
Development of e-LKPD Based on Real Problems in Theory Statistics Data Class VI SDN 101868 Sena Village

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Abstract

This research is motivated by the absence of appropriate teaching materials in the online learning process. Learning is only done through whatsapp groups because of the limited distance between teachers and students. This study aims to produce Electronic Student Worksheets (e-LKPD) based on Real Problems on data statistics material with sub-materials mean, median and mode to be applied in mathematics learning activities in elementary school and determine the feasibility of the developed e-LKPD. The subjects in this study were material experts and media experts. This type of research is Research and Development (R&D) using ADDIE Analysis (Analysis), Design (Design), Development (Development), Implementation (Implementation), and Evaluation (Evaluation). However, this research only limits the stages to the ADD stage, namely Analysis, Design, and Development. The instrument used in this study was a validation sheet that was reviewed by material experts and media experts. The data analysis technique used in this study is a qualitative descriptive analysis technique. The results of this study are e-LKPD products based on Real Problems that fall into the "very valid" category in terms of the validation results of material expert studies with a percentage of 96.13% obtained from the content feasibility aspect 96.8%, the presentation feasibility aspect 97.2%, and linguistic aspects 94.4%. The validity of the e-LKPD from the media expert's review was stated to be very valid with a percentage of 95.2% obtained from the graphic aspect 95.4% and the software engineering aspect 95.0%. Based on the validation results from the material expert review and the media expert review, it can be concluded that the Real Problem-based e-LKPD that was developed is suitable for use in the mathematics learning process in elementary school.

Keywords – Development; e-LKPD, Real Problem ; Mathematics



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1. Introduction

Learning is an effort or process carried out by every human being in order to get changes in behavior, both in knowledge, skills, attitudes and positive values as an experience from various materials that have been studied. Learning is a process of interaction between educators and students and learning resources in a learning environment. The success of a learning can be created through several factors, one of which is the teacher who can interact directly with students during the learning process.

Mathematics is a science that studies things that are abstract and connected with concrete things. Mathematics is one of the learnings known as exact sciences. There is only one correct answer to a math question, but there are many ways or steps that can be taken to find the answer.

Mathematics is a scientific discipline that applies the concepts of analytical thinking and logic, formalizing models which are approaches from the real world that are used in everyday life. Hidayat & Khayroiyah, (2018) .

The COVID-19 pandemic that has occurred for the past 2 years has caused education to change the learning system to online. During online learning, it causes the low ability of students to understand mathematical concepts in data statistics material. Teachers do not provide additional teaching materials other than printed books that are less effective for use in online learning. Therefore, Electronic LKPD (e-mail) can be utilized. LKPD which can be accessed by teachers and students through various digital devices. However, at SDN 101858 Sena Village, there is no e-LKPD developed to help the online learning process.

Based on direct observation at SDN 101868 Sena Village, the learning model used during online learning is less efficient. The learning model that is always used is only the lecture model. The teacher only gives assignments to students without providing an explanation regarding the assigned material. Giving materials and assignments through whatsapp groups does not interest

students to read. This causes students to not have a basic understanding of the material and tasks given by the teacher.

This opinion is supported by the research of Khayroiyah & Hidayat (2018) which states that the mathematics learning model currently applied by most teachers uses the ordinary learning model, which is more focused on the teacher.

Based on the results of an interview with one of the sixth grade teachers at SDN 101868 Sena Village, the teacher said it was difficult to guide all students during online learning. The difficulty of the teacher is that the teacher cannot directly control the activities of the students during the learning process .

Mira, et al (2021) who say that online learning has an impact on teachers because it is not optimal in providing learning materials and in short the learning process causes the material to be incomplete.

Based on the above problems, an Electronic LKPD (e-LKPD) is needed that can be accessed by teachers and students through various digital devices. e-LKPD is a sheet that contains a series of student activities to make it easier for students to understand learning materials in electronic form that can be accessed through notebooks, smartphones, desktop computers, and tablets. The success of learning using e-LKPD is influenced by the selection of the right learning model. Real learning model Problem is the right learning model to be combined with e-LKPD.

