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Analysis Of Completeness And Presentation Of PBL-Based Physics LKPD On Newton's Law Materials To Improve Student's Critical Thinking

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Abstract.
This study aims to determine the feasibility of LKPD through validity activities. The research method used is descriptive quantitative research. The data was collected by providing an instrument in the form of LKPD, where the data in this study was in the form of data from the validation results of LKPD. The results of research on the validity of LKPD are based Problem Based Learning it can be seen that the average value of the total validation is 84.38% with a very good category. LKPD Physics based Problem Based Learning in class X Newton's Law material can be said to be valid and can be used as one of the teaching materials to support the physics learning process in accordance with the Independent Curriculum.

Keywords: *Student Worksheets, Problem-Based Learning, Physics*

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INTRODUCTION

The 21st century generation is prepared to face various global demands and challenges through the 21st century learning process. Developments and advances in technology and information are developing very rapidly and affecting all fields of education. Education is a conscious effort that is planned to create learning situations in learning activities in the classroom. Education is carried out in a structured and planned manner through various policies. The government took a policy to characterize the learning and learning process in the classroom. Various efforts have been made by the government to improve the quality of education in Indonesia, such as adjusting the 2013 curriculum to become an independent curriculum.

Learning in the independent curriculum is designed to focus more onstudent cemter which is expected to improve skills, communication, social, and character skills. In independent curriculum learning, it is characterized by: (1) Freedom of students in the learning process, (2) Information that is available anywhere and can be accessed at any time, (3) Automation that replaces routine jobs, (4) Communication that can be done from anywhere and anywhere.

Learning media can be understood as "Everything that can convey and distribute messages from sources to recipients so as to create a conducive learning environment and can carry out the learning process efficiently and effectively. Learning media is anything that can be used to channel messages from the sender to the recipient of the message by stimulating the thoughts, feelings, concerns, and interests and attention of students so that the learning process can be intertwined.

According to Kasimin et al (2017: 64-65) Learning Media can be interpreted as everything related to software and hardware that can be used to convey the contents of teaching materials from learning sources to learners (individuals or groups), so that they can stimulate thoughts, feelings, concerns and learner's interest in such a way that the learning process (inside or outside the classroom) becomes more effective. Learning media is a tool (auxiliary) or object used in teaching and learning activities, with the intention of conveying messages (information) learning from sources (teachers or other sources) to recipients (in this case students or learning citizens) in order to achieve learning objectives by effective and efficient way.

The use of learning media will affect student activities during the teaching and learning process (Juliantara, 2019: 1). The selection of instructional media must be adapted to the material being taught and the conditions of the students, so that students are expected to be actively involved in learning activities. A teacher must be able to choose the right learning media so that students can be motivated to play an active role in learning.

Potential in students can be developed through learning models that can make students more active and interactive in interacting during the learning process. Basically the learning model is a form of learning that is illustrated from the beginning to the end which is presented in a special way by the teacher. The learning model is a wrapper or frame of application or approach, method and learning technique. From the results of the literature and previous research there areproblem class It is known that of the 36 students in the class there are only 7-8 students who can actively participate in learning well. Therefore, to overcome these problems the researcher used Student Worksheet (LKPD) validation with the learning model Problem Based Learning.

THEORITICAL STUDY

To cope with the demands of modern life, people need to acquire a number of skills that are often referred to as 21st century skills, such as critical thinking skills, communication and collaboration skills, social and cross-cultural skills, and information literacy. The key characteristic of the 21st century era is the massive use of information and communication technology which leads to easy access to a lot of information. Therefore, to face the challenges of the 21st century, people need to master various functional and critical thinking skills related to information, media and technology. One of them is a skill called information literacy (Zulfah, 2017).

