



Development of Longline Board Media for Creative Thinking in Class IV Elementary School Students

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Abstract

This research aims to assess the successful development of Longline Board Media, which is extended to think of creative students. The R & D (Research and Development) approach uses a four-D model involving four Suites: defining, designing, developing, and deploying. Research assessment tools utilize media and material expert validation attachments and responses from class IV respondents at SDN Kalideres 10 Pagi. Validation results from a media expert is an academic with expertise in media-based media test results. A score of 93% qualifies as very good. Expert validation evaluation curriculum or materials, i.e., a material expert lecturer and teacher, based on the material test results obtained 93%, which was very good. After that, a response test was also carried out; 25 students got 85%, and an excellent evaluation was verified for the homeroom teacher, who got 90%, an excellent evaluation tool to support learning currently being developed. The data shows that the Longline Board Media is appropriate for use in mathematics lessons, especially on the topic unit long. This Longline Board Media is interesting and exciting for students to think creatively when calculating unit material for the length of what is being studied. In learning media unit long, yes interactions aimed at improving creativity deep counting on the topic.

INTRODUCTION

The subject of mathematics is learning to calculate based on addition, subtraction, multiplication, and division. In this context, in mathematics, lessons focus on length unit material of class IV elementary school. Mathematics is a vital subject relevant to daily life and can be applied [1]. Level mathematics learning also has many processes. There are obstacles to learning mathematics perception, and eye lessons are considered less attractive [2].

Learning mathematics is not limited to teaching in front of the class. Both psychologically and intellectually, student medium growth is necessary as a medium or container in learning to make things easier and think creatively from engaging and exciting media for students. Media, as an element of learning, has a role as a non-verbal communication tool. As an essential part of learning, media use becomes mandatory in session study learning in class [3]. Instructional media is all things that can be used to convey messages or learning materials [4]

Instructional media becomes a receptacle for students learning in class. This time, the Longline Board Media will be presented. This is a board interactive form for calculations and understanding concepts material. The interactive board containing Draw a Line will help with implementation calculation and problem-solving in unit material long. This media is shaped concretely and possibly used over time to help students learn mathematics, especially on extended topics. This board can be affixed to the classroom wall so students can operate the unit line. Unit line board this length will become board interactive as a receptacle for students to pour creativity for calculating unit long.

The higher-order thinking skills cover critical, creative, and metacognitive skills, each with different characteristics [5]. Mathematics lessons are essential for discussing creative thinking ability [6]. The importance of developing creativity from an early age is visible at different levels of the school base. Students who have mathematical creativity will tend to have innovations in various fields [7]. Creativity in mathematics is the capacity to create or discover unique and original new ideas that lead to the right solution [8].

The thought process starts with student recognizing existing problems until they convey their ideas [9]. With a thought process, These students are also creative and can solve problems all the way you have them. Creative abilities make it possible to progress in various aspects of life. As experts often put forward, each individual has the potential to be creative, though at a certain level or through a different method [10]. It can be seen where the thought process is. This creativity will solve problems, and humans need to have creativity.

Creativity in learning mathematics is essential, especially the subject matter. This lesson is difficult, but many ways or tricks exist to solve math problems. In this case, creative students will walk as you get used to planting creativity in students. This research was conducted at an elementary school in one of the areas in Jakarta, namely SDN Kalideres 10 Pagi. After making observations at school on this basis, I found some problems, especially in mathematics lessons, especially on topics unit length, including (1) lack of availability of learning media contextual, (2) ongoing learning activities using just a whiteboard and markers, (3) not enough to provide interaction creative to students. It triggers students to think creatively, especially by embedding creative and familiar students in sharpening creativity to make things easier for students to think in the future and accept and generate new ideas.

It is not only creative students who must always think without knowing the existing abilities that students will gain. Indicators of thinking creatively, according to Munandar in [11], include (1) fluency thinking, (2) flexible thinking, (3) original thinking, and (4) elaboration ability. Unit media has long been developed by researchers [12], [13], [14].

