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Development of Interactive Learning Multimedia by Applying *Contextual Teaching and Learning* for Basic Graphic Design Subjects

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ABSTRACT

The objectives of this study were to 1) create interactive learning multimedia materials by incorporating contextual teaching and learning to aid students in understanding graphic design topics for class X, 2) examine the viability of interactive learning multimedia by incorporating contextual teaching and learning to fundamental design subjects, and 3) assess the efficacy of using interactive learning multimedia by incorporating contextual teaching and learning. The three stages of this research's development-planning, design, and development are based on the Alessi and Trollip model. A total of 36 students from class X Multimedia 2 at SMK N 2 Sewon served as the research participants, while X Multimedia 1 served as the control group. gathering information through observation, questionnaires, learning product assessments, and learning accomplishment tests the findings revealed that: 1) Multimedia interactive learning materials for the foundational subject of graphic design in class X multimedia semester 2 at SMK N 2 Sewon were prepared. 2) Students (87.77%; "extremely feasible"), media professionals (94.18%), and material specialists (84.16%) rate the viability of learning media. (3) When contextual teaching and learning are applied, interactive learning media are said to be quite successful at improving student learning results.

Keywords*:* interactive learning multimedia, feasibility, basic graphic design

INTRODUCTION

Today's increasingly sophisticated technology requires us to keep up with technological developments. Humans as technology users must be able to take advantage of developing technology or future technology. Humans need the education to be able to adapt to technological developments. The existence of technology such as computers, cell phones, and the internet has made progress in aspects of human life, one of which is graphic design.

Blanchard said that graphic design in the view of communication science is a form of communication that uses images to convey information as effectively as possible. The role of graphic design is currently also very important, one of which is in the world of education. Graphic design is a medium for developing imagination and creativity as outlined in an image to convey information and opinions interestingly. In the world of education, it is necessary to develop learning about technology that is effective and efficient for students, given the rapid development of technology in today's digital era.

Interactive learning multimedia is media that contain media elements, namely audio, images, video, graphics, text, animation, and simulation that can interact between the media and the user. Multimedia interactive learning in which there are three important points, namely multimedia, learning, and interactive. So when developing MPI, it must contain clear material, the material presented must include multimedia elements, and be able to determine the level of learning outcomes, for example in the form of quizzes or games [1]. Multimedia develops following the development of technology, initially multimedia is only a combination of images and text but after the development of multimedia technology, it is not only a combination of images and text but a combination of other multimedia elements such as video, animation, sound, and interaction. There are 2 divisions of multimedia, namely

interactive multimedia and presentation multimedia [2]. The conclusion is that interactive multimedia is media that contains a combination of multimedia elements such as images, videos, sounds, animations, and interactives that are used in learning activities so that students are more interested and motivated in learning. It is said to be interactive because there is reciprocity between the media and users or students so they can be more active and critical in learning.

Learning media has an important role in the effectiveness of the learning process, teachers must use learning media that is compatible with their students' qualities [3]. The use of interactive learning multimedia in the learning process without the support of the appropriate learning model will probably not maximize the results, because it will only stimulate students' curiosity [4]. As a result, the use of interactive multimedia in the learning process must be complemented with a suitable learning model or approach. The contextual approach (Contextual Teaching and Learning is one learning strategy that can enable the usage of interactive multimedia in the learning process [5].

Contextual Teaching and Learning (CTL) is a learning model that fully makes students the center of learning. Students are also asked to study the material they get. [6] states: CTL learning emphasizes the material studied about daily life or in real life so that students can relate and apply the material to everyday life. More or less the same as the statement above [7] interprets CTL as a learning strategy where students are the center of learning so that students can find problems for themselves according to the material being studied obtained from everyday life or real life. The opinions of these experts can be summarized that CTL is a learning strategy or model that focuses on students as the center of learning so that students can explore their knowledge and skills and relate the material obtained to real life so that students can easily understand the material they get.

