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Development of Canva-Based Mathematics Learning Media on the Simple Fractions Concepts

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Abstract

This research aimed to develop a Canva quiz-based mathematics learning media tested on simple fraction material in grade III elementary schools. The type of research used is Research and Development (R&D) research, using learning material instruments, tests, and 4D development models (Define, Design, Development, and Disseminate). Based on the analysis results, including media expert validation, material expert validation, and user validation, it can be concluded that the development of Canva quiz-based media can improve the learning process. This is taken from the results of media validation, obtained good qualifications with an average score of 95.5% (valid), and has material aspects on mathematics problems received good qualifications with an average score of 88%. In the questionnaire results, teachers obtained good qualifications with an average 92% (valid) score. Therefore, the development of canva quiz-based learning media can be used to improve the mathematics learning process in grade III elementary schools.

Keywords: Learning Media, Mathematics, Canva

INTRODUCTION

Mathematics learning is one field of study that exists at all levels of education. According to Hasan (2016), mathematics is an analysis of the patterns and relationships of a way or pattern of thinking, an art, a language and a tool. Meanwhile, according to Heruman (2015), mathematics is a symbolic language or deductive science that does not accept inductive proof, the science of dependency patterns and organized structures, starting from undefined elements to defined elements to axioms or postulates and finally to postulates, the most important thing in learning that must be considered is the process, not just the final result (Nurjannah *et al*., 2021).

Based on the interviews and observations conducted with grade III teachers the implementation of grade III mathematics learning at an elementary school in Indonesia, the availability of learning media in mathematics lessons only utilizes learning media in the form of images or videos that only come from YouTube. The videos shown also sometimes do not follow the needs of students, so students have difficulty interpreting the learning videos shown by teachers to improve the learning process. Canva application-based learning media at an elementary school in Indonesia has only been used once, but it is still not optimal. Because students are very interested in learning through digital media, learning tends to be uninteresting when learning media using digital media is not used as well as possible.

Therefore, it is very important to use learning animation quizzes and the Canva application to make learning more interesting and fun. Teachers have also used information technology (Chromebooks) and searched for several online learning resources, but they only searched and displayed them on the Infocus screen. Teachers have not used other digital media to create learning media. As a result of this problem, the impact that occurs is 1) Students are less enthusiastic about learning when the teacher only assigns them to read and solve the problems in the package book, which can lead to boredom. Teachers also use more conventional media and lecture methods in the classroom; 2) Limited learning resources and media that tend to use package books and picture media without any sources and image media without any other sources and learning media must be a concern. For students to play a more active role, innovation is needed so that the learning process can be achieved.

According to Yuliandri & Priatna (2019), emphasizing reasoning in mathematics subjects can develop a more critical, logical, creative, and systematic mindset so that mathematics is used as the main benchmark for determining a person's intelligence. This is due to makeshift teaching materials, which greatly affect the optimal development of student learning due to the lack of creativity of teachers in developing learning media. So, learning media is a tool that supports the learning process indoors and outdoors. So, with the use of learning media in the teaching and learning process, there will be a good, active, and useful learning process. Especially in mathematics subjects, there is a great need for interesting learning media, considering the stigma of students towards mathematics lessons that are considered difficult and boring. Asyhar (2011) states that learning media is divided into four parts: (1) visual media, (2) audio media, (3) audiovisual media, and (4) multimedia.

Canva is an online audiovisual media application. According to Tanjung & Faiza (2019), Canva media can also make it easier for students to understand the lesson because this media can display text, video, animation, audio, images, graphics, and others according to the desired appearance and can make students focus on the lesson because of its attractive appearance. In Jannah's (2023) research, the use of Canva application learning media can be used as a reference in the use of the right application media in the innovative learning process, especially in mathematics learning, because the Canva application is one of the unique and interesting platforms that are also very innovative, so it can be used for effective learning media. With the use of Canva learning media, there is an increase in motivation, science literacy, and student learning outcomes so that it is suitable for use in the learning process to increase the capacity of mathematics learning to be better, besides it can be a reference or

reference for teachers in determining learning media to activate the role of students in the classroom.

