Liveworksheets: E-LKPD Geometry Based on Contextual Junior High School Level

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Abstract. Mathematics is a science that cannot be separated from science and technology, so mastery of mathematics in the future requires the integration of technology as a form of teaching innovation in order to achieve learning objectives. This study discusses the development of teaching materials in the form of contextually-based electronic worksheets using Liveworksheets at the SMP/MTs level. This study aims to determine the final results of E-LKPD, validity and practicality. This type of research is R&D using the ASSURE development model. This research was conducted at SMP Datok Sulaiman Palopo with 15 male students in class VIII as the research subjects. The data collection techniques were obtained using interview guide sheets, material expert validation sheets and media experts, as well as a practical questionnaire for class VIII students at the school. The data obtained were analyzed by descriptive qualitative and descriptive quantitative. The final result of the development is in the form of teaching materials in electronic form with an attractive and interactive appearance that contains a variety of learning activities such as easy-to-understand learning videos, interesting practice questions and are equipped with contextual images and supporting animations. Based on the results of data analysis, it can be concluded that contextually based E-LKPD using Liveworksheets on flat sided geometric material is valid and practical to serve as teaching material.

Keywords: E-LKPD · Contextual Learning · Liveworksheets

1 Introduction

Mathematics is a universal science that is useful for human life and underlies the development of modern technology and has an important role in various scientific disciplines and advances human thinking. In other words, mastery of technology in the future requires adequate mastery of mathematics. Therefore, it is important to teach mathematics to all students from elementary school to senior high school and continue at tertiary institutions. That way students will be equipped with the ability to think systematically, logically, innovatively, and creatively, as well as the ability to cooperate.

Mathematical objects are conceptual, logical, systematic, the discussion is deductive and involves operations. Uniquely, mathematics is the main subject and at the same time

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a servant so that it can be used in every subject and is closely related to everyday life [1]. But in reality, mathematics is still a frightening specter for some students. Not infrequently mathematics is considered a science that is difficult, monotonous, and boring to understand and learn. This fact is supported by the results of the 2018 Program for International Student Assessment (PISA) which show that the level of mathematical ability of students in Indonesia is still relatively low. Indonesia is in 72nd position out of 78 countries participating in the assessment [2]. The results of this assessment are constant with the results of the previous year's PISA [3]. These low results indicate that learning mathematics in Indonesia requires innovative solutions to overcome students' difficulties.

In learning mathematics, the role of educators is very important, especially in the implementation of distance learning. Educators are required to be able to prepare and implement strategies, models and learning tools that are appropriate and in accordance with the conditions of the educational process [4]. In order to realize this role, the teacher as an educator must be able to provide convenience for students, by providing various facilities and learning resources adequate. One of the learning resources commonly used by teachers is teaching materials. Majid stated that teaching materials are all forms of materials used to assist teachers/instructors in carrying out teaching and learning activities [5]. Through teaching materials, the teacher will find it easier to carry out learning and students will find it easier to learn a subject matter.

Based on the results of an interview with a mathematics teacher at SMP Datok Sulaiman Palopo, information was obtained that during the pandemic, learning was carried out online through learning applications such as the Google Meet, WhatsApp and Google Form applications as attendance media. During distance learning, students experience difficulties in understanding the material. For example, in the flat sided geometric material, it is difficult for students to identify the elements of the flat sided shape up to the use of the solving formula. The use of teaching materials that are not interactive and difficult to access is another obstacle for students. Due to limitations, the explanation of material that requires teaching aids is explained by the teacher using teaching materials sourced from electronic mathematics books.

Based on the problems above, it can be concluded that distance learning has an impact on the level of understanding of students, especially in learning mathematics. Learners have difficulty understanding the subject matter in distance learning rather than face-to-face learning. The focus of researchers in this problem is the use of teaching materials in the form of student worksheets (LKPD). Worksheets that are sourced from printed books alone are not effective in distance learning. This is not in accordance with the needs of students because it is not interactive and does not contain learning activities that involve students to find mathematical concepts and apply them in real life.

Good teaching materials are teaching materials that match the characteristics of students. Usually teaching materials are prepared by the teacher, because only the teacher can know the characteristics of students. Therefore, teaching materials are needed that are interesting, interactive and take advantage of progress information technology, one of which is the Electronic-based Student Worksheet (E-LKPD). E-LKPD is teaching material in digital form as an exercise for students and is carried out systematically

and continuously for a certain period [6]. In its use, E-LKPD does not only follow technological developments, but also pays attention to needs learners.

