Katela Media Technology for multiplication count operations

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Abstract. The purpose of this study was to determine the effectiveness of Katela learning media for multiplication count operations in grade II elementary school students in the Cut Nyak Dien cluster in Sulang district. This research method refers to the theory of Borg and Gall, using seven steps of research implementation, namely information gathering, research planning, developing initial products, field testing, revision, validation, and final improvement. Sources of data in this study were class II students and class II teachers in the Cut Nyak Dien cluster, Sulang district. There are 2 classes as a control class and an experimental class. The Control class carried out calculation learning activities without using media. The effectiveness test in this study was conducted by comparing the results of the students' multiplication written test in the control class and the experimental class. It is found that t count is 6.44. From the results of this study, it can be concluded that the katela media for multiplication operations can be used in multiplication learning in grade 2 elementary school. Hopefully it can inspire teachers to innovate in other learning.

1. Introduction

In the process of advancing education the role of teachers is very important. Teachers are one of the main factors for the creation of the nation's next generation. Before carrying out learning, [1] stated that: “the teacher was suggested to pay more attention to students or groups in learning”. Teachers in the 2013 curriculum are also required to teach cognitive and character. According to [2] “Character Education is intended to build the insight of nationality as well as to shape the character of students into human beings as the next generation of dignified nation based on the national value”. Learning by experiencing firsthand the student's world will increase students' knowledge. [3] states that: “Study habit is a form of action that is done repeatedly and regularly so that formed an attempt to gain knowledge and in the student's change from not knowing to know”.

The 2013 curriculum packs all subjects in one thematic learning except for certain subject matter which cannot be combined in thematic learning and must stand alone. Thematic learning is very successful if it utilizes media development. [4] states that: “The development of smart card learning media implies increased effective student learning outcomes and can create a more effective learning atmosphere in thematic learning.” This makes teachers have to be extra creative in presenting the right learning media so that students are not bored. [5] stated that: “Thinking creative is to think consistently and continuously in generating something creative/original in accordance with necessity”.

Various methods, learning models and media development as well as teaching materials must be carried out by the teacher in order to achieve the expected learning. Teachers who have a wealth of materials and methods in implementing teaching and learning activities greatly affect the conditions of student learning. [6] argues that: “Therefore, teachers must constantly modify and enrich the range of teaching methods to entice students in improving the learning outcomes”
Mathematics learning according to [7] is: “The study of Mathematics is considered, to be basic for the development of all other Sciences”. Mathematics learning that applies children to experience will improve their memory and understanding of the concepts being taught. According to [8] that: “Many learners responded that JCLS could increase their learning motivations and help them concentrate on the instruction and learning activity”. However, until now there are still many students who feel mathematics is a difficult, unpleasant, and even frightening subject. Teachers play a very important role in facilitating student learning. [9] stated that:” The teacher is a facilitator for students in understanding all the materials taught to acquire optimal competence”

Researchers’ observations on the learning process of grade 2 elementary school students in elementary schools were that some students were less enthusiastic in participating in Mathematics, confusion in studying multiplication material, so that the learning outcomes of students were still under the Minimum Completeness Criteria (KKM). In his research, [10] explains that “the use of dagon game media improves the learning outcome of students with the score of 17.60%”. Pembelajaran akan sangat bermakna jika guru menggunakan media. Pembelajaran bermakna akan mengena dengan keseharian siswa. Sesuai pernyataan [11] “In an everyday setting, any teacher who has written up original homework assignments or examinations will have experience in posing mathematical problems”. Media has an important role in learning. [12] stated that: “The importance of development of instructional media is done to increase and produce a new learning products.”. With the media, students will be inspired in learning. [13] argues that: “Learning media has an important role in the process of teaching and learning activities.”

In an effort to overcome these problems, researchers used learning media, namely Katela Media. This media can bridge abstract multiplication to be more concrete so that the multiplication material can be easily understood by students. The researcher means the multiplication of chicken eggs. Katela’s media consists of physical media, manuals and animated videos. [14] stated that: “the animation is a kind of illusion of movement of images or objects that are stationary and arranged regularly according to a predetermined groove”. The basic concepts of multiplication and can calculate multiplication easily, quickly and accurately.

2. Research Method

This research was conducted at SDN Kebonagung, SDN Karangsari and SDN Pragu, Sulang District, Rembang Regency using a research and development method called Research and Development (R&D). This research used a research and development design with ten steps of implementation referring to the theory of Borg and Gall. Due to time constraints, researchers only used seven steps of research implementation. Researchers will analyze needs, review literature, research on a small scale related to the topic of study. To find out the need for multiplication media development, it is done by submitting a questionnaire related to the need for multiplication media for SD. Then the researcher will define the development of cassava, formulate research objectives, determine the sequence of learning multiplication learning, and test feasibility on a small scale, then the researcher developed the initial product in the form of Katela media. After the Katela media was formed, it was then assessed by experts based on the format of the assessment items, using the assessment score numbers, the suggestion column, and suggestions for improvement materials.

The type of data obtained from this study comes from needs analysis data, validity data, acceptance data and effectiveness data. First, data analysis of student and teacher needs. Second, data on the feasibility of non-contested media from the results of expert validation by providing input for the improvement of non-contested media. Third, the acceptance data of non-contested media were obtained from the analysis of teacher responses and interviews with students, and data on the effectiveness of non-contested media. The research instrument used Learning Observation Guidelines, interview guidelines, product validation guidelines, and assessment of mathematical communication results. The data needs analysis test was carried out by determining the characteristics of the needs according to the perceptions of teachers and students by analyzing the results of interviews with media needs in improving students' mathematical multiplication. From the results of interviews with 4
teachers and 10 students, conclusions will be made. This conclusion is used for the development of prototypes of unsolicited media. Analysis of the Effectiveness Test of Unonticated Media. The assessment was carried out in the control class and the experimental class.

