

Design of Kahoot-based visual presentation media for exponent material with CAI models

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Design of Kahoot-based visual presentation media for exponent material with CAI models

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Abstract. The use of instructional media in senior high schools is currently not optimal. It causes students difficulty in understanding the concepts conveyed by the teacher so that students are less able to solve problem problems. Thus, it is hoped that through visual presentation Kahoot media with the Computer Assisted Instruction (CAI) model, students can more easily understand mathematical concepts. The purpose of this study is to produce a Kahoot-based visual presentation media with CAI models that meet valid criteria in learning mathematics in senior high school. The research method uses the ADDIE model (Analysis, Design, Development, Implementation, and Evaluation). The research subjects were students of class X SMA UPGRIS Lab School. The sampling technique uses cluster sampling. The results of this study are visual Kahoot media presentation with the CAI model suitable to be used as a medium for learning mathematics in senior high school.

1. Introduction

As a teacher, the development of technology and information should not be considered as a frightening thing. Still, it must be made a challenge to create a condition for learning that is more interactive, innovative, and motivating students by utilizing various existing technological developments. Especially in a COVID-19 pandemic situation like now, the use of technology must be truly maximized. It is vital to consider how teachers can create positive engagement in the classroom using technology [1]. Students who take e-learning with interactive video have much better results than conventional learning [2]. Some ways that can be done to utilize technological developments in learning activities are by implementing web-based learning (e-learning), computer-based learning, computer-assisted learning, and multimedia-based learning. Then "The use of multimedia in teaching and learning presents the impact of institutions of higher education." Multimedia is a multi-sensory that stimulates multiple senses of the audience at a time. "Its interactive nature enables teachers to control the flow of information" [3]. It is illustrated that using multimedia in the teaching and learning process will have a positive impact on students.

Mathematics is one of the fields of science whose existence is compiled from a system that is full of agreements and is built on an area consisting of a group of elements, relations, operations that are mixed axiomatically, and their truth must be guaranteed [4]. Mathematics is a compulsory subject for all primary and secondary school students in Malaysia. Nowadays, educators take opportunities to harness the power of computer technology in helping students to learn Mathematics [5]. Thus, mathematics is a mandatory subject for all primary and secondary school students. Today, educators



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are taking the opportunity to take advantage of computer technology to help students learn mathematics.

Learning models that are deemed appropriate and appropriate to support students' mathematical learning outcomes are the CAI learning model and the Computer Based Instruction (CBI) learning model. "CAI, it is rather a device that provides students with interactive involvement with instructional materials" [6]. In this model, the computer can display learning using various types of media (text, images, sound, video). The computer can provide quiz learning activities and atmosphere. Also, the computer can give interaction from students, evaluating student answers, giving feedback, and determining student learning styles so students can interact actively learning independently [7].

Technology can facilitate mathematical problem-solving. Technology can develop a deep mathematical understanding, communication, reasoning, and proof. Moreover, technology can provide students with opportunities to explore different representations of mathematical ideas, support them in making connections both within and outside of mathematics, and allow the student to focus on decision making [8]. In computer-based learning or also called CBI, broadly produces positive effects for students [9]. CBI can be used as a tool that helps teachers in the learning process and allows students to do the learning process by evaluating and reflecting independently. CBI can motivate students to learn better by providing interactive media and vital concepts formed from exciting games. Learning by using a game application can facilitate teachers in transferring knowledge to students more effectively and efficiently [10].

In addition to learning models, to attract students' interest in learning mathematics, teachers need to provide innovation in the learning process. One of them is by using appropriate and effective learning media. "One of the ways to introduce modern technologies in class is through gamification items that allow applying gaming elements and principles in academic and working environments" [11]. "Kahoot!" can be used as an alternative in the choice of mathematics learning media because it is quite exciting and easy to use. "Digital assessment in education is important in terms of feedback, control of the learning rates that vary from individual to individual, and learning quality to be achieved at the end of the assessment process" [12]. "Kahoot!" can be used for several forms of assessment, including online quizzes, surveys, and discussions in which all three have a variety of ways to play. "Kahoot!" can be played individually; however, the main design is a group game. By implementing strategies and using the right learning media, it is expected to be able to improve student learning outcomes.

Combining teaching with digital excellence can produce positive effects on student motivation and learning outcomes [13]. Learning outcomes are several experiences gained by students that cover the cognitive, affective, and psychomotor domains. Thus, learning outcomes can be used as a benchmark in assessing the success of the learning process.

