

Learning From Home Video Tutorial for Computer Graphic Courses

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ABSTRACT

Lectures during the COVID-19 pandemic have obstacles that need to be found for practical solutions. Computer Graphics as a practicum subject in normal conditions is usually carried out by the lecturer's direct instruction method as the tutor. This method turned out to be ineffective in the Learn From Home (LFH) condition. Different signal conditions in each region make it difficult for lecturers and students to access online video conferencing as a learning platform. Based on needs analysis, this study aims to develop teaching materials on Computer Graphics courses. This module is uploaded on YouTube to be accessed when the lecturer and students get a signal (asynchronous) and can be opened on any device, not only on a laptop. The method used is research and development from Borg and Gall [1]. The results showed that if the teaching material in the form of video tutorials was useful in LFH. This research can be developed into other courses as a solution to LFH and internet signal constraints.

Keywords: *Course materials, Video tutorial, Computer graphic, Covid-19, YouTube*

1. INTRODUCTION

The Computer Graphics course is one of several studio-based times (practicum) in the S1 Visual Communication Design (DKV), Department of Design, Universitas Negeri Surabaya (Unesa). As a practical subject, he emphasized the importance of students' skills in operating software to design solution design work by applying design elements and principles learned at the beginning of the semester. Following the Semester Class Plan, in the Computer Graphics course, DKV undergraduate students must master vector type software. The software studied is Adobe Illustrator and CorelDRAW.

Based on the preliminary study and the results of discussions with the research team and lecturers who teach Computer Graphics, there are obstacles in the lecture process. The barrier is the difficulty of lecturer and students attending lectures, especially during the Learn From Home (LFH) period due to the COVID-19 pandemic, which has not ended until now. Courses that were previously carried out using the direct instruction method in computer studios became difficult to adapt during the LFH period, mostly due to different signal factors in each region. Indeed, for practicum-based lectures, the lecturer uses an online video conference platform to replace conventional face-to-face lessons in

computer studios. Through this platform, students follow the steps exemplified by lecturers directly, and lecturers conduct evaluations through the share screen feature of each student's laptop screen. Synchronous learning is very dependent on a large internet quota and a stable internet signal so that at every meeting, there are always some students who cannot join because of these constraints.

Based on Computer Graphics lectures during the LFH period, it is necessary to design teaching materials that can overcome internet signal constraints but are still useful and under the direct instruction method's characteristics. Learning also needs to be changed to asynchronous so that it is flexible, not limited to one time. Referring to this condition, the teaching material that is deemed appropriate is a video tutorial. This teaching material can answer lecturer and students' problems when it is difficult to access internet signals. This video is then uploaded to the YouTube platform so that students can access it without time constraints (synchronous). This research's objectives can be formulated as follows; describes the process of developing the Computer Graphics Course teaching materials for DKV undergraduate students and examines the feasibility of the Computer Graphics Course module through the validation process.

Research on teaching materials has been done a lot. Some relevant to this study is the work of Rafianti et al. [2]. He researched the importance of interactive modules for junior high school students. According to Jhonson and Tambunan (in Rafianti [2]), most students need interactive learning media to make as a learning tool individually. This is undoubtedly a supporting factor regarding the importance of teaching materials during the LFH period. Asmi et al. [3] also examined the importance of teaching materials in civics learning in universities. In this study, the supporting variable was the method used, namely the Borg and Gall development model. Meanwhile, Jati et al. [4] examined the benefits of YouTube as a learning medium. Several studies on the advantages of video as teaching material are also used as a reference in the development of this media [5][6][7].

2. METHOD

This research aims to produce a module product in the form of an electronic module, about tutorials in the Computer Graphics course, especially the material for designing batik motifs with computers. Therefore, the research that will be carried out is research and development. Ruseffendi argues (in Rafianti [2]) that development research is research to develop and produce educational products in the form of materials, media, tools and learning strategies, evaluation, and solving academic problems, not to test the theory. It can be concluded that development research is a process carried out to produce new and existing educational products through a series of trials to assess changes to improve the quality of education better.

