small groups are also carried out, which are useful to see the practically of the researchers' questions that the students will do. At this stage of the test or trial, 12 junior high school students with heterogeneous abilities (high, medium, and low). Previously, it was determined that around 20 students would be involved in the field test. Still, because the field test was held online via zoom, there were only 12 students who fully participated in this stage due to the signal capacity of the students. The obtained data were analyzed descriptively.

RESULTS AND DISCUSSION

In this study, several questions and activities using the context of social distancing during the pandemic resulted in one activity and one evaluation question. The questions and activities in this study were divided into three situation: keeping a distance during a pandemic with various kinds of situations, including (1) Art Performance at Kuto Besak Fort and (2) Art Performance at School Field.

Preliminary

Students in grades A and B IX of SMP Negeri 13 Palembang were used as participants during the one-to-one (three students) and small group (six students) trials with varying academic abilities (high, medium and low). Then for class IX D SMP Negeri 13 Palembang as a subject for testing at the field test stage, which amounted to 12 people with an age range of 14 to 15 years and had varying academic abilities (high, medium, and medium-low). The purpose of the diversity of students' ability levels intends to be a benchmark in the success of the questions and activities made by researchers from each student with different groups based on the level of difficulty in the work according to each student.

Then, the researchers identified the learning materials based on the curriculum used by SMP Negeri 13 Palembang as the subject of the implementation of this research. SMP Negeri 13 Palembang used the 2013 Emergency Curriculum during the COVID-19 pandemic. In the 2013 emergency curriculum, shape and space content has been taught with the topic area and circumference in basic competencies 3.6 and 4.6. At this stage, the researchers evaluate the questions that have been developed. The PISA questions developed were taken from the PISA questions in 2006. Figure 1 is a picture of the 2012 PISA questions taken as an example for the development of the questions in this study.

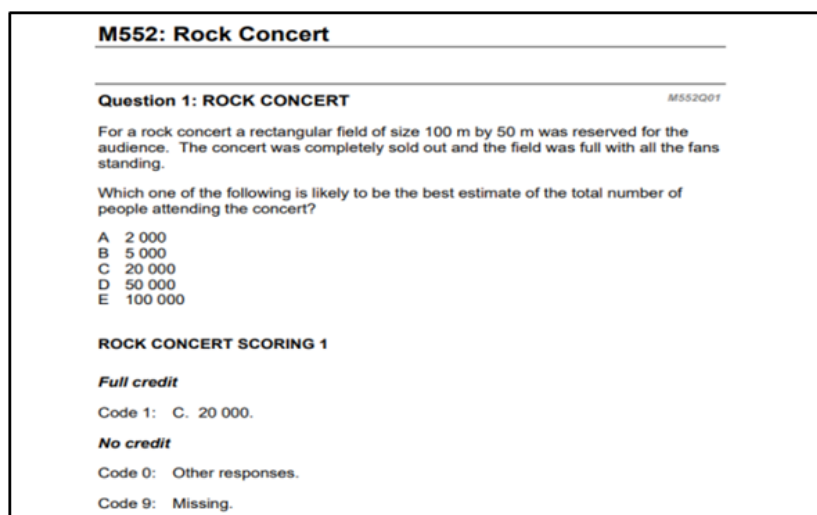


Figure 1. Original PISA questions in 2006 with the context of "Rock Concert"


Figure 1 shows a PISA question with shape and space content which tells about the situation in a concert. The question explains that there is a rock concert with an area of 100 meters long and 50 meters wide for the audience. The question posed in this question is how many estimated audiences can occupy the rock concert hall. From these questions, the answer choices are given into four kinds of options, one of which must be chosen. To answer this question, students are required to have the ability to calculate the area of a rectangle and think logically in making estimates. In this problem, it is necessary to have an algebraic ability for students to be able to do it and understand the concept of area and perimeter of a flat shape. According to Machaba (2016), stating that working on area and perimeter questions is something that is not too difficult to do but many students themselves still do not understand the concepts of the two types of strings. Based on these questions, the researchers plan to develop questions using the context of social distancing during the pandemic which is divided based on the current pandemic situation.

