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DEVELOPMENT OF E-MODULE GIS MULTIMEDIA LEARNING TO INCREASE LEARNING MOTIVATION WITH PADICREF APPROACH

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Abstract

This GIS E-Module aimed to examine how using a multimedia learning-based GIS E-Module affected student motivation. One of the main challenges is presenting GIS learning material excitingly and interactively to increase student learning motivation. Every campus is improving itself to face the current digital era. However, the ITB STIKOM Bali campus is experiencing problems, namely the need for digital media to deliver Geographic Information System (GIS) material. The Geographic Information Systems course is a course that requires higher-order thinking skills in the process of understanding theory and requires high concentration in digitizing digital maps, so an E-Module with GIS material is packaged using learning multimedia consisting of text, narration, audio, and video. The characteristics of the E-Module use the Padicref approach (Passion, Discovery, Creative, and Fun Learning). The research method is the ADDIE model method developed by Dick and Carry in 1996 for the development of e-modules. The research results are in the form of e-modules that have been tested by subject matter experts and content experts, as well as 36 questions in a questionnaire to 30 students in the class. Analyzing student learning motivation uses the ARCS technique (Attention, Relevance, confidence, and Satisfaction). Based on the results of the analysis of the ARCS motivation technique, it states that the impact of the GIS E-module in learning is a good category, meaning it is feasible to be used as a learning resource that can increase student learning motivation and can be accessed online using the LMS (Learning Management System), namely Moodle, as a medium for e-learning.

Keywords: E-Modul; SIG; Multimedia Learning; Motivation; Padicref; ADDIE; ARCS; LMS; E-Learning.

1. INTRODUCTION

One of the most important components in the development of a community and a country is education. With the introduction of technology as a tool in the learning process in the contemporary era of information technology, education has experienced a significant revolution. In the digital era, information technology is currently advancing very quickly year after year. In the current digital era, all data and information are dispersed globally, making it simple for anyone to get any information they require. The ability for the learning process to be conducted digitally has had a significant impact on how the educational sector in the twenty-first century has responded to the problems of the era of the fourth industrial revolution. Educational technology refers to the use of tools, technologies, processes, procedures, resources, and strategies to enhance the learning experience in various forms of learning, such as formal learning, informal learning, non-formal learning, lifelong learning, on-demand learning, workplace learning, and timely learning.

One of the technologies that plays an important role in the field of education is the Geographic Information System (GIS). GIS is a system that integrates geographic data with information technology, enabling users to store, manage, analyze, and present spatial information. While GIS offers tremendous potential in education, there are still many challenges faced by educators in integrating GIS courses into traditional curriculum and learning methods. One of the main challenges is how to present GIS

learning material in an interesting and interactive way so as to increase student learning motivation. Every campus is improving it self to face the current digital era, but the ITB STIKOM Bali campus is currently experiencing problems, namely the lack of digital media in the process of delivering Geographic Information System (GIS) material. This course requires higher-order thinking skills in the process of understanding theory and requires high concentration in digitizing digital maps [1]. Until now, learning in the classroom has relied on less interactive media, particularly when it comes to incorporating practiced digitizing techniques into software to scan digital maps for the course. Based on these problems, a GIS E-Module is needed that is packaged using learning multimedia. Learning Multimedia has been proven to be an effective approach to increasing student motivation and understanding by combining GIS with multimedia learning to create a GIS E-Module, which is an interactive electronic module that contains learning material about GIS with the support of multimedia elements such as images, animation, audio, and video.

Previous research has shown that the use of the E-Module for Geography learning based on multimedia learning has good criteria that can be used as teaching materials [2]. In addition, the GIS E-Module can also provide a more in-depth and interactive learning experience, enabling students to learn independently and think critically, but despite the potential benefits, further research still needs to be carried out to identify the extent to which the use of the GIS E-Module can improve students' learning motivation significantly. Characteristics of the GIS E-Module, which was built using the Padicref approach (Passion, Discovery, Creative, and Fun Learning), so that this e-module can provide enthusiasm to discover new knowledge, be creative, and have fun.

