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Development of Interactive Electronic Student Worksheets on Pythagorean Theorem Material to Support Students' Mathematical Reasoning in Junior High Schools

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Abstract

This study aims to develop Electronic Learner Worksheets (LKPD) or interactive E-LKPD on Pythagorean theorem material that meets valid, practical, and effective criteria. This development research was conducted at SMP Negeri 1 Parittiga with the research subjects of class VIII B students totaling 22 people. This research uses the RnD method with the Tessmer model which consists of two stages, namely preliminary studies and formative evaluation. This research is since there are still many secondary school students who have low mathematical reasoning skills on geometry topics, including the Pythagorean theorem. The results of this study indicate that the development of interactive E-LKPD on Pythagorean theorem material is categorized as valid and practical. The average validity value obtained was 89.46% with a very valid category. The characteristics of valid interactive E-LKPD on Pythagorean theorem material are (1) Presenting contextual problems that are close to the lives of students; (2) E-LKPD reflects the principles and characteristics of interactive E-LKPD; (3) E-LKPD guides students in constructing their own knowledge. Interactive E-LKPD on Pythagorean theorem exercise material is reviewed in terms of ease and benefits of use, time efficiency, and presentation attractiveness. The average practicality score obtained was 83.748% with a very practical category. The characteristics of the practicality of interactive E-LKPD are (1) Interactive E-LKPD is easy to use because the instructions provided are complete, clear, and the language is easy to understand; (2) E-LKPD processing time is efficient; (3) Commands and questions on E-LKPD are clear and easy to understand; (4) The appearance and color combination on E-LKPD is attractive; (5) Students are helped in understanding the concepts and material of the pythagorean theorem. Based on the results of interviews with teachers and students, interactive E-LKPD on Pythagorean theorem material facilitates students in learning and arouses students' interest in learning. Interactive E-LKPD on pythagorean theorem material can facilitate teachers and parents in conducting student learning activities anywhere and anytime. This research can be a meaningful experience and learning resource for students in learning geometry, especially about the Pythagorean theorem.

Keywords: *Interactive e-LKPD; Pythagorean Theorem Material; Mathematical Reasoning.*

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Abstrak

Penelitian ini bertujuan *untuk mengembangkan Elektronik Lembar Kerja Peserta Didik (LKPD) atau E-LKPD interaktif pada materi teorema Pythagoras yang memenuhi kriteria valid, praktis dan efektif. Penelitian pengembangan ini dilaksanakan di SMP Negeri 1 Parittiga dengan subjek penelitian siswa kelas VIII B yang berjumlah 22 orang. Penelitian ini menggunakan metode RnD dengan model Tessmer yang terdiri dari dua tahap, yaitu studi pendahuluan dan evaluasi formatif. Penelitian ini dilandasi karena masih banyak siswa sekolah menengah yang memiliki kemampuan penalaran matematis yang rendah pada topik geometri, termasuk teorema Pythagoras. Hasil penelitian ini menunjukkan bahwa pengembangan E-LKPD interaktif pada materi teorema Pythagoras dikategorikan valid dan praktis. Nilai rata-rata kevalidan yang diperoleh sebesar 89,46% dengan kategori sangat valid. Karakteristik E-LKPD interaktif yang valid pada materi teorema Pythagoras adalah (1) Menyajikan masalah kontekstual yang dekat dengan kehidupan peserta didik; (2) E-LKPD mencerminkan prinsip-prinsip dan karakteristik E-LKPD interaktif; (3) E-LKPD menuntun peserta didik dalam mengkonstruksi pengetahuannya sendiri. E-LKPD interaktif pada materi latihan soal teorema Pythagoras ditinjau dari segi kemudahan dan manfaat penggunaan, efisiensi waktu, dan kemenarikan penyajian. Rata-rata nilai kepraktisan yang diperoleh sebesar 83,748% dengan kategori sangat praktis. Karakteristik kepraktisan E-LKPD interaktif yaitu (1) E-LKPD interaktif mudah digunakan karena petunjuk yang diberikan lengkap, jelas, dan bahasanya mudah dipahami; (2) Waktu pengerjaan E-LKPD efisien; (3) Perintah dan pertanyaan pada E-LKPD jelas dan mudah dimengerti; (4) Tampilan dan perpaduan warna pada E-LKPD menarik; (5) Peserta didik terbantu dalam memahami konsep dan materi teorema pythagoras. Berdasarkan hasil wawancara dengan guru dan peserta didik, E-LKPD interaktif pada materi teorema Pythagoras memudahkan peserta didik dalam belajar dan membangkitkan minat belajar peserta didik. E-LKPD interaktif pada materi teorema pythagoras dapat memudahkan guru dan orang tua dalam melakukan kegiatan belajar siswa dimanapun dan kapanpun. Penelitian ini dapat menjadi pengalaman dan sumber belajar yang bermakna bagi peserta didik dalam mempelajari geometri khususnya mengenai teorema Pythagoras.*