Najmi (2021) shows that the Real learning model Problems combined with LKPD succeeded in increasing students' understanding of mathematical concepts in elementary schools. Real learning model The problem has 5 stages, namely orientation of students to problems, organizing students to learn, guiding individual and group investigations, developing and presenting work, analyzing and evaluating the problem solving process. Each stage of the Real learning model Problems can be done online so that the learning model is Real

The problem was chosen by the researcher as a model to be combined with the developed e-LKPD.

Based on the above, researchers will develop a Real -based e-LKPD Problems that will be developed with the help of the website liveworksheet. Liveworksheet is one of the websites for making e-LKPD that can be used by teachers where the results of e-LKPD developed through live worksheets can be used by students.

According to Dharmayanti et al (2019) , "LKPD are sheets containing material, summaries and instructions for implementing learning that must be done by students".

Learning required in skeleton prepare student face era resolution industry 4.0 which requires 21st century skills, namely creative thinking, critical thinking, communication, and collaborated with Sukmawati , et al (2022) .

The development of the 2013 curriculum is a further step towards Competency-Based Curriculum Development which was pioneered in 2004 and the 2006 KTSP, which emphasizes the achievement of integrated attitudes, knowledge, and skills competencies Sukmawati & Hidayat (2020).

Formulation of the problem

Based on the limitation of the problem described above, the formulation of the problem in this study is how to develop e-LKPD based on Real Problems in data statistics material. suitable for use in online learning mathematics in grade VI SD .

Development Goal

Based on the formulation of the problem described above, the purpose of this study is to find out the development of e-LKPD based on Real Problems in data statistics material. suitable for use in online learning mathematics in grade VI SD

2. Method

Research development or research and development (R&D), namely research oriented to the development of a product Sukmawati, Hidayat (2021) . The product produced in this study is an e-LKPD based on real problems in data statistics material.

The development model used in this research is the analysis, design, development, implementation, and evaluation (ADDIE) model. According to the ADDIE development model there are 5 stages of development, namely analysis (analysis), design (design), development (development), implementation (implementation), and evaluation (evaluation). But in this study the researchers only wanted to know the feasibility of the e-LKPD developed, therefore the researchers only used three stages of development, namely the analysis stage , design , development .

Research Subject, Object and Time

The subject in this study is e-LKPD and the object in this study is a real problem model in mathematics learning material statistics data and research time will be carried out in July 2022 for Class Students VI SDN 101868 Village Sena .

Development Research Procedure

Analysis (Analysis)

Before e-LKPD is developed , the needs will be analyzed first adapted to the stages of worksheet development . The curriculum analyzed is the 2013 curriculum for sixth grade elementary school mathematics. Analysis of teaching materials is carried out to find out which teaching materials are needed and can be used. Analysis of teaching materials was carried out by observing learning resources, teaching materials, school facilities, and learning conditions.

Design (Design)

Starting with the determination of the titles of e-LKPD . Then the e-LKPD is designed in form and the components that compose it. Furthermore, the contents, materials, evaluation tools, and various structures that will be included in the Real Problem -based e-LKPD are designed . At this stage, it is also designed how the

appearance of the e-LKPD and the language used will be made using Liveworksheets after consulting with the supervisor first.

Development (Development)

Once completed, the e-LKPD will be tested for validity. The validity test was carried out using the validation sheet instrument that had been made. The validity of the e-LKPD is assessed by an expert or a review consisting of media experts and material experts. In this case, the e-LKPD will be improved according to the shortcomings and suggestions submitted by the Study.

Product Trial Design

Product trials are an important part of development research which aims to determine the feasibility of the products that have been made. How many shortcomings must be corrected so that it can achieve the desired goal. Then after being validated , an evaluation stage will be carried out on the shortcomings of the developed e-LKPD so that it will produce e-LKPD that is ready to be used in the field for research subjects.

Research Instruments

The instrument used to collect data in this study was a validation sheet of media experts and material experts in the form of a non-test in the form of a questionnaire.

Data collection technique

Collecting validation data using a validation sheet instrument. Material experts and media experts will assess the validity of the real problem e-LKPD developed.

Data analysis technique

The data analysis technique used is descriptive quantitative data analysis technique. Quantitative data obtained through the validation sheet by looking at the score obtained from the validator shows the percentage of numbers stating whether the e-LKPD is not valid, less valid, quite valid, valid and very valid.