Padicref is an intersection of 21st century learning (Critical Thinking, Creativity, Communication and Collaboration) with PAKEM learning (Active, Effective and Fun Learning) so that this e-module can provide enthusiasm for student motivation to discover new knowledge, be creative and have fun learning. Multimedia-based e-modules are very helpful and useful in the world of education because their general characteristics are interactivity, flexibility, and the integration of various media that can support learning. The research method used is the ADDIE model (Analysis, Design, Development, Implementation, and Evaluation) [3].

The software used in making learning multimedia is Adobe Captivate, which will be combined with Moodle's LMS (Learning Management System) to be accessed online by students. Moodle is one of the technologies used for e-learning. E-learning continues to be present in today's educational discourse, thanks to advances in technology, learning methodologies, and public or organizational policies. This e-module will be tested for validity by 2 media experts and 2 material experts and tested on 30 students in the class to determine student motivation for using the e-module. Thus, this study aims to investigate the impact of using the GIS E-Module based on multimedia learning on student motivation. The results of this research are expected to provide valuable input for educators and curriculum developers to improve the quality of GIS learning in the digital era and optimize the use of technology in education.

2. LITERATURE REVIEW

2.1 E-Modul GIS

E-Module is a form of module that is packaged digitally and interactively because the material can be presented in the form of text, audio, video, animation, and so on, which can make students learn actively and independently. E-modules are electronic versions of modules where access and use are carried out via electronic devices such as computers, laptops, tablets, or even smartphones. E-modules are teaching materials designed independently as a whole and systematically for certain learning units presented in electronic format, where each learning process is linked with a link that is able to make learning more interactive and equipped with audio, video, and animation to enrich the students learning experience [4]. The content contained in the e-module is GIS course material. Geographic Information System (GIS) is very unique compared to other information systems because the type of data used is spatial data and non-spatial data that are integrated with each other and processed in a computerized database so that they can produce geographic information in the form of digital maps. E-modules are the result of interesting and interactive e-learning innovations that can motivate student learning. In designing modules, the main idea is to keep cognitive load low for usability and learnability purposes. As working memory is an important factor, users should not be overwhelmed with unnecessary content-related thoughts and information processing; instead, they should be allowed to interact with the interface that accompanies the targeted content.

2.2 Learning Multimedia

To make Geographic Information System (GIS) material and content more interesting, interactive, and fun, multimedia is used as a medium to convey it to students. Multimedia consists of elements such as text, images or photos, graphic art, sound, animation, and digitally manipulated video elements. Multimedia (computer-assisted) learning is a type of e-learning in which instructions or learning are delivered via a computer with learning content (text, images, graphics, audio, video, animation, etc.) stored or presented on a CD-ROM or computer file. Multimedia e-module learning for Geographic Information Systems (GIS) courses is packaged with three types of cognitive processes, namely [5].

1. Extra Cognitive Processing

Cognitive processing that pays attention to learning design according to student behavior. Extraneous cognitive load depends on the way the material to be studied is presented. If the presentation of the material is not well designed, irrelevant and inefficient cognitive processes occur.

2. Essential Cognitive Processing

Cognitive processes that function to represent important material in learning. The complexity of the material given to students in full, which contains many steps in detail, can burden students' cognitive abilities.

3. Generative Cognitive Processing

Cognitive processes that can be carried out by creating an interesting learning environment, such as when the narrator uses a conversational style with polite speech, If students can engage in essential and generative ways, they are more likely to

construct meaningful learning outcomes, which allow for good retention and knowledge transfer performance as well.