INTRODUCTION

Reasoning and mathematics are interrelated because reasoning is needed to solve mathematical problems and learning mathematics can train reasoning skills (Shidqiya & Sukestiyarno, 2022). Reasoning skills are widely used in mathematics and are one of the foundations for success in other disciplines and the basis for developing the cognitive aspects of learners (Barnes, 2019). Mathematical reasoning is defined as a skill to connect statements into an idea or concept to solve mathematical problems (Hidayat, et al., 2022). With mathematical reasoning, students can learn more meaningfully, not only remember facts, concepts, and procedures, or imitate examples, but also understand mathematical concepts in an integrated manner (Thompson et al, 2017; Thuneberg et al, 2018). In addition, mathematical reasoning skills also receive more attention in the new minimum competency assessment. The composition of the questions that will be tested in the Minimum Competency Assessment will focus more on developing students' reasoning power by referring to the Program for International Student Assessment (PISA) and Trends in International Mathematics and Science Study (TIMSS) standards (Kemendikbud, 2020). The World Economic Forum report also shows that reasoning skills are among the top 10 most needed skills in the future (WEF, 2020). Therefore, it is very important for students to master mathematical reasoning skills. According to Hendriana et al. (2017) who refer to the Technical Guidelines of the Regulation of the Director General of Education and Culture of the Ministry of Education and Culture Number 506/C/Kep/PP/2004, detailing the indicators of mathematical reasoning ability as follows: 1) Presenting mathematical statements orally, in writing, pictures, diagrams; 2) Make conjectures; 3) Perform calculations based on certain rules or formulas; 4) Construct evidence, provide reasons or evidence for the correctness of solutions; 5) Draw conclusions from statements; 6) Check the validity of an argument; 7) Finding pat-

terns or properties of mathematical phenomena to make generalizations. However, this research uses 4 indicators, namely 1) Carry out calculations based on certain rules or formulas; 2) Estimating answers and selection processes (Making conjectures); 3) Providing reasons or evidence for the correctness of the solution; 4) Drawing conclusions from statements. Researchers used these 4 indicators based on research conducted by Aflch Yusnita in (Yuliani, 2021) on the relationship between mathematical reasoning ability and student learning interest which contributed or influenced where based on observations and interviews conducted in class VIII SMP Negeri 2 Banyubiru, information was obtained regarding students' ability to solve story problems is still low. Students cannot understand the meaning of story problems and convert story problems into mathematical models. Students cannot conclude a problem. Students are unable to solve problems that use many formulas. Most students do not like math lessons, and they have difficulty in estimating answers to solve problems. This often happens because students consider math as a difficult subject so that they reduce their interest in learning. Students think that mathematics is only a lesson that memorizes formulas.

