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Development of Obicah Box Learning Media (Integer Number Operations) on the Achievement and Self Efficacy of Grade I Students of Bawang O3 Batang Elementary School

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Abstract

This research aims to: 1) produce Obicah Box learning media on whole number operation material for Grade I students at SD N Bawang 03 Batang; 2) To produce practical Obicah Box learning media on the operation of whole numbers for Grade I students at SD N Bawang 03 Batang; 3) To determine the effectiveness of the learning media developing Obicah Box on whole number operation material on learning achievement and self-efficacy in Grade I students at SD N Bawang 03 Batang. This research was conducted in September – October 2024. This research was conducted at SD N Bawang 03 Batang in the 2024/2025 school year. The type of research used is research and development (R&D). The product produced in this research and development is the Obicah Box (Whole Number Operation Box). The results of this research obtained the following results: 1) based on the validity test results of material experts and media experts, the average results were 3.9 and 4.2 in the good category, so that the obicah box media is suitable for use as a supporting medium for mathematics learning in the operation of 1-20 counter counting. ; 2) based on the results of the class teacher's assessment in the small scale trial, the average result was 3.92 in the good category and the average student assessment was 88.67 in the good category. No revisions are required, in other words, this obicah box media is practical to use; 3) based on the results of the spss paired sample t test, the 2-tailed sig value is 0.001, this shows that there is a significant difference between the pretest and post test scores. It can be concluded that the use of obicah box media is effective in increasing student learning achievement. Based on the results of the spss paired sample t test, the 2-tailed sig value is 0.002, this shows that there is a significant difference between the value of using the obicah box media and self-efficacy, it can be concluded that the use of obicah box media is effective in increasing students' self-efficacy.

Keyword: Obicah box learning media, self-efficacy, elementary school students

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INTRODUCTION

Based on the Regulation of the Minister of National Education No. 22 of 2006, students are expected to master mathematical ideas and explain the relationships between concepts or algorithms flexibly, precisely, effectively, and precisely when completing assignments. Through meaningful learning, the purpose of mathematics learning can be realized. In this situation, teachers should pay attention to the use of multimedia, resources, learning tools, various approaches, models, and media that are suitable for elementary school mathematics learning. Math learning materials can be found anywhere and, in any

format, and are essential for students to learn and achieve their desired learning goals. Teachers can use existing learning resources or teaching aids in addition to books. Learning media plays an important role in the learning process. The existence of learning media means that material that was previously difficult or even abstract for students to understand, now becomes more concrete with the help of learning media also makes students more active and creative when learning.

Learning media can also be understood as a tool used by teachers and students to communicate information during teaching and learning activities. It can be images, audio, video, movies, or learning aids that are created or used according to the content of the learning. The purpose of using media in the classroom is to support and assist teachers in presenting material to students. By using learning media, teachers can expand and deepen the teaching and learning process, and it would be even better if there were media that activated several purposes (Abdul, 2018).

Learning media is a tool or means that can convey information or messages to support the teaching and learning process. This is because each student has a unique learning style and a different understanding of the material, learning activities require the use of learning media. According to Brunner, there are three stages of knowledge learning: Direct experience, visual experience, and abstract experience. Direct experience means performing and refers to educational activities that require practice. Pictorial/drawing experience, which means presenting an example of an object in the form of a picture. Whereas in abstract experiences, students compare what they hear or read with real reality. Therefore, the teaching tools used by teachers are very important in the learning process. Because for students, learning media is an important part of learning. Eelementary school Bawang 03 Batang has used learning media, especially the material on number operations. Most still use learning media such as abacus, sticks and the like or only rely on existing learning books, however, some students still cannot complete more assignments because they still cannot do calistung. In mathematics learning, especially in the operating material in grade 1 at SDN Bawang 03 Batang, currently the media used is in the form of cardboard media and sticks. The media is still considered ineffective and more interesting media innovations are needed.

