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DEVELOPMENT OF MACROMEDIA FLASH MODULE IN THE LEARNING MEDIA COURSE FACULTY OF TEACHER TRAINING AND EDUCATION UNIVERSITY OF PEJUANG REPUBLIK INDONESIA

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Abstract:
Students in the Faculty of Teacher Training and Education, University of Pejuang Republik Indonesia, comes from different background and knowledge. The problem is when the lecturer teaches the students to use an application on the computer, in this case the macromedia flash application. This research aims to develop a macromedia flash module that can be used by the students in the Faculty of Teacher Training and Education, University of Pejuang Republik Indonesia, as well as to determine the need, design, level of validity, practicality, and effectiveness of the Macromedia flash module. Furthermore, to distribute the module. In this study, the researcher uses research and development (R&D) methods with a 4-D development model, define, design, develop and disseminate. The developed module is then tested for its feasibility with validity, testing, and product evaluation. The results of this research showed that the level of validity coefficient by the two validators with an average score of 75%, with the level of practicality after being given a limited trial to students getting a very practical category with an average score of 3.32% and the level of effectiveness of the Macromedia flash module could be seen through pre-test and post-test with an average score of 56.00% during the pre-test and 89.20% during the post-test. In conclusion, the macromedia flash module can help lecturers and students to make the learning process more effective.

Keywords: Module, Macromedia Flash, Teaching Aid

PENGEMBANGAN MODUL MAKROMEDIA FLASH PADA MATA KULIAH MEDIA PEMBELAJARAN FAKULTAS KEGURUAN DAN ILMU PENDIDIKAN UNIVERSITAS PEJUANG REPUBLIK INDONESIA

Abstrak:
Mahasiswa Fakultas Keguruan dan Ilmu Pendidikan, Universitas Pejuang Republik Indonesia memiliki kemampuan awal yang berbeda-beda. Hal ini membuat dosen kesulitan dalam mengajar mata kuliah yang menuntut mahasiswa melakukan praktik khususnya praktik penggunaan aplikasi pada komputer, dalam hal ini aplikasi macromedia flash. Penelitian ini bertujuan mengembangkan modul macromedia flash

yang dapat digunakan mahasiswa Fakultas Keguruan dan Ilmu Pendidikan (FKIP) Universitas Pejuang Republik Indonesia dalam proses perkuliahan serta untuk mengetahui kebutuhan, desain, tingkat validitas, kepraktisan, dan efektivitas modul macromedia flash hingga penyebaran modul. Metode yang digunakan adalah research and development (R&D) dengan model pengembangan 4-D, yaitu: define, design, develop, dan disseminate. Produk yang dikembangkan kemudian diuji kelayakannya dengan validitas, uji coba, dan evaluasi produk. Hasil penelitian terhadap modul macromedia flash menunjukkan tingkat koefisien validitas oleh kedua validator dengan perolehan skor rerata 75%, dengan tingkat kepraktisan setelah diberikan uji coba terbatas terhadap mahasiswa mendapatkan kategori sangat praktis dengan perolehan skor rerata 3,32% serta tingkat keefektifan modul macromedia flash dapat dilihat pada uji coba lapangan terhadap mahasiswa melalui pre-test dan post-test dengan perolehan skor rerata 56,00% pada saat pelaksanaan pre-test dan saat pelaksanaan post-test memperoleh 89,20%. Sehingga modul macromedia flash dapat membantu dosen dan mahasiswa dalam memperlancar proses perkuliahan yang lebih efektif.