One branch of mathematics that is believed to be a place for students to learn to reason is geometry. Geometry standards include a solid foundation of facts and the development of careful reasoning and evidence, using definitions and undeniable facts (NCTM, 2000). Geometry learning aims to foster students' confidence in their mathematical abilities, train students to find solutions to problems, communicate ideas mathematically, and reason mathematically (Siregar, Rosli & Maat, 2020). One of the geometry materials contained in the Merdeka Curriculum is the Pythagorean theorem material taught in grade VIII of junior high school (Kemendikbud, 2020).

However, results from several studies show that many secondary school students still have low mathematical reasoning skills on geometry topics, including the Pythagorean theorem (Islami, et al. 2019; OECD, 2019). The low level of student reasoning in geometry is because students are still accustomed to memorizing (Setiawati, et al., 2019), are not accustomed to working on non-routine problems (Andayani & Lathifah, 2019), and lack material related to mathematical reasoning (Lane, 2020). According to (Ferguson, et al., 2015), students' low mathematical reasoning will influence students to have a high level of math anxiety, which in turn will have an impact on their math learning ability. So that students have difficulty when faced with non-routine problems that require a higher level of thinking, such as reasoning problems (Pratiwi, et al., 2021).

One solution to overcome the problem of low mathematical reasoning ability is to prepare teaching materials that can facilitate students' abilities, involve students' activeness, relate to everyday life, and make students' learning experiences more diverse and interesting. One of the teaching materials used by teachers in the learning process is LKPD (Umaroh, 2020). LKPD is defined as a reference or learning resource for students used in the teaching and learning process that contains tasks that must be done and leads students to construct the knowledge, they have learned to solve a problem in a mathematical context (Ariani, 2020). LKPD has not been utilized optimally. The questions contained in the LKPD generally only train numeracy skills and rarely contain questions related to daily life problems, so that students cannot develop their insights and thoughts to understand the concepts being studied (Yustianingsih, et al., 2017).

So that students' mathematical reasoning skills are not well developed not only because learning activities do not provide opportunities for students to convey their ideas but also because the LKPD used does not support these abilities (Arif, et al., 2021). Of course, the LKPD used also needs to be considered to train and guide students in facilitating mathematical reasoning skills.

In fact, with the existence of LKPD that is in accordance with the character of students and their learning environment, it is expected to be able to facilitate students' mathematical reasoning skills. In line with technological developments, LKPD is now made and presented in the form of electronic applications, thus creating electronic teaching materials - student worksheets (E-LKPD) or electronic-based student worksheets.

The advantage of E-LKPD is that it can simplify and narrow space and time so that learning becomes more effective. In addition, E-LKPD can be an interesting tool when students' interest in learning decreases (Syafitri & Tressyalina, 2020). E-LKPD can help teachers to direct students who are capable, creative, independent and have knowledge in accordance with the development of their abilities (Maghfiroh & Sukardiyono, 2018). Previous research on LKPD with Pythagorean theorem material, one of which is "Development of problem-based LKPD with a realistic mathematics education approach in the context of a wetland environment on Pythagorean theorem material for class VIII SMP / MTs (Ariani, et al, 2023). In this study, the LKPD used the PMRI approach.

The study produced a product in the form of printed LKPD, while the LKPD that will be developed in this study is an interactive E-LKPD with Pythagorean theorem material and presented in electronic form that can be accessed on a laptop or smartphone. Interactive E-LKPD (Learner Worksheet) is an alternative that consists of material and computer-based exercise questions to work on it. Interactive E-LKPD can provide feedback between the media and its users. Interactive E-LKPD is like regular E-LKPD, but the input is different. Interactive E-LKPD is made with an attractive appearance, efficient and more practical (Alfa, 2017). Interactive E-LKPD itself includes various elements, namely images, sound, video, text, animation, simulations, and photos that are mixed and matched interactively (Geni, et al., 2020). This is supported by the results of Damayanti's research (2020), that the learning process using interactive-based learning media is useful as an alternative learning activity to be more effective, so that it can visualize problems better. As Tambunan (2021) said, that visualization is indispensable in the concept of geometry thinking because to be able to solve geometry problems requires analysis, computational reasoning, and high imagination. In addition, based on Pasaribu & Mailani's research (2023), electronic-based Student Worksheets can help and build students' mathematical reasoning process in a simple way.

