Intellektika : Jurnal Ilmiah Mahasiswa
Vol.1, No. 5 September 2023
e-ISSN: 3025-2822 ; p-ISSN: 3025-2814, Hal 10-17
DOI: https://doi.org/10.59841/intellektika.v1i5.347

Development Of Multimedia Planting The Concept Of Spacing (Kocah) For Grade IV Students

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Abstract.*Based on the analysis of student needs and interviews with teachers, it shows that mathematics learning, especially in fraction material, has not used innovative media and the minimal use of technology-based learning media has caused students to feel bored and less interested. The purpose of this study was to determine the feasibility and readability of KOCAH Multimedia products for learning Mathematics for fraction material. This type of development research is RnD which has been developed by Sugiono with 7 stages. This study used a questionnaire sheet instrument and interview and observation techniques. Based on the results of the validation test by 9 validators, it is known that KOCAH multimedia can conclude the feasibility of the media by obtaining results from material experts of 87.28%, 91.11%, from media experts and 88.33% from linguists. The results of the student readability questionnaire on KOCAH Multimedia obtained a percentage of 96.15% and the results from the teacher readability questionnaire obtained a percentage of 93.41%.*

Keywords*: Fractions, Multimedia, and Development*

Abstrak*. Berdasarkan analisis kebutuhan siswa dan wawancara dengan guru menunjukkan bahwa pembelajaran matematika khususnya pada materi pecahan belum menggunakan media yang inovatif dan minimnya penggunaan media pembelajaran berbasis teknologi menyebabkan siswa merasa bosan dan kurang tertarik. Tujuan penelitian ini adalah untuk mengetahui kelayakan dan keterbacaan produk Multimedia KOCAH untuk pembelajaran Matematika materi pecahan. Jenis penelitian pengembangan ini adalah RnD yang dikembangkan oleh Sugiono dengan 7 tahap. Penelitian ini menggunakan instrumen lembar angket dan teknik wawancara dan observasi. Berdasarkan hasil uji validasi oleh 9 validator diketahui bahwa multimedia KOCAH dapat menyimpulkan kelayakan media dengan memperoleh hasil dari ahli materi sebesar 87,28%, ahli media sebesar 91,11%, dan ahli bahasa sebesar 88,33%. Hasil angket keterbacaan siswa pada KOCAH Multimedia memperoleh persentase sebesar 96,15% dan hasil angket keterbacaan guru memperoleh persentase sebesar 93,41%.*

Kata Kunci *: Pecahan, Multimedia, dan Perkembangan*

1. INTRODUCTION

The development of technology in the field of education requires the use of a variety of increasingly sophisticated learning media. Even the world of education is currently becoming more modern by involving the role of learners and the use of technology. Along with the development of increasingly sophisticated technological advances, it can affect the quality of education quality (Suprapto, 2006). In order to improve the quality of education, technology-

Received Juli 24, 2022; Revised Agustus 22, 2022; Accepted September 24, 2023
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based media plays a role in changing the paradigm of education for the better, especially changes in conventional education towards modern technology-based education. However, based on the results of observations at 3 Elementary Schools in Blitar City, teachers still rarely use technology-based media. Based on interviews with grade IV teachers, it was stated that there are technology-based learning support facilities such as laptops, computers and internet networks as well as projectors that have not been fully utilized by teachers.

The existence of learning media in schools can be used to convey teaching materials that can attract students' attention and interest, stimulate thoughts and feelings in such a way in the learning process (Sadiman, 2014: 7). Meanwhile, according to (Munadi, 2013: 8) learning media is a means used to convey teaching materials from various sources so as to create a pleasant learning environment. Based on the results of interviews with grade IV teachers, it is known that the teacher in delivering teaching material only comes from books and explains on the blackboard. The lack of availability of instructional media and the lack of teacher innovation in its use can cause fourth grade students in 3 elementary schools based on the analysis of student needs, it is known that 60% of 65 students get bored easily. In addition, student activities become less active in the learning process. Students rarely ask questions, so the activities in class that are often carried out by students are only taking notes or copying material and sample questions. It is known based on a questionnaire to analyze student needs that 55% of 65 students do not actively ask questions related to fraction material during Mathematics learning.