2.3 Padicref Approach

The characteristics of the e-module developed in this study used the Padicref learning approach. Padicref is the discovery of a new approach as a wedge between the 21st century learning model (Critical Thinking, Creativity, collaboration, and Communication) and the PAKEM model (Active, Creative, effective, and Enjoyable Learning). The Padicref approach stands for Passion, Discovery, creativity, and Fun Learning, with the following explanation:

1. Passion

Passion is the spirit or motivation to learn. The tendency for someone to do activities they like and do them sincerely without coercion from anyone Passion is a strong tendency towards activities they like, for which they give their time and energy. Someone will become passionate about certain activities through two important processes: activity assessment and internalization of activity representations in one's core aspects, namely one's identity.

2. Discovery

Discovery is giving students the opportunity to discover something by studying independently. Discovery learning is an intellectual activity for students where they are able to describe a principle or concept. Intellectual activity includes observing, understanding, being able to classify, make assumptions, describe, measure, and draw conclusions.

3. Creative

Students with independent learning are expected to be creative in thinking about creating a new product or idea. Creativity is the ability to find or get new ideas and solve problems; therefore, creativity needs to be increased in an effort to solve all the problems faced in life.

4. Fun Learning

Fun Learning is creating fun learning. This learning is able to create a relaxed atmosphere, free from pressure, interesting, arouse interest in learning, full involvement, enthusiasm, feelings of joy, high concentration, and other pleasant feelings so that the learning process can be carried out. well. Fun learning is a learning process in which there is a strong relationship between the teacher and students without feeling forced or pressured.

Image 1 shows that the four components support each other, namely passion, discovery, creativity, and fun learning, so as to create fun learning for students, provide enthusiasm for learning, and encourage students to be creative in discovering new knowledge.

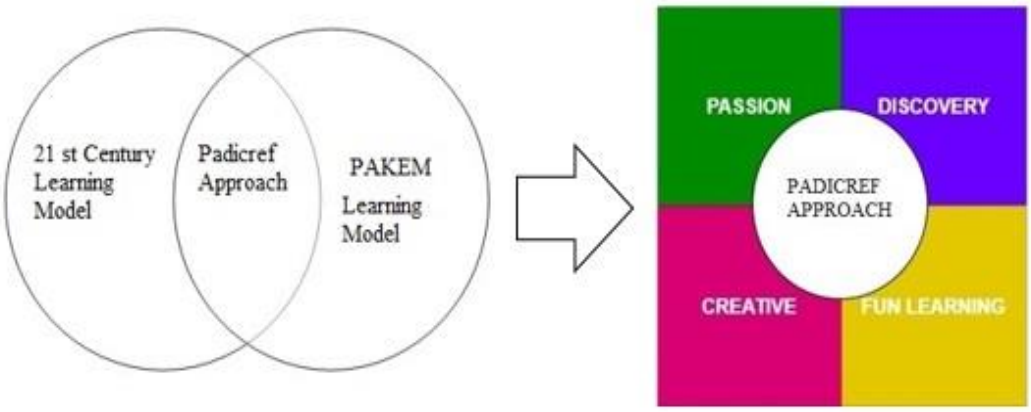

Figure 1: Padicref Approach

2.4 Motivation to Learn

The term motivation comes from the Latin movere, which means motion and encouragement to move; thus, providing motivation can be interpreted as providing encouragement so that something that is motivated can move. So, the role of motivation in learning is to encourage students to be active in learning and achieve the expected goals. John Keller has designed a problem-solving approach to designing aspects of motivation and the learning environment to encourage and maintain student motivation to learn called the ARCS model (Attention, Relevance, Confidence, and Satisfaction). These four components that can support students' motivation to receive knowledge in the learning process are as follows [6]:

a. Attention

Attention is a form of direction to be able to consult or concentrate in dealing with students in the learning process because attention from educators will encourage students' enthusiasm for learning.

b. Relevance

Relevance between the learning material presented and the learning experiences of students This linkage or suitability can automatically foster learning motivation in students because they feel that the subject matter presented has direct personal benefits in their daily lives.

c. Confidence

Strategies that can be used to increase student self-confidence include increasing student expectations for success by increasing student experience, compiling learning activities into smaller parts so that students are not required to learn too many new concepts at once, and increasing expectations. To succeed, this can be done by conveying learning objectives and test criteria at the beginning of learning and increasing expectations for success by using strategies that put control of success in the hands of the students themselves. Students' self-confidence by assuming students have understood this concept well and mentioning students' weaknesses as things that still need to be developed, providing relevant feedback during the learning process so that students know their understanding and learning achievements so far.

d. Satisfaction

Feelings of joy can be positive; that is, they arise when people get appreciation for themselves. This feeling can increase students' feelings of self-confidence later by arousing enthusiasm for learning.

