# Validity of Development of E-LLPD "Si Elma" to Achieve SDG's Number 4

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**Abstract.** The era of globalization has brought significant changes to the educational process, including in Indonesia. This shift aligns with Sustainable Development Goal (SDG) 4, which emphasizes ensuring inclusive and equitable quality education and promoting lifelong learning opportunities for all. One effort to improve learning quality is the use of student worksheets (LKPD), which, when developed using technology, become electronic worksheets or E-LKPD. In science learning, particularly on the topic of forces, many students still struggle to understand concepts and identify their applications in daily life. To address this issue, the E-LKPD "SI ELMA" was developed to assist students in learning various types of forces such as muscular, frictional, gravitational, elastic, and magnetic forces. This study aims to describe the validity of the "SI ELMA" E-LKPD on the topic of forces around us. Validation results from material and media experts indicate that the developed product is highly valid and suitable for use in elementary schools. The development of this E-LKPD is expected to support the achievement of quality education and strengthen students' understanding of science concepts as part of 21st-century learning.

**Keywords :** technology, E-LKPD, validity, SDGs .

## 1 Introduction

Everything must change except change itself. A term that show how changes occur in all aspect of life, including the world of education. Curriculum changes often occur with the aim of meeting current needs and following educational developments in the world[1]. Curriculum changes respond to current challenges and so that we can be on par with other developed countries [8]. The Merdeka Curriculum is 1 curriculum with diverse intracurricular learning where the contenct will be more optimal so that strudents have enough time to deepen concepts and strengthen competencies [6].

The rapid growth of information technology in today's era of globalozation is inevitable.Technological advancements worldwide haveimpacted various aspects of life, including economics, politics, culture, arts, and education[5]. The progress of technological is inextricably linked to scientific advancements, making it something we cannot escape [2]. As

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information technology contuse to develop at a fast pace, ist influence on global education becomes undeniable[4]. The demands of a globalized world require educational systems to continuously adapt to technological advancements in order to improve the quality of education.

LKPD is an effective tool for developing science process skills, as it allows students to engage with and address existing problems[1]. Worksheets play a crucial role in science education, forming an integral part of teaching and learning activities[3]. Using LKPD as a learning method helps equip students with essential science process skills. It is expected that electronic LKPD, by leveraging technology, will enhance students' understanding of the material and motivate them to learn more effectively[6].

Understanding the importance of LKPD in classroom learning makes researchers want to develop an electronic LKPD called E-LKPD “SI ELMA”. E-LKPD “SI ELMA” is an electronic LKPD that teachers can use to support learning which contains material on gravitational forces, elastic forces and magnetic forces. Apart from these three styles, E-LKPD “SI ELMA” is also equipped with material on mucle and friction styles. The material in the “SI ELMA” E-LKPD is presented simply, making it easier for students to understand the concepts presented. The aim of this research is to determine the validity of the development of the E-LKPD “SI ELMA” on the material  Styles Around Us.

## 2 Research Method

This research is a type of development research, commonly referred to as R&D (Research and Development). The developed product is an E-LKPD called "SI ELMA," which was created using an application called liveworksheets. This development research model will follow the 4-D (four D model) developed by Thiagarajan[9] . The use of this model is based on the consideration that it is developed procedurally according to systematic steps. The development with this model consists of four stages: define, design, develop, and disseminate.

A trial was conducted to assess the validity, effectiveness, and appeal of the "SI ELMA" E-LKPD developed. The E-LKPD "SI ELMA" was validated by both material and media experts. The validity level of the E-LKPD "SI ELMA" was determined through the analysis of validation activities conducted by two validators[7].

The data obtained from the trial of the E-LKPD "SI ELMA" product is divided into two types: qualitative and quantitative data. Qualitative data consists of feedback, responses, and suggestions for improvement from expert assessments, which were collected through validation and questionnaires. Quantitative data, on the other hand, includes the assessment scores given by the validators[10].

Descriptive quantitative analysis was used to evaluate the data, including scores from validation questionnaires, student response surveys, and learning outcomes tests. The validity of the E-LKPD "SI ELMA" is determined based on the validation results from teaching material and subject matter experts.

$$V = \frac{\Sigma\ TSEV}{\Sigma\ S - max} x\ 100\%$$

Information :

V = validity of eligibility

∑ TSEV = the total number of validator empirical scores

∑ S-max= the maximum expected score

(1)

**Table 1.** Validity Criteria for E-LKPD "SI ELMA" Products

| Value achievement | Validity criteria | Information |
|---|---|---|
| 81,25% ≤ V ≤ 100,00% | Very Valid | Can be used |
| 62,50 % ≤V < 81,25% | Valid | Can be used |
| 43,75% ≤V < 62,50% | Less valid | Should not be used |
| 25,00% ≤V < 43,75% | Not Valid | May not be used |

## 3 Result and Discussion

E-LKPD validation "SI ELMA" functions to determine the validity of E-LKPD. Validation was carried out by media experts and IPAS material experts. Media experts are taken from lecturers, while material experts are taken from elementary school teachers who are considered to undestand the material.

In validating teaching materials, there are 13 questions that must be filled in by the validator.