Based on the description of the problem above, it is necessary to conduct research entitled "Development of Interactive Electronic Student Worksheets on Pythagorean Theorem Material to Support Students' Mathematical Reasoning in Junior High School".

METHOD

This research uses the tessmer model development method with the research subjects being students of class VIII B SMP Negeri 1 Parittiga in the 2023/2024 academic year totaling 22 people consisting of 10 female students and 12 male students. The following is a flow chart of the

tessmer development model.

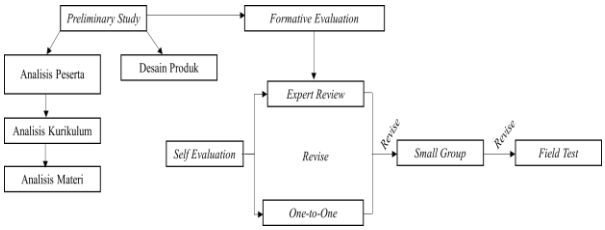

Figure 1. Flowchart of the Tessmer Development Model

The research instruments used in this study were validation sheets, questionnaires, Electronic-Learners' Worksheets (E-LKPD), Learning Implementation Plans (RPP), tests and interview guidelines. The data collection techniques in this study were tests and interviews. The test was used to see the potential effect of the E-LKPD. Interviews were used to obtain information to support all data obtained during the test and to see the validity of the data. The test scores obtained by students will be converted into values with a range of 0 - 100 using the following formula:

$$Final\ score = \frac{Achivement\ Score}{Maximum\ Score} \times 100$$

Students' mathematical reasoning ability is assessed based on whether the indicators of students' mathematical reasoning ability appear with the assessment criteria guidelines based on the scoring table that the researcher has made. The data obtained through test activities consisted of 4 questions describing mathematical reasoning ability with details of the indicators used in this study as written in Table 1.

Table 1. Indicators and descriptors of Mathematical Reasoning Ability

Indicators	Descriptors
Perform calculations based on certain rules or formulas	• First read the problem and any information from the questions given • Review known information and ask questions about problems
Estimating answers and selection process (Proposing guesses)	• Make a plan for what will be done to solve the problem given. • State the reasons why you use the chosen plan to solve the problem
Provide reasons or evidence for the correctness of the solution	• Review the reasons used appropriately. • Resolve problems based on valid evidence
Conclude from the statement	• Check again the results that have been obtained. • Conclude using appropriate reasoning

Next, researchers categorized students' problem solving abilities using scoring criteria as written in Table 2.

Tabel 2. Scoring Criteria

Score Range	Category
$90 \leq n \leq 100$	Very good
$80 \leq n \leq 89$	Good
$70 \leq n \leq 79$	Enough
≤ 70	Not enough

(Apertha, 2018)

Researchers determine the percentage of occurrence of indicators of mathematical reasoning ability using the following formula:

$$P\% = \frac{\Sigma Student\ score\ at\ indicator - i}{\Sigma maximum\ score\ at\ indicator - i} \times 100\%$$

RESULTS AND DISCUSSION

Results

This study aims to produce an interactive E-LKPD on Pythagorean theorem material for grade VIII junior high school students that is valid and practical and to see the potential effects of interactive E-LKPD on students' mathematical reasoning skills.

This product development goes through two stages, namely the preliminary study stage (preparation, analysis, and design) and the formative evaluation

stage using the Tessmer model (self evaluation, expert review, one to one, and small group).