Self-Evaluation

Several aspects that need to be seen and considered again from the development of these questions and activities include content, construct, and language (Zulkardi, et al., 2020). Then, if there were errors in the design process in the form of errors interms of typing, word selection, and some

words that are lacking, the researchers will correct them personally at this stage. In this study, there were two types of questions and activities tested on students.

JUMPING TASK ACTIVITY



Sumber : Wikipedia.com

At an art performance activity in the Palembang BKB field. Known shape. The capacity of the BKB field during the pandemic and weekdays is different. All groups must comply with the protocol to maintain a minimum distance of 1.5 meters from each other. The number of visitors who can occupy the area is estimated to be around 1,920 people during the pandemic. The committee plans to make flyers around the field as part of the sponsorship. However, it must be known how much the circumference of the BKB field is.

- 1) Can you find out how big the BKB field actually is? If yes, please describe the steps!
- 2) From this question, what should you look for to determine the circumference of the BKB field?
- 3) If you have determined the steps for solving the problem, then what is the circumference of the BKB field? Describe the steps below!

(a)

EVALUATION TEST

At a mass art performance by Tsu Zhi High School during the COVID-19 Pandemic, there was a field with a length of 100 meters and a width of 50 meters prepared for visitors to the art event. The tickets for the art show were sold out, but due to the pandemic, regulations were put in place to keep the distance, each visitor at least 1.5 meters from one another. How many visitors to the art show?



(b)

Figure 2. Prototype 2 of PISA question and activity on shape and space content

Figure 2a, in the about and activity section, the researchers previously thought that in this question, it was known that the length and width of the Benteng Kuto Besak field were 112 m x 98 m. However, after seeing these difficulties, what is known is the length and width of the Benteng Kuto Besak, the researchers feels that the environment has changed the instructions regarding this matter, namely replacing it with the following sentence "All parties must comply with the protocol to keep a distance between each other of at least 1.5 meters per person Number of visitors that can be found in the area is estimated to be around 1,920 people during the pandemic". Figure 2b for the evaluation questions, previously, the researchers did not add related images. Therefore, the researchers decided to add an image to it. Then for the evaluation question, it is known that the changes made are changing the editorial and the words used to be more efficient. Previously, the explanation in the matter was quite long-winded.

There were several things that have been personally improved, including changing sentences to be more effective and changing pictures related to activities and evaluation questions. Revisions through self-evaluation will later be given to experts for consideration and input. The researchers had been revised and got *prototype 1*.

Expert Review and One-to-One

Validation tests were carried out by experts through FGDs and one-to-one activity, which aims to get valid qualitatively in terms of constructs, content, and language (Nusantara et al., 2021). In the characteristics seen by researchers for PISA's shape and space content with the current independent emergency curriculum. Furthermore, in terms of constructs to know the suitability of the level of students' abilities, especially in the ability to examine problems following reality for students. Furthermore, in terms of language, several aspects that are seen include the suitability of writing questions with PUEBI rules, using sentences that are easy to understand, and not experiencing problems. Ambiguity in the meaning of the developed questions (Zulkardi et al., 2020).

In line with it, the researchers also did one-to-one to see students' opinions in working on the problem and see comments and suggestions in the development of this prototype 1 question. After this stage, valid PISA prototype 2 type questions and activities are obtained based on comments and suggestions on prototype 1 questions.

Table 1. Comments/suggestions and revision decisions

Validation	Comments and Suggestions	Revision Decision
	Jumping Task	
Experts	It is better if the image used is the caption at the very bottom or the top. It is better if the explanation in the sentence in the question is not separated. The use of the level of questions and activities used is quite good, but it would be better on the jumping task so that the clues given to the questions are made more difficult	The image has been revised and placed according to suggestions. Then, the use of questions in the jumping task was reduced to only two questions
Students	I don't understand how to work on art performance activities at BKB	Students find it challenging to solve the problem because it is the first time they see a question of this type. Therefore, the questions were made using an easier-to-understand editor for reading information. The author adds an editorial to the question, "The number of viewers during the