This is supported by research conducted by Fitri Sholehah that the application of E-LKPD can support online and offline learning activities in improving student learning outcomes [4]. In addition, through the implementation of the E-LKPD students will be helped to gain knowledge and stimulate their curiosity [7]. This is an effort to increase students' learning motivation through new ways of learning. One of the platforms that can be used to create in the form of input, criticism, and suggestions from the validator for product improvement. While quantitative data, namely data obtained from validation sheets and practicality questionnaires using a Likert scale with intervals E-LKPD is Liveworksheets.

*Liveworksheets*is a web-based platform for displaying material in the form of student worksheets that can be accessed online.

[8] The existence of Liveworksheets changes the view of using conventional worksheets that must be printed and done offline into worksheets that can be accessed online without being printed but still looks attractive and provides a variety of activities. In addition, Liveworksheets are an alternative for teachers in delivering material online and evaluating students, especially in learning mathematics. This is in line with research conducted by Anita Widiyanti that the development of teaching materials using Liveworksheets is said to be suitable for use as teaching materials [9]. Because through this learning students more quickly understand the material being taught, for example in the material of flat sided shapes.

2 Research Methods

This type of research is research and development or R & D (Research and Development) which uses the ASSURE development model (Analyze Learners, State Standards and Objectives, Select Strategies Technology Media and Materials, Utilize Technology Media and Materials, Require Learner Participation, Evaluate and Revise). The research instrument uses a guide sheet interviews, validation sheets and product practicality questionnaires. This validation sheet is given to competent media expert validators and subject matter experts as well as math teachers. As for the practicality questionnaire, a limited trial was conducted on 15 class VIII students of SMP Datok Sulaiman Palopo. The data obtained in this study were divided into two, namely qualitative data and quantitative data. Qualitative data of one to five. Number five is the highest score and number one is the lowest score.

As for the validation and practicality sheets that have been filled in by the three validators and several students, the percentage of validity and practicality of the product is obtained using the following formula [10].

$$\text{Percentage} = \frac{\sum \text{score per item}}{\text{maximum score}} \times 100\% \quad (1)$$

Furthermore, the percentage results obtained are categorized according to the Table 1.

Table 1. Categories of Validity Test/Practicality Test [11]

Percentage (%)	Category
81–100	Very Valid/Very Practical
61–80	Valid/Practical
41–60	Valid Enough/Practical Enough
21–40	Less Valid/Less Practical
0–20	Invalid/Impractical

3 Results and Discussion

This development research went through several stages, including:

3.1 Analyze Learners

The researcher started this stage by interviewing the subject teacher and some eighth-grade junior high school students. Interviews in the Analyze Learners stage aim to find out the general characteristics of students, the initial specifications of students and the learning styles of students.

The results of this stage, there needs to be learning innovations that support the implementation of distance learning that is interactive, not boring and easily accessible. That way, students easily understand the subject matter, are more active and enthusiastic in solving the questions given. This indicates the importance of learning media in supporting the learning process as a solution for explaining mathematics lessons that require concrete and abstract explanations. With learning media the discussion of flat side shapes can be simplified into videos and contextual images about flat side shapes.

3.2 State Standards and Objectives

The stage of determining the standard learning objectives is carried out with reference to the curriculum syllabus used in schools, namely the 2013 curriculum. With this reference, it can be seen that the basic competencies for learning flat sided geometric shapes, namely KD 3.9 Distinguish and determine the surface area and volume of flat sided shapes (cubes, beams, prisms and pyramids) and KD 4.9 Solving problems related to the surface area and volume of flat side shapes (cubes, blocks, prisms and pyramids), and their combinations.

3.3 Select Strategies Technology Media and Materials

After determining the learning objectives, the researcher chose liveworksheets as a learning medium for the learning process carried out. Liveworksheets provides several educational technologies such as: video, audio, choose (select), drag and drop (match), tick

Fig. 1. Display of Cube E-LKPD

(tick) and can make questions in the form of voice using a microphone. So that live-worksheets can support mathematics learning, including making it easier for students to access worksheets in a practical and efficient manner via computers or mobile phones.

The E-LKPD used in the liveworksheets is the result of their own design and design. The researcher took sources/references for making materials and questions from the Mathematics package book of the Ministry of Education and Culture class VIII semester 2, Middle School Math books for grades VII, VIII and IX, Mathematics book for class IX, learning videos about flat sided shapes and several other sources. math related (Fig. 1).

3.4 Utilize Technology Media and Materials

The results of the E-LKPD teaching material product design are based on the condition of students who prefer concise material that contains learning videos and is presented interactively. The results of the initial design of the E-LKPD teaching materials are divided into 4 parts, namely Cubes, Blocks, Prisms and Limas, as follows.

Table 2. Validator Assessment Results

No	Validators	Assessment Aspect	Score	Max Score	Percentage	Interpretation
1	Media	Media Introduction Media View Basic Principles of Multimedia Final Section	10 42 11 5	96	70,83	78.64
2	Theory	Learning Fill Instructions and Language	7 54 22	96	86,46	

The e-LKPD feasibility assessment was validated by three validators, namely one media expert validator and two material expert validators. The results of the proposed product development validation can be described in Table 2.