Kata Kunci: Modul, Macromedia Flash, Media Pembelajaran

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INTRODUCTION

Education in Indonesia has entered the digital era, and as educators, we must be ready to master the existing technology. The next step that lecturers and students must take to face the digital era is to maximize the use of existing technology as a learning tool. Anshori (2019) states that advances in information technology make humans deal with other parties as if they are no longer limited by time and place. Whenever and wherever, humans with these technological devices can establish relationships, obtain information, and disseminate information to others. So that not using technology optimally will impact many things, including a decrease in student interest in learning (Aina & Sundari, 2019). Therefore, lecturers and students need to be more active in utilizing technology to maximize competency results and improve digital literacy (Septia, Edrati, & Pratiwi, 2016; Ramly & Alfadil, 2021). Especially in the learning media course, where at the end of the lecture,

students are required to make effective media that can be used in conducting learning. So that it can achieve the goal of forming a golden generation in the digital era in the Independent Campus Learning Program (MBKM). Furthermore, to be able to improve student competence in the digital era, there have been many interactive multimedia-based learning products that can be developed in various fields of knowledge in the lecture process, including the independent campus learning program.

Macromedia flash is a simple application that can be used to create simple animations and games. If packaged effectively, these animations and games will produce interesting learning media to impact delivering more material efficiently (Hwang, Tam, Lam, & Lam, 2012; Supriharyanti, Usodo, & Slamet, 2020). However, based on the observations, it was found that the main problem in learning this application was the delay of students in pursuing the material presented by the lecturer. This is due to the inequality of basic knowledge and the lack of students' ability to follow the lecturer's rhythm (Kurniati, 2017). So that when other students have understood the material well, there are still other students who need re-explanation. This is the main reason for researchers to develop a macromedia flash module that can be used by lecturers and students in the lecture process and can be used for elements of society both through formal and non-formal education, especially in the Pejuang University of the Republic of Indonesia Faculty of Teacher Training and Education. The module is one form of teaching material packaged completely and systematically. It contains a set of learning experiences planned and designed to help students master specific learning objectives.

The minimum module contains learning objectives, learning materials/substances, and evaluation (Rahdiyanta, 2016). With this module, students can study Macromedia Flash material independently by applying the concept of independent learning (Negara, Suherman, & Yayat, 2019). The modules that will be developed are adapted to the learning outcomes used by the faculty. The minimum module contains learning objectives, learning materials/substances, and evaluation (Rahdiyanta, 2016). With this module, students can study macromedia flash material independently, of course, in accordance with the application of the concept of independent learning (Negara, Suherman, & Yayat, 2019). The modules that will be developed are adapted to the learning outcomes used by the faculty. The minimum module contains learning objectives, learning materials/ substances, and evaluation (Harahap & Fauzi, 2018; Rahdiyanta, 2016; Siregar, 2022). With this module,

students can study macromedia flash material independently, of course, in accordance with the application of the concept of independent learning (Negara, Suherman, & Yayat, 2019). The modules that will be developed are adapted to the learning outcomes used by the faculty.

The development of the macromedia flash module can assist lecturers and students in delivering material so that there is an increase in effectiveness in the lecture process (Fadlul Amdhi Yul, 2017; Handayani, 2019; Dewi, 2022). This module can explore student insights with well-structured material explanations so that lecturers and students can create interesting learning media and apply them in everyday life. The development of the macromedia flash module contains material explanations, animations, and practice questions aimed at enabling students to hone their skills while using the module and studying lecture material.

This study aims to determine the need for macromedia flash module design, determine macromedia flash design, and determine the validity, practicality, and effectiveness of the macromedia flash module up to the deployment stage.

METHODS

The method used by the researcher is research and development (R&D) with the use of a 4-D development model. The 4-D development model is the development of learning tools with stages: define, design, develop, and disseminate. At the defining (define) stage, the researcher conducts the initial analysis by bringing up the facts and alternative completions of the module development. The researcher also analyzed the research subjects, namely students of UPRI Makassar, Faculty of Teacher Training and Education (FKIP), in the 5th semester for the academic year 2021/2022, which included the characteristics of their academic abilities in learning media courses. At this stage, material analysis, concept analysis, and goal specifications are also carried out to determine the material in the developed module and the concepts and indicators of achievement of the module development.