Luthfitah (2023) developed A concrete media, a rolling whiteboard, to make it easier for students to count unit material. Sari and Munir (2023) developed concrete media, namely GASPAT, to increase performance in learning mathematics on the topic unit heavy and prolonged. Mahmudi's (2023) development of a concrete media form conversion board aims to create a practical and usable learning tool to maximize learning. Previous research has been developing media to support the topic of the learning process for a long time. However, the unit line long Not yet developed tool show aims to make things easier for students in calculating and sharpening creativity students with interactive media unit line board interesting and exciting length.

Based on the matter, it is a research development by the author with a purpose as a form of concrete media development from unit line board long. Aim to add and hone creative students and make it easier for students to count unit material long in the eye mathematics lessons in class IV. This reset is a development tool learning made board being developed become a learning medium.

METHODS

This research occurred at SDN Kalideres 10 Pagi from December 2023 to April 2024. The research involved fourth-grade students at SDN Kalideres 10 Pagi as a sample, students in a class with 25 students. This research uses A. The current R&D research method applies the four-D. This model, as the name suggests, has four stages in it. The first step, namely definition, begins with the four-D model. This stage aims to understand the reason behind the need to develop Longline Board Media for students and teachers. Apart from that, this stage also aims to adjust topics with tools the display or container that is developed. Thus, what is defined is the need to support A learning for students and implement curriculum accordingly at school.

Second, planning or design, namely stage next after stage definition, starts with thinking and forming a draft by making an initial draft containing materials for making Longline Board Media long and the framework for making Longline Board Media long. This stage exists because the media used in concrete media, with the target being students on a fixed school basis, must be kept safe from the media. After it exists, the development or development stage is stage planning or a. The initial design is: materials in making Longline Board Media long, shaped existing materials arranged, will be assembled to become an interactive learning media for students. This stage of development is also a stage realization from previous stages, whereby going through a validation test hello to future material and media experts will implement it in stages.

Stage Dissemination: this stage is the stage. The last one in the 4D model is the distribution of Longline Board Media, which has already been done several stages previously. Distribution of Longline Board Media is aimed at the target audience, namely students' school base. Existing dissemination or implementation aims to utilize this learning media as an interaction study student and add a sense of creativity to students in thinking through the medium of the unit line board long. Data collection techniques through questionnaires and observations. It is done to find out problems experienced by both teachers and students in learning. The research questionnaire validated material, media, and student and teacher responses. Calculated use formula:

$$P = \frac{f}{n} \times 100\%$$

Information

P = Validation percentage

N = Minimum score

F = total data score

Evaluation from expert media and materials is arranged in categories in Table 1 below.

Table 1. Percentage response suitability of media and materials

Percentage	Score	Category
76% - 100%	4	Excellent
51% - 75%	3	Good
26% - 50%	2	Not good
0% - 25%	1	Not good

Determine learning media development criteria, which are also assessed as success based on responses from respondents towards the media, which is represented in percentage responses in Table 2.

Table 2. Percentage of teacher and student responses

Percentage	Score	Category
76% - 100%	4	Excellent
51% - 75%	3	Good
26% - 50%	2	Not good
0% - 25%	1	Not good

RESULTS AND DISCUSSION

Research and development produces Longline Board Media. The length of this mathematics lesson uses the four D model (Define, Design, Develop, Disseminate). Development research (R&D) involves several things that are applied to develop and validate product education. The product in question is not only textbooks, films, concrete media, or the like but can also be in the form of educational programs developed in schools.

Stage Define

Stage This definition is the stages carried out by researchers in research, namely the analysis of students, teachers, and materials to achieve the purpose or analysis needs of the intended targets. The analysis that has been sought will become An analysis that is needed in a research analysis. This needs to be able to see teaching materials or media needed during the learning process and still put first and hone student creativity. As with collection analysis, it also lacks a container or medium for sharing with students when exploring or pouring. Creative students with this concrete media can make students more intertwined, interacting creatively with other students about the learning material to see what teachers need. Currently, teachers are exposed to digital media throughout the pandemic, and the lack thereof gives students a receptacle to get to know concrete media that can be used directly by teachers as media and independently by students as a means of study. Likewise, with analysis, the teacher's material needs are that he feels inadequate to understand the unit material. He is still studying mathematics using the method count of the old ones. Medium learning or curriculum valid at SDN Kalideres 10 Pagi, namely the Independent Curriculum.