2.5 LMS (Learning Management System)

LMS (Learning Management System) is software for administrative purposes, documentation, activity reports, activities, teaching and learning activities online (connected to the internet), e-learning, and training materials, all of which are carried out online. The Moodle LMS as an online education management tool can utilize the event logs discussed in this study to explore sample learning processes for decision-making in online education development planning [7]. The learning management system, or LMS, grows and develops along with the development of the current digital era. The features displayed are constantly changing according to user needs. The benefit of using the LMS (Learning Management System) is to provide more understanding to students because learning content can be accessed repeatedly until students understand learning; LMS can increase cooperation and social interaction between students and educators, which can be done online and is not limited by space and time; LMS can create learning independence so that it gives freedom to students to explore their abilities to find something so that students can think creatively and innovatively. In general, LMS facilitates content sharing and online interaction between instructors and students.

3. METODOLOGY DAN DESIGN

The method used in this research is to use the ADDIE model developed by Dick and Carry, which consists of the stages of Analysis, Design, Development, implementation, and evaluation, which can be seen in image 2.

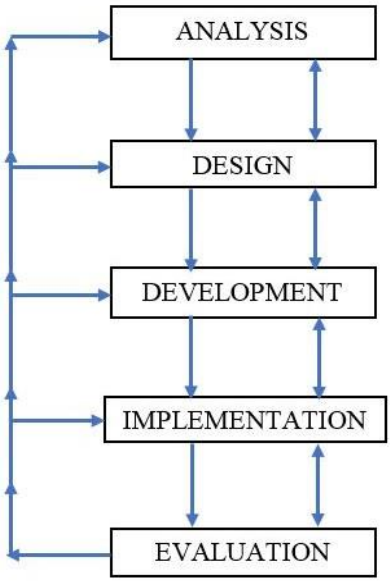

Figure 2: Model ADDIE (Dick, W., Carey, L. (1996)

The validation of the e-module was carried out by 2 media experts and 2 material experts, with the questionnaire instrument design listed in Table 1 for material experts.

Table 1: Questionnaire for Material Experts [12]

Aspect	Question
A. Material suitability with learning objectives and learning outcomes	1. Material eligibility
	2. The breadth and depth of the material
B. Material Completeness	3. Completeness of learning materials
	4. Serving order
C. Material accuracy	5. The accuracy of the formulation of learning objectives
	6. The accuracy of the formulation of learning outcomes
	7. Accuracy of concepts, definitions and facts
	8. The accuracy and consistency of terms and symbols
	9. The accuracy of the evaluation/test questions
	10. Evaluation contains feedback/reinforcement
	11. Reference accuracy
	12. Compatibility with the development of informatics
D. Material Update	13 Up-to-date examples, pictures and illustrations
	14 Library updates
E. Suitability with student life	15. Development and abilities of ITB STIKOM Bali students
	16. Social environmental conditions and situations
F. Sensitivity to the values of the institute and faculty	17. Sensitivity to the values of the institute and faculty
G. Interactivity (Stimulus and Response)	18. Encourage curiosity
	19. Foster creativity
	20. Develop life skills
	21. Satisfaction with the material provided

Validation of the e-module by providing questions in the form of a questionnaire as a research instrument for validation is contained in Table 2.