Based on the table above, media experts give an assessment score of 70.83% which is in the valid category, material experts give a score of 86.46% which is in the very valid category. The validator saw that the product being developed was good from all indicators so that it concluded that it was feasible to use with small revisions.

3.5 Require Learner Participation

After the validation stage, limited trials were carried out online and offline with 15 class VIII students at SMP Datok Sulaiman Palopo. The online trial was carried out via the Whatsapp application with four meetings. Meanwhile, in the offline trial, an overall evaluation of learning was carried out from the first meeting to the last meeting.

3.6 Evaluate

At this evaluation stage the researcher analyzed the results of observations and the practical results of using the E-LKPD in the learning process. Observation results were obtained by looking at the activeness of students in listening and responding to material during learning, as well as working on the E-LKPD as seen from the notification of sending answers on the liveworksheets account.

The results of these observations indicate that the use of electronic worksheets is needed in distance learning because of their ease of access and their diverse and attractive appearance. This changes the view of using printed worksheets which are done offline and requires a lot of paper to be accessed online wherever and whenever.

Whatever the practicality test results of students are stated in the Table 3.

The trial results to assess the practicality of the product being developed obtained an average score of 76.53% in the practical category. Overall students gave a positive assessment.

Table 3. Student Practicality Test Results

Validators	Assessment Aspect	Score	Max Score	Percentage	Interpretation
Learners	Appearance	119	750	76,53	76,53 (Practical)
	Material/Content	173			
	Utility	282			

Fig. 2. QR-code to access the Liveworksheets

4 Conclusion

Contextual-based KPD using Liveworksheets on flat sided building material can be accessed on the barcode as in Fig. 2.

ELKPD has met the eligibility and practicality criteria for use as seen in the average validator assessment results of 78.64% with the valid category, and the practicality test results for class VIII students of SMP Datok Sulaiman Palopo show an average rating of 76.53% with practical category.

References

1. AM Abi, "Ethnomatematics Integration in the School Mathematics Curriculum," JPMI (Journal of Educators. Mat. Indones., vol.1, no. 1, p. 1, 2017, doi: https://doi.org/10.26737/jpmi.v1i1.75
2. YE Haruusilo, "2018 PISA Score: Ranking List of Mathematics Ability, How many Indonesian Report Cards?," Kompas.com, 2019. https://edukasi.kompas.com/read/2019/12/07/09425411/skor-pisa-2018-list-ranking-mathematics-how-however-Indonesian-reportcards (accessed Sep. 05, 2021).
3. I. Pratiwi, "The Effect of the PISA Program on the Curriculum in Indonesia," J. Educator. and Kebud., vol. 4, no. 1, pp. 51–71, 2019.
4. Fi. Sholehah, "Development of Contextual-Based E-LKPD Using Liveworksheets on Class VII Social Arithmetic Material at SMP Ahmad Dahlan Jambi City," 2021.
5. RMF Sampurna, "Development of Pjbl Model-Based Teaching Materials for Writing Narratives," Pros. Monday. Nas. Educators, pp. 470–476, 2020, [Online]. Available: https://prosiding.unma.ac.id/index.php/semnasfkip/article/download/356/339.

6. MF Lathifah, BN Hidayati, and Z. Zulandri, "Effectiveness of Electronic LKPD as Learning Media during the Covid-19 Pandemic for Teachers at YPI Bidayatul Hidayah Ampenan," J. Pengabdi. Master of Educator. IPA, vol. 4, no. 2, pp.0–5, 2021, doi: https://doi.org/10.29303/jpmpi.v4i2.668.
7. NK Ridwan, "Development of Student Worksheets based on Guided Discovery on Building Materials for Class VIII Students of SMPN 1 Sungguminasa, Gowa Regency," 2019.
8. N. Rosyidah, MT Munifah, Trisniawati, and RA Hidayat, "Optimizing Assessment with Liveworksheets in Flipped Classrooms in SD," J. Taman Cendekia, vol. 05, no. 01, pp. 568–578, 2021
9. A. Widiyanti, "Development of E-LKPD Teaching Materials Using Live Worksheets on Flat Building Materials for Grade IV Elementary Schools," 2021.
10. MS Kahar and MR Layn, "Analysis of Student Responses in the Implementation of Problem Solving Oriented Worksheets," Berk. Science. Educator. Fis., vol. 6, no. 3 p 292, 2018, doi: https://doi.org/10.20527/bipf.v6i3.5054.
11. Sugiyono, Research and Development Methods (Research and Development). Bandung: Alphabet.