The design stage (design) includes media selection, format, and initial design of the macromedia flash module. At this stage, the validator provides input regarding the initial design. Furthermore, at the development stage (develop), expert validation was carried out by material expert lecturers and media expert lecturers. The results of this validation are used to improve the developed module's perfection. After the draft I was validated and revised,

draft II was produced. The second draft will then be tested on students in the limited field trial phase, which aims to determine the results of implementing the macromedia flash module in classroom learning. The results obtained from this stage are in the form of a revised module. As for the dissemination stage (dissemination), the researcher publishes the module in the form of an ISSN book published nationally.

RESULTS AND DISCUSSION

The media development procedure used in this study is the Thiagarajan development model, known as the 4-D model, with a sequence of development stages, namely the defining stage (define), design stage (design), development stage (develop), and the deployment stage (disseminate) (Semmel, Semmel, & Thiagarajan, 1974). The product developed will then be tested to find out the results of the responses of lecturers and students.

1. Overview of Macromedia Flash Module Development Needs

a. Preliminary Analysis

The initial analysis carried out was to identify the problems faced by lecturers and students during the lecture process so that they became a concern, especially in the subject of learning media development. Based on the results obtained in the field of the implementation of media development lectures

Learning at the Faculty of Teacher Training, Universitas Pejuang Republic of Indonesia Makassar shows that students need help understanding the material because of the inequality of students' basic knowledge in using computers and the lack of students' ability to follow the rhythm of the lecturer. Therefore, one solution that can be offered is developing a macromedia flash module. Through the macromedia flash module, students can learn to easily absorb or accept and independently understand the material presented by the lecturer inside and outside the classroom. The module is expected to make students more active in independent learning and have high motivation to achieve lecture goals.

b. Student Analysis

Student analysis was carried out to determine the characteristics of students in accordance with the design and development of lectures. Based on the results of interviews of researchers with the school, namely the lecturer in charge of learning media development courses, several explanations regarding the characteristics of students were obtained, namely; 1) the average age of

students is 20 years; 2) they have different ethnic backgrounds; 3) the ability of students obtained in the learning media development course, some have not reached the cumulative achievement index; 4) lack of interest and motivation of students in paying attention explanation of the material; 5) the media used by lecturers is less innovative so that students are less motivated to take part in learning; 6) in general the learning styles of FKIP UPRI Makassar students are more inclined towards technological developments.

c. Task Analysis

Based on the concept analysis for the learning media development lecture material, an analysis that refers to learning achievement is carried out. The competence directs the students' ability to understand better and be able to master the lecture material related to the development of learning media and complete tasks after the lecture process is complete so that the lecture objectives can be achieved. Every student meeting must pay attention and listen to the lecture material using the macromedia flash module.

d. Analysis of Learning Objectives

The analysis of lecture objectives is prepared based on the learning outcomes of graduates as determined. Based on the lecture material, namely, 1) Introduction to macromedia flash, 2) Creating animations, 3) Making media about the formula for adding squares, a large number of angles of a triangle, the area of a parallelogram, 4) Introduction to action scripts, 5) Making quizzes, 6) Inserting sound.

Analysis results on stages define preliminary analysis, student analysis, task analysis, and specification of learning objectives through observation and discussion with lecturers in charge of learning media development courses is obtained an illustration that the use of learning media is not optimal. Lectures tend to be dominated by lecturers, so students are ineffective in the lecture process. With these problems, it is necessary to carry out the development of the macromedia flash module to achieve predetermined graduate learning outcomes.

2. Overview of Macromedia Flash Module Design

Some stages are carried out at the design stage, including developing ideas, conducting concept analysis, making initial descriptions, and drawing flow charts and storyboards. These stages can be explained below.

a. Design Stage

Based on the needs analysis, it is important to develop the macromedia flash module in the learning media development course that supports the implementation of the lecture process. This stage aims to design a prototype macromedia flash module for troubleshooting. The results of each activity at the design stage are described as follows:

1) Media Selection

Media selection is carried out to identify media relevant to the material's characteristics. Moreover, the selection of media was chosen to suit the concept analysis and task analysis, as well as the characteristics of the use of media in helping students achieve learning objectives. The learning media used in the lecture process uses a macromedia flash module that allows every student to use it.