In the preparation stage, the researcher determined the research location, namely SMP Negeri 1 Parittiga. Furthermore, the researcher contacted the school and discussed with the subject teacher to determine the research subject. The researcher also prepared research instruments and took care of research permits and other necessary letters. The second stage of the preliminary study is analysis. At this stage, researchers analyzed 3 things, namely students, curriculum, and materials. And the last stage is the design stage. At this stage, the researcher designs the E-LKPD to be developed based on the interactive E-LKPD framework that has been made focusing on content, construct, and language. After designing the E-LKPD to be developed, researchers conducted a self-evaluation. At this stage of self-evaluation, researchers pay attention to sentences that are less precise or activities that are deemed inappropriate, resulting in prototype 1. Furthermore, prototype 1 was validated by two validators, namely 2 mathematics education lecturers and 1 teacher (expert review).

There were differences in perceptions about the activities developed between researchers and validators, so researchers equalized perceptions again and revised the E-LKPD based on suggestions from validators. After making improvements, researchers revalidated the two validators and obtained an average percentage of validity of 89.46%. In addition to conducting validation, researchers also conducted trials with 3 students individually (one to one) to see the difficulties experienced by students when using E-LKPD.

After producing a valid E-LKPD, researchers will also look at the practicality of the E-LKPD developed. The practicality of E-LKPD is seen from the small group stage. At the small group stage, researchers conducted trials on 2 groups of students, each group consisting of 3 students. The practicality of E-LKPD is seen from the learning process using E-LKPD and the practicality questionnaire filled out by students after learning. When using E-LKPD, students look active in discussion.

From the results of the discussion, students understand most of the activities presented on the activity sheet. This is in line with Juliantri, et al. (2017) which states that practicality is an aspect of the convenience contained in the product developed, where this aspect includes use, preparation, storage, and interpretation. Based on the calculation of the practicality questionnaire filled out by students, the E-LKPD developed obtained an average percentage of practicality of 83.748% with a very practical category.

Based on comments and suggestions as well as interviews conducted, students stated that the E-LKPD design was very interesting, and the context used was easy to understand. Comments and suggestions from students and supervisors were used as reference materials to improve the E-LKPD being developed to produce a valid and practical E-LKPD prototype 3. The following are excerpts of some parts of the E-LKPD before and after revision (*see Table 3 at appendix*).

Discussion

By using E-LKPD, the relationship between teachers and students is well established, where students are not shy to ask if there are problems or things they do not understand. This is in line with Hasmiati, et al. (2017) which states that learning activities can also create an impression between students and educators in learning

activities. At each meeting, students looked very active and enthusiastic in completing the activities given. In line with the statement of Sipayung and Simanjuntak (2018) which states that E-LKPD can also be used to actively involve students in learning activities and act as a medium that can bridge students in solving mathematical problems. On the third meeting, researchers conducted a written test consisting of 4 mathematical reasoning questions in story form. This test was conducted with the aim of seeing the emergence of indicators of students' mathematical reasoning ability after using E-LKPD. More than 50% of students can complete the test correctly. The results of students' mathematical reasoning ability were obtained based on the test scores conducted at the third meeting. The overall results of students' mathematical reasoning ability are as written in Table 4.

Table 4. Achievement of Mathematical Reasoning Ability Results

Final score	Assessment category	Mathematical Ability Reasoning	
		Frequency	%
76-100	Very Good	8	36,36%
51-75	Good	5	22,72%
26-50	Enough	4	18,18%
0-25	Not Enough	5	22,72%
Jumlah		22	100%
Average of Student Score		70,62 (Enough)	

From table 4, the reasoning ability of students at SMP Negeri 1 Parittiga is in the sufficient category with an average value of 70.62. Furthermore, table 5 shows the percentage of occurrence of each indicator in mathematical reasoning ability.