Learning Mathematics can improve thinking skills and can be applied to everyday life in solving problems (Susanto, 2013: 185). So that mathematics learning needs to be provided and must be mastered by students from an early age. However, 65% of the 65 students stated that they found it difficult to learn Mathematics, especially on fractions. Students find it difficult to understand the fraction material due to the lack of interest in the media used. So, the existence of learning media is able to help students learn fraction material easily. One of the media that can be used by teachers and students in the learning process is to use technology-based media in the form of multimedia.

Multimedia is a combination of several components of images, text, graphics, animation, video and sound with the help of tools that are useful for conveying information through electronic media so that it allows users to interact, create, communicate and navigate (Darmawan, 2015: 32) . Multimedia can be developed and used properly and appropriately and will be beneficial for teachers and students during the learning process because learning

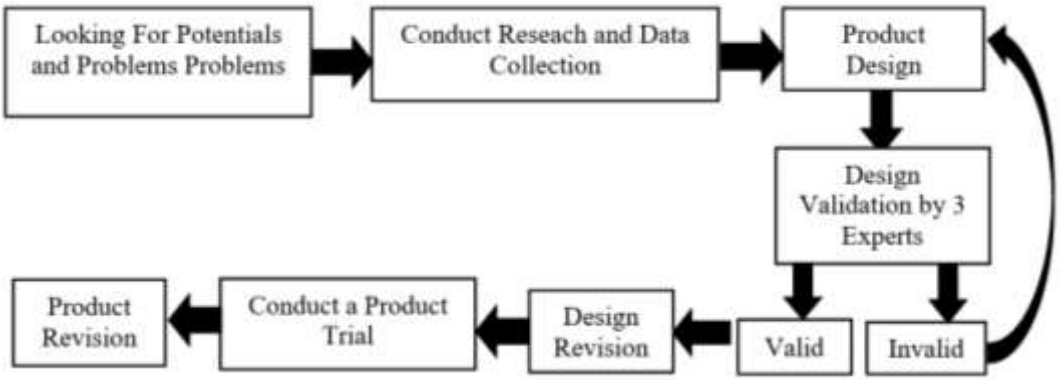
becomes more interesting, increasing the quality and attention of students' learning (Daryanto, 2013).

The development of multimedia by previous researchers, including the development of multimedia as a medium for learning mathematics in improving student learning outcomes developed by Margarita in 2018. Based on the results of trials in the multimedia field, it obtained a validity percentage of 88% with a very good category. Furthermore, research on multimedia development by Henny Khoirunisaa 'in 2012 shows that the use of multimedia is practical, when the learning process of students is very enthusiastic and motivated, students prefer and are happy with mathematics learning fractions because it is easy and good, students do not get bored in the learning process as well as students. enthusiastic and easy in working on fraction material evaluation questions.

From the development of multimedia by previous researchers, it can be continued for similar research and made the basis that learning using multimedia is a solution that can be used as a learning medium to make it easier for students to learn fraction material.

2. RESEARCH METHOD

This research uses the type of RnD research or research and development. The research procedure with the Borg and Gall model was subsequently adopted and developed by Sugiono with a limit of 7 steps. The steps are as follows:



In the first step, looking for potentials and problems in 3 elementary schools, namely UPT SDN Kepanjenlor 1, UPT SDN Kepanjenlor 3 and UPT SDN Kauman 2. The next step is to conduct research and data collection by distributing questionnaires on the needs of students in grade IV totaling 65 students from 3 school and conducted interviews with grade IV teachers and observations during mathematics learning. The third step is product design carried out by analyzing learning and designing product content. The fourth step, namely the

design validation carried out by 9 validators including, 3 material validators, 3 media validators and 3 language validators. The next stage of the design revision is adjusted according to the advice of experts. After being revised, the product was tested on 10 grade V students and 5 grade IV teachers. Furthermore, product revisions and will be corrected according to teacher and student suggestions during the trial.