2) Format Selection

The format of the semester process plan used is adjusted to the KKNI procedures at the University, in the semester learning plan listed graduate learning outcomes, capal (CPL), Course Learning Outcomes (CPMK), Sub-CPMK, indicators, time allocation, materials, methods, steps for lecture activities, lecture facilities and infrastructure. The macromedia flash module developed for the learning media development course is in accordance with the learning achievements of graduates.

3) Initial Design

After determining the semester learning plan according to the student's needs, the researcher designed the macromedia flash module. The initial range is a prototype macromedia flash module design overview. The initial design of this macromedia flash is a prototype to be developed, and the results of this design are obtained. Prototype, the macromedia flash module as a lecture medium, was then developed through validation, revision, and limited trial stages. The initial design of learning media is described as follows:

a) Teaching Materials/Lecture Materials

The initial design of this teaching material is made in a material. This teaching material is faced with supporting students' knowledge related to learning media development material which includes several materials in each meeting, namely, 1) Introduction to macromedia flash, 2) Creating animations, 3) Making media about the formula for adding squares, the number of angles of a triangle, the area of a parallelogram, 4) Action script introduction, 5) Create quiz, 6) Insert voice.

b) Designing Macromedia Flash Module

The design of learning media or macromedia flash modules begins with designing the media cover.

Figure 1. Cover Module Macromedia Flash

Figure 1 shows the front and back cover of the module. This section provides information on the title of the module to a synopsis related to the module's content, which is designed to be attractive to increase the attractiveness of the macromedia flash module that will be used in the lecture process.

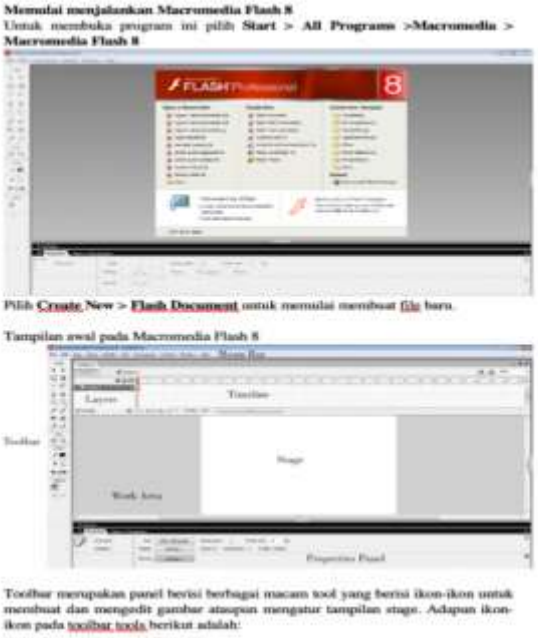

Figure 2. Macromedia Flash Module Content Page

Based on figure 2, the above module displays the contents in the macromedia flash module. The module's contents are equipped with pictures, explanations, and practice about lecture material, making it easier for students to understand lecture material and attract student interest in learning.

Based on the storyboard cover to the content page of the macromedia flash module while still considering the lecture process in using the macromedia flash module.

c) Lecturer Response Sheet

The lecturer's response aims to determine the response of the lecturer in charge of the learning media development course to the macromedia flash module that has been implemented for lecturers and students to determine the extent of the lecturer's response in a limited trial in the classroom.

d) Student Response Sheet

Student response aims to determine student responses to the macromedia flash module that has been implemented by the lecturer in a limited trial in the classroom. The initial design of the macromedia flash module results from a temporary (hypothetical) learning media that two experts will assess.

