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ENGLISH LEARNING MEDIA BASED ON INTERACTIVE MULTIMEDIA FOR GRAPHIC TECHNOLOGY STUDENTS

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Abstract

This study aims to design an interactive learning media with Multimedia-based for English Course in the Graphic Technologies study program and test the feasibility. This Interactive Media will encourage students' learning independence, especially in answering the limitations of lectures to learn English independently and intensively wherever they are. The research was carried out at Politeknik Negeri Media Kreatif Medan. The interactive media is developed for English courses for the Graphic technology Study Program students of semester 2 in the 2020/2021 academic year. The study applies the R & D (Research and Development) method by developing educational products of interactive multimedia-based stored on DVDs for English language courses and testing the effectiveness of these products. The data in a learning series is recorded in DVD media with settings based on the syllabus and an outline of English learning following Graphic Technology. The media is validated by some experts in graphic technology, learning media and computer programming, scored as 4.38, or it is classified as good. After validated, the interactive learning media with Multimedia-based is tested to suitable responses to the students; it is shown as the questionnaire reaches 4.37 or categorized as so good or very positive. The research can produce the main output in prototypes interactive media with validated and tested multimedia-based
Keywords: *multimedia, interactive, English, graphic technology.*

INTRODUCTION

In higher education learning, students must focus on the main courses in the department or study program they take. However, it cannot deny that general courses that are not the department's core also significantly affect the competencies. For example, in English courses for the ESP study program, especially in English courses in the Graphic technology study program, students are introduced to use English related to Graphic technology. Indeed, it helps students speak English in general actively and know English terms related to the field of Graphic technology. The language in information technology is English, so neglecting to master English will impact to fall behind the IT knowledge.

On the other hand, the minimum number of direct learning English in higher education is a challenge that an English lecturer must solve. Therefore, interactive multimedia is urgently needed to solve ESP learning problems to master English even with the limitations. The rapid development in the information technology era requires one to look carefully. No matter how severe the learning challenges are, it is necessary to seek a solution to achieve effective and efficient learning.

Learning modules contain learning objectives, learning activities, exercises, competency tests and can be constructed in multimedia technology using video clips, sound recordings, images, animations, and texts. The multimedia series is stored in a DVD (Digital Video Disc). The DVD can shorten the time without depending on the lecturer's presence and can be calibrated to the students' ability. Learning is an activity of communicating teaching materials from teacher to learners. The interaction cannot take place without media. Specifically, the notion of media in the learning process is

determined as graphic, photographic, or electronic tools for taking, developing and setting visual and verbal information.

The form of stimulus used as media includes human socialization and interactions, moving images, writing and recorded sound. These five forms of stimulus help students learn specific subjects. However, it is not simple to put all five forms at once. The use of computers in information and communication technology is an innovation that allows combining some or all forms of these stimuli so that learning is more optimum. Good learning media must meet several requirements. Learning media must increase learner motivation. The use of media has the purpose of motivating learners. In addition, media need to stimulate learners to review learning and provide new learning stimuli. Good media will also activate learners in providing feedback and encourage learners to carry out independent learning. Therefore, media is needed as a loyal friend in the learning process and becomes a self-tutorial (independent tutorial) to accelerate their knowledge and skills with or without a teacher.

Multimedia today is a variety of combinations of graphics, text, sound, video, and animation. The combination can display information, messages or lesson content at once (Arsyad, 2017). This combination concept demands various hardware parts to continue conducting the primary function, and the computer is the controller of all equipment. The types of equipment are computers, video cameras, video cassette recorders (VCRs), overhead projectors, CD players, compact discs. All tools must be compatible and work multi-tasking in conveying information to the user.

The presented information of multimedia is a living document, observable on a monitor screen or when projected on a widescreen through an overhead projector. It is heard, seen by the video and animation. Multimedia consists of two categories, namely linear and non-linear (interactive) movies. Non-linear movies can interact with other web applications by pressing a navigation key and filling out a form. Web designers create non-linear movies by creating navigation buttons, logos, animations, and sound synchronization. For linear movies, the principle is the same as non-linear movies, but in this movie, there is no merging as in non-linear movies, only regular animations. All multimedia objects require handling data compression, storage, and retrieval.