Contextual Teaching and Learning (CTL) is a learning concept that assists teachers in linking the material they are learning with real-world situations of students and encourages students to make connections between their knowledge and its application in everyday life by involving the seven components of effective learning [8].

But, in the other hand, Contextual teaching Learning (CTL) has its own lacks, such as the contextual learning process takes a long time; if the teacher cannot control the class well, it can create a less conductive classroom situation.

Graphic design is a form of visual communication that uses images to convey information or messages as effectively as possible. In the modern era, graphic design in print media has begun to be widely applied to make it look good and to make it easier for readers to understand and read. We can use our environment or daily life as a tool to get images and ideas to create a work of graphic design. Nowadays there are much graphic design works around us such as posters, billboards, and others so that we can get inspiration and ideas in making a product/work. Explanation of the use of the contextual teaching learning (CTL) learning model in basic graphic design subjects, especially the material for operating vector image processing software (CorelDraw) to motivate students to study the material with real help that occurs in everyday life. Students can see directly the shapes and graphic design ideas so that they can be more creative in creating a product/work. This research will develop interactive learning media based on contextual teaching learning where materials and evaluations are made based on real life. Evaluation is made like a simulation by watching video tutorials so that students can imagine according to reality.

Vocational High School (SMK) is a formal education that prepares students to be ready to work according to their field [9]. [10], Vocational High School education prepares and creates an attitude of professionalism in students

to enter the workforce that is following the expertise that has been occupied. The main objective of vocational education is to produce SMK graduates who are ready to work in certain fields, which is why Basic Graphic Design material is important to master as a science to creating attractive media in conveying information and opinions.

One of the subjects in the Computer and Informatics Engineering expertise program is basic graphic design. This subject tells related to the tools, information and the procedures according to the field and scope work on the basic of graphic design.

The basic design play important role in the process of creating designs by using components such as graphic design elements and pronciples in the creation of graphic designs, then producing quality designs and works in line with graphic design criteria. This subject is acquired by students in the first year of admission. Graphic Design subjects are taught in class X semesters 1 and 2. The material in the Graphic Design subject in class X for semester 1 emphasizes the basics of making graphic designs, initial knowledge for students can make graphic designs, color selection, image formats, and layout. place in manufacture. The material in the Graphic Design subject in class X semester 2 emphasizes the method and use of software to create graphic designs.

Research has been carried out in the form of interviews with one of the teachers in the Multimedia Skills Competency subject with the discussion of introduction CorelDraw in Graphic Design subjects which have their level of difficulty for students, especially in terms of operating CorelDraw software and there are no learning media used in the subject matter of CorelDraw. Especially for class X Multimedia, there are still many students experiencing difficulties in operating the *CorelDraw software.* This can be seen when the teacher demonstrates the steps for making a design in front of the class, there are still many students having difficulty following the steps for making the design, so the teacher has to explain many times and sometimes the teacher has to come one by one to explain again then the new teacher can proceed to the next step.

Making graphic designs requires a real picture of life around us so that the design looks real and attractive. There are many graphic designs in real life so they can provide imagination and creativity for us when we want to make graphic designs. To overcome this problem the teacher needs a model that does not only provide a theory to students but provides a picture or real object that can be found in everyday life.

The teaching and learning process is an activity that involves teachers and students in achieving learning objectives [11]. According to the explanation [12], educators must be able to make the learning process like playing, learning, and working by implementing student-centered learning strategies so that students themselves can be independent in solving a problem, responsible for the answer, more active and participating in every activity, collaborating among students, communicative and think critically.

Based on these problems, a learning approach is needed that can facilitate students to learn based on their experiences and everyday life. Contextual Teaching and Learning (CTL) is a learning concept that will help teachers/teachers to relate learning material to the real life they experience [13]. This CTL will encourage students to be fully involved in the learning process because they can directly learn from their daily lives. The material will be more meaningful if students present the material in the context of their lives.