Validation	Comments and Suggestions	Revision Decision
		pandemic will be less than normal days"
	Evaluation Question	
Experts	In the context of the questions, some of them used ineffective sentences, so it was suspected that it would confuse students when working on them. The editor is "Can you find out how big the BKB field is from that question? If yes, please describe the steps!"	Sentences have been revised so that the sentences used are more effective. The editor has changed it to "Based on the problem, describe the steps in finding the actual BKB field area!"
Students	Students already knew and did the evaluation questions well	No Revision

Table 1 above states that all opinions from experts regarding the development of the questions and activities are good with revisions that must be considered in the future. Zulkardi et al., (2020) state that to assess qualitative validity, three aspects are seen. The first aspect is the content that contains the relationship between the broad and circular material and the context of social distancing during the pandemic. The second aspect is the suitability of the level and framework of PISA mathematics, literacy skills, and strategies. The third aspect is the language aspect related to the characteristics of good and correct language.

When conducting interviews with students in the one-to-one stage, students stated that the questions and activities that the researchers had made were exciting and could provide convenience in doing them. The following are the results of interviews with students at the one-to-one stage.

(Note: R: Researchers; S: Student)

R : From the information obtained, why did you use the subtraction operation?

S : Because the number of visitors on pandemic days is less than normal days.

R : Why don't you use a division operation to solve it?

S : I think subtraction or division is the same

R : Are you sure? Did the values from the two types of operations the same?

S : Oh, didn't. But I'm confused...

R : Let's look again. The written information states that each visitor's distance is 1.5 meters, right?

S : Oh yes. I just got it. The distance between each person is 1.5 meters, so this information applies to each person, not only one person.

Based on the interview results, it can be seen that the students initially felt confused in determining the correct answer. However, the researchers finally invited the students to re-read and

understand the information provided. Therefore, to determine the solution, students must know the data and understand correctly the information provided.

Small-Group

The following is Prototype 2, which is the result of the revision and development of prototype 1, which will be used in the small group.

JUMPING TASK ACTIVITY

At an art performance activity in the Palembang BKB field. It is known that the shape of the field for the art performance has a shape like the image below! The capacity of the BKB field during the pandemic and weekdays is different. All groups must comply with the protocol to maintain a minimum distance of 1.5 meters from each other. The number of visitors who can occupy the area is estimated to be around 1,920 people during the pandemic. The number of viewers during the pandemic is less than normal days. The committee plans to make flyers around the field as part of the sponsorship. However, it must be known how much the circumference of the BKB field is.

1) Based on these questions, describe the steps in finding the actual BKB field area!"

2) From this question, what should you look for to determine the circumference of the BKB field?

(a)

EVALUATION QUESTION

At a mass art performance activity by Tsu Zhi High School during the COVID-19 Pandemic, there was a field that was shaped with a length of 100 meters and a width of 50 meters prepared for visitors to the art event. The tickets for the art show were sold out, but due to the pandemic, regulations were put in place to keep the distance, each visitor at least 1.5 meters from one another. How many visitors to the art show?

(b)

Figure 3. Prototype 3 of PISA question and activity on shape and space content

Figure 3a, shows the development of the jumping task activity from the previous activity to be held in a small group. Then for Figure 3b, it is an evaluation question that is in accordance with the results of the experts' suggestions. After doing a small group, it can be stated that there is nothing that needs to be revised in that section. Students solve the problem within 40 minutes. At this stage, it is also carried out using the IBL model, which among other things, researchers apply to carry out IBL model stages such as problem orientation, formulating problems, formulating hypotheses, collecting data, testing hypotheses and formulating conclusions. However, some students still have not answered the questions and activities correctly. Students can understand the meaning and purpose of the activities and questions. In these activities and questions, students are given several kinds of information about the field, the size of the field, the distance between the people in it, and sentences that are less effective are changed to become more effective.

JUMPING TASK ACTIVITY

At an art performance activity in the Palembang BKB field. It is known that the shape of the field for the art performance has a shape like the image below! The capacity of the BKB field during the pandemic and weekdays is different. All groups must comply with the protocol to maintain a minimum distance of 1.5 meters from each other. The number of visitors who can occupy the area is estimated to be around 1,920 people during the pandemic. The number of viewers during the pandemic is less than normal days. The committee plans to make flyers around the field as part of the sponsorship. However, it must be known how much the circumference of the BKB field is.