Tabel 5. Percentage of Occurrence of Mathematical Reasoning Ability Indicators

Indicators	Percentage (%)	Students
Perform calculations based on certain rules or formulas	86,36%	19
Estimating answers and selection process (Proposing guesses)	45,45%	10
Provide reasons or evidence for the correctness of the solution	77,27%	17
Conclude from the statement	72,72%	16

From table 5 the indicator that appears most often is carrying out calculations based on certain rules or formulas with a percentage of 86.36%. This is because students already know the formula of the Pythagorean theorem and they still remember the formula, making it easier for them to answer questions directly related to the Pythagorean theorem. While the indicator that appears least often is estimating the answer or selection process (making conjectures) with a percentage of 45.45%. From the 4 questions given, as shown in table 5, it can be concluded that the ability of each reasoning indicator is different. The following is a discussion of each indicator of student reasoning.

Indicators of performing calculations based on certain rules or formulas

The level of student mastery in this indicator was 86.36% with a high category. One of the snippets of student answers can be seen in the Figure 2.

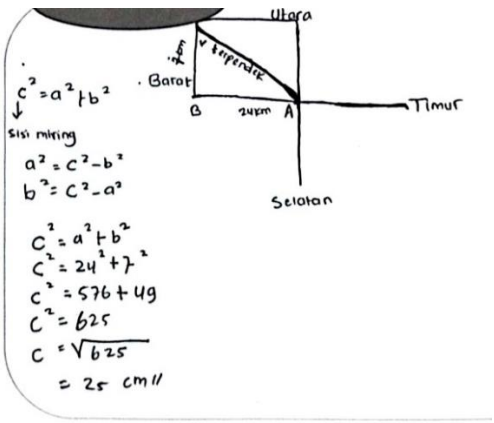

Figure 2. Excerpts of student answers on indicator 1

Furthermore, the interviews were analyzed in depth as follows.

I : Do you use certain formulas when answering questions?
S1 : Yes, ma'am.
I : What kind of formula do you use?
S1 : I use the Pythagorean theory formula.
I : Why can you think of using this formula?
S1 : Initially I was confused about whether to solve using the Pythagorean theorem formula or not. However, after I made the points of the compass, I saw the route formed in the problem, like a right triangle, so I looked for the distance, which was the slanted side, using the Pythagorean theorem.

Based on the interview results, students can carry out calculations based on certain rules or formulas based on the information in the problem. Students can adjust the formula used to solve the problem appropriately.

Indicator Estimating the answer and selection process (Conjecturing)

The level of student mastery in the indicator of estimating answers and the selection process or making conjectures is 45.45% in the low category. The following is a snippet of student answers on these indicators.

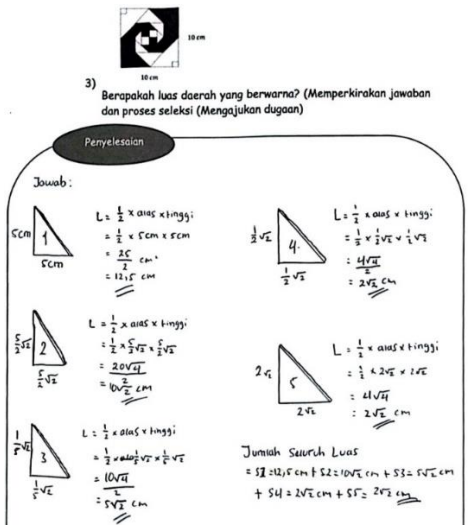

Figure 3. Excerpts of students' answers on the 2nd indicator

Furthermore, the interviews were analyzed in depth as follows.

I : When answering questions, do you use guesswork to solve them?
S2 : Yes, ma'am.
I : What do you think?
S2 : When I do it, I first look for the area of the largest triangle. Then find the area of the smaller triangles. But because the area of the smaller triangle does not know the length of the base and height, we need to find the hypotenuse of the previous large triangle.

Based on the results of the interview, the student has his own guesses in solving it even though the answer is not correct. When viewed from the results of the student's answer, he has been able to solve it, it's just that the student is still wrong in doing the calculation operation. Students can think about their conjecture in solving the problem even though the answer is not correct.