3. Result and Discussion
3.1. Result
Data Validity Test Expert Validation
After the compilation of realistic mathematics-based non-contested media is complete, a validity test is carried out on media experts to determine the feasibility of the media that has been designed in the learning process, and revisions are made to improve the designed media. The validity and revision of this media learning media are in the form of quantitative and qualitative data. Katela media validation consists of 2 parts, namely the physical product of the media and the presentation.

| Table 1. Book Validation Result Data |
|---|---|---|---|
| No | Aspect | Indicator | Skor 1 | Skor 2 | Average |
| --- | --- | --- | --- | --- | --- |
| 1 | Story content feasibility | Conformity with the development of basic competencies | 4 | 4 | 4 |
| | | Conformity with child development | 4 | 4 | 4 |
| | | Conformity with moral values and social values | 4 | 4 | 4 |
| 2 | Language | Legibility | 4 | 3 | 3.5 |
| | | Clarity of Information | 4 | 4 | 4 |
| | | Conformity with the rules of Good and Correct Indonesian | 3 | 3 | 3 |
| | | Use of language effectively and efficiently | 3 | 3 | 3 |
| 3 | Graphics | Book size | 3 | 4 | 3.5 |
| | | Use of font, type, and font size | 3 | 4 | 3.5 |
| | | Lay out dan tata letak | 3 | 4 | 3.5 |
| | | Rancangan tampilan | 3 | 4 | 3.5 |
| Rata-rata | | | | | 40 |
| Hasil Validasi | | | | | 90.8 |

| Table 2. Product Validation Results |
|---|---|---|---|
| No | Aspect | Indicator | Skor 1 | Skor 2 | Average |
| --- | --- | --- | --- | --- | --- |
| 1 | Physical media | Katela’s size | 3 | 4 | 3.5 |
| | Kasela’s look | 3 | 4 | 3.5 |
| | Katela supporting property | 4 | 4 | 4 |
| 2 | Presentent | Connecting the concept of multiplying learning with the characteristics of elementary students | 4 | 3 | 3.5 |
| | Presentation of learning (student involvement) | 4 | 4 | 4 |
| | the final amount | | | 18 |
| | Final score | | | 90 |
From the media product aspect katela for multiplication counting surgery in 2nd grade students of elementary school obtained an average score of 18.3.6 with a percentage of 90% with excellent category, the book aspect in katela media for multiplication counting operations in 2nd grade students of Elementary School obtained an average score of 34 3.09 with a percentage of 77% with good categories, and the animated video aspect in katela media for multiplication counting operations in 2nd grade students of Elementary School earned an average score of 36 3.6 with a percentage 90% with excellent category.

After a limited test is carried out, a field test is carried out. Field tests were carried out in 2 elementary schools. This trial was conducted to test the effectiveness of Katela media for multiplication count operations in multiplication learning.

3.2. Discussion

From the research that has been done, the discussion that can be obtained are: After obtaining the validation results, the researcher will use Katela media in learning. The effectiveness of this media is based on the t test between the control class and the experimental class. The control class at SDN Karangsari without using Katela media for multiplication count operations in multiplication learning, and SDN Kebonagung as an experimental class using Katela media for multiplication count operations in multiplication learning. Observation of learning at meeting 1 was 43 and only increased by 15 to 58 at meeting 2. While the results of the analysis of the control class written test showed that the average multiplication arithmetic skill of students was 58 with the highest score of 70 and the lowest score of 20. From the average calculation, obtained the value of variance (s²) 240 and standard deviation (s) 15.49 with an N-gain of 0.26 in the low category.

In the experimental class, learning observations were made using Katela media for multiplication count operations at meeting 1 getting an average of 47.5 and meeting 2 getting an average of 78. Students were very enthusiastic and interested in using Katela media. When the written test assessment was carried out for meeting 1, students were confused when entering how many eggs to pair each chicken. At the end of the lesson, the teacher emphasized that how many times showed the chickens to prepare and how many eggs to pair each chicken. At the second meeting, students began to get used to playing the chicken egg harvest with the concept of multiplication on the presented story cards. The average of meeting 1 written test was 47.5. At the second meeting obtained an average of 78 with the highest value of 100 and the lowest value of 20. The value of variance (s²) 101.053 with a deviation value (s) of 10.05. Researchers also calculated the N-gain by comparing the average pre-test and post-test performance. The calculation results obtained the results of g = 0.58 in the medium category.

Overall, it can be concluded that the media katela for multiplication counting operations in grade 2 students of this elementary school is worth using in the implementation of multiplication learning. This is in line with the results of research conducted by[15] concluded that rainbow egg rack media multiplication material in grade 2 elementary school students can improve students' learning outcomes. The results are also strengthened by [16][17][18] that the results of the study concluded that there is an influence of learning media application on students' learning outcomes so can be used as an alternative learning medium in order to support the successful implementation of the 2013 curriculum. In addition, this research as an effort to create meaningful learning is seen from the results of the study that students are very enthusiastic and interested in using katela media and the student learning results are improving. Another advantage with the application of educational play media for children can give rise to mathematical knowledge that corresponds to the development of age [19][20]

4. Conclusion

Based on validation and interview results, katela learning media for multiplication counting surgery in elementary school grade 2 students is declared eligible for use in the learning process. With the media katela for multiplication counting operations in elementary school grade 2 students are expected to add knowledge about the concept of multiplication correctly, easily and meaningfully.
5. References

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