Table 2: Questionnaire for Media Experts

Aspect	Question
E-Module graphics	1. Use of fonts (Type and size)
	2. Layout
	3. Illustrations, graphics, pictures and photos
	4. Display Design
E-Module functionality	5. Conformity with the requested / expected results

To measure student motivation using an instrument in the form of questions included in a questionnaire consisting of 36 questions, the results will be analyzed using the ARCS (Attention, Relevance, Confidence, and Satisfaction) technique found in Table 3.

Table 3: Questionnaire for Student Motivation

No	Question	Answer Choices				
		1	2	3	4	5
1	The first time I saw this learning e-module, I believed that learning was easy for me.					
2	At the beginning of learning, there was something that interested me.					
3	This learning material was more difficult to understand than I expected.					
4	After reading the introductory information, I am confident that I know what I have to learn from this lesson.					
5	Completing the tasks in this lesson makes me feel satisfied with the results I have achieved.					
6	It is clear to me how this learning material relates to what I already know.					

7	Many of the slides in the e-module contain a lot of information, making it difficult for me to take in important ideas and remember them.					
8	This learning material is very interesting.					
9	There are stories, pictures, or examples that show me how the learning materials benefit some people.					
10	Completing the course successfully is very important to me.					
11	The quality of the writing makes me very attractive.					
12	This learning is so abstract that it is hard for me to keep my attention.					
13	While I work on this lesson, I believe that I can learn the content.					
14	I enjoyed this study so much that I wanted to know more about this subject					
15	This e-learning module is not interesting.					
16	The content of this lesson is in accordance with my interests					
17	The way the information in the e-module is organized makes me stick with it					
18	There are explanations and examples of how humans use this knowledge in learning.					
19	The exercise tasks in this lesson are too difficult					
20	In this lesson there are things that trigger my curiosity					
21	I really enjoy learning this lesson					
22	The number of repetitions of this lesson sometimes bores me					
23	The content and writing style in this lesson give the impression that the content is useful to know					
24	I have learned something very interesting and unexpected before					
25	After studying this course for a while, I was confident that I would do well on the test.					
26	This learning is irrelevant					
27	Feedback sentences after practice, or other comments on the lesson make me feel rewarded for my efforts					
28	The variety in the readings, assignments, illustrations and so on kept my attention on this lesson					
29	The writing style is boring					
30	I can relate the content of this lesson to things I have seen, done or thought about in my daily life					
31	On each page there are many words that are very disturbing					
32	I feel happy to successfully complete this lesson					
33	The contents of this study will be useful to me					
34	At least I do not understand this learning material					
35	The good organization of the contents of this learning material makes me confident that I will be able to learn it					
36	It's a lot of fun to learn well-designed lessons					

4. RESULTS

1. Analysis

At this stage, an analysis of semester lecture plans is carried out regarding the course material for Geographic Information Systems (GIS), literature studies, and the preparation of material that will be displayed in the e-module according to characteristics using the Padicref approach (passion, discovery, creativity, and fun learning).Passion: The e-module is equipped with examples of the latest inventions in Geographic Information System technology so that it can increase learning motivation.

Discovery: The e-module is equipped with tasks and challenges that allow it to be found for Geographic Information System technology updates.

Creative: The e-module is equipped with case studies to find out students' creativity in thinking.

Fun Learning: e-modules are equipped with animations, videos, and audios to make learning fun.

2. Design

At this stage, a storyboard is prepared as an e-module design, which is given at each meeting in learning. Storyboard regarding the layout of animation, text, audio, learning videos, and so on. Image 3 is one of the storyboards made for the development of multimedia-based GIS e-modules.