After the validation sheet is filled in, the response to each instrument point is converted into a score according to a predetermined weight. The final value of the validity of each validator with the following formula.

$$NA = \frac{S}{SM} \times 100\%$$

3. Result and Discussion

This research is a development research that produces the final product in the form of Electronic Student Worksheets (e-LKPD) for Elementary Mathematics in data statistics material in class VI. This research was conducted based on the ADDIE development model whose stages consist of Analysis , Design , Development . The model developed into 3 (three) stages because this research is only limited to developing and producing a teaching material in the form of a valid e-LKPD.

Analysis (Analysis)

The first step in the research Analysis (Analysis) consists of curriculum analysis, analysis of teaching materials, and analysis of student characteristics. Curriculum analysis by analyzing the emergency curriculum for the sixth grade Elementary School Mathematics. analysis is done by analyzing basic competencies, time allocation, and subject matter. Analysis of the need for teaching materials was carried out by interviewing teachers and students at the school where the research was conducted, namely SDN 101868 Sena Village. Analysis of student characteristics was carried out by interviewing teachers and students who became the research site, namely SDN 101868 Sena Village. The analysis was conducted to assess students' readiness to accept changes in learning methods and use of teaching materials.

Design (Design)

The design phase begins with determining the titles of the e-LKPD. Then the e-LKPD is designed in form and the components that compose it. Furthermore, the contents, materials, evaluation tools, and various structures are designed to be included in the Real Problem -based e-LKPD . The title design used in e-LKPD 1,

e-LKPD 2, and e-LKPD 3 products is determined based on the sub-materials discussed in each e-LKPD.

The titles assigned are as follows: e-LKPD Data Statistics Based on Real Problem Mean , e-LKPD Data Statistics Based on Real Problem Median and e-LKPD Data Statistics Based on Real Problem Mode . The electronic student worksheet (e-LKPD) which will be developed entitled “e-LKPD Data Statistics Based on Real Problems” will be divided into 3 sub-headings which will then become e-LKPD 1, e-LKPD 2, and e-LKPD 3 in web form.

Development (Development)

The development stage begins with the collection and manufacture of materials that will be used in the e-LKPD. The e-LKPD base is then created using the Canva website. After the basics of all e-LKPD are completed, the contents of the e-LKPD are made using the liveworksheet site . After the e-LKPD has been compiled, the validity of the e-LKPD is tested both from the material and media aspects. The development stage begins with the collection of materials that will be the contents of the previously designed e-LKPD. The materials to be prepared are pictures, videos, cover backgrounds , and tables. The image for each e-LKPD is obtained from the Pinterest website according to the theme of elementary school children. e-LKPD which was developed based on the Real Problem stage has stages of data collection and processing .

The next stage is the creation of the basic e-LKPD. e-LKPD began to be compiled by adjusting the pre-determined design. The stages in the e-LKPD are in accordance with learning with the Real Problem model . At the basic stage of making e-LKPD, it starts with making a cover containing the title . The e-LKPD cover display is shown in Figure 1.

The data used in this study is the technique of qualitative descriptive analysis in the form of a questionnaire assessment sheet obtained from comments or suggestions which is the result of Validation by material expert lecturers and media experts. Sukmawati , et al (2020) .



Figure 1. Cover display of e-LKPD

Furthermore, a template for the contents of the e-LKPD is made by displaying instructions for filling out the e-LKPD and then proceeding with displaying the basic competencies, indicators and learning objectives. e-LKPD followed by the stages in accordance with the stages of the Real Problem model . The display of instructions for filling out and basic competencies on the e-LKPD is shown in Figure 2.



Figure 2. Display of Instructions for Filling in and Basic Competencies in e-LKPD

The next stage is the creation of the contents of the e-LKPD. At this stage, the contents of the e-LKPD will be completed in accordance with the stages of the Real Problem model . The contents of the e-LKPD consist of stages of student

orientation to problems, organizing students to learn, guiding individual investigations, developing and presenting data results, analyzing and evaluating problem solving processes. The display of student orientation stages on the problem is shown in Figure 3 .



