

Electronic Modules in an Indonesian Higher Education: Conceptualisation, Development and Application

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ABSTRACT

One of the 21st-century learning focus is innovation on technology-integrated teaching materials. Teaching materials are often ineffective because lecturers are the primary source of learning activities, resulting in student dependency. This research aimed to develop a Marketing Management E-Module following the feasibility assessment by the experts and measure the effectiveness of the Marketing Management E-Module. The E-Module adopted a 4-D development model (Define, Design, Develop, Disseminate). The data collection was through experts' review and validation tests (material experts, media experts, and linguists) and pre-test and post-test questions. The results showed that the development of the Marketing Management E-Modules is very feasible, shown by the experts' validation assessment of 89.16%. Moreover, Marketing Management E-Module is practical since the student learning outcomes increased after utilising Marketing Management E-Module.

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1. INTRODUCTION

The current development of the digital era is affecting several sectors. One of them is the education sector. There is no denying that the appropriate use of technology will improve performance and allow various activities to be carried out appropriately and quickly. The education sector is greatly supported by today's technology development, no exception for an educator. The ability of educators to achieve learning outcomes can be influenced by several factors supporting the success of a learning process, one of which is the availability of suitable teaching materials.

Suitable teaching materials can support student understanding. Teaching materials are one of the component aspects in implementing a critical learning process (Arsyad, 2017). Teaching materials can be interpreted as materials or lesson materials prepared thoroughly and systematically based on the principles of learning used by teachers and students in the learning process. It should have a certain quality, which can motivate and improve the learning outcomes. One of the teaching materials that support teaching and learning activities is the module. The learning module is a learning resource

designed systematically by experts in specific fields of study according to the rules of design to improve effectiveness and efficiency and increase learners' interest to continue learning, even without the help of teachers. The purpose of the module is to make students surmount the competencies as best as possible. The material in the module contains sequencing, the creation of the sequence of display of the lesson material, and synthesizing, the effort to show the learners the interrelationship between facts, concepts, procedures, and principles contained in the learning material (Santayasa, 2009).

The focus of education on 21st-century learning is to integrate technology, skills, and knowledge in students. It aims to make students become graduates who have qualified competencies to compete globally. Collaborating technology with skills and knowledge is essential to produce these 21st-century learning skills (problem-solving, self-regulated learning, collaboration, sharing ideas, focus on learning, and technology proficiency) (Chelliah & Clarke, 2011). Along with the development of today's technology, modules are developed with innovation and creativity, either in appearance, content, or other components, to make the module's more attractive but still accentuate the content of learning materials. One of the module innovations is integrating electronic learning with subject tailored material modules. Integrated Technology Modules, commonly called E-Modules or Electronic Modules, are more effective and efficient because they only require electronic devices. Electronic module based on communication information technology compared to a print module. An interactive convenience allows users to display or load images, audio, video, and animations and comes with test or formative quizzes that allow live feedback (Tan, 2004). Digital-based learning is very effective and makes it easier for readers to access it because readers do not have to carry heavy textbooks anywhere. E-Module as one of the electronic teaching materials is expected to improve the quality of the learning process. Ideally, the learning process should be a two-way communication process in the learning activities, teaching conducted by the teacher (lecturer) as an educator and students as subjects. Student Learning-Centred communication is an effort to achieve learning objectives, namely achieving changes in behavior or competence in students and individuals who follow the learning process. The use of technology turned out to be effective in the learning process (Tomas, Lasen, Field, & Skamp, 2015). Learning will be more meaningful if the students experience what they learn instead of only knowing it. Electronic media has different benefits. It makes the learning process more engaging, interactive, can be done anytime and anywhere, and can improve the quality of learning.

Target-oriented learning of material mastery is proven to be successful in short-term memory competence. Still, it fails to support the children to solve problems in long-term life. An educator must choose a learning model that can actively encourage each student to engage in their learning experience. Classroom learning has limited time. Thus, the student has to learn more independently. E-module is a digital or non-printing learning media tool that is built systematically for self-learning needs. It demands students to solve problems in their way (Fausih & Danang, 2015). E-Module can be used as a learning medium since it is accessible anywhere and integrated content (video, audio, and images) that help understand the lesson (Suarsana & Mahayukti, 2013). The advantages of E-Module are economical, very efficient to carry, substantial and will not be worn out, and can be equipped with images, video, audio, and animation. It also can reduce the use of paper in the learning process. The E-Module has successfully supported the role of teachers as a source of information and improved student learning outcomes.

Higher education level is expected to produce learning outcomes following the field competence and adequate skills. Marketing Management is a course and prerequisite expertise course in the Business education study program in Higher Education. The course aims to utilize learning resources, information and communication technology to support student competencies. The competencies are the core concept of marketing activities, consumer behavior and factors that affect it, marketing strategies based on Segmentation, Targeting, Positioning, marketing mix consist of product strategy, price, distribution and promotion channels and consumer satisfaction and loyalty.

Current facts show that the learning activities in the marketing management class are still teacher centers. Students are highly dependent on their lecturers. During the in-class learning process, the activities are limited to case studies discussing, and media usage has limitations. Lecturers only use

PowerPoint slides and only occasionally show a video to deliver the material or printed modules. It often felt ineffective because the lecturer is the only source who plays the media. Thus, the material learning achievement result is not maximum, and students tend to be dependent. When students feel comfortable with what has been conveyed by the lecturer. They will never try to explore their abilities optimally, so that it will result in students' perceptions, interests, and attitudes towards courses that will never be optimal (Marlena, Dwijayanti, & Dewi, 2015). The habit of enjoying lectures, for students it may be boring, because they constantly have to listen to the teacher speak (Muthoharoh, 2019). Learning media that lack of variety can be the cause of not achieve the desired learning objectives. There is variation in learning, it is expected that students more active and less easily saturated in the process learning (Fauzi & Wiyono, 2015).

In addition, based on the results of interviews with students, the lack of technology in the learning process makes students less motivated in learning materials. The use of teaching materials modules and power points is also less attractive to students. Considering the material in this Marketing Management course is complex and theoretical. PowerPoint is only used by teachers as a tool to convey material to students in the learning process. The media is only the teacher's control in its use. That is, only teachers use the media, and students are only the target of using the media (Muthoharoh, 2019)

Based on the above problems, as an alternative solution, the development of more interesting, not monotonous, and utilizes digital technology Marketing Management E-Module is necessary. The design of the E-Module should apply enjoyable technology. Thus, the students can understand the course materials easily. It can use 3D Page flip applied to electronic devices, i.e. computers/laptops and cell phones. The development of modules packaged in electronics allows students to learn independently because they can be read using a computer or electronic book reader (Wijayanto & Zuhri, 2014). E-modules are more effective than printed manuals (Astalini, Darmaji, Kurniawan, Anwar, & Kurniawan, 2019). Marketing Management E-Module is developed based on 1) feasibility assessment from experts, 2) students effectiveness measurement

2. METHODS

This research method was Research and Development (R&D). It produces certain products and tests the products' effectiveness. This research is about Marketing Management E-Module. The development of this teaching material uses modifications of the 4-D learning development model consisting of four stages of development, namely Define, Design, Develop, Disseminate (Thiagarajan