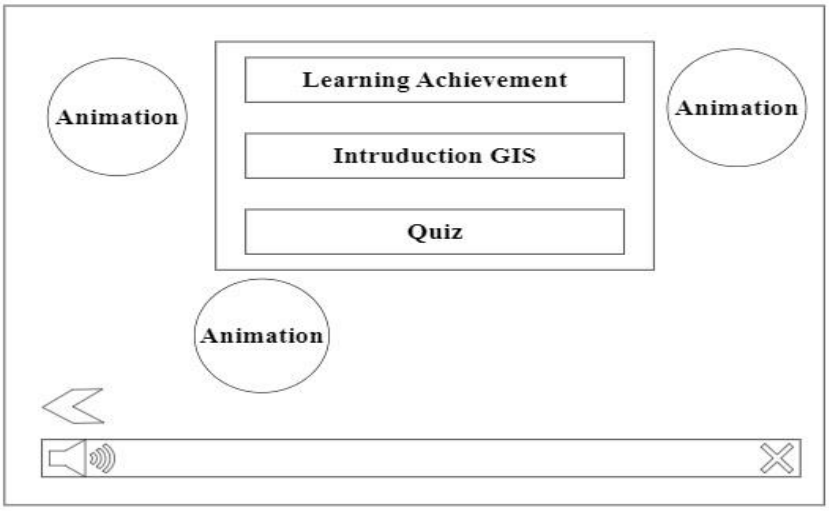

Figure 3: Storyboard

3. Development

At this stage, the development of GIS e-modules was carried out using Adobe Captivate software based on learning multimedia. This stage was also validated by media experts regarding the feasibility of e-modules in terms of media to serve as an interactive, interesting, and fun learning resource. One of the results of product development can be seen in image 4.

Figure 4: E-Module display

4. Implementation

At this stage, the implementation of the e-module that has been built using Adobe Captivate software for multimedia learning is carried out, which is then distributed to students to be accessed online by collaborating using the Moodle-based LMS (learning Management System). Students are given the freedom to study online and view material in the form of e-modules without being limited by space or time, as long as they are connected to the internet. Learning services are carried out online, or e-service learning, with social constructivism theory, whose application emphasizes social interaction in an educational environment and trains students to impart knowledge to others [8]. The implementation of e-modules for GIS courses that are distributed online (e-learning) using Moodle LMS can be seen in image 5. In terms of strengths, e-learning allows learners to study independently whenever they want. It can also reduce student expenses, such as travel expenses. Meanwhile, e-learning causes less face-to-face contact between learners and instructors [9](Muhammad Safuan Abdul Latip et al., 2022). In a technology-enhanced learning environment, learners produce a variety of learning outcomes that are influenced by the surrounding technology [10]. E-Learning is usually provided on a special platform designed for educational purposes [11].

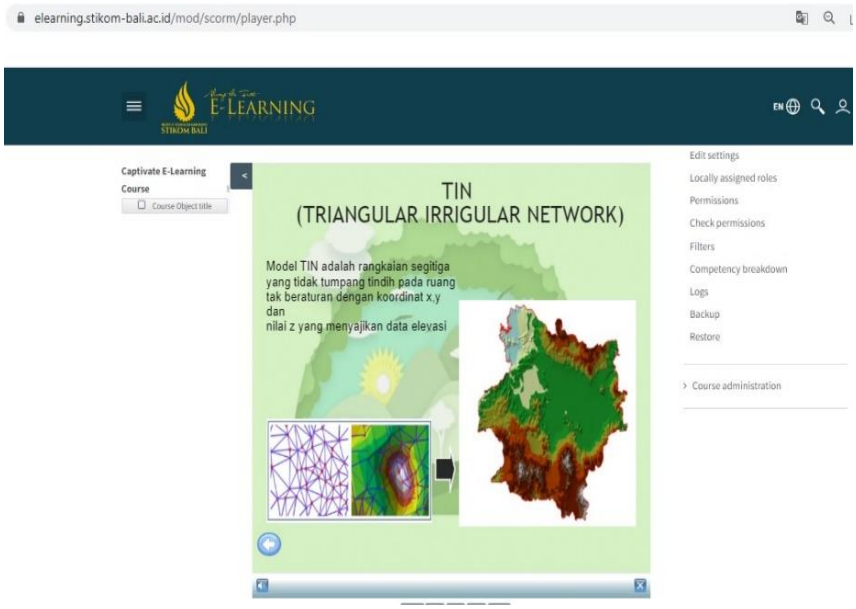

Figure 5: Display of E-Modules in Moodle LMS

5. Evaluation

This evaluation phase starts with the results of the material expert test, media expert test results, and e-module assessment by students to increase student motivation in learning online, which can be accessed easily through the Moodle LMS.