2. Methods

This research includes development research (educational research and development). This research method is a method used to produce certain products, in this case, to develop KAHOOT-based visual presentation media with the CAI model, while testing the validity and practicality of the product. The subjects of this study were students of class X SMA UPGRIS Lab School. The development procedures using the ADDIE model [14] are 1) analysis, 2) design, 3) development, 4) implementation, and 5) evaluation. Thus procedure can be seen in figure 1. Through visual presentation media, high school students can understand what the essence of mathematics subject matter is well, not dull and fun.

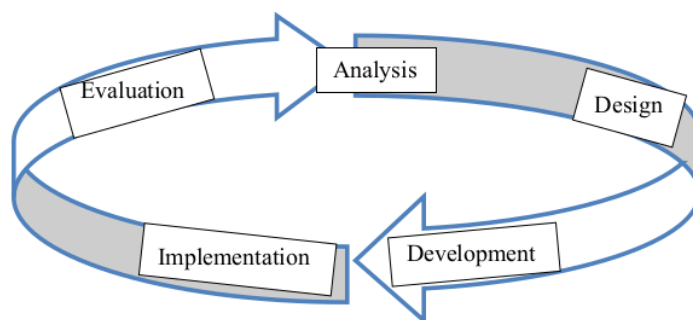


Figure 1. ADDIE learning design model.

3. Results and discussion

Based on the ADDIE development model procedure, the stages of conducting this research are as follows:

3.1. Analysis

At this stage, the main activity is to analyze the need for new product development through interviews with UPGRIS Lab School high school teachers. Based on the results of the interviews produced the fact that there are still many teachers who have not used learning technology to the fullest. For this reason, it is necessary to develop learning media that can accommodate these problems. Also, based on the results of observations made by researchers showed that the learning process on exponential material is less active and less attractive. It is caused by the absence of learning media used by game-based teachers so that students become bored quickly. After analyzing the problem of the need for new product development, the researcher also analyzes the feasibility of developing the new product. Analysis of new products needs to be done to determine the feasibility of the product if the product is applied. At this stage, the researcher will conduct a preliminary analysis, namely analyzing the syllabus, lesson plans, and general-purpose exponential learning material in class X. One of the effective technology-based learning media is Kahoot-based visual presentation media with the CAI model.

3.2. Design

At this stage, researchers developed product design based on the results of the analysis that has been done in the previous stage. From this research, a visual presentation based on Kahoot was produced using the CAI model. The material contained in this media is exponent material. Display learning media can be seen in figure 2.

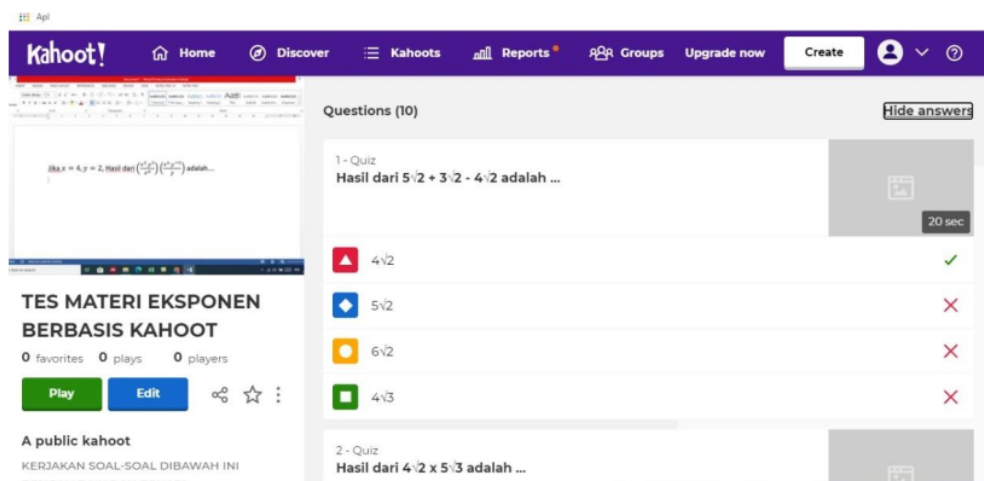


Figure 2. Design of Kahoot-based visual presentation media using the CAI model according to exponent material.

3.3. Development

At this stage, the researcher developed the Kahoot-based visual presentation media with the CAI model according to the exponent material. After completion, validation will be carried out by media experts and material experts to obtain input and evaluation of the media. The results of the validation will be described below.

3.3.1. Material validation. Development products evaluated by material experts are Kahoot-based visual presentation media with CAI models on exponent material using a questionnaire that must be filled out by material experts. The questionnaire filled out by material experts has the following criteria: Score 5: Strongly Agree (SA), Score 4: Agree (A), Score 3: Quite Agree (QA), Score 2: Disagree (D), and Score 1: Strongly Disagree (SD). There are four aspects of the validation assessment criteria, namely the Material Extent Aspect, Material Update, Language Usage, and Evaluation Questions. The results of the validation and assessment from the learning material experts for each aspect are presented in table 1.