3. Level of Validity, Practicality, and Effectiveness of Macromedia Flash Module

The development stage (develop) is the final stage of module development macromedia flash to be able to see the level of validation, practicality, and effectiveness, and more details will be described as follows:

a. Development Stage

At this stage, it aims to produce learning media that have been revised based on input from experts and after limited trials. The steps in the development stage are as follows:

1) Validation

One of the main criteria for determining whether a learning media is suitable for use or not is the validation results. Expert validation involves two expert experts, one material expert, and one media expert. As for those who act as validators in assessing the validity of existing instruments by keeping the name of the existing expert validators, they are given a V1 code to maintain the code of ethics, namely:

a) Validator 1 (V1)

Professor at Makassar State University who is competent in learning media development materials. Based on the results of expert validation of the material. The results of the assessment/validation of material in the development of the macromedia flash module provided by the validator are presented in table 1 below.

Table 1. Material Validation Results

No	Aspect	Validator Value
Theory		
1	Conformity with learning objectives	4
2	Determination in choosing material	4
3	Sufficient material to achieve learning objectives depth	3
4	Material presented	3
5	The order of the material is in accordance	4
6	The subject matter of the examples presented	4
7	Clarity of language in the material	4
8	Relevance of the material to the subject	4
The average validity of each criterion on the material aspect		3,7
Learning		
1	Conformity of competency standards and basic	3
2	Competencies clarity of goals to be achieved	3
3	The suitability of indicators with basic competencies	4
4	The learning sequence is clear and easy to follow	4
The average validity of each criterion on the aspect of attractiveness		3,5
The average validity of each criterion on the aspect of attractiveness		3,6

Source: Material Validation Data Analysis, 2022

Based on the validator's assessment of the material aspect, an average score of 3.6 was obtained, which indicates that this aspect is in the very valid category. The material aspect obtained an average score of 3.7, which indicates that this aspect is in the very valid category. An average score of 3.5 is obtained in the learning aspect, which indicates that this aspect is in the very valid category. The previously found problem was the absence of applied materials related to graduate learning outcomes. The expert validator's advice

on the material may be developed by including an explanation of the material with strong relevant values to technological developments.

b) Validator 2 (V2).

Lecturer at the Faculty of Teacher Training and Education, Universitas Pejuang Republic of Indonesia Makassar. He was chosen as a media expert validator because; competent in learning media; here are the results of expert validation of the module. The results of the media assessment in the development of the macromedia flash module provided by the validator are presented in table 2 as follows.

Table 2. Media Validation Results

No	Aspect	Validator Value
Appearance		
1	The accuracy of the selection of letters in the text	4
2	The accuracy of choosing the image	4
3	Background color compatibility with text color	4
4	The accuracy of visualizing the material	3
5	Module design view	3
6	Content image display	4
7	Clarity of content	3
The average validity of each criterion on the appearance aspect		3,5
Design		
1	It can be understood well	4
2	Easy to use and simple to understand	4
3	Accuracy in selecting designs for material development	4
4	Ease of interaction with the module	4
5	Clarity of choosing a design	3
The average validity of each criterion in the design aspect		3,8
Average total validation of media assessment instruments		3,6

Source: Media Validation Data Analysis, 2022

Based on the validator's assessment of display quality, an average score of 3.5 was obtained, indicating that this aspect is in the very valid category. An average score of 3.8 was obtained in the design aspect, indicating that this aspect is in the very valid category. So that the average score of validation on the macromedia flash module is 3.6, which indicates that the module is in the

very valid category. The problem found earlier is that the module design could be more attractive as for what the validator recommends: design as attractive as possible with the nuances of graphic design so that it can attract students' reading interest.

c) Results of Assessment/Validation of Lecturer Response Instruments

The results of the assessment/validation of the lecturer response instrument in the development of the macromedia flash module can be seen in table 3 as follows.