3. RESULTS AND DISCUSSION

This research produces a multimedia product in the form of an application with the name KOCAH Multimedia, in this Mutimedia there is an apperception of animated stories, materials of various forms of fractions, trial and error questions and evaluation questions. Mulimedia is made with the Adobe Flash Player 9 application, has a size of 13 MB which can be opened on a computer or laptop with a Windows system. Multimedia is declared feasible based on material validation, media validation, language validation and the results of student and teacher readability trials.

The developed KOCAH multimedia has been adapted to the comments and suggestions of the validator. The presentation of the fraction material is designed in an attractive manner using a clear narrative or voice, the material is also equipped with sample questions and practice questions along with their solutions. The results of this media development are expected to be able to help make it easier for students to learn Mathematics on fractions material

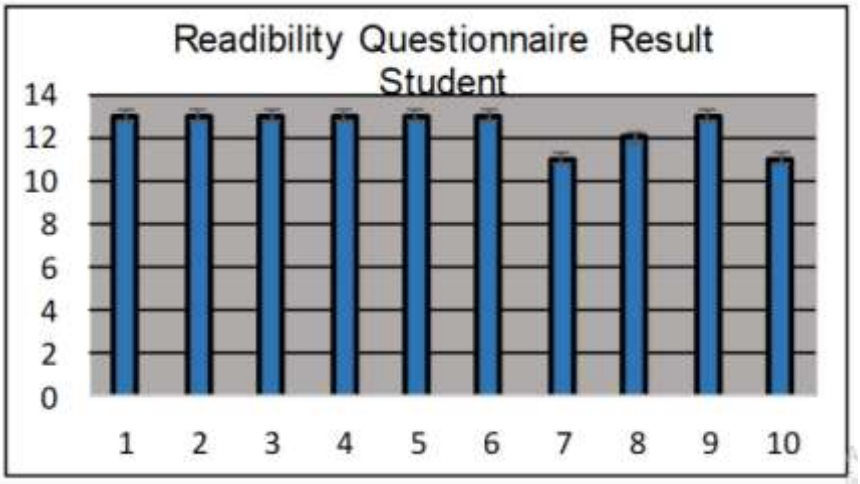
KOCAH Multimedia Development received an assessment through validation by 9 validators including 3 material validators, 3 media validators and 3 language validators. The validation aims to evaluate the media being developed. Quantitative data analysis was carried out in the form of the number of scores obtained from each validator, while for qualitative data it was taken from comments and suggestions from expert validators. The following is the assessment of 9 validators

No	Validator	Amount	Average	Criteria
1	Material Expert	36	87.28%	Well worth it
		29		
		38		
2	Media Expert	55	91.11%	Very worth it
		57		
		51		
3	Linguist Expert	19	88.33%	Well worth it
		16		
		18		