5.1 Content Expert Test Results

The validation stage by a multimedia e-module content expert for the Geographic Information Systems course. Content experts consist of two experts who provide an assessment of the multimedia e-module. The assessment was carried out by providing answers to several questions in the form of a Likert scale, namely from a value of 1 to 5, on the given questionnaire. The results of the due diligence from the content expert are in Table 4.

Table 4: Content Test Results

Question	Respondents	
	Content Expert first expert	Content Expert Second expert
1	5	5
2	4	5
3	4	5
4	4	5
5	4	5
6	4	5
7	4	5
8	4	5
9	4	5
10	4	5
11	4	5
12	4	5
13	4	5
14	4	5
15	4	5
16	4	5
17	4	5
18	4	5
19	4	5
20	4	5
21	4	5
Total	85	105
Ideal Score	105	105
%	81 %	100%
Category	Good	Excellent

Minimum score : 21

Maximum score : 105

Maximum-minimum = 105-21 =84

Intervals : 84/5 = 16,8 = 17

$$P = \frac{\sum x}{\sum y} \; x \; 100 \; \%$$

Information :

P : Eligibility Percentage

∑x : Number of Respondents Answers

∑y : Maximum Total Score

Table 5: Categories of Content Test Results and Media Tests

Likert scale	Category	Interval value	Percentage	Frequency
5	Excellent	90-106	86%-100%	1
4	Good	73-89	70%-85%	1
3	Average	56-72	53%-69%	0
2	Poor	39-55	37%-52%	0
1	Very Poor	21-38	<= 36%	0

Based on calculations from the Likert scale, the total score for the first test material expert is 85, the percentage of 81% when seen in table 5 is included in the good category and the total score for the second test material expert is 105, the percentage

is 100% when seen in table 5 excellent category it can be concluded that the multimedia e-module for the Information Systems course is appropriate to use as a learning resource based on the material contained in the e-module at each meeting so that students can understand the material well.

5.2 Media Expert Test Results

The Validation Stage by multimedia e-module media experts in Geographic Information Systems courses. Media experts consist of two experts who provide media-based assessments (audio in the form of music and narration, video, animation, and so on) for multimedia e-modules. The assessment was carried out by providing answers to several questions in the form of a Likert scale, namely from a value of 1 to 5, in the questionnaire given. The results of the media expert trial are in Table 6 as follows:

Table 6: Media Expert Test Results

Question	Respondents	
	Media Expert first expert	Media Expert Second expert
1	4	5
2	4	4
3	4	4
4	4	5
5	5	5
Total	21	23
Ideal Score	25	25
%	84	92
Category	Good	Excellent

Minimum score : 5

Maximum score: 25

Maximum-minimum = 25-5 =20

Intervals : 20/5 = 4

$$P = \frac{\sum x}{\sum y} \; x \; 100 \; \%$$

Information :

P : Eligibility Percentage

∑x : Number of Respondents Answers

∑y : Maximum Total Score

Based on the Likert scale calculation, the total score of the first person media test expert is 21, the percentage of 84% when seen in table 5 is in the good category and the total score of the second person media expert is 23, then the percentage is 92% when seen in table 5 in the excellent category, it can be concluded that the multimedia e-module for the Information Systems course is suitable for use as a media-based learning resource (audio in the form of music and narration, video, animation and so on) contained in the e-module at every meeting so that learning is more enjoyable with the e-module Multimedia-based GIS.

5.3 Analysis of student learning motivation

Analysis of student motivation was carried out with 30 students in the class. Students as respondents were given 36 questions using a Likert scale for selected answers with a value range of 1-5. Questionnaires are distributed online via google form.