The stages in this study were carried out under the research and development procedures of Borg and Gall [1]. From the existing development research stages, researchers modify according to need. This research will describe the results obtained from the five stages of the development research implementation including (1) a preliminary study, (2) research planning, (3) design development, (4) preliminary field testing, and (5) revision of preliminary field testing.

A preliminary study is an initial stage in this research; the things that are done are analyzing needs as well as looking for literature studies. The needs analysis was carried out by distributing closed questionnaires to students who took Computer Graphics courses, namely S1 DKV class 2018 class A students. After the preliminary study was carried out, the research planning was then carried out by determining the division of tasks

for the team and the form of participation in this study and planning the concept of the interactive tutorial module that would be produced. The next stage is design development, namely designing an interactive module for Computer Graphics learning tutorials on the material of creating batik patterns that are ready to be validated by material experts and media experts. Furthermore, the media is prepared to be tested on a limited basis to students. At this stage, the development of the module is in the form of repetition of the material to be used, making materials teach interactive tutorials in more detail.

After going through the design development stage, the next step is a limited trial for students. The indicators of measuring success are in the results of validation and test results for students. Before the little trial, an expert test would carry out to determine the interactive module's feasibility on the Computer Graphics learning tutorial that was developed before the module was used. Product validation does by giving questionnaires to experts. The expert test questionnaire uses a Likert scale. At this stage, a limited trial was also carried out on 9 S1 DKV class 2018 students as research subjects. Based on the validation questionnaire data obtained, the formula used to calculate the results of the questionnaire from experts is as follows [8]:

$$s = \sum x$$

Information:

s : score

$\sum x$: the number of validator answers

The criteria for the material expert test's validity level related to aspects of content, presentation, completeness of terms, summary, and language in the interactive module of Computer Graphics learning tutorials consist of 14 questions. Furthermore, for the criteria for the validity level of the media expert test related to display aspects, navigation, integration of content and material, consisting of 24 questions.

Limited scale trials were carried out by taking nine students as subjects. The student response questionnaire that will be given is closed and open. The aspect or indicator seen is the feeling of being happy with the given module, the tendency of students to act to deepen the computer graphics course after using the interactive tutorial module and understand the material for designing batik decorations after using the module. After analyzing the data from the closed student questionnaire, then the results of the student's open questionnaire in terms of appearance, material presentation, problem

example questions, and feelings in using the interactive module of computer graphics learning tutorials.

Revision of preliminary field testing is the last step after expert testing and limited-scale trials. There are several things that will improve the development of interactive modules. This research was conducted at the State University of Surabaya. The research sample for the limited trial was students of the Visual Communication Design S1 study program who attended Computer Graphics courses. Students consist of 9 people who are samples of product development trials. In the next stage, after an expert (validator) assessment is carried out, the module will go through the product trial stage for students.

3. RESULTS AND DISCUSSION

This study aims to develop an interactive module on Computer Graphics learning tutorials on designing batik patterns. Module in the form of interactive media can empirically make students more active, independent, and responsible in the learning process. All aspects of both cognitive, affective, and psychomotor will achieve. The stages in this study were carried out until the fifth stage in accordance with the research and development procedures of Borg and Gall [1]. The following are the results of the research and discussion:

3.1. Preliminary Studies

A preliminary study is an initial stage in this research. The things that do are analyzing the needs and looking for literature studies. At this stage, it finds that synchronous lectures during LFH using the Zoom Meeting platform encountered a problem: not all students could join due to quota problems and different internet signals between regions. Moreover, the analysis of the closed questionnaire that gives to 9 students concluded that synchronous learning was not sufficient and students needed a tutorial module that was easily accessible as a companion to lecture material.