Rahmatullah *et al*. (2020) research concluded that the Canva application-based audiovisual learning media is suitable for use in pilot schools. The results of the first cycle of field trials were 67.13%, and the second cycle was 88%. The percentage of student learning outcomes showed an increase. This shows that it is easier for students to master employment materials using audio-visual learning media based on the Canva application with very good criteria. The ability of students to solve simple problems in the learning process has not been maximized; therefore, the researcher took the material of "simple fractions" of mathematics content as an effort to improve the learning process using Canva-based quiz media. Based on the above problems, this research aims to develop a Canva quiz-based mathematics learning media tested on simple fraction material in grade III elementary schools.

METHOD

Development research is a method used to develop a product through certain stages; until later, a product is produced and tested for its validity, practicality, and effectiveness against needs. According to Sugiyono (2019), R&D (Research and Development) is research that produces a specific product and tests its effectiveness. This research was carried out to develop a product in the form of a canva-based quiz learning media.

The development model is the basis for developing a product to be produced. In this development research, a development model, the 4-D model, will be used, as proposed by Thiagarajan (1974). According to Trianto (2014), this model consists of four stages: define, design, development, and dissemination.

The data analysis technique in this canva-based quiz media development research is qualitative data analysis and quantitative data. The qualitative data was obtained from interviews with teachers and students about Canva-based quiz learning media. Meanwhile, quantitative data was generated from the validity assessment scores of media experts and material experts, and product practicality assessments were obtained from questionnaires of Arabic teachers and students' responses to Canva-based quiz media. The data collection instruments used are validation questionnaires for media experts and material experts and response questionnaires for Mathematics teachers and students. The validation questionnaire aims to assess the feasibility level of Canva-based Quiz media. In the validation sheet, the researcher used a score range of 0 to 100% with the description: 81% - 100% (valid), 71% - 80% (moderately valid), 51% - 70% (less valid), 0% - 50% (invalid). The score obtained is calculated using the formula:

$$P = \frac{Sx}{Sxi} \times 100\%$$

Information:

P = Percentage

Sx = Total number of answers

Sxi = Sum of total values of all items

% = Constant

The criteria for validity/feasibility, according to Ernawati (2017) can be seen in Table 1.

Table 1. Eligibility Criteria for Media Expert and Material Expert Validators

Percentage (%)	Validity Level
81% - 100%	Valid
71% - 80%	Quite valid
51% - 70%	Less valid
0% - 50%	Invalid

RESULTS AND DISCUSSION

This research was carried out in grade III of an elementary school in Indonesia, the selection of learning media using quizzes based on the Canva application was chosen because teachers only use learning media in the form of pictures and books, with the needs of elementary school students who like to learn through visuals in the form of pictures. Therefore the use of the Canva application is an alternative in delivering material so that students can understand learning from teachers independently because learning is more interesting and fun. This research will produce a product in the form of a canva-based quiz learning media using the Lawhon (1976) research model, namely the Four D Model known as the 4-D model.

Define Stage

The definition stage is observing learning activities in the classroom, in this case the researcher's Mathematics learning through interviews with teachers during learning at a elementary school in Indonesia of grade III mathematics lessons of simple fraction material. The results of observations and interviews show that the teaching has used electronic media in the form of youtube shows and quiz games available on Canva but is not following what students need, the development of interesting learning media, and following the needs of students in simple fractional materials, teachers must try to make students understand the concepts given.

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Design Stage

Canva quiz media is a media designed for K-13 in learning mathematics on simple fraction material, and then the quiz format is compiled, starting from the selection of character characters, the background of the atmosphere, the selection of colors and types, as well as the size of letters and numbers, to the preparation of the initial appearance of the quiz using templates from the Canva application. The media quiz design activity is adjusted to the package book that will be used.