- 1) Based on these questions, describe the steps in finding the actual BKB field area!"
- 2) What should you look for to determine the perimeter of the BKB field?
- 3) What is the perimeter of the BKB field? Describe the steps below!

(a)

EVALUATION QUESTION

At a mass art performance activity by Tsu Zhi High School during the COVID-19 Pandemic, there was a field that was shaped with a length of 100 meters and a width of 50 meters prepared for visitors to the art event. The tickets for the art show were sold out, but due to the pandemic, regulations were put in place to keep the distance, each visitor at least 1.5 meters from one another. How many visitors to the art show?

(b)

Figure 4. PISA activity and question on shape and space content

Figure 4a and figure 4b is the result of a revision after observations were made on small group activities. The researchers states that adding information to the questions and activities into it aims to make it easier for students to review the information in the jumping task activity. The National Teachers Council of Mathematics (NCTM) (2000) states that school mathematics standards must include content and process standards. Process standards, in this case, have problem solving, understanding and evidence, linkage, communication, and representation. The students' understanding indicates this in analyzing information from text to mathematical form (Sari et al., 2017).

Field Test

In the next stage, a field test was carried out to see students' mathematical literacy abilities. In the field test activity, 12 students took part in it. Field tests were also conducted at SMP N 13 Palembang. In implementing the field test, students who took part in it have high, medium, and low abilities. The researchers collaborated with the classroom teacher, namely Kania Siti Syarah, M.Pd; in conducting teaching on the ongoing field test. The learning used in this research using IBL model, which is applied to existing activities. Furthermore prototype 3, which has been declared valid and practical, will be used in classroom learning to carry out field tests.

Then the implementation of learning using IBL model, the researchers also gave the material contained to the students before providing questions and activities. The steps in IBL model learning include orientation, formulating problems, formulating hypotheses, collecting data, testing ideas, and formulating conclusions. In the problem orientation section, the researchers makes a problem into an activity that must be solved by students so that students become interested in doing it. Furthermore, the researchers allowed students to formulate the issues and propose hypotheses based on questions on activities that led students to think about solving them based on existing activities. Then, the researchers

gives students the freedom to collect helpful information and data in completing the training. If students have collected information, they are free to prove the hypotheses and conclude the answers.

In this evaluation question, mathematical literacy skills that appear include communication skills, mathematical abilities, representation abilities and reasoning abilities. Based on the student's answers, it can be seen that the students' mathematical literacy ability can be seen through the students' way of mathematizing the information contained in the problem and the way students parse the steps chosen to solve the problems that exist in the problem. This indicates that students' mathematical literacy skills appear when working on the problem.

dik: jumlah penonton = 1.920 orang
 jarak penonton = 1,5 M
 L = ?
 : jumlah penonton \times jarak penonton
 : 1.920 \times 1,5
 : 2.580 \rightarrow Activity 1
 2.580 = p \times l \rightarrow Activity 2
 p \times l =

Translated into English:

1. Information:

Total Viewers = 1920 people

Viewers Distance = 1,5 meter

Question : Area?

Area : Tot. Viewers \times Viewers Distance

Area : 1920 \times 1,5 = 2580

2. 2.580 = l \times w

l \times w =

Figure 5. Field test student answer of jumping task activity

Figure 5 shows the results of students' answers at the field test time. These answers show that the student can work on the questions following the directions from the questions and activities given. The jumping task consists of 3 kinds of activities, but in the picture students can only answer 2 activities. However, students can only answer questions on question number 1, and for questions, number 2 and 3, students cannot answer it. It indicates that although students already know what the question is asking and the correct information, it does not guarantee that students can complete the questions and activities from the problem to the end.

In question 1 in the jumping task, students can easily work on the questions and activities in it. This is because based on understanding and interviews with students, they stated that they had started to get used to doing it because it had been explained in learning at the time of delivering the material about how to do it. Then for question 2, students have started to know what is known and what ways can be used to answer it. However, students cannot answer it until the end. This is because based on interviews with students that they are still not familiar with questions that emphasize algebraic concepts and explanations like that. Students become troubled and confused about how to get the length and width. Furthermore, for question 3, because students cannot answer the questions in question 2, students also cannot answer in question 3 because question 2 and 3 are interrelated.