3.2. Research Planning

After conducting a preliminary study, the research planning is establishing a team that helps the researcher by first determining the qualifications and forms of participation in this research. As a result, three research teams were assigned to develop an electronic module for Computer Graphics learning tutorials on the material for

designing batik decorations. The team leader is in charge of conducting a preliminary study and writing a research report. The first member is in order to develop batik patterns, and the second member is in charge of designing electronic modules. This stage also includes the formulation of development objectives to be achieved and the design of the product components being developed.

3.3. Design Development

The next stage is design development, namely by designing the initial design up to an interactive tutorial module that is ready to be validated by material experts and media experts. The steps taken in developing the interactive module include compiling the material; sorting practice questions and exam questions, designing layouts in Adobe Illustrator software, including Learning Outcomes and Indicators according to curriculum analysis, including material Designing Batik Patterns with the Covid-19 Theme, including sample questions, practice questions, and exam questions, publishing them in a Genially online form.

3.4. Preliminary Field Testing

After the design development stage is carried out, the next step is the preliminary field test. After the product finish and developed, validation is carried out, which is an activity of collecting data or information from experts in their fields (validators) to determine the validity of the interactive tutorial module. The purpose of validation is to assess the feasibility of the interactive tutorial module developed before the module is generally used. The validity test is given to expert validators by giving questionnaires to the experts.

3.4.1. Validation Results of Material Expert Test

The computer graphics expert test was carried out by a lecturer in the Design Department, Surabaya State University. The following are the criteria for the validity of the content, presentation, completeness of terms, summary, and language criteria in the interactive module of the Computer Graphics learning tutorial, which consists of 14 questions (Table 1).

Table 1. Criteria for the level of validity and revision of material expert products

Value Achievement	Validity Category	Information
$14,00 \leq s \leq 24,50$	Invalid	Should not be used
$24,50 < s \leq 35,00$	Valid Enough	Can be used with major revisions
$35,00 < s \leq 45,50$	Valid	Can be used with minor revisions
$45,50 < s \leq 56,00$	Very Valid	Very good to use

Based on the material expert validation test, the developed electronic module product has a score of 49 or 87.5% with a very valid category so it is very good to use.

3.4.2. Media Expert Test Validation Results

The media expert test was conducted by a lecturer at the Department of Educational Technology, Surabaya State University. The following are criteria for the level of validity related to aspects of the display, navigation, integration of content, and material, consisting of 24 questions (Table 2).

Table 2. Criteria for the level of validity and revision of material expert products

Value Achievement	Validity Category	Information
$24 \leq s \leq 42$	Invalid	Should not be used
$42 < s \leq 60$	Valid Enough	Can be used with major revisions
$60 < s \leq 78$	Valid	Can be used with minor revisions
$78 < s \leq 96$	Very Valid	Very good to use

Based on the media expert validation test, the media product developed has a score of 76 or 79.17% with a valid category so that it can be used with minor revisions.

Based on the two experts' test, if the percentage of each score is made, then the material expert's score of 49 is 87.5%. Simultaneously, the score from the media expert test was 76, so if the percentage was 79.17%. If the average is taken, from the two experts' tests, this electronic module has a ratio of 83.34%, meaning that it

is above the success indicator. Besides, a limited trial was also carried out on nine students who had attended Computer Graphics courses as research subjects at this stage. The response questionnaire given is closed and open.

The following are the criteria for the level of eligibility to determine whether or not the interactive tutorial module is interesting from a closed student questionnaire. The aspect or indicator seen is the feeling of being happy with the given module, the tendency of students to act to deepen the computer graphics course after using the module, and understanding the benefits of the computer graphics course after using the module.

Based on a closed questionnaire assessing student responses as many as nine people, the module product developed had an average score of 26.56 or 66.4% with an interesting category (Table 3).