To help the mathematics learning process on the topic of number operations, researchers are interested in creating the Obicah Box (Operation of Numbers Box). The medium that has been created is the Operating Box medium of the number of counts. The researcher conducted an observation of class I Bawang 03 Batang Kramatwatu Serang on May 15, 2024, to see how the teaching and learning process was carried out. Instructors use instructional technology to carry out the learning process based on observational findings. However, instructors have not included engaging learning resources in the classroom. During the learning process, students often come and go from class, there are even students who argue with their classmates, students often do not pay attention to the explanation of the material presented by the teacher in the learning process, as a result

students often do not understand what the teacher has explained before and often ask questions during practice. After that, the researcher conducted an interview with the teacher, from the results of the interview there were around 15 students out of 28 students who did not understand the operation of the number of numbers because during the learning activity there were students who joked and chatted with their classmates, so that students had difficulties and were still confused about how to operate the number of the number. It is very important to ensure that students do not understand the operation of the number of the number, because the material of the operation of the number is a very crucial and the most basic material for students to master as a prerequisite material to understand the more difficult material.

The researcher chose the operation of the number of digits as the material for the development of learning media. Based on this story, it was also found that some students had not mastered the subject of number operation due to the teacher's less successful learning method and less enthusiastic student answers. When demonstrating the material of the operation of the number of numbers, the media used are hands, straws, and visual aids. Based on interviews, it was found that instructors should create teaching materials that are even more interesting when presenting material topics. Increasing students' interest and learning in mathematics, especially number operations, teachers can use more interesting media to help students understand the information being taught. The researcher will create a media in the form of additional calculation media. The researcher chose this medium because it is proven to be applicable for use in subject class instruction for arithmetic operations of counted number operations. This is in accordance with the findings of Robertus Farman Santi's previous work. The findings and analysis of the research show that the teaching materials made have met the requirements to be piloted on elementary school first-grade students (Eli Manizar, 2019).

This study is a guideline for researchers who are making goods by changing the media to be more interesting, useful, and adjusted to the subthemes that the researcher will use in the context of product trials. The selection of Obicah Box media by the researcher is also based on research conducted by Suharmanto regarding the media of the distribution board for grade II elementary schools. Based on this, the researcher proposed to create an Obicah Box medium. Students can operate a decimal number more easily using the Obicah Box.

METHODS

Types of Research

The type of research used is research and development or *Research and Development* (R&D). The product produced in this research and development is the Obicah Box (Operating Box of Numbers Counts). In terms of ADDIE development research procedures developed by Robert M Branch (Branch, 2009), it is revealed that the R&D cycle is structured in several research steps as follows: *1. Analysis, 2. Design, 3. Development, 4. Implementation, then 5. Evaluation.*

Development Model

This study adapts the ADDIE (Analysis, Design, Development, Implementation, Evaluation) development model with the following adjustments:

1. Analysis Stage

1. Needs analysis: identifying mathematics learning problems in number operations in grade I Elementary School
2. Curriculum analysis: examining Basic Competencies and Competency Achievement Indicators related to integer operations
3. Analysis of student characteristics: understanding the cognitive and psychological characteristics of grade I elementary school students
4. Learning environment analysis: identifying the availability of facilities and infrastructure at Bawang 03 Batang Elementary School

2. Design Stage

1. Formulate the learning objectives to be achieved with the OBICAH BOX media
2. Designing the concept and components of OBICAH BOX media (shape, size, color, material)
3. Compiling learning content that will be integrated into the media
4. Create storyboards and media usage flows
5. Designing assessment instruments (learning achievement tests and self-efficacy scales)
6. Designing validation instruments for media experts and subject matter experts

3. Development Stage

1. Prototype OBICAH BOX media as planned
2. Develop media usage guidelines for teachers and students
3. Conduct product validation by media experts and subject matter experts (minimum 2 experts for each field)

4. Revised products based on expert validation results

4. Implementation Stage

1. Small-scale trials (6-10 students) to get an initial response and identify constraints
2. Product revision based on small-scale trial results
3. Large-scale trials (one experimental class) with quasi-experimental design (pre-test and post-test)
4. Measuring student learning achievement before and after using OBICAH BOX media
5. Measuring students' self-efficacy before and after using OBICAH BOX media