The implementation of the CTL learning model requires media that can support the learning process. Using learning media not only helps teachers convey the material to be taught but also helps students understand the material being taught. Using interactive learning media that contains material, questions, and video tutorials to help students in the learning process.

In the digital era as it is today, teachers use media to assist in conveying material to students.

Learning media is recognized as one of the success factors of the learning process. Media is very important to adjust to the developmental stages of students to understand a concept that is being studied. With media, students can be motivated and maximize all the senses of students in learning and make it more meaningful.

Learning during the current pandemic is very different from the learning that was carried out before the pandemic. Learning before the pandemic was carried out with educators being able to meet face-to-face with students at school. But now learning is being done, namely, educators and students cannot meet face to face because there is a distance that separates educators from students. In practice, online learning, online, or distance learning aims to meet educational standards by utilizing information technology by using computer devices or gadgets that are interconnected with students and teachers and students [14]. The pandemic period has encouraged educators to use interactive learning media that students use to study independently because of online learning. Students can study independently using interactive learning media so that they still easily understand the material being taught.

The results of observations made at SMK Negeri 2 Sewon for graphic design subjects are still students who have difficulty understanding the material which is only presented in theory without any media or teaching aids to further stimulate their curiosity. Submission of material that is not interactive makes students become bored and makes students motivation low. This results in student learning outcomes that can be said to be low. Low learning outcomes are shown by the results of student tests of 38 students with Minimum Completeness Criteria (KKM) of more than equal to 75, obtained results that are declared complete as many as 24 students or a percentage of 68.50% with an average class score of 69. There are major problems in learning activities in Basic Graphic Design subjects, namely limited supporting learning media and less effective learning models. In learning activities in the classroom, the teacher explains the material using the lecture method, this is done because of the limited learning media available at school. the teacher only relies on the media module in explaining the material, in this case, the learning becomes less effective, so it is necessary to have a suitable and flexible learning model and learning media to help the learning activities take place so that students can fulfill the completeness of Corel Draw in the eyes of Basic Graphic Design.

METHODS

This research method uses a development model (Research & Development) which aims to develop productive learning multimedia products in the contextual teaching learning multimedia approach. The development model used is the Alessi & Trollip model which consists of three stages, namely 1) Planning, 2) Design, and 3) Development. This research method uses a development model (Research & Development) which aims to develop productive learning multimedia products in the contextual teaching learning multimedia approach. The criteria for determining whether interactive learning multimedia is Interactive learning media should be systematically organized and interesting to improve learning motivation in students [15]. Interactive learning media must be able to conveying messages and lesson content to students, as well as providing information in an interesting and reliable manner [16]. It should suitable for implementation are based on the evaluation of material experts and media experts, positive responses from teachers and students, and its proven efficacy in increasing interest and learning activities [17]. The instruments were tested for validity and reliability, the questionnaire validation test was carried out by a validation process with experts (judgment experts), while the reliability of the instrument used the alpha formula. Data were analyzed descriptively quantitatively with categories formulated on a Likert.

RESULT AND DISCUSSION

The product developed in this study is a learning medium for basic graphic design subjects. The development model used is the Alessi and Trolip models. The background of the development of this learning media is the result of observations made at school. Observations made were observing the learning process and giving a needs analysis questionnaire to students about what students needed related to the learning process.

The results of these observations show that there are problems such as 1) the use of learning media to support learning is lacking, 2) the application of learning tends to be conventional, 3) the level of knowledge and skills of students in basic graphic design lessons is still low. Analysis of the problems above requires learning innovations that can support the student learning process. The learning innovation developed in this study is in the form of interactive learning media CorelDraw.