Based on the analysis, the next is product development. The product design is in the form of a quiz display in Figure 1, Figure 2, Figure 3, and Figure 4.

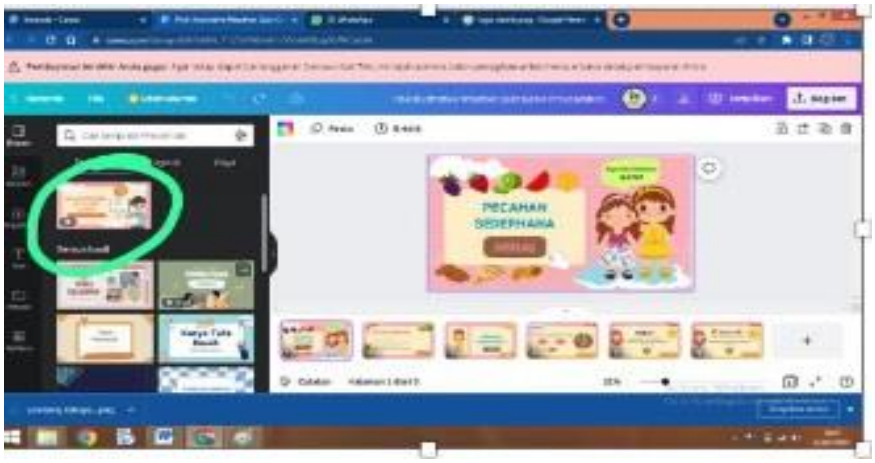

Figure 1. Creating Media Quiz

Media Quiz Creating product in a play is adjusted to the available tools and according to the desired display needs.

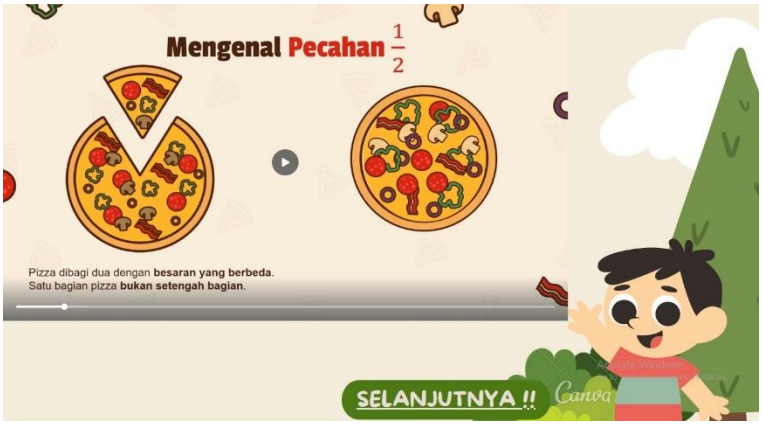

Figure 2. Introduction to Quiz Fractions

Introduction of Quiz Fractions: A media product in the form of a quiz display in the form of a video exposure to the material to be studied after completing the video exposure students can play the quizzes that are already available.

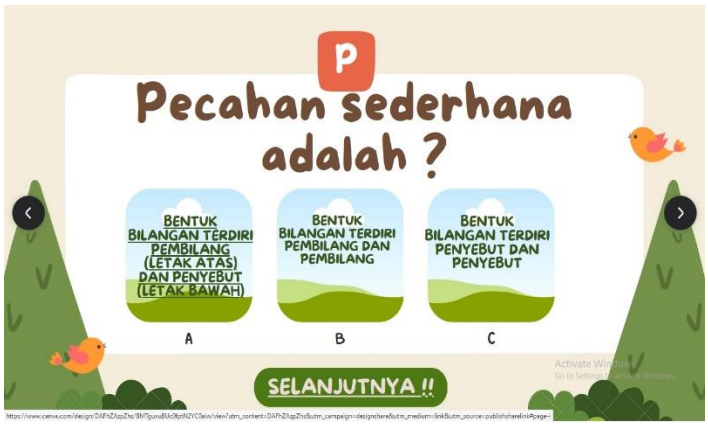

Figure 3. Design Quiz Play

Quiz played: There is a choice of 7 numbers which contain questions about mathematics lessons, simple fraction introduction material for third grade elementary school students.