5. Evaluation Stage

1. Analysis of implementation data (learning achievement and self-efficacy)
2. Overall product evaluation based on test results
3. Final revision of the product for the enhancement of OBICAH BOX media
4. Compile research reports and recommendations for the use of media

Data Collection Techniques and Instruments

1. Data Collection Techniques:

1. Observation
2. Interview
3. Questionnaire
4. Test
5. Documentation

6. Data Collection Instruments:

1. Validation sheet for media experts: assessing aspects of appearance, ease of use, and suitability with student characteristics
2. Validation sheet for subject matter experts: assessing material suitability, concept correctness, and achievement of learning objectives
3. Learning observation sheet: observing the learning process with OBICAH BOX media
4. Teacher response questionnaire: get teachers' feedback on the feasibility and practicality of the media
5. Student response questionnaire: get student feedback on the interest and ease of use of media
6. Learning achievement test: measuring understanding of concepts and ability to operate numbers (pre-test and post-test)
7. Self-efficacy scale: measures students' self-confidence in completing number operations (pre-test and post-test.

RESULTS & DISCUSSION

Result

Obicah Box Media Eligibility

Based on the results of the Validity Test, material experts, and media experts obtained an average result of 3.9 and 4.2 with good categories, so that the obicah box media is suitable for use as a media to support mathematics learning in the operation of count counts 1-20. This is in line with the research conducted by Destri Wiranda et al (2021) This research aims to determine the development process, validity, and practicality of the calculation box media to improve the ability of the work process to reduce the reduction of students of dyscalculia grade II in elementary schools. The type of research used is Research and Development (R&D) with the ADDIE Mulyatiningsih model, (2011) Analysis, Design, Development, Implementation and Evaluation. The assessment instruments in this study are in the form of questionnaires and educator responses, documentation and assessment of students' abilities. The subjects of the research are media experts, material experts, learning experts for dyscalculia students, engineering experts, educators and one of the dyscalculia students. The product validation assessment from experts was combined and analyzed using a deep formula (Florensia, 2018) so that a score of 91.86% with very valid criteria and information did not need revision, then the product practicality from the educator's response got a score of 95% with a very practical category.

The results of this educator's response are related to the convenience and usefulness of the calculator box media by looking at the learning outcomes of students using the calculator box media for the reduction work process. With this explanation, it can be concluded that the effectiveness of calculation box media is used in increasing the ability to reduce students with calculus. The use of learning media can increase the attractiveness of students to the learning process that is being carried out. They are motivated to be enthusiastic about learning because the learning process takes place actively and fun. The learning process is not monotonous, and the material is easy to accept. Learning media also serves to remind knowledge, expand knowledge, and provide flexibility in the process of delivering messages. Media also functions as a communication tool, as a means of solving problems and as a means of self-development (Nurdyansyah, 2019).

Practicality of Obicah Box Media

Based on the results of the assessment test for teachers in the Bawang 01 Elementary School class, an average hail of 3.92 was obtained with a good category, there was no suggestion in the assessment of this obicah box and the media of this obicah box was practically used (data attached). Based on the results of the assessment test of teachers in the Bawang 03 Elementary School class, an average hail of 3.6 was obtained with a good category with suggestions that the learning process has gone well, but it needs to be

optimized again in the use of learning media so that children are more interested in using it, it can be concluded that this obicah box media is practical to use (data attached). Based on the results of the student assessment test, an average hail of 86.67 was obtained with the very good category. It can be concluded that this obicah box media is practical in applying and helping students in the mathematics learning process (data attached).

This is in line with the research of Baiq et al. (2022), based on the assessment for the practicality test is in the "very valid" category for teachers and students with a percentage of 89% for teacher practitioners and 89.3% for student practitioners. Based on the results of the research that has been conducted, it can be concluded that the mathematics learning tutorial media developed is practical to use. Another similar opinion is the research of Syahsyiatun et al (2023), The practicality of the media was obtained from the teacher's response questionnaire and obtained a percentage score of 96% and from the student response questionnaire of 91%. From the acquisition of the percentage, the practicality of the Counting Box media is included in the very practical category.