Table 7: Results of Likert Scale Assessment of E-Module for Student Learning Motivation

Respondents	Total question score 1-36	P value	Category
1	141	78	Good
2	125	69	Good
3	134	74	Good
4	126	70	Good
5	149	83	Excellent
6	125	69	Good
7	126	70	Good
8	144	80	Excellent
9	128	71	Good
10	131	73	Good
11	129	72	Good
12	130	72	Good
13	129	72	Good
14	123	68	Good
15	132	73	Good
16	151	84	Excellent
17	128	71	Good
18	129	72	Good
19	125	69	Good
20	128	71	Good
21	134	74	Good
22	133	74	Good
23	126	70	Good
24	135	75	Good
25	125	69	Good
26	144	80	Excellent
27	129	72	Good
28	126	70	Good
29	139	77	Good
30	132	73	Good

The technique of analyzing the learning motivation of students taking the Geographic Information Systems course using multimedia e-modules as learning media can be analyzed after distributing the ARCS model questionnaire with the following formula :

$$P = \frac{S}{N} \text{ x } 100\ \%$$

Description:

S : Total number of aspects

N : Total score

Table 8: Categories and Frequency of E-Module Assessment for Student Motivation

No	Value (P)	Criteria	Frequency
1	80 % ≤ P ≤ 100 %	Excellent	4
2	66 % ≤ P ≤ 79 %	Good	26
3	56 % ≤ P ≤ 65 %	Average	0
4	40 % ≤ P ≤ 55 %	Poor	0
5	P ≤ 39 %	Very Poor	0

Based on table 8, the frequency of respondents in the e-module assessment for student motivation for the "Excellent" category was 4 out of 30 students/respondents, the frequency of respondents for the "Good" category was 26 respondents. The conclusion is that the e-module for the Geographic Information System course is good for use as a learning resource so that it can increase student learning motivation. One of the efforts to increase students' interest and motivation in learning, namely the use of learning media that is good and correct and interesting. Media use learning in the teaching and learning process can generate new interests and desires, generate motivation and stimulate learning activities, and even bring psychological influences on learning (Yolanda F and Maria Ulfah, 2019).

6. DISCUSISION

The e-module validity test was carried out by material experts with a total score for the first subject matter expert was 85, the percentage of 81% was in the good category and the total score for the second test content/material expert was 105, the percentage was 100% in excellent category, based on the test results of the two content experts states that the multimedia e-module for the Information Systems course is suitable for use as a learning resource based on the content/material contained in the e-module at each meeting so that students can understand the material well.

The e-module validity test was carried out by media experts with a total score for the first tester media expert was 21, the percentage was 84% in the good category and the total score for the second tester media expert was 23, the percentage was 92% in excellent category, based on the test results of the two media experts states that the multimedia e-module for the Information Systems course is suitable for use as a media-based learning resource (audio in the form of music and narration, video, animation and so on) contained in the e-module at every meeting so that learning is more enjoyable with the GIS-based e-module multimedia.

Testing the e-module on students to find out the impact of the e-module in increasing student learning motivation, the results of the study, namely the e-module for student motivation in the "excellent" category, were 4 respondents out of 30 students or respondents, and the frequency of respondents in the "good" category was 26 respondents. Based on the frequency of students, most of them stated that the e-module course for Geographic Information Systems was good to use as a learning resource so that it could increase student learning motivation, according to the answers given by students to the 36 questions in the questionnaire as a research instrument.

7. CONCLUSION

1. In this research, an e-module has been successfully built for the Multimedia-based Geographic Information System course that can be collaborated on using Moodle LMS as one of the technologies for e-learning.
2. This e-module has been tested for validity by media and content/material experts with good results or is suitable for use as a learning medium.
3. The e-module was also tested on students to find out the impact of the e-module on student learning motivation. The result is that the e-module is able to have a good impact so that it can increase student learning motivation.

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