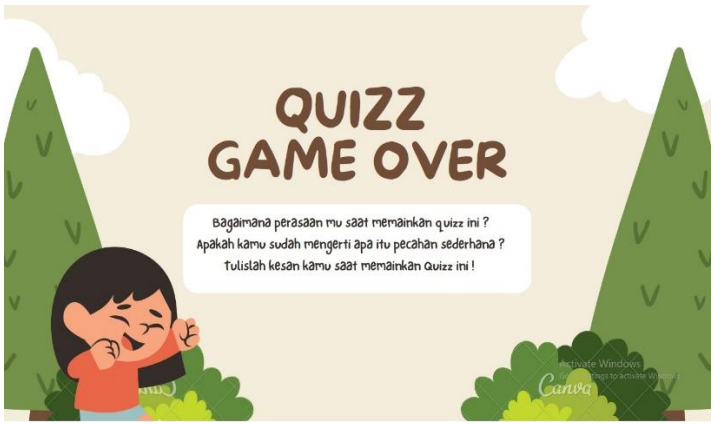

Figure 4. Final Quiz Design

End of Quiz: At the end of the quiz, students are invited to express their feelings while playing it and students are given several questions related to the quiz.

Development Stage

This stage is carried out after the learning media has been developed perfectly. The stages of developing a canva-based media quiz begin with a product validity test conducted by media and material experts. Media and material experts are called validators. In this case, the validators are mathematics education lecturers and teaching media experts lecturers. The validity test of this media is carried out to find out the shortcomings of the media that has been developed. The validation test process is done by providing media that has been developed along with a questionnaire in the form of a validation sheet that uses a checklist system and a Likert scale, which is a tool used in assessing the validity of the product. The media validation instruments and the scores obtained are attached in Table 2.

Table 2. Media Validation Results

Aspects	Percentage (%)	Criterion
Concept Presentation	100%	Valid
Content Design	86%	Valid
Design Display	100%	Valid
Use	96%	Valid
Average	95,5%	Valid

In Table 2, it is known that the average score obtained from the results of media validation is 95.5%. As it can be seen in Table 1, namely the criteria for validators of media experts and material experts, the figure of 95.5% is in the range of 81-100% and valid. So it can be stated that the results of the validation of the canva-based media quiz are declared valid. In addition to validating media, cana-based media quizzes also go through the material validation process. For material validation, the assessment results from the validators are attached in Table 3.

Table 3. Results of Mathematics Material Validation

Aspects	Percentage (%)	Criterion
Content of the material	90%	Valid
Presentation of material	80%	Quite Valid
Material Language	92%	Valid
Use	90%	Valid
Average	88%	Valid

Based on Table 3. Canva-based quizzes get an average score of 88% on the validation of math material and are included in the valid criteria. After going through the stages of the validation process by media and material experts, the media quiz is based on canva. Entering the next stage, namely the practicality test stage. At the product practicality test stage, the role of teachers and students is needed to see the practicality of canva-based quiz media. The purpose of this material practicality test is to find out whether this canva-based quiz media is practical and suitable for use by students. The practicality test was carried out by applying canva-based quiz media to students and teachers. After that, teachers and students were given an assessment instrument sheet in the form of a teacher and student response questionnaire. In this stage, the respondents comprised 22 students in class III and teachers in class II. Table 4 of the assessment results of the response of grade III students of an elementary school in Indonesia.