The learning media developed in this study contains material about using Corel Draw as design software. The target users of this media are students of class X Multimedia. Learning media made based on smartphone/mobile. The material in this learning media is an introduction to CorelDraw, the features contained in the CorelDraw software, and the effects the CorelDraw software. This learning media contains KD (basic competence) of the material, there is also the purpose of learning the material, there is material consisting of 4 materials, there is an evaluation which contains multiple choice questions so that students can hone their knowledge after reading the material in this learning media, there is also a video tutorial on how to create design effects in CorelDraw to help students practice making designs.

Media expert feasibility assessment includes aspects of quality of content and objectives, quality of the instructional, technical, interface, and content design. Based on the data obtained in the media validation, the quality aspect of the content and objectives got a percentage of 100% (very feasible). Testing this learning media using alpha and beta testing. The media eligibility results were 94.18% which was categorized as very feasible and for material eligibility was 84.16% which was the very feasible category. For testing the feasibility of learning media carried out by students, the results obtained were technical aspects of 97.14%, the interface of 83.66%, aspects of quality of content and objectives of 87.14%, aspects of instructional quality of 87.32% and content of 83.57%. The average of the five aspects is 87.77% with a very decent category. From the data above, it can be concluded that the learning media assessment score is very suitable for use in the learning process. The overall results of the feasibility level of learning media can be seen in the diagram below:

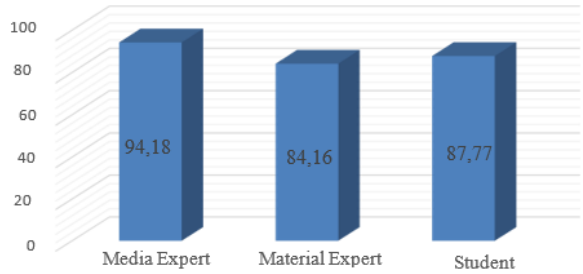

Figure 1 Feasibility Result Diagram of Learning Media

Assessing the level of success of learning media in improving learning outcomes is carried out by evaluating learning outcomes. The experiment began with the first stage in both sample classrooms. Before using the media, the teacher gave pre-test questions to students in order to determine the students' initial ability in both classes.

Learning activity was taken in two classes: the experimental class (X Multimedia 2) use CTL-based interactive learning media, and the control class (X Multimedia 1) use traditional learning.

At the end of the learning process, students were given a posttest in both classes to measure student learning results.

Table 1 Average Student Learning Outcomes on Knowledge Material

Question	Control Class		Experimen Class	
	Average	Mastery Learning (%)	Average	Mastery Learning (%)
Question Pre-test	55	11,43%	54	22,22%
Question Post-test	72	48,57%	80	77,78%

The average pre-test for the control class was 55 with complete learning 11.43% in the "very poor" category of complete learning, while the pre-test for the experimental class was 54 with 22.22% complete learning in the "less" category. After the pre-test was carried out learning using learning media for the experimental class and conventional learning for the control class, the post-test for the control class averaged 72 with learning completeness of 48.57% in the "enough" category while for the experimental class the post-test average 80 with learning completeness 77.78% with the "good".

Table 2 . Average Student Learning Outcomes on Material Skills

Question	Average	Mastery Learning (%)	Description
Soal Pre-test	68	31%	Less
Soal post-test	82	78%	Good

for skills material assessment pre-test was 68 with a learning completeness percentage of 31% in the "low" learning completeness category. The average post-test result is 82 with a learning completeness percentage of 78% in the "Good" learning mastery category.

The results above can be concluded that there was an increase in the average student and completeness of learning outcomes in material knowledge or skills. Data the pre-test and post-test class X M1 were normally distributed. This decision was taken after the Shapiro-Wilk score for the post-test was greater than 0.05 (0.05<0.487). Likewise in the post-test, where the score obtained is greater than 0.05 (0.05 <0.234). The same results were also obtained in the pre-test and post-test of class X M2. It was concluded that the pre-test and post-test data for class X M2 were normally distributed. a decision was taken after the Shapiro-Wilk pre-test showed a value of 0.073 or greater than 0.05. Likewise for the post-test scores, where the score obtained was 0.130 or greater than 0.05.