Table 1. Validation and assessment result from material experts.

No.	Assessment Aspects	Expected Score	Evaluation Score	Appropriateness
1.	Extent of Material	15	14	93.33%
2.	Material Updates	15	14	93.33%
3.	Use of language	15	13	86.67%
4.	Evaluation Problem	10	9	90.00%

In the next stage, the researcher analyses the overall results of the assessment by material experts. With Σ (the answer \times the weight of each choice) is 50, n is 11, highest weight is five and calculated using equation (1), the percentage of feasibility based on a visual presentation based on boot with the CAI model on exponent material was 90.91% by the material expert. After being converted to a scale conversion table, Kahoot-based visual presentation media with the CAI model on exponential material is in the range of 81% - 100%. So placing the position on the criteria is very good.

$$\text{Percentage} = \frac{\sum(\text{the answer} \times \text{the weight of each choice})}{n \times \text{highest weight}} \times 100\% \quad (1)$$

Expert comments on learning materials (validation of expert assessment of materials) in general, namely the material, is following the learning objectives. Still, the story should be necessary to increase the allocation of work time. Comments and suggestions from learning material experts are taken into consideration for improving the design of Kahoot-based visual presentation media with the CAI model. Thus the need to make improvements is to increase the allocation of time to work on story problems.

3.3.2. *Media validation.* Development products evaluated by media experts, namely Kahoot-based visual presentation media with the CAI model on exponential material using a questionnaire that must be filled out by media experts. The questionnaire filled out by media experts has the following criteria: Score 5: Strongly Agree (SA), Score 4: Agree (A), Score 3: Quite Agree (QA), Score 2: Disagree (D), and Score 1: Strongly Disagree (SD). There are three aspects of the validation assessment criteria, namely General Display Aspect, Language Display Aspect, Media Presentation Aspect. The results of the validation and assessment by media experts for each aspect are presented in table 2.

Table 2. Validation and assessment result from media experts.

No.	Assessment Aspects	Expected Score	Evaluation Score	Appropriateness
1.	General Display	15	14	93,33%
2.	Language Display	15	14	93.33%
3.	Media Presentation	20	18	90,00%

In the next stage, the researcher analyzes the overall results of the assessment by media experts. With Σ (the answer \times the weight of each choice) is 46, n is 10, the highest weight is five, and calculated using equation (1), the percentage of feasibility is Kahoot-based visual presentation media with CAI model on exponent material of 92.00% by media experts. After being converted to a scale conversion table, the Kahoot-based visual presentation media with the CAI model on exponential material is in the range of 81% - 100%. So placing the position on the criteria is very good.

Media expert comments (validation of media expert assessments) in general, that is, Kahoot-based visual presentation media with the CAI model on exponent material, is an interesting medium for class X learning. However, during the Covid-19 pandemic, there were difficulties for students to open the zoom and Kahoot applications simultaneously for the interactive process of learning. Comments and suggestions from instructional media experts are taken into consideration for improving the design of Kahoot-based visual presentation media with the CAI model. Thus, improvements need to be made by adding the assistance of other applications in the interaction between teachers and students through WhatsApp groups.

3.3.3. *Student response results.* After the results of the Kahoot-based media presentation product with the CAI model were validated to material experts and media experts, the next was the Kahoot-based visual presentation media with the sample model. Students agree that the Kahoot-based visual presentation media with the CAI model is through a questionnaire in the form of a google form that is sent through the WhatsApp group because of online learning. This is done so that researchers know that the Kahoot-based visual presentation media with the CAI model is used for students. The questionnaire instrument is in the form of a Google 8 question form with "yes" or "no" answer choices according to the Guttman scale, which is a rating scale that asks cumulatively to get a particular question [15].

There are 3 student response indicators, namely respondent's interest in media, ease of use of media, the usefulness of media use. The results of student responses are presented in table 3. The

average percentage of feasibility based on Kahoot-based visual presentation media with the CAI model was 83.84% by students. After being converted to a conversion table, the scale is in the range 81% - 100%. So placing the position on the criteria is very good.

Table 3. Results of students' responses to Kahoot-based visual presentation media.

No.	indicators	Expected Score	Evaluation Score	Appropriateness
1.	respondent's interest in media	33	29	87.88 %
2.	ease of use of media	33	27	81.82%
3.	usefulness of media use	22	18	81.82%

4. Conclusions

Kahoot-based visual presentation media with the CAI model has been produced on exponential material. The product validation results are 90.91% from material experts and 92.00% from media experts. Student responses at 83.84%. It means the Kahoot-based visual presentation media with the CAI model it's worth using it in senior high school learning.

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