Stage Design

Design this stage. The plan made in this research is a Longline Board Media that is made creatively. It will attract students' attention, hone creative students, and become a means for students to calculate questions regarding unit material. Stage This planning starts with materials from making this board media.



Figure 1. Materials for making media



Figure 2. Initial media design

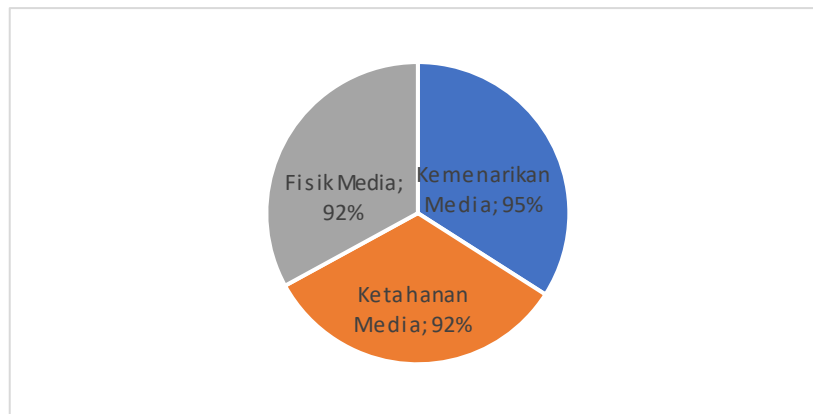
Stage Development

The stage after designing safe materials for students to implement. The picture below is a lesson on the result of the product to be developed: Longline Board Media. Figure 3 will become a means for students to pour creativity or think creatively in solving the problems about the long search of unit material and determining answers according to what was asked.



Figure 3. Length Longline Board Media

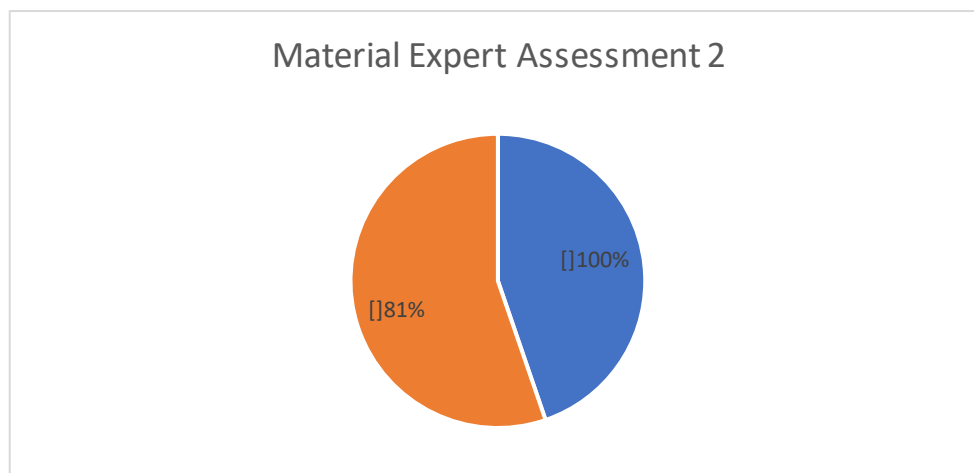
Furthermore, media and curriculum experts evaluated the Length Line Board Board media. Media validation, aspect attractiveness board, resilience board, and physical media. Produce, around 93%, is in the excellent category.



Average 93% Excellent

Diagram 1. Media Assessment

Evaluation of their score and category from aspects assessed by media experts. Do you have any suggestions to provide An identity on the board as form owner from the media that has been created? Media experts also suggest refining every still side rough because the base is made of planks or wood. The target of this media development research is students. School-based matters could have been more noticed. Validation by material experts includes evaluation of the appropriateness of the material and delivery of the material, which results in a score of 93%, which is in the excellent category.