Figure 3. Stage of Student Orientation on Problems

The next stage is to analyze students to learn. Furthermore, at this stage students are asked to write down their opinions regarding one of the sub-subjects as a form of initial introduction that guides students to learn. The display of the stages of organizing students to learn can be seen in Figure 4.

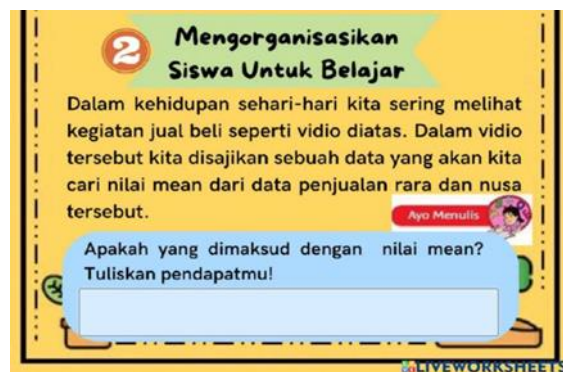


Figure 4. Stages of Organizing Students for Learning

The next stage is guiding individual investigations, this stage is still related to the first stage of student orientation on the problem, where the video presented in the first stage will continue to become a problem that will be solved by students at the stage of guiding individual investigations. Students are presented with a problem that includes data and from these data students are asked to determine the Mean value, the boxes provided at this stage of guiding

this individual investigation. After students finish adding up, students will find the Mean result from the existing data. The stages of guiding individual investigations can be seen in Figure 5.

3 Membimbing Penyelidikan Individu

Ayo Berlatih

Rara dan nusa berjualan kue cubit di pasar. Hari ini ada 10 pembeli kue cubit rara dan nusa, hasil penjualan mereka dapat dilihat pada tabel di samping.

Tentukan nilai mean dari data penjualan rara dan nusa di samping!

Ayo jumlahkan seluruh data dari tabel di sampingnya:

No.	Nama	Hasil Penjualan
1.	Bu Fita	5
2.	Bu Irma	6
3.	Bu Rena	4
4.	Pak Anand	7
5.	Indah	5
6.	Dina	10
7.	Ira	3
8.	Fia	8
9.	Adin	7
10.	Kawati	5

$$F = \square + \square + \square + \square + \square$$

$$= \square$$

$$\bar{x} = \frac{F}{n} = \square$$

Figure 5. Stage of Guiding Individual Investigation

The fourth stage in the Real Problem model is the stage of developing and presenting the data results at this stage the students are presented with a sheet. Students are asked to communicate or write about their work. The work requested is an understanding of the Mean sub-material and the conclusion of the sum of the Mean values that they have worked on in the previous stage. The stages of developing and presenting the data results are shown in Figure 6 .

4 Mengembangkan dan menyajikan hasil data

Ayo Mengkomunikasikan

Tuliskanlah hasil kerjamu pada lembar ini

► Nilai mean adalah.....

► Dari kegiatan jual beli yang dilakukan rara dan nusa, kamu dapat mengetahui berapakah nilai mean/rata-rata penjualan rara dan nusa dalam sehari?

Figure 6. Stages of Developing and Presenting Data Results

The last stage in the Real Problem model in e-LKPD is the stage of analyzing and evaluating the problem solving process. This stage contains five evaluation questions that will be done by students. The questions presented can be answered by calculating them in advance as in the previous stages, then students can match the question boxes with the available answer boxes. The display of the stages of developing and presenting the data results is shown in Figure 7 .



Figure 7. Stage of Analyzing and Presenting Data Results

After the e-LKPD was developed, the validity of the e-LKPD was tested in terms of material and media aspects using instruments in the form of a material expert validation sheet and a media expert validation sheet. The results of the evaluation of the validity of the e-LKPD from the material aspect by the study, obtained an average score of 96.13% with reference to the validity criteria, entered into the percentage achievement interval of 81% - 100%, then e-LKPD was categorized as "Very Valid".