Multimedia-based learning media is a mixture of text, images, graphics, sound, video, animation, and simulation in an integrated and synergistic manner of particular computer applications to accomplish learning objectives (Borodzhieva, 2020); (Ayob, 2019). By learning by applying multimedia, users can interact, communicate and control dynamically. This learning multimedia is interactive and, in the future, referred to as Interactive Learning Multimedia. In learning with multimedia, the material is presented into words, either in narration, written text and images, either still or moving (Surjono, 2017).

The COVID-19 pandemic that has hit the whole world for more than a year has forced various educational parties to create effective learning media for students. Online learning using Zoom meetings or other video conferencing is insufficient to encourage students to stay active studying at home

(Hasanah et al., 2021). Frequent technical problems and a lack of physical interaction between teachers and students are the main obstacles in online learning (Hazaymeh, 2021). Therefore, interactive learning media are needed to minimize the learning losses experienced by students throughout this pandemic.

he utilization of interactive multimedia in learning is not new. Previous research has shown positive leverage on the application of interactive multimedia in learning. This media can foster interest in learning in students, guide the learning process, and improve student learning outcomes in the mastery of concepts and skills (Wiana et al., 2018). One form of interactive learning multimedia that most people make is a game. Interactive games are known to increase emotional intelligence in deaf adolescents (Nakpong & Chanchalor, 2019), Excite Cognitive Abilities in Preschoolers (Sudarmilah & Arbain, 2019), and provide an opportunity for elementary school students to organize themselves in learning activities to become more independent (Saputrı et al., 2018). However, the researcher will create interactive multimedia in a tutorial because it is considered more relevant for the university student level.

Regarding learning English, itself, there are already several teachers who are trying to develop interactive multimedia. The outputs show that the media can improve students' writing skills (Elviana et al., 2020), master grammar (Tiarina et al., 2019), adding vocabulary and pronunciation (Sudarmilah et al., 2019). The use of interactive multimodal content is increasingly available on platforms accessible via smart TV, tablets and personal computers (Orso et al., 2017).

As a component in a learning system, the decision and use of learning multimedia are suggested to recognize the characteristics of other components, such as learning objectives, materials, strategies and evaluation. Learning English involves a lot of text and conversation; if a teacher is fixated on textbooks or television, the interactivity is covert because it only involves the user's mentality. However, with multimedia technology, interactiveness involves the user's physically and mentally when trying and exploring media based on multimedia technology.

In the presentation, English learning multimedia can be grouped into several formats, including:

a) Drill and Practice Method
b) Tutorial Method
c) Simulation Method
d) Games (Surjono, 2017).

The need to fulfill English learning media in graphic science is very urgent, considering that English is a non-core subject and only has two credits. Therefore, English learning media are considered one solution to accelerate the human resources compliance of graphic technology in terms of global competition. However, research on English learning media for graphic technology is still rarely done (Agustina & Murtopo, 2017); (Agustina et al., 2019). Therefore, researchers want to create interactive multimedia-based learning for graphic technology students. The presentation of material in this interactive multimedia is in tutorials where students must actively follow the learning process carried

out by interacting with computers. Each subject matter is presented first through computer interaction, and then the students work on the practice question.

METHOD

This research applies the R & D (Research and Development) method. Researchers develop education products and test their feasibility (Sugiono, 2019). In Developmental research, theories are not created or tested. However, it develops contributive products for education. The developed product in this research is ESP English learning media made by using multimedia technology to combine relevant text, graphics, sound, animation and video to the learning material.

This research was conducted at the Politeknik Negeri Media Kreatif PSDKU Medan. The interactive multimedia-based is developed for English courses for Graphic Technology Study Program students in semester II of the 2020/2021 academic year.

The procedure of developing self-study of English learning tutorial goes through the following stages:

1. Identification of need and problem

   At this stage, the activities carried out include:

   a. Conducting a study and analysis on the needs of the syllabus and the Outline of Lesson of ESP Learning in the Graphic technology Study Program.
   b. Collecting teaching materials is needed following the results of the study and need analysis
2. Product Design

   This phase aims to plan a multimedia technology-based English learning tutorial that combines video clips, sound recording, image, animation and text interactively. The activity at this stage is to design interactive learning media using software such as Adobe Flash, Macromedia and Visual Basic to combine elements of video, sound, text and graphics.
3. Product Validation

   At this stage, the designed product is consulted with several experts mastering the problems of interactive multimedia-based learning media. The experts assess the design of interactive learning media prepared by the research team. They are lecturers of graphic technology, educational technology and multimedia from confidential universities.
4. Product Revision

   The reviews from several experts will be used as material for revising the interactive learning media that has been designed. After that, the preliminary revision outcomes will examine students enrolled in the second semester of the Graphic Technology Study Program.
5. Product Testing

   This stage is used to evaluate the effectiveness of the media.