Average 93% Excellent

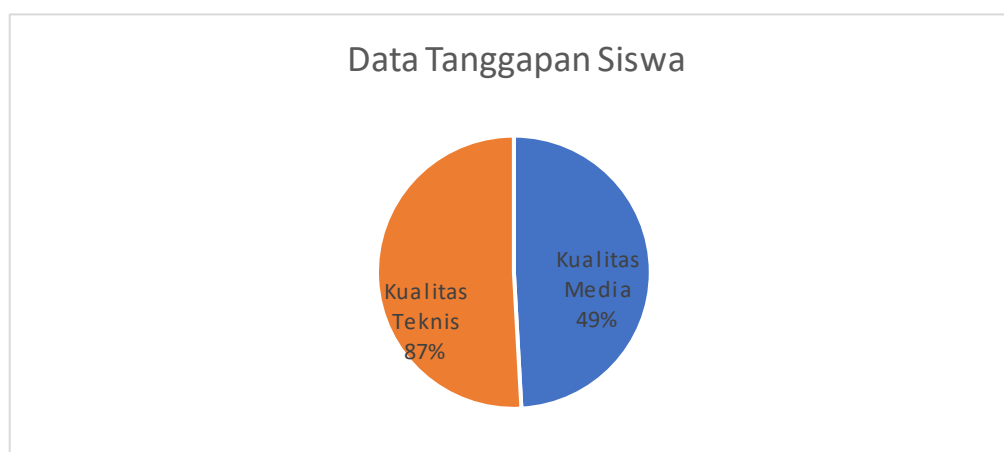
Diagram 2. Material Assessment

Verification by aspect evaluation material experts curriculum includes the point of delivering material in the learning process, can be helped with the media that is currently available developed, can make the student more creative in answering what you have learning media facilities longline board. Evaluation material experts 1 and 2 scored 100%, which is very good. Material experts responded well to the material's content in this development research, where this development research develops interactive products for students to think creatively to solve possible problem complexes in unit material long.

Unit line media is long and designed with simple materials that are not difficult for students to understand by the school base. A few years ago, when the world was experiencing a disaster, a virus outbreak, and field education, Circumstances impacted the school and study in a way that distance Far make students always present digitally. This time, there are concrete media present as event interaction students and start to hone your thinking again creative students with the topic unit long utilize means unit line board.

Stage Disseminate

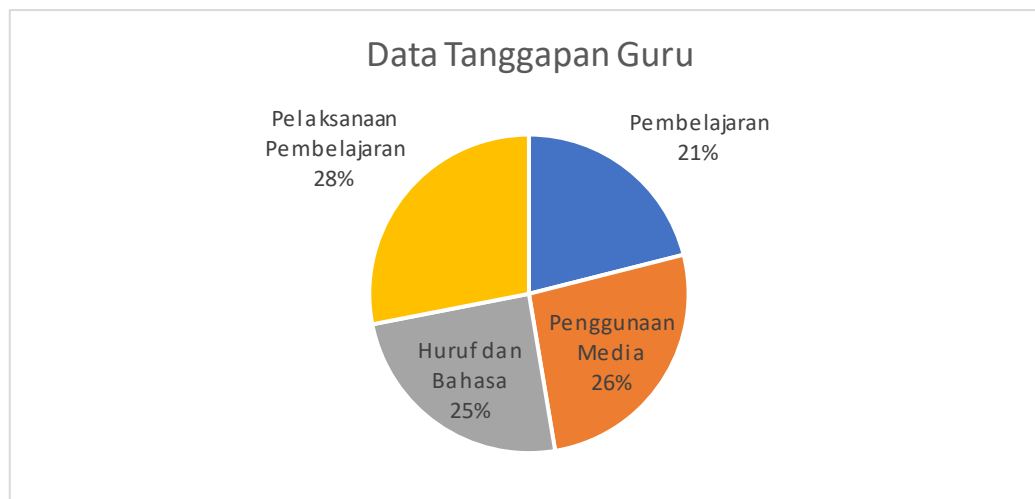
Learning media in this research has gone through a series of comprehensive stages. Longline Board Media long as means learning for unit material long Already through a validation process with media experts and experts curriculum or materials. Application of Longline Board Media long Class IV students at SDN Kalideres 10 Pagi conducted product testing. After that, the results response students had an average of 85% excellent. The results of the teacher's responses were obtained. The average value at a percentage of 90% is excellent, suggesting that the media can be used. With learning media as a tool to help education, the learning process becomes more attractive, allowing teachers to hone creative ideas and create exciting media [15].