The ability to solve problems in the form of word problems as part of mathematical literacy must be owned by every student. Because, this ability is not only used to solve mathematical concepts, answering questions that learning only requires cognitive aspects, but is used by students to solve all problems in their lives, which involve various complex elements and various problems. Therefore, this ability is considered important to be mastered by students. But in fact, the competence of problem solving skills has not been mastered by students. When students are unable to understand

the questions given, errors will occur in making plans that will be applied in solving the problem. So that it will produce wrong answers (Marian & Suparman, 2019).

Newton's law is a material that discusses the relationship between internal and external forces acting on an object and the motion that is generated and is a basic concept used to understand other physics concepts (Ergin, S, 2016).If students do not understand Newton's law material, then in the next material students will experience difficulties. Several studies have revealed that so far students have experienced difficulties and problems in recognizing forces in Newton's law material (Abdullah et al, 2019).

This is because the concepts of force and motion have abstract concepts that make it difficult for students to understand (Alias, 2020). In addition, Newton's law material has unique characteristics to be studied in the learning process, Newton's law material is very easy to express, but often causes errors, difficulties and even misconceptions in students if students do not understand the material properly (Anggraeni & Khairurradzikin, 2018).

The concept of Newton's law is a concept that is closely related to everyday life. The concept of Newton's law is directly related to various natural phenomena related to everyday life. The concepts of Newton's laws explain position, time, velocity and acceleration. The concept of Newton's law is an important concept because the concept can explain natural phenomena related to motion. The concepts in Newton's laws require students to think abstractly. In addition, in understanding Newton's laws students are expected to be able to analyze the problems given (Januaryfin, et al, 2018).

RESEARCH METHODS

The method used in this research is descriptive quantitative research. The purpose of this research is to describe something in accordance with the actual situation. According to Sugiono (2016), the descriptive method itself is a method used to analyze data by describing or illustrating the data that has been collected (Suryani, 2022). In the research conducted, data was collected by providing an instrument in the form of LKPD. The type of data used in this research is quantitative data. Where the data in this study is in the form of data from the results of the LKPD validation.

Data collection was carried out by giving an assessment sheet to the validator with the rating scale used was a Likert scale ranging from 1-4.

Table 1 Likert Scale

Percentage	Category
Very Less	1
Less	2
Good	3
Very Good	4

The formula for calculating the validation sheet is as follows:

$$\text{Percentage } (\%) = \frac{Number\ Value}{Criterion\ Value} \times 100\%$$

Where the criterion value = the highest value of the total aspects of the total validator

Table 2 Interpretation of the Percentage Value of LKPD Validation Result

Percentage	Category
0% - 20%	Very unworthy
21%-40%	Not feasible
41% - 60%	Pretty decent
61% - 80%	Worth it
81% - 100%	Very worth it

RESULTS AND DISCUSSION

This research is a type of research conducted by the methodResearch and Development (R&D) where the final result of this research is a learning media product in the form of Student Worksheets (LKPD) basedProblem Based Learning on Newton's Law material for class X high school students. Learning modelProblem Based Learning was chosen in the development of Student Worksheets (LKPD) because the PBL model can improve students' learning outcomes and critical thinking skills.

In developing this learning media, the ADDIE learning design model was used, but only 4 stages were carried out consisting of:Analysis, Design, Development, and,Evaluation. This is because the LKPD that is made is not to be implemented, but only to find out the validity value of the based LKPDProblem Based Learning.

The first development stage is the analysis stage. This analysis phase consists of needs analysis and curriculum analysis. Needs analysis is carried out to determine the abilities or competencies that students need to learn. Based on the results of the needs

analysis of the developed LKPD, namely the LKPD made in accordance with the Merdeka Curriculum for SMA. Students need worksheets with inventions so that they can activate them in learning and can strengthen the concept of the material from the problems they find. LKPD is arranged systematically according to the syntax of the learning model used. Students need worksheets that can make it easier for them to be able to solve a physics problem from the teacher.

Curriculum analysis is carried out to analyze competency standards, basic competencies and indicators that students must achieve by promoting the Independent Curriculum for SMA level.