Researchers conduct the testing on students.

The students watch the DVD on their own time.

6. Final Revision

   If there is a lack of interactive learning media, it will be revised again to produce interactive learning media that are truly tested.

The technique of Data Analysis

The data analysis technique uses quantitative descriptive techniques, namely questionnaires and testing. The questionnaire is assessed using the Likert Summated Rating (LSR) method.

Table 1. Likert Scale

STATEMENT	QUALITY
Strongly agree	5
Agree	4
hesitate	3
Disagree	2
Strongly disagree	1

The quantitative data are taken from calculations and measurements of the questioner. The formula used is as follows:

Feasibility percentage (%) $= \frac{\text{observed score}}{\text{expected score}}$ x 100%

Table 2. Feasibility Percentage Scale

Percentage	Interpretation
76 - 100 %	Strongly feasible
56 - 75 %	Feasible
40 - 55 %	Fair
0 - 39 %	Not feasible

To produce excellent and feasible interactive learning media, a feasibility test instrument is needed, namely:

1. The Material Expert Test Instrument

The instrument used for material experts focuses on aspects of the quality of the material and the usefulness of the material. The material expert's instrument grid is presented in the following table:

Table 3. Instrument Specification of Material Expert

No	Aspect	Indicator
1.	Material quality	a. The proper content to expected competency b. Material completeness c. Material hierarchy
2.	Material usage	a. Material usefulness b. Motivation quality

2. The Media Expert Test Instrument

   The instrument used for media experts focuses on media quality, language use, media layout. The media expert's instrument grid is presented in the following table:

Table 4. Instrument Specification of Media Expert

No	Aspect	Indicator
1	Media quality	a. Quality videos, images, animations b. Ease of use c. Visual clarity d. Voice clarity e. Text clarity / legibility
2	Language use	a. Quality of language use b. Appropriateness of sentence placement
3	Media layout	a. Video presentation b. Layout

3. Instrument Specification of Testing

   This instrument tests the product on the student's scope, focusing on appearance, operation, and usability.

Table 5. Instrument Specification of Testing

No	Aspect	Indicators
1	Display	a. The attractiveness of the view b. Video clarity; images, text and sound
2	Operating	a. Ease of choosing the tutorial to follow b. Ease of operation
3	Usefulness	a. Facilitate independent student learning

		b. Clarity of competencies to be achieved c. Increase student attention

RESULTS AND DISCUSSION

The Need Analysis

The development of interactive multimedia in the English subject of graphic technology as a rectifier carried out field studies conducted by observation and interview. Observations made in the learning process and students' interview is followed. The results of the observation and interview are:

Table 6. The Need Analysis of Lecturer of Interactive Multimedia

No	Question	Answer
1	material breadth	Yes
2	Availability of media to learn graphic technology English materials	Inadequate (in modules)
3	The need for additional or complementary learning media	necessary
4	Response on new media	Strongly agree
5	Response on interactive multimedia-based learning media	Strongly agree
6	Believing the use of interactive multimedia-based media can improve student learning outcomes.	Yes
7	The material needs to be adjusted to the syllabus and Learning Competence and the books	Yes
8	How to deliver material	Brief, correct,
9	The arrangement and packaging is made attractive	Necessary
10	Evaluation at the end	Necessary
11	Evaluation form	Short essay
12	Font size	Medium
13	Display base color	Bright

From the recapitulation results, it is known that in learning, students only use one book source in the form of a module, so that media is needed to make learning exciting and innovative. Students strongly agree with the interactive multimedia adapted to the syllabus and Learning Competence. Interactive multimedia is made interestingly to provoke students' curiosity. The media display is also made with bright colors that provide students with medium font sizes.

In addition to the needs of teachers, researchers also distributed questionnaires on student needs for interactive multimedia learning media to 30 graphic technology students. Following are the results of the recapitulation of the student needs questionnaire.