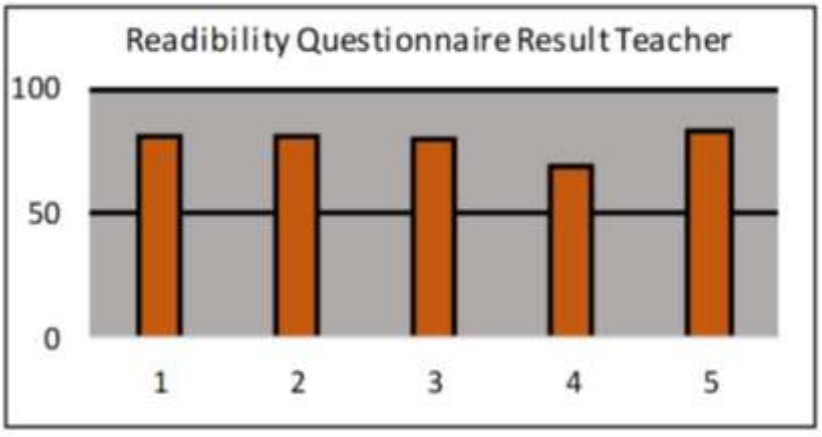
The results of the questionnaire from 3 validation experts showed that material evaluation by material experts with criteria was suitable for use, obtaining the highest average with a percentage of 87.28%. This shows that the material in KOCAH Multimedia is in accordance with the characteristics of Mathematics learning in SD, namely at the beginning the material concept is given first and examples of questions along with clear discussion, giving questions with different difficulty levels, skills using new concepts, and meaningful learning. through understanding the material. This is in accordance with the opinion of Heruman (2014) that learning Mathematics, especially fraction material, emphasizes curriculum concepts through concept planting by getting to know new concepts with concrete examples, understanding concepts and developing skills in using Mathematical concepts. In addition, learning is taught in stages and learning should be meaningful. In the media validation test, a percentage of 91.11% was obtained with a very feasible category and showed that KOCAH Multimedia had an attractive media appearance suitability, based on digital technology, and the ease of using the media. This is in accordance with the criteria according to Munir (2012: 27), namely multimedia integrating various components (text, images, audio, and animation) which is attractive, computer-based multimedia and easy to operate by teachers and students. Meanwhile, for language assessment by linguists, it gets a percentage of 88.33% and is said to be suitable for use. Language is suitable for use in KOCAH Multimedia because language spelling is in accordance with Indonesian language rules, is easy to understand and is in accordance with the age and development of students according to Piaget's opinion (in Heruman 2014: 1)

The results of the assessment by nine validators show that KOCAH Multimedia is feasible to be tested and knows the level of media readability. So the researchers tested and

distributed student and teacher readability questionnaires. The following are the results of the student's readability questionnaire.



Based on the readability questionnaire data, students obtained a total score of 125 from a maximum value of 130, so that they got a percentage value of 96.15% with the criteria very suitable for use and in accordance with the student. Based on the results of the student readability questionnaire shows that KOCAH Multimedia has a good appearance, is attractive, easy to use, is equipped with KD, indicators and learning objectives, animation perceptions along with material that is easy to understand, examples of questions and discussion and there are learning scenarios so that it is very helpful and suitable for used as a medium of learning. Meanwhile, the results of the teacher's readability questionnaire are as follows.



The teacher readability questionnaire obtained a total value of 397 from a maximum value of 425 so that it got a percentage value of 92.29% so that it was categorized as very feasible. From the results of the teacher readability questionnaire showed that the KOCAH Multimedia was in accordance with the learning objectives and the contents of the fraction material were presented sequentially and systematically, the spelling of the language used was

clear so that it was easy to understand, designed attractively, and made it easier for teachers to operate the Multimedia. The appropriateness of the media has met the criteria supported by Arsyad's (2016) explanation that the media is said to be suitable for learning media if it is in accordance with the objectives, supports learning content, is practical, and flexible, easy to use and has good technical use.

4. CONCLUSION

This study produces KOCAH Multimedia products which aim to help facilitate teachers and students in the mathematics learning process of fraction material so that learning becomes interesting, fun and can increase student interest in learning. Based on the results of limited trials, it can be concluded that the feasibility of the media obtained by the end result of material validation is considered feasible with a percentage of 87.28%, media validation is considered very feasible with a percentage of 91.11%, and language validation is considered feasible with a percentage of 88.33%. Meanwhile, for the readability test, students obtained a very decent score with a percentage of 95.38% and the results of the teacher's readability test were assessed as getting a percentage of 93.41% so that this media was categorized as very feasible.

5. SUGGESTIONS

It is hoped that KOCAH multimedia can be used by teachers or students properly so that it makes it easier for students to learn mathematics and makes it easier for educators to convey fraction material. Through the development of Multimedia KOCAH, it is also hoped that it can develop more innovative technology-based learning media by being able to add content to the media in the form of games or different materials so that it can improve the quality of learning media.

ACKNOWLEDGEMENT

The author would like to thank all staff of Balitar Islamic University as well as the supervisory lecturers, especially the Primary School Teacher Education study program, both parents and beloved extended family, friends, friends of PGSD 2016 and other friends who have supported and motivated researchers in completing this article.

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