Indicator Provide reasons or evidence for the correctness of a solution

The level of student mastery in this indicator was 77.27% with a high category. One of the snippets of student answers can be seen in the following figure.

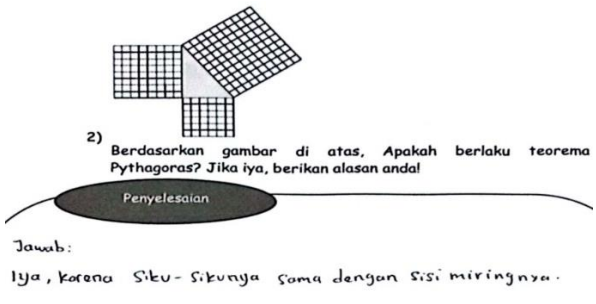

Figure 4. Excerpts of students' answers on the 3rd indicator

Furthermore, the interviews were analyzed in depth as follows.

I : Can you explain the solution you made?
S3 : first I add up the square of the side of length 6 and the side of length 8 then make it the same as where we find the square of the side of length 10. Then both left and right sides each we get the result 100 = 100.
I : But why didn't you write a solution like that above?
S3 : Sorry, ma'am. I think a statement should be given, not a calculation, ma'am.

Based on the interview results, the student can provide reasons or evidence for the correctness of a solution, but he did not explain in detail the reasons for his answer.

Indicator of drawing conclusions from a statement

The level of student mastery in this indicator is 72.72% with a high category. One of the snippets of student answers can be seen in the following Figure 5.

Furthermore, the interviews were analyzed in depth as follows.

I : What is the conclusion?
S4 : The sum of the squares of the right angles is the same as the square of the hypotenuse, ma'am.
I : Why is it the same?
S4 : Because if 6 is squared and 8 is squared the result is 36 plus 64 which is the same as 100. Well, this result is the same as the square of the hypotenuse, which is 100 too, ma'am. I : So what kind of conclusion can you draw? S4 : So, I conclude ma'am that the sum of the squares of the right angled sides is the same as the square of the hypotenuse of the right triangle, ma'am.

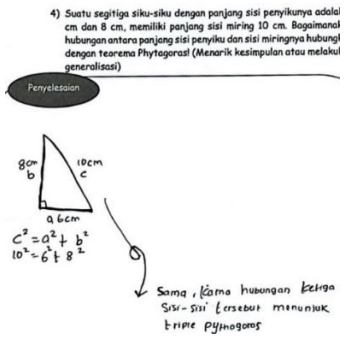

Figure 5. Excerpts of students' answers on the 4th indicator

Based on the interview results, students can draw conclusions from a statement appropriately. From the results of the study, it can be concluded that students' mathematical reasoning skills in solving problems are good enough and several success indicators have been achieved. So it can be said that the E-LKPD developed has a potential effect in improving students' mathematical reasoning skills. It's just that on the indicator of estimating the answer process or making conjectures that the percentage is low. This is in line with the research of Anisah, et al (2011) that students have difficulty in estimating a solution to a given problem. This is because students are not used to working on problems that require estimating the answer process first. In line with the results of research by Asdarina & Ridha (2020) that the low indicator of estimating the answer process is because students are not used to being given problems that are a little complicated and require a high level of problem solving.

Implication of Research

This research can be a reference for teaching materials to see and develop interactive E-LKPD in learning geometry, especially about the Pythagorean theorem. In addition, it can be a meaningful experience and learning resources for students in learning geometry, especially about the Pythagorean theorem. This study can also be a reference or source of research references in developing teaching materials, especially E-LKPD to conduct relevant further research.

Limitation

Limitations that occurred in this research were that not all students had smartphones to be able to work on the interactive e-LKPD provided. Apart from that, many students do not understand

how to use the features available on smartphones to complete the e-LKPD given so they need more time to complete the e-LKPD. It can be concluded that the use of e-LKPD cannot be used in certain research because you must look at the school background and school conditions to see whether it is possible to carry out research like this.