The second development stage is design. The thing to do at this stage is to formulate the purpose of using the product. The purpose of using the product is to make it easier for students to understand Newton's law material and stimulate students to be active in learning. The next process is the preparation of LKPD consisting of covers, student group identity pages, Basic Competencies, indicators, problem orientation sheets, practicum implementation instructions (consisting of problem formulation, practicum objectives, tools and materials, practicum steps, observation tables, data analysis with some questions about the results of the practicum carried out, and conclusions), assessment sheets, bibliography, and the author's page.

The third development stage is development. The development stage is the stage of creating or modifying LKPD by conducting LKPD validity by each expert. The validation test of the Physics LKPD material was carried out by two validators who are lecturers of the Physics Education Study Program, Faculty of Teacher Training and Education, University of Jember. Validation data was obtained by distributing material validation sheets consisting of 4 aspects of validation with a total of 9 components where the components discussed were components of material completeness and presentation systematics with a total of 4 questions. Learning media that have been developed are then given a value and input in the form of comments and suggestions by the validator as a guide for revising the learning media. The validator's assessment was carried out using a Likert scale of 1 to 4 where a value of 1 indicates very poor, a value of 2 indicates less, a value of 3 indicates good, and a value of 4 indicates very good.

Judging from the component completeness of the material, Physics-based LKPD Problem Based Learning it can be stated very well where the total calculation result of the two validators is 81.25% with the aspects that are assessed are the completeness of the material in the LKPD and the depth of the material in the LKPD. That is, the LKPD is said to be in accordance with the applicable curriculum, namely the Independent Curriculum and can be used as a medium of teaching materials.

Judging from the presentation technique component, Physics-based LKPD Problem Based Learning it can be stated very well where the total calculation result of the two validators is 87.50% with the aspects that are assessed are the coherence of presentation and the accuracy of typing. That is, the LKPD is said to be in accordance with the applicable curriculum, namely the Independent Curriculum and can be used as a medium of teaching materials.

Table 3 Feasibility Validation Results of Base Learning Project-Based LKPD Development

No.	Validity Aspect	Percentage	Category
1.	Material Completeness	81.25%	Very good
2.	Serving Technique	87.50%	Very good
	Mean	**84.38%**	**Very good**

According to Riduwan (2012), based on the score interpretation criteria presented in Table 2, the LKPD developed is considered valid (valid) to be used in learning if the results of the percentage calculation of the criteria are ≥ 61% with a valid or very valid category. Based on the results of the LKPD-based validity assessmentProblem Based Learning it can be seen that the average value of the total validation is 84.38% with a very good category. That is, LKPD Physics basedProblem Based Learning in class X Newton's Law material can be said to be valid and can be used as one of the teaching materials to support the physics learning process in accordance with the Independent Curriculum.

In general, the product assessment after being validated in every aspect is in a very valid interpretation. This opinion is supported by research that has been done previously which states that learning LKPD is of good quality and is appropriate to be applied in the learning process if it meets the validity standards on predetermined aspects which are then assessed by experts or experts and the use of letters used in printed teaching materials

may not be too small and easy to read. Besides that, the selection of background colors contrasts with the letters so that the writing is easy to read. (Arsih, 2014; Ministry of National Education, 2008:18).

CONCLUSION

In the development of this learning media, the ADDIE learning design model was used but carried out 4 stages consisting of analysis, Design, Development, dan, Evaluation. This is because the LKPD that is made is not to be implemented, but only to find out the validity value of the based LKPDProblem Based Learning. LKPD learning quality and appropriate to be applied in the learning process if it meets the standard of validity on the aspects that have been determined which are then assessed by experts or experts. After being reviewed by several Physics-based LKPD componentsProblem Based Learning said to be very good and in accordance with the applicable curriculum, namely the Independent Curriculum and can be used as a medium of teaching materials.

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