Table 7. Recapitulation of Student Needs for Interactive multimedia-based Media

No	Question	Answer	Score
1	Difficulty with English graphic technology material	So difficult Difficult Easy	4 24 2
2	Media availability	Complete Fair incomplete	8 18 1
3	The need for learning media in interactive multimedia	Necessary Fair Not necessary	20 7 3
4	Students know the procedures for using interactive multimedia	Necessary Fair Not necessary	21 6 3
5	Materials are set hierarchy	Necessary Fair Not necessary	23 5 2
6	The arrangement and the package is made interesting	Necessary Fair Not necessary	26 4 0
7	Need evaluation at the end part	Necessary Fair Not necessary	26 4 0
8	Types of evaluation	Multiple choice Essay Another form	20 6 4

9	Color character	bright dark another color	23 0 7
10	Font size	Big Medium Small	9 19 2

From the recapitulation above, it is concluded that students still have difficulties understanding the English subject material of graphic technology. The availability of media for English subject material of graphic technology is still lacking, so students need learning media in interactive multimedia. Most students need the existence of the learning media with attractive arrangements and packaging attached to evaluation. Color characters on interactive multimedia display bright colors that provide students with medium font sizes.

Prototype of Interactive Multimedia

The following are the results of the designed prototype. The design of interactive multimedia is carried out in several stages. These stages are:

1) Concept Analysis

   The results of the activities in this step are to determine the concept of the media to be developed and determine the teaching materials that are then carried out in the preparation of the material.

2) Create a Flowchart

   The program flow chart is needed to facilitate the program development process because reading the program navigation flow can be done using a flow chart. The following is a flow chart of the developed product, which can be seen in the figure.

   a) Main Page Flowchart and Title Page.

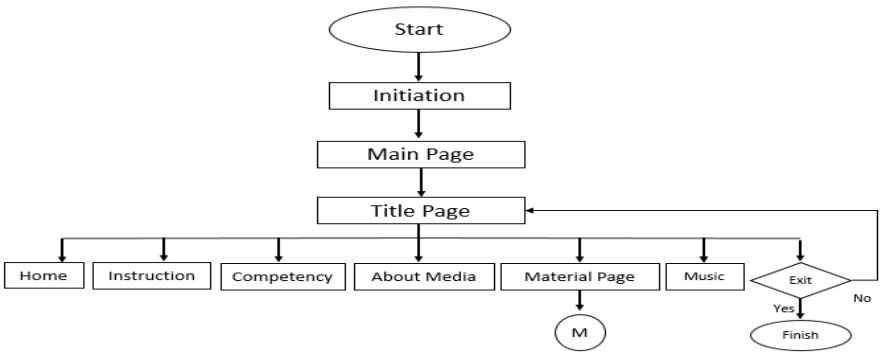

Figure 1. Main Page Flowchart and Title Page

Vol. 1, No. 3, December 2021, pp. 191-205
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b) The Flow chart of Material Pages