Furthermore, to ensure that the number of populations to be measured is homogeneous, a homogeneity test is carried out, as follows:

Table 3 Result Homogeneity Test

Test of Homogeneity of Variance

		Levene Statistic	df1	df2	Sig.
Student Learning Report	Based on Mean	2,740	1	69	,102
	Based on Median	2,176	1	69	,145
	Based on Median and with adjusted df	2,176	1	67,705	,145
	Based on trimmed mean	2,791	1	69	,099

The homogeneity test results obtained were Based on a Mean of 0.102. This value is greater than 0.05 (0.102> 0.05). So that it can be concluded that the variance of the post-test of the experimental class and the post-test of the control class are the same or homogeneous.

Then a Gain-test was carried out to measure the increase in science process skills and cognitive learning outcomes between before and after learning. The Gain-test results are as follows:

Table 4 Result N Gain Test

Control Class	N Gain scor	Experiment Class	N Gain scor
1	81,25	2	50
1	45,45	2	81,82
1	70	2	100
1	-120	2	85,71
1	-33,33	2	-133,33
1	37,5	2	55,56
1	76,47	2	81,82
1	14,29	2	100
1	100	2	100
1	90,91	2	60
1	100	2	-50
1	46,15	2	38,46
1	-66,67	2	66,67
1	-11,11	2	28,57
1	33,33	2	38,46
1	66,67	2	71,43
1	91,67	2	41,67
1	71,43	2	66,67
1	83,33	2	0
1	-200	2	77,78
1	-20	2	72,73
1	46,67	2	66,67
1	23,08	2	62,5

1	-200	2	0
1	38,46	2	64,29
1	25	2	55,56
1	-25	2	85,71
1	37,5	2	73,33
1	0	2	20
1	66,67	2	83,33
1	11,11	2	72,73
1	22,22	2	58,33
1	70	2	100

The results of the N-Gain test are the average N Gain for the control class (not using interactive learning media integrated with the contextual teaching learning) of 21.3 (21.3%) or included in the ineffective category with a maximum score of 100 and a minimum value of -200. Meanwhile, for the experimental group (using interactive learning media integrated with contextual teaching learning), the average N Gain score was 57.7 (57.7%) or included in quite effective with a maximum score obtained of 100 and a score minimum of -133.3. Thus, it can be concluded that the use of using interactive learning media that is integrated with contextual teaching learning is quite effective in increasing learning outcomes in the basic subject of graphic design class X. In addition, when learning does not use interactive learning media that is integrated with the learning model contextual teaching-learning, the results will be ineffective for improving learning outcomes in the basic subject of graphic design class X.

Then a t-test was carried out to see whether there were learning outcomes before and after using the developed learning media. The results of the t test are as follows:

Table 5 Result t Test

		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	*Pre test*	54,58	71	17,763	2,108
	Post test	75,92	71	15,407	1,828

The results of the t-test, namely the pre-test showed a score of 54.58 and a post-test of 75.92. This score shows that the pre-test score is smaller than the post-test score (54.58 <75.92) or there are differences in learning outcomes before using interactive learning media integrated with contextual teaching learning and after interactive learning media integrated with learning models contextual teaching learning.

CONCLUSION

The product developed in this study is a learning medium for basic graphic design subjects using the Alessi & Trollip development model which consists of 3 stages, namely planning, design, and development-based learning media Mobile/smartphone integrated with contextual teaching-learning models. The results of testing CorelDraw learning media are very suitable for use in the learning process with a material expert feasibility value of 84.16% and 87.77% of students. The effectiveness of interactive multimedia-based learning media by applying contextual teaching and learning for the basic subject of graphic design gives quite effective results and can improve learning outcomes quite a lot with pre-test lower than post-test (54.58 <75.92).

The potential research that can be done in the future is the type of action research. The resulting media production can be utilized for action research to find out how the media used can improve student motivation and learning outcomes.

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