The use of obicah box media is practically carried out by students with the guidance and direction of the teacher, which because of the use of this obicah box, some students experience an increase in learning outcomes. Which is evidenced by the value of the posttest results. Learning outcomes are changes that occur in students after undergoing the teaching and learning process. Learning outcomes can be seen from various aspects that include the cognitive, affective, and psychomotor domains. This means that the teaching and learning process runs well or fails if there are changes in students after participating in the learning process. According to Nana Sudjana in Khaerul Mubin (2022), defining student learning outcomes is essentially a change in behavior as a learning outcome in a broad sense covering the cognitive, affective, and psychomotor fields. Where the teaching and learning process is aimed at shaping students' attitudes and mindsets in accordance with their environment in dealing with every problem that exists. This means that learning outcomes can be measured from the way of thinking and student behavior in dealing with every problem that exists after learning from the learning process.

The practicality of Media according to Mois (2016), is based on the ease of teaching teaching materials by using media such as: a) The media used has been familiar for a long time, so that operating it can be carried out easily and smoothly; b) Easy to use without the need for specific tools; c) Easy to obtain from around so it does not require expensive costs; d) Easy to carry or move.; e) Easy to manage

The Effectiveness of Obicah Box Media Media

Based on the results of the SPSS Paired Sample T test, it shows that the Sig 2-Tailed value is 0.001, which shows that there is a significant difference in value between the pretest and post values. It can be concluded that the use of obicah box media is effective in improving student learning achievement. Based on the results of the SPSS Paired Sample T

test, the Sig 2-Tailed value of 0.001 shows that there is a significant difference in value between the value of using obicah box media and self-efficacy. It can be concluded that the use of obicah box media is effective in increasing students' self-efficacy.

This is in line with the research of Sudi et al. (2023), Based on the calculation of the t-test in the table, tcal = 4.7017, -ttable = - 1.999 and ttable = 1.999 with significance level (1 − α 2) = 0.975 and dk = 36 + 36 - 2 = 70. Since tcount is not located in the region of H0 where the region H0 is between - ttable and ttable, so H0 is rejected. This shows that there is a difference in the learning interests of students who are taught using learning video media compared to using ebook media in PDF format. Based on the description above, it shows that the interest and learning achievement of students who are taught using learning video media is better than using ebook media in PDF format.

Another opinion that is in line is Arfin's (2024) research. Data was analyzed using an independent sample t-test (α = 5%) using the IBM SPSS V.25 program. The results of the data analysis showed that in the posttest data, the learning outcomes were obtained sig(2-tailed) = 0.021 and in the self-efficacy questionnaire data, sig(2-tailed) = 0.018 was obtained. Thus, it can be concluded that: (1) there is a difference in learning outcomes between students who learn using media and students who learn without using media; and (2) there is a difference in self-efficacy between students who learn using media and students who learn without using media.

Effective learning is a combination that is composed of human elements, materials, facilities, equipment, and procedures to change student behavior in a positive and better direction with the potential and differences that students have to achieve the learning goals that have been set (Supardi, 2018). The use of learning media can help increase the effectiveness of learning and the delivery of messages and lesson content at that time. In this study, the effectiveness indicator to be used focuses on the medium used, namely the obicah box. It can be concluded that the use of obicah box media can convey material well, make the lesson process more interesting and improve the quality of learning outcomes from students.

CONCLUSION

OBICAH BOX learning media has proven to be effective in improving the mathematics learning achievement of grade I students, especially in the material of number operations. The test results showed a significant improvement in the grade point average after the use of this medium. The consistent use of OBICAH BOX can increase students' self-efficacy (confidence) in mathematics learning. Students showed a more positive and enthusiastic attitude in dealing with number operation problems. The attractive and interactive design of the OBICAH BOX succeeds in creating a pleasant learning

atmosphere, thus reducing students' anxiety about math lessons. The implementation of this media facilitates active learning where students can conduct independent exploration in understanding the concept of integer operations through hands-on experience.

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