Table 3 Product eligibility criteria

Value Achievement	Eligibility Category
$10,00 \leq s \leq 17,50$	Very less
$17,50 < s \leq 25,00$	Quite interesting
$25,00 < s \leq 32,50$	Interesting
$32,50 < s \leq 40,00$	Very Interesting

Table 4. Recapitulation of product eligibility level

Respondent	Score	Eligibility Category
R1	27	Interesting
R2	27	Interesting
R3	24	Quite interesting
R4	26	Interesting
R5	26	Interesting
R6	28	Interesting
R7	26	Interesting
R8	29	Interesting
R9	29	Interesting
Total Score	239	Interesting
Average	26,56	Interesting

After analyzing the data from the closed questionnaire, it results from the open questionnaire in terms of appearance, presentation of material, problems/examples of questions, and feelings in using

the electronic module. The results of the student's open questionnaire stated that the electronic module was attractive because it was interactive, had contrasting color choices, and was easily accessible with laptops and cell phones. Respondents also indicated happy learning with this electronic module because it felt more fun than learning with books. Besides, respondents stated that the presentation of the material was clear. The examples of questions were under the material being taught even though some responded that the practice questions were more complicated than the standards.

3.5. Revision of Preliminary Field Testing

Based on expert testing and limited scale trials, several things have undergone revisions in the electronic module development. Among them are completing the stages in designing batik motifs with the theme Covid-19 (Figure 1 and Figure 2) and changing the typeface in the title on the front page of the module (Figure 3).

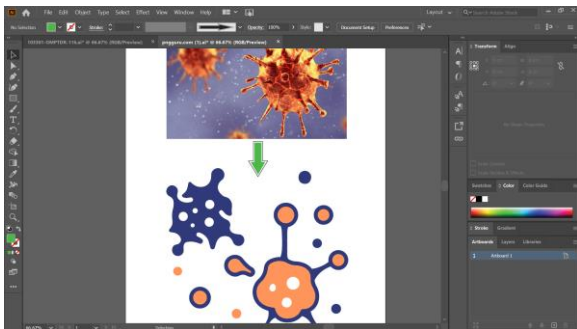


Figure 1 The initial stage of designing batik patterns from a photo of the Covid-19 virus



Figure 2 Applying the Covid-19 motif to batik patterns

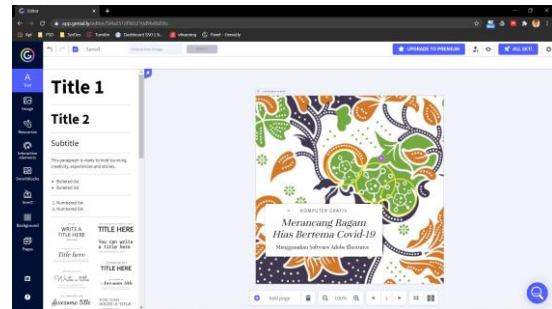


Figure 3 Change the font on the title page Genially

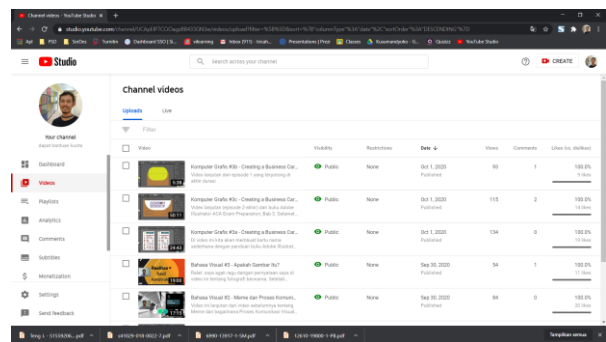


Figure 4 YouTube account home page containing computer graphics teaching materials

4. CONCLUSION

The teaching material in the form of video tutorials for computer graphics courses made with the online platform Genially and uploaded on YouTube is designed as a solution for lectures during the LFH period. This module is suitable for application in asynchronous courses to overcome internet signal connection, which is different in each region. Through this teaching material, both lecturers and students can continue to attend lectures, and learning outcomes can still be appropriately achieved. Its implementation requires both teacher's and students' commitment to achieving learning outcomes even though courses are limited to the network.

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