Table 3. Results of Validation of Lecturer Response Instrument

No	Aspect	V_1	V_2
Instruction			
1	Instructions for filling out the questionnaire are clearly stated	4	4
2	The choice of the lecturer's response is stated clearly	4	4
The average validity of each criterion on the instruction aspect		4,0	4,0
Language			
1	The use of language in terms of the use of Indonesia language rules	3	4
2	Clarity of instructions/directions, comments, and problem-solving	3	4
3	The simplicity of sentence structure	3	4
4	The language used is communicative	4	4
The average validity of each criterion on the language aspect		3,2	4,0
Contents			
1	The purpose of using the questionnaire is clearly stated and measurable	4	3
2	The statements in the questionnaire can capture all the lecturers' responses to the macromedia flash module	4	3
3	The statements submitted are in accordance with the measurement objectives	3	4
4	The formulation of the questions on the questionnaire uses words/commands/statements that require a response from the lecturer	4	3
The average validity of each criterion in the contents aspect		3,7	3,2
Average total validation of media assessment instruments		3,6	3,7

Source: Data Analysis of Lecture Response Instrument Validation, 2022

As for the results analysis table 3, it can be said that the validity obtained is 1 or V = 100%. This means that the assessment results of the two validators have "strong relevance" with this validity coefficient of more than 75% or V > 75%, so it can be said that the results of the measurements or interventions carried out are valid.

d) Results of Assessment/Validation of Student Response Instruments in Module Development Macromedia Flash can be seen in table 5 as follows.

Table 4. Results of the validation of student response instruments

No	Aspect	V_1	V_2
Instruction			
1	Instructions for filling out the questionnaire are clearly stated	4	4
2	The choice of the lecturer's response is stated clearly	4	4
The average validity of each criterion on the instruction aspect		4,0	4,0
Language			
1	The use of language in terms of the use of Indonesia language rules	4	4
2	Clarity of instructions/directions, comments, and problem-solving	4	4
3	The simplicity of sentence structure	3	4
4	The language used is communicative	4	4
The average validity of each criterion on the language aspect		3,7	4,0
Contents			
1	The purpose of using the questionnaire is clearly stated and measurable	4	3
2	The statements in the questionnaire can capture all the lecturers' responses to the macromedia flash module	3	3
3	The statements submitted are in accordance with the measurement objectives	3	4
4	Uses words/commands/statements that demand responses from students	3	3
The average validity of each criterion in the contents aspect		3,2	3,2
Average total validation of media assessment instruments		3,6	3,7

Source: Student response instrument validation data analysis, 2022

The results of the analysis in table 4, it can be said that the validity obtained is 1 or V = 100%. This means that the assessment results of the two validators have "strong relevance" with a coefficient this validity is more than 75% or V > 75%, then it can be said that the results of the measurement or interference carried out are valid.

2) Limited Trial

After analyzing the results obtained from the two validators, a limited trial was carried out on lecturers and objects to obtain data on the assessment of the development of the macromedia flash module. At this stage, 1 lecturer was involved in the subject of learning media development at the Faculty of Teacher Training and Education, Universitas Pejuang, Republic of Indonesia, Makassar.

a) Student Response Analysis

The results of the analysis of student responses to the development of the macromedia flash module can be seen in each category statement in table 5.

Table 5. Results of student Response Analysis

No.	The average score of respondents (1-39 respondent)	Category
1	3,25	Very Practical
2	3,50	Very Practical
3	3,75	Very Practical
4	3,33	Very Practical
5	3,58	Very Practical
6	3,33	Very Practical
7	3,58	Very Practical
8	3,33	Very Practical
9	3,50	Very Practical
10	3,58	Very Practical
11	3,25	Very Practical
12	3,16	Very Practical
13	2,08	Practical
14	3,08	Very Practical
15	3,50	Very Practical
Related	3,32	Very Practical

Source: Student response data analysis, 2022

Based on table 5 shows that students give a good response after following lectures using the macromedia flash module with a score of 3.32,

which means students gave a good response in the very practical category. So it can be concluded that the students' responses strongly agree with the development and use of macromedia flash in supporting the lecture process.