Table 4. Teacher Questionnaire Results

Aspects	Percentage (%)	Criterion
Material Language	90%	Valid
Content of the material	90%	Valid
Design Display	90%	Valid
Use	80%	Valid
Average	87,5%	Valid

Table 4 shows the result of the grade III teacher assessment questionnaire. Four aspects were found that became the assessment of the teacher's response. First, the aspect of Material Language obtained a percentage value of 90%. Second, the material aspect with a percentage value of 90%. Third, the Design Display obtained a percentage value of 90%. Four Uses obtained a percentage score of 80%, The average score from the results of the assessment questionnaire The results of the teacher questionnaire were 87.5% and could be considered very feasible. So it can be concluded that canva-based quiz media is declared very feasible and can be used as a learning medium, especially for mathematics learning. The results of student questionnaire can be seen in Table 5.

Table 5. Results of Student Questionnaire

Aspects	Percentage (%)	Criterion
Interest	100%	Valid
Content of the material	90%	Valid
Design Display	90%	Valid
Use	90%	Valid
Average	92%	Valid

Table 5 is the result of the questionnaire for assessing the response of students in grade III. The four aspects and the percentage value contained in the students' responses are the interest aspect getting 100%, the material aspect getting 90%, the Design Display aspect getting 90% and the use aspect reaching 92%. Thus, the average score obtained from the assessment questionnaire of the third-grade student response of an elementary school in Indonesia is 92% and is included in the valid criteria.

Dissemination

At the Dissemination stage in this study, the dissemination of canva-based quiz learning media is limited through the Class III Teacher Working Group.

The analysis of needs in the learning process is that the availability of learning media in mathematics lessons only uses images or videos that only come from youtube and are used in certain learning. The videos shown sometimes do not match the needs of the students.

Mathematics

The Ministry of National Education states that the Competency Standards for Elementary School Graduates in mathematics are understanding the concept of fractional numbers, comparison in problem-solving, and their use in daily life. Learning mathematics is closely related to learning and thinking activities and processes. Mathematics is essential in improving thinking skills (Alexandra & Ratu, 2018). In learning, we can learn various things, one of which is learning mathematics. Mathematics is a discipline with a peculiarity where these peculiarities, including the presentation of the material, are systematic, deductive, and axiomatic (Rosmaiyadi, 2017).

Learning Media

Learning media is used to help convey subject matter in the teaching and learning process to facilitate the achievement of formulated learning objectives (Pribadi, 2017). Learning media can increase learning motivation and significantly increase student learning outcomes. According to Arsyad (2015), learning media can be used to convey students' learning interests during the teaching and learning process. Meanwhile, according to Sundayana (2015), the use of learning media helps teachers deliver material to attract more attention to students and help them understand the material presented well.

Canva

According to Hapsari and Isroyati (2021), implementing the digital-based interactive quiz learning media obtained positive results for its participants. One of the benefits felt after this activity is to foster enthusiasm for reviewing new knowledge, especially technological advances that can be used when running as a teacher. The use of technology in the learning process, according to Kartiwi and Rostikawati (2022) is an effort to encourage renewal so that the learning process becomes more effective. Technology can be used in learning media. One of the uses of learning media that uses digital technology is the use of the Canva and Quizizz applications. According to Royani & Darusalam (2022), using this quiz application provides an interesting and not boring learning medium to the entire community, especially children, by taking advantage of current technological developments.

Table 6. Expert Validation and Questionnaire Results

Aspects	Percentage	Criterion
Media Validation	95,5%	Valid
Material Validation	88%	Valid
Teacher Questionnaire	87,5%	Valid
Student Questionnaire	92%	Valid

CONCLUSION

The conclusion can be a generalization of the findings according to the research problem, it can also be in the form of a research conclusion The development of canva-based quiz media can be used to improve the learning process of mathematics in grade III elementary school based on the results of media validation covering four aspects obtained to get a presentation of 95.5% results (valid), for material in Mathematics problems covering four aspects with a percentage of results of 88Furthermore, the results of the teacher questionnaire include four aspects to get a score of 87.5%, the student questionnaire consists of 4 aspects to get a result of 92% (valid).

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