CONCLUSION

Based on the results of research conducted in class VIII B SMP Negeri 1 Parittiga, it can be concluded that the interactive E-LKPD on Pythagorean Theorem material that has been developed can be categorized as a valid and practical product with a percentage of validity and practicality of 89.46% and 83.748%. Apart from that, the developed E-LKPD also has a potential effect on students' mathematical reasoning abilities. This can be seen in the analysis of test results and interviews that have been carried out. Judging from the analysis of student test results, overall students were able to complete the test questions given, with 8 students categorized as very good with a percentage of 36,36%, 5 students categorized as good with a percentage of 22,72%, 4 students categorized as fair with a percentage 18,18% and 5 of students were categorized as poor with a percentage of 22,72% and were in the sufficient category with an average score of 70.62.

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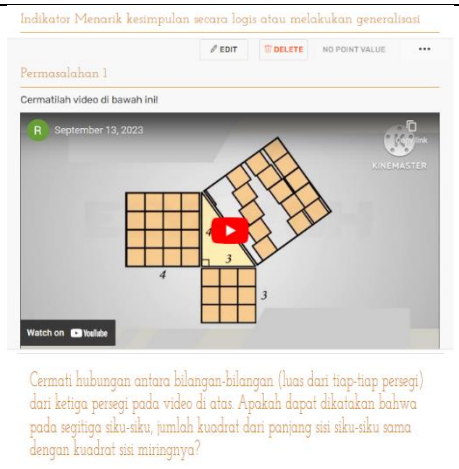
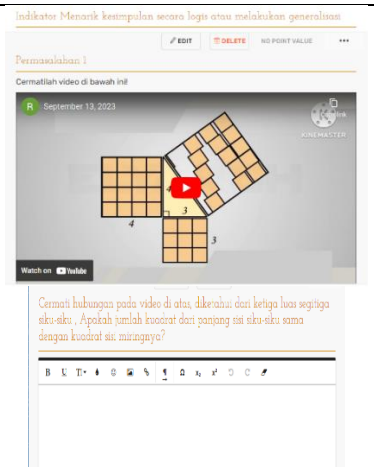
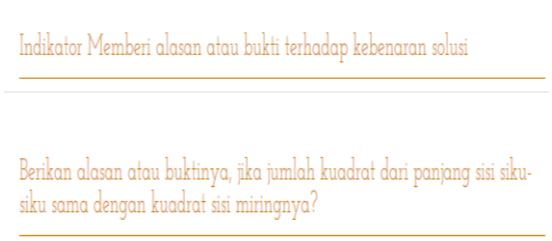
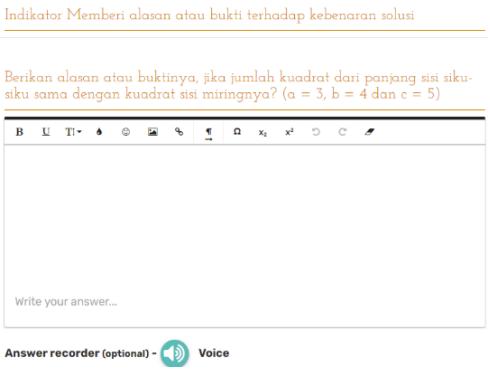
Appendix of article entitled: on Development of Interactive Electronic Student Worksheets on Pythagorean Theorem Material to Support Students' Mathematical Reasoning in Junior High Schools

Table 3. E-LKPD before and after revision

No.	E-LKPD before and after revision	
	Before revision	After revision
1.		 The editorial of the question was changed because the previous editorial's sentence was quite convoluted
2.		 Add information regarding the length of the sides because it is less effective if students have to watch the video again.
3.		 Add an editorial to the question

No.	E-LKPD before and after revision	
	Before revision	After revision
4.		 Add point C to the beacon