Furthermore, e-LKPD is validated from the media aspect. The evaluation of the validity of the e-LKPD by media experts is carried out based on 2 indicator aspects, namely the graphic aspect and the engineering aspect . The results of the evaluation of the validity of the e-LKPD from the media aspect by the study, obtained a percentage score of 95.2% with reference to the validity criteria,

entered into the percentage achievement interval of 81%-100%, the e-LKPD was categorized as "Very Valid".

Discussion

Real Problem - based e-LKPD which was developed is intended to produce valid teaching materials so as to help the learning process on data statistics material with sub-materials mean, median and mode. e-LKPD which is used as a supporting teaching material that will help students understand this material during online and offline learning by following the stages of learning. Based on the results of the research data analysis, the results obtained that the developed e-LKPD has been categorized as very valid. Based on these results, the e-LKPD can be used in learning mathematics for data statistics, especially in the sub-materials of mean, median and mode.

e-LKPD is declared very valid in terms of material. The value of the validity of the developed e-LKPD in terms of material is 96.13 % . The results of the analysis show that the feasibility aspect of the content is categorized as very valid with a value of 96.8% which means that the content of the developed e-LKPD is in accordance with the SK and KD and is in accordance with the needs of students and teaching materials and guaranteed the truth of the subject matter. Furthermore, the presentation aspect is categorized as very valid with a value of 97.2 % , meaning that the developed e-LKPD has been arranged in an orderly, clear, and complete format . Then the linguistic aspect obtained a percentage value of 94.4% with a very valid category, meaning that the e-LKPD was in accordance with the Indonesian language rules and contained clear information. This statement is supported by Haqsari (2014) which states that a valid e-LKPD must be presented clearly and completely by taking into account the appropriate linguistic rules.

The validity of e-LKPD in terms of media is stated to be very valid with a percentage value of 95.2 % . The results of the analysis show that the graphic aspect is in very valid criteria with a percentage value of 95.4 % which means that the layout , font , and layout of the e-LKPD are in accordance with the function,

besides that the selection of illustrations is also correct. Furthermore, from the aspect of software engineering, e-LKPD is categorized as very valid with a value of 95.0 % which means e-LKPD has good reliability with the selection of appropriate software . It is evident that the developed e-LKPD can be easily accessed through various digital devices without supporting applications. The two percentage values of this aspect are in line with the statement of Zulmi et al (2020) where the e-LKPD is declared valid from the media aspect if the selection of images, writings and videos is correct and the graphicly valid e-LKPD has an attractive design also in terms of software engineering. e-LKPD is declared valid if it is made by first selecting the right software .

Based on the overall validation results both in terms of material and in terms of media, it can be concluded that the Real Problem-based e-LKPD developed has answered the problem formulation in this study by stating that the e-LKPD development in this study is appropriate and the feasibility results have been validated by a material expert review. and reviewed by media experts to get very valid results. The benefits obtained from the e-LKPD based on Real Problems in learning are that it becomes easier for students to understand the material and solve learning problems with the materials in the e-LKPD because it is in accordance with the material in class VI mathematics learning.

4. Conclusion

Development of e-LKPD in mathematics learning, especially data statistics material for class VI SDN 101868 Sena Village with the ADDIE model that has been modified into ADD, namely: Analysis (Analysis) at this stage carried out in research on the development of e-LKPD is a needs analysis. The needs analysis carried out consisted of curriculum analysis, analysis of teaching materials, and analysis of student characteristics; The design at this stage is to design the titles of the e-LKPD and the components contained in the e-LKPD; Development at this stage is carried out by starting with the collection and manufacture of materials that will be used in e-LKPD. The e-LKPD base is then created using the Canva website. After the

basics of all e-LKPD are completed, the contents of the e-LKPD are made using the liveworksheet site .

The validation results based on the Real Problem-based e-LKPD validation sheet in mathematics learning meet the very valid criteria. Very valid criteria were obtained from the study of material experts and media experts. The results of the validation of the material expert's review were 96.13 % obtained from the content feasibility aspect 96.8%, the presentation aspect 97.25%, and the linguistic aspect 94.4%. The results of the media expert review validation of 95.2% obtained from the graphic aspect 95.4% and the software engineering aspect 95.0%. The results of the validation of the material expert's study and the media expert's study obtained an average of 95.66 % which shows that the developed e-LKPD is in the very valid category.

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