**Table 2.** Media Expert Validation Results

| No | Assesment Indicator | Score |
|---|---|---|
| 1. | Clarity of instructions for use | 2 |
| 2. | Ease of using E-LKPD “SI ELMA” in teaching practice | 4 |
| 3. | Helps make understanding the material easier | 4 |
| 4. | Generating students motivation in learning | 4 |
| 5. | Suitability of type and size of letters to student characteristics | 4 |
| 6. | Suitability of narrative to student characteristics | 4 |
| 7. | Suitability of image display with student characteristics | 4 |
| 8. | Suitability of questions to student characteristics | 3 |
| 9. | Suitability of questions diversity of student characteristics | 4 |

| | | |
|---|---|---|
| 10. | Suitability of the appearance of the E-LKPD “SI ELMA” with student characteristics | 3 |
| 11. | The E-LKPD “SI ELMA” sequence is displayed | 4 |
| 12. | Display quality of E-LKPD “SI ELMA” | 4 |
| 13. | Efficiency of using E-LKPD “SI ELMA” in relation to time | 4 |
| **Total score** | | **48** |

Based on the results of media validation, the data as above was obtained. Point 1 gets a score of 3, this is because the E-LKPD "SI ELMA" is still not equipped with instructions for use. Instructions for use are directly given by the teacher and just follow the directions in the E-LKPD "SI ELMA". The second point gets a score of 4 because the E-LKPD "SI ELMA" is easy to apply in class. Point 3 gets a score of 4 because the E-LKPD "SI ELMA" can make it easier to understand the material, this is supported by pictures and explanations.

Point 4 gets a score of 4 because the E-LKPD "SI ELMA" can raise students' learning motivation because it is as if students are completing a game in learning[4]. Point 5 gets a score of 4 because the size of the letters is clear and large enough to be suitable for grade 4 elementary school students. Point 6 gets a score of 4 because the narrative is considered to be very appropriate to the characteristics of the students and does not give rise to multiple interpretations and does not confuse students[11]. Point 7 gets a score of 4 because the images displayed are child friendly and can be easily understood for 4th grade elementary school students.

Points 8 and 9 respectively get a score of 3 and 4 because the questions are varied and the way they are done is also varied, besides that the way the questions are done is varied so that it makes students challenged and not easily bored. Point 10 gets a score of 3 because it is considered that the appearance of the E-LKPD "SI ELMA" is quite appropriate to the student's characteristics. points 11 to 13 each get a score of 4, namely the E-LKPD "SI ELMA" contains coherent material, the display quality of the E-LKPD "SI ELMA" is considered attractive and appropriate for the age of 4th grade elementary school children. Meanwhile, the time efficiency of the E-LKPD "SI ELMA" really helps make it easier and more efficient when studying material around us[13].

The results of the evaluation of the IPAS e-module teaching materials obtained a total score of 46 with the following calculation.

$$V = \frac{\Sigma\ TSEV}{\Sigma\ S - max} x\ 100\%$$
$$V = \frac{48}{52} x\ 100\%$$
$$V = 92{,}31\%$$

(2)

Based on the results of calculations using the equation above, the validity value obtained for the validation of the E-LKPD "SI ELMA" is 92.31% which is included in the very valid category and suitable for use.

The second validation is material expert validation for elementary school teachers who are deemed to understand and master the 4th grade elementary school science material. The following are the results of material expert validation.

**Table 3.** Material Expert Validation Results

| No | Indicator | Score |
|---|---|---|
| 1. | The material is in accordance with core competencies | 3 |
| 2. | The material is in accordance with basic competencies | 3 |
| 3. | The material is in accordance with learning objectives | 3 |
| 4. | E-LKPD “SI ELMA” is appropriate to the students level of cognitive development | 2 |
| 5. | E-LKPD “SI ELMA” according to students characteristics | 2 |
| 6. | E-LKPD “SI ELMA” is easy to use in learning activities | 3 |
| 7. | Learning topics are presented clearly | 2 |
| 8. | E-LKPD “SI ELMA” can make it easier for students to understand the material | 3 |
| 9. | The content of the material in the E-LKPD “SI ELMA” is clear | 2 |
| 10. | E-LKPD “SI ELMA” makes it easier for students to understamd concepts | 3 |
| 11. | The questions in the E-LKPD “SI ELMA” are easy to understand | 3 |
| 12. | The flow of thought is presented clearly | 3 |
| 13. | Language use is clearly understood | 3 |
| 14 | E-LKPD “SI ELMA” motivates students to understand the material | 3 |
| **Total Score** | | **38** |

Based on the validation results from material experts, points 1 to 3 received the maximum score, namely 3. This is because the E-LKPD "SI ELMA" has appropriate core competencies, basic competencies which are summarized in learning outcomes and learning objectives. Points 4 and 5 get a score of 2, which means the validator agrees with the suitability of the "SI ELMA" E-LKPD to the level of cognitive development and student characteristics. Point 6 gets a score of 3 because the E-LKPD "SI ELMA" is easy to use anytime and anywhere. Point 7 gets a score of 2, which means the validator agrees that the learning topic is presented clearly[12].

Point 8 gets a score of 3, which means the E-LKPD "SI ELMA" helps students understand the concept of forces around us easily. Pon 9 gets a score of 2, which means the validator agrees that the content of the material in the E-LKPD "SI ELMA" is clear and does not confuse students. points 10 to 14 get a perfect score, namely 3, which means that the E-LKPD "SI ELMA" makes it easier for students to understand the material, the questions displayed are also easy to understand and the work is also varied so that it makes students motivated to work[4].

The total score obtained in the material expert validation is 39 with the following calculation:

$$V = \frac{\Sigma\ TSEV}{\Sigma\ S - max} x\ 100\%$$
$$V = \frac{38}{42} x\ 100\%$$
$$V = 90{,}48\%$$

(3)

Based on the calculation results, a value of 90.48% was obtained, which is in the very valid category and can be used in research and utilized in research without revision.

## 4 Conclusion

The validity of the development of the E-LKPD "SI ELMA" in an effort to improve the science process skills of elementary school students is in the very valid category, this is obtained from data from validation results of materials and media to different validators according to their expertise.

## 5 Expression of Gratitude

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