Average 85% excellent

Diagram 3. Student Response Data

Response student load aspect media quality and quality technical Longline Board Media length in unit material makes students enthusiastic and growing, which adds to the desire to know students because this media is interactive media; board media also teaches thinking creatively in learning mathematics, especially in length topics. The average result is 85% in the excellent category.



Average 90% excellent

Diagram 4. Teacher Response Data

The teacher responded that there are four aspects to everything, the types of points contained in it, and the average percentage is 90%, which is categorized as excellent, so The teacher's response in this research was also excellent.

The development of mathematics media in elementary schools has a vital role in improving students' creative thinking skills. Interactive and exciting learning media can help students understand abstract mathematical concepts more quickly. For example, using visual aids such as diagrams, graphs, or educational games can stimulate students' imagination and understanding so that they can see various ways to solve the mathematical problems they face.

One effective method is using technology, such as math applications and software designed specifically for education. These applications usually offer various interactive features, such as animations, simulations, and quizzes, making learning more fun and challenging. Thus, students learn to find the correct answer and explore various problem-solving strategies and approaches. This can stimulate their creative thinking and help them develop better analytical and logical skills.

Apart from that, the development of mathematical media can also be done through a collaborative approach, where students work in groups to complete mathematical assignments or projects. This improves their ability to think creatively and teaches critical social and communication skills. Discussions between students can give rise to new ideas and creative solutions that individuals may not have thought. Therefore, integrating innovative and collaborative learning media in the elementary school mathematics curriculum is very important to optimally develop students' creative thinking.

Research on the development of unit-length line board media aims to measure its impact on the creative thinking abilities of fourth-grade elementary school students. The length unit line board is a learning aid designed to help students understand the concepts of length and measurement through a visual and practical approach. This media is expected to stimulate students' imagination and creativity because they can concretely see and measure various length units.

This research used experimental methods to test the effectiveness of unit-length line boards. Students were divided into two groups: the control group, which used conventional methods, and the experimental group, which used unit-length line boards. The research showed that students who used this board media significantly increased their creative thinking abilities compared to the control group. This can be seen from their ability to solve problems that require out-of-the-box thinking and their ability to make connections between long-term concepts and everyday phenomena.

In addition, direct observations and interviews with students and teachers show that the length of unit board media helps understand academic concepts and increases interest and motivation to learn. Students are more enthusiastic and actively involved in the learning process. In conclusion, the development of unit-length line board media is instrumental in improving the creative thinking abilities of class IV students and can be used as an effective alternative learning media in elementary schools.

CONCLUSION

The development of Longline Board Media with an R&D (Research and Development) approach using the four D model, media or facilities developed learning the tested by respondents, i.e., homeroom teacher and fourth-grade students at SDN Kalideres 10 Pagi. Experts validate that the materials and media developed reach an excellent verified percentage. Respondents' responses about media or tools The model developed has also been verified to be very good. Longline Board Media can be treated for a pretty long period. This media is also easy to use and becomes a place of active interaction and creativity for the student. Thus, the Longline Board Media length is perfect for learning to think creatively fourth-grade students at SDN Kalideres 10 Pagi.

Based on research results, discussions, and conclusions that have been discussed, the researcher wants to provide advice regarding the moderate learning developed in this research. According to the research results, the Length Line Board Media is feasibly used. Therefore, it is feasibly applied in the learning process. The researcher's advanced expectations can increase the quality of the development media board.

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