Based on the results of observations of interviews and student work in doing the jumping task activity, it is known that students can only answer questions according to the examples that have been

given previously. Meanwhile, to answer questions related to a deep understanding of concepts, students cannot answer them and have difficulty finding the steps.

Handwritten student work for an evaluation question. The student lists "dik:" (given) with "Panjang = 100", "lebar : 50", and "Jarak : 1,5". The question is "dit ? jumlah pengunjung" (asked? number of visitors). The student calculates "luas = 100 x 50 = 5000" and then divides "5000" by "1,5" to get "33,333". A red arrow points from the "lebar : 50" line to a box labeled "Evaluation Question".

Translated into English:

Information:

Long = 100

Width = 50

Distance = 1,5

Question : Total of visitors?

Area : $100 \times 50 = 5000$

$$= \frac{5000}{\text{total visitors}} = \frac{500}{1,5} = 33,333$$

Figure 6. Field test student answers to evaluation question

Figure 6 shows that students already understood the intent and purpose of the question. However, the answers and paths written by students are not entirely correct. It can be seen from the description of the answers given to the answers students write down the number of visitors, even though the correct distance is the distance of visitors. Then for the results of the division operation, the answer is still not right. This calculation error is not a fatal error for students. Still, if students make these mistakes in mathematical procedures, these events will usually occur from the understanding stage. At the process skills stage, they produce incorrect solutions but not errors in mathematical approaches (Siregar, 2019). It is because these students did not practice enough in solving problems related to mathematics, especially regarding addition, subtraction, multiplication, and division operations.

In the matter of this activity, the only student's ability that appears is mathematical ability. Students are very good at processing the information contained in the questions to be made into mathematical form. However, to solve them and find solutions to these problems, students still cannot like literacy skills to think logically, representations have not appeared in this section (Machaba, 2016).

This error can occur because the student still has a weakness in understanding concepts, especially in the area and perimeter of squares and rectangles. Students still do not understand the concept in depth of the properties and how to get the formula for the area and perimeter of the wake. This error is also caused by the lack of students' ability to master the concepts of the area and perimeter formulas of squares and rectangles, such as lowering the formula or rotating the formula. Based on Machaba (2016), most students lack a conceptual understanding of an area and do not know what a perimeter is. Learners also hold misconceptions about the relationship between area and perimeter, and it appears that inadequate prior knowledge of area and perimeter is the root cause of these misconceptions. The question in this activity is related to the derivation of the formulas for the perimeter and area of squares and rectangles. However, students are still unable to master it, both from the concept of area and perimeter or even the algebraic process of solving these problems and activities. Another cause of students' difficulties in answering questions and activities can also be due to a lack of experience in practicing math skills by answering various types of level questions.

The Organization for Economic Cooperation and Development (OECD) (2019) states that the definition of mathematical literacy can be analyzed in three interrelated aspects namely: The purpose can be interpreted in 3 parts, namely: (1) the process, which includes communication, mathematizing, representation, reasoning and argument, devising strategies for solving problems, using symbolic, formal and technical language and operations, and using mathematics tools; (2) content, which includes change and relationships, space and shape, quantity, and uncertainty and data; and (3) context, which includes personal, work, community, and scientific.

In the process section, it can be seen that in working on the questions and activities given, students can communicate questions and activities in the form of text communication into communication in mathematics. In addition, students can also determine the condition of operations and processes that must be completed in solving problems in these questions and activities. Although, some of them made mistakes in counting due to errors and lack of understanding of students about the area and perimeter of squares and rectangles. Based on Machaba (2016), students should notice that all rectangles with the same perimeter will not necessarily have the same area. When necessary, learners should be able to develop general formulae to calculate the area and perimeter. Moreover, students are often familiar with level one and level two questions that only enter formulas and explain concepts through writing in books, without doing enrichment questions.