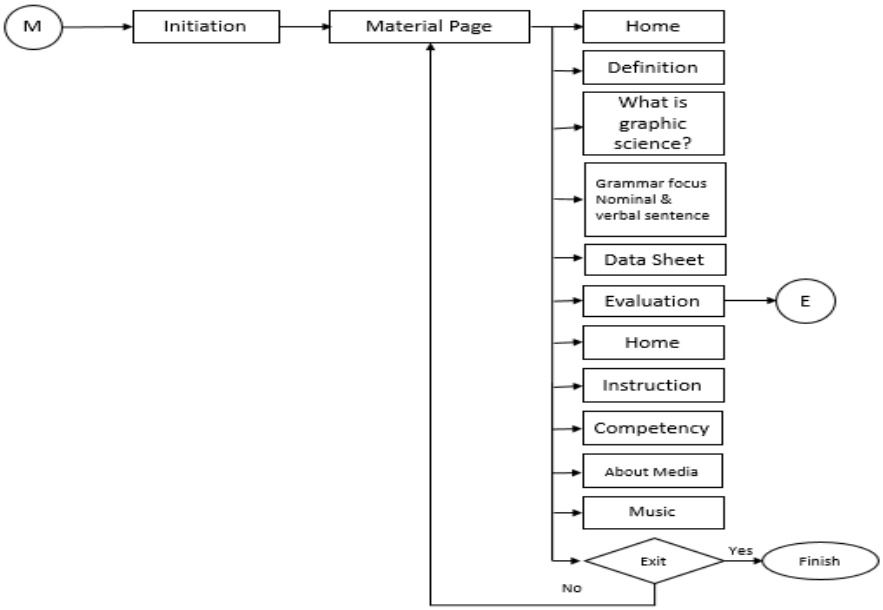

Figure 2. The Flow Chart of Material Pages

c) The Flow chart of Evaluation Pages

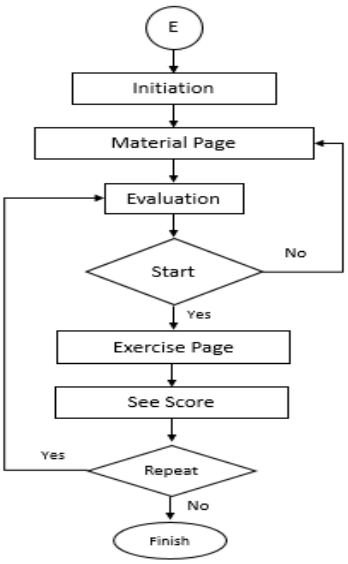

Figure 3. The Flow chart of Evaluation Pages

3) Collecting Learning Materials

The results of the activities in this step are to prepare all teaching materials related to competence.

4) Material Preparation

   The activity in this step is compiling material from teaching materials that have been prepared according to competence.

5) Interface Design Creation

   Interface design is the display design of the developed learning media. The design is a layout design consisting of the main page, coding to realize these objects as they function. The code in Adobe Flash Pro CS5 is called ActionScript. In developing the interactive multimedia, ActionScript 2.0 is used for coding.

6) Test Movie

   Test Movie is carried out for testing of objects that have been coded to find out whether the object is functioning as expected or not. If it doesn't work as expected, it's fixed on the object in question. These objects include navigation buttons, mute/on buttons, play/stop buttons. After doing a test movie, it yields file extension ".swf."

7) Product Publishing and Packaging

   At this stage, the interactive multimedia are stored as a file with the extension ".exe." On each computer, this file is used to use learning media apps. This stage's final product is then put on a DVD.

The following are the outcomes of graphic technology learning media design.

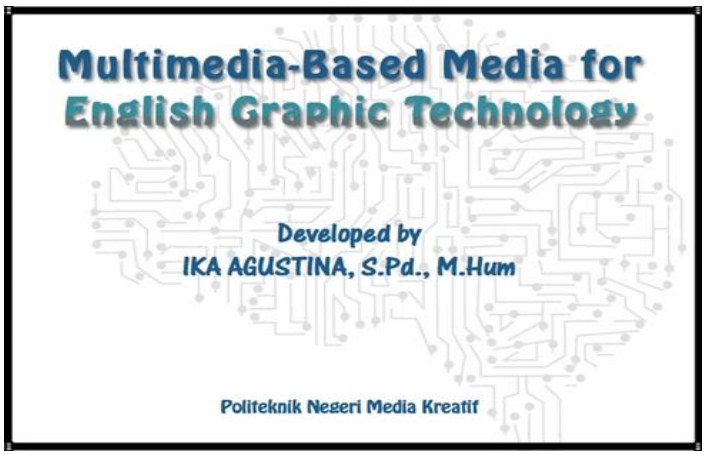

Figure 4. The Initial Page Display

Vol. 1, No. 3, December 2021, pp. 191-205
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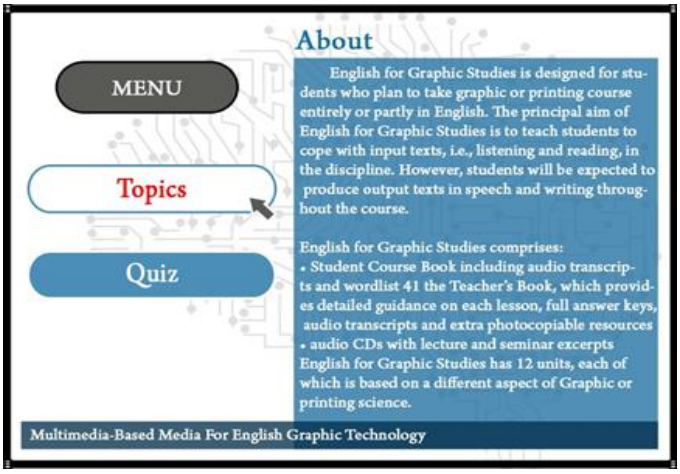

Figure 5. The Interface page display

The interface is the main navigation where users can enter the media sub-menu. Then the user can enter the material button, which contains the view of course material in one semester.