b) Lecturer Response Analysis

In addition to student responses in this limited trial, it also involved one lecturer in charge of the learning media development course to provide information response regarding the development of the macromedia flash module. This assessment is used to determine the lecturer's response after carrying out the lecture process, which can be seen in table 6 as follows:

Table 6. Results of Lecturer Response Analysis

No.	The average score of respondents (1-39 respondent)	Response
1	The macromedia flash module is very practical	4
2	The macromedia flash module is easy to use	3
3	The macromedia flash module can make it easier for lecturers	4
4	The macromedia flash module makes it easier for lecturers to explain the material	4
5	The macromedia flash module adds interaction between lecturers and students	3
6	The macromedia flash module can help students learn independently	4
7	The macromedia flash module is easy to understand	4
8	The macromedia flash module can activate lecturers in the lecture process	3
9	The macromedia flash module uses an attractive graphic design	3
10	The macromedia flash module makes it easier for students to understand the material presented by the lecturer	4
11	Macromedia flash module can develop student talent	3
12	Macromedia flash module can improve student academic achievement	4
13	The macromedia flash module has a clear systematic description	4
14	The macromedia flash module can always be developed with technological developments	4
	Average	3,64

Source: Lecturer response data analysis, 2022

Based on table 6 shows the lecturer's response after carrying out the process study using the macromedia flash module, an average score of 3.64 was obtained, which means that the lecturer's response was in the very practical category. So it can be concluded that the lecturer's response stated that using the macromedia flash module in supporting the lecture process was very practical.

Based on the results of the development with consideration, where the module was developed based on needs in the lecture process to be able to provide benefits for faculty, lecturers, and students.

3) Effectiveness of Macromedia Flash

In general, lecturers and students consider that the development of the macromedia flash module has good qualifications. In the next stage, to determine the effectiveness of the macromedia flash module, field tests were carried out on students using a pre-test and post-test. The pre-test is given to students before the application of the macromedia flash module in the lecture process and the post-test is given to students after the application of macromedia flash in the lecture process is carried out. The following is the data on the pre-test and post-test scores achieved by students in table 9. As follows:

Table 7. Student pretest and posttest score

Number Respondent	Pretest Score	Posttest Score
1	55	88
2	54	88
3	54	90
4	55	90
5	55	88
6	57	90
7	60	88
8	56	85
9	56	90
10	63	98
11	50	90
12	55	90
13	60	88
14	55	85
15	55	90
Average	56,00	89,20

Source: Analysis of the student pre-test and post-test data, 2022

Based on table 7 shows that the pre-test got an average score of 56.00% while the post-test got an average score of 89.20%. This means that the results process lectures before and after using the macromedia flash module are not the same. In other words, it can be said that there is a significant difference between student learning outcomes before and after using the macromedia flash module in the lecture process. In a limited trial, the activities of students and lecturers in the lecture process were in the active category, so it can be said that in the process of developing the macromedia flash module, it met the criteria of being valid, practical, and effective for use in the lecture process.

The learning product developed by the researcher on the macromedia flash module is considered suitable because the level of validity of the two validators has a strong relevance with this validity coefficient of more than 75% with the level of practicality after being given a limited trial to students getting a very practical category with an average score of 3.32 % and the effectiveness of the macromedia flash module could be seen in field trials on students through pre-test and post-test with an average score of 56.00% during the pre-test and 89.20% during the post-test so that the macromedia flash module can help lecturers and students to make the lecture process more effective. These results are in accordance with the results of previous studies which also applied modules in presenting various materials (Cramer, Ross, Plant, & Pschibul, 2018; Septia, Edrawati, & Pratiwi, 2016; Supriharyanti, Usodo, & Slamet, 2020).

CONCLUSION

Based on the research results that have been described, namely, the need, description, level of validity, practicality, and effectiveness of the macromedia flash module, it can be said that in the lecture process, using the macromedia flash module is very supportive and facilitates the lecture process so that learning outcomes can be achieved properly.

Modules need to be designed and developed by following the rules and elements that require them to produce learning modules that are able to play their functions and roles in effective learning.

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