In addition, in the questions and activities section that asks how much area the BKB field is in the question, students can interpret and understand that it turns out that the information in the question in the form of the number of visitors and the distance between visitors can be used as main information in knowing the area of the BKB field. The previous researchers have repeatedly made revisions to become prototype 3. One of the goals is to lead students to understand the work on the problem, one of which is the problem described. Initially, students had difficulty understanding and thinking about how to answer them, but because the researchers gave clear explanations based on the questions and activities, students could answer them. Students can answer the questions and activities through several stages. Based on Zulkardi et al (2020), there are steps in how students understand and solve the problem. First, student students observe a picture and read the question. Second, students refer to all data for solving problem. Third, students calculated all of the data and compared them.

When students worked on questions and activities, students could adequately examine the images and observe the information contained in them. In addition, students also write down the correct information when solving the questions and activities. Researchers did not find any difficulties in understanding students from the information provided. In addition, students can also determine the operating steps that must be carried out on questions that require this reasoning. In the section on charitable activities on the school grounds, students can quickly determine the operation used to determine the number of sessions by performing a division operation on the number of visitors and the distance between visitors. Following the finding of Sholihah & Shanti (2017), a question can be successfully seen from students' success in answering the question.

Based on the data obtained in this study, the use of IBL model in the development of activities and questions significantly impacts student literacy development. There are six steps in IBL model: orientation, formulating problems, formulating hypotheses, collecting data, testing ideas, and formulating conclusions (Tohir et al., 2020). Regarding the previous explanation at the orientation stage, students can easily digest and find out about the information contained in the activity even though the training given is quite long. Furthermore, in the section on formulating problems, students can know the issues that must be solved from these activities. Then, based on the work and activities provided, students can formulate hypotheses in which students can make an example of possible answers and steps that must be taken in completing these activities and questions. Furthermore, the student again collects information from the activities and questions given, which aims to find a solution. Then for the last step, students formulate conclusions or results from the existing answers to the questions and activities that have been given.

It can be seen directly through the steps and students' answers when answering questions in the jumping task (Machaba, 2016). If there is no description and activity given, students will not know from the start that the area of the field can be related to the number of visitors in it. Students in answering these activities can use estimates that rely on their ability to make hypotheses. There are several kinds of estimations made by students, but most of them are realistic, so they make sense to relate to reality. To get the answers and these steps, the researchers used the IBL model steps to lead students to complete them.

The steps in IBL model contribute to the convenience for each student to complete the questions and activities given. In addition, IBL model also teaches students to learn to be more independent. It can be seen from the students' ability to make decisions when solving problems based on the IBL model steps written by researchers on the development of these questions and activities. The application of IBL model can personally improve students' ability to understand questions. Students are taught to be more independent and are given a workflow for these activities and questions (Tohir et al., 2020). Students can easily find out the steps that must be taken even though the questions and activities given are PISA types.

Most students have not been able or have not been able to fully involve the ability to reflect mathematical solutions and mathematical abilities and have not been able to make various kinds of arguments related to the possibility of completing activities, due to a lack of understanding of students' concepts about the material. area and circumference. In this case, students' reasoning and critical thinking skills are very low, especially in solving problems that focus on mathematical literacy, especially aimed at students' ability to use the mathematics they learn in order to solve problems related to everyday life. Magen & Nagar (2016) stated that the cultivation of concepts in improving mathematical abilities is essential for students. Not only that, there needs to be a solution used to improve literacy skills for students to be the basis for dealing with the realities of everyday life and solving various kinds of problems that require literacy skills (Munayati et al, 2015).

CONCLUSION

This study achieved the successful development of incorrect and practical parameters and activities using IBL model and might affect mathematical literacy. The development of questions and activities using IBL model in this study focused on form and space content, explicitly using the context of social distancing during the pandemic. Learning using the development of questions and activities with IBL model can help students understand and work on questions and activities to make them easier to reach and provide students with experience to improve students' mathematical literacy skills. Some of them have difficulty answering questions because students do not understand the basic concept of the material. The context of social distancing during the pandemic can be used as an introduction for students to the current phenomenon and help students get closer to solving problems.

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