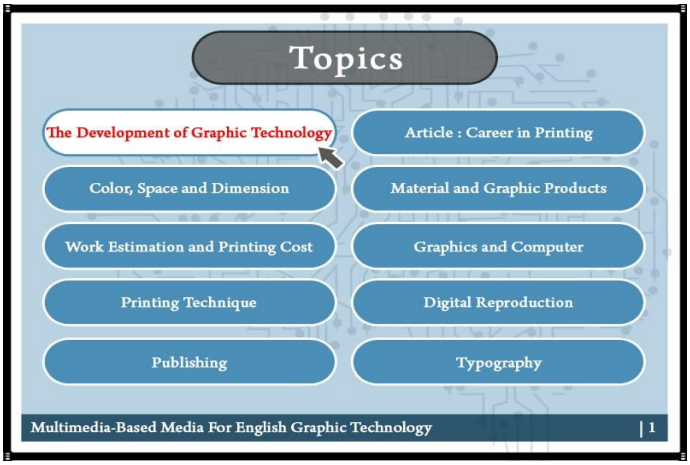

Figure 6 The Material Page Display

The material sub-menu will appear if the user selects one material, namely reading or listening activity, post-reading activity, grammar focus and exercise, as shown below. Then the user can select a Reading Activity sub-menu as follows:

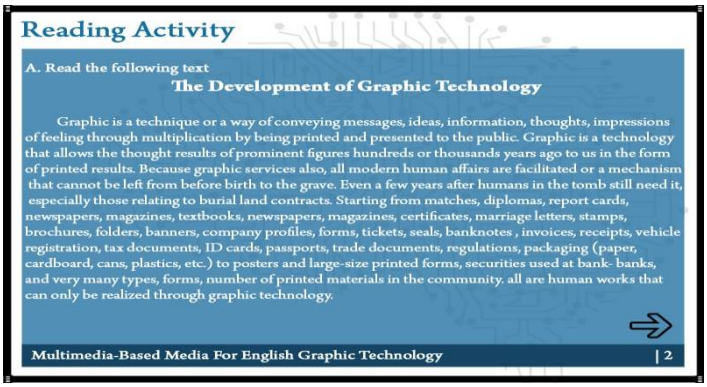

Figure 5.8 The Display of *reading activity* menu

Furthermore, if the user finishes the Reading Activity stage, then as an exercise, the user can practice their reading skills by selecting the Post-reading activity sub-menu.

Expert Validation and Revision

The result of the activities in this step is the implementation of product reviews by media experts. The data from the review results are used to determine the attractiveness and ease of the product being developed. The validator provides an assessment of the developed media to be revised until students test the learning media product. After the expert states, the product can be used and tested on students as users. The result of the assessment of media quality is counted on a scale of 1-5, with the following criteria:

X > 4.2 = Very good
3,4 < X 4.2 = Good
2.6 < X 3.4 = Enough
1.8 < X 2.6 = Less
X 1.8 = Very Less

Tabel 8. The Media Validation Result

No	**Aspect**	**Score of Validation**		
		1	**2**	**3**
1	Media design	4,50	4,40	4,40
2	Appropriateness	4,50	4,20	4,20
3	media reliability	4,50	4,20	4,20
Average		**4,50**	**4,37**	**4,27**
Total		**4,38**		

Based on table 8, the score of validation is 4,38. It can infer that the designed media has good quality.

d. Testing and Product Revision

The result of this activity is the implementation of a review of interactive multimedia-based learning media by several students as users. Students are asked to use the developed media and then fill out a questionnaire to assess how attractive and easy the media is as a learning aid. In addition to the data obtained from questionnaires by providing a checklist, students also provide suggestions or input on the media used. The learning media test questionnaire is focused on students as the subject of the use of learning media with 20 question items and 20 respondents on the first-semester level. Students

respond to this interactive multimedia with an excellent response, as indicated by the questionnaire score of 4.37.

CONCLUSION

Based on the research on developing interactive multimedia, It can conclude that interactive multimedia can display material content, discussions, and exercises consistently, lean, relevant, coherent, and up-to-date according to the study of graphic technology. The interactive multimedia runs well on computer devices in a compatible, synchronous and smooth as indicated to the validation results with an average value of 4.38 or in good categories by validators of learning media experts, computer programming experts and graphic technology experts. The interactive multimedia can potentially accommodate students' needs for a book replacement. They are easy to carry and can be used anytime and anywhere, as indicated in the testing results to students with a response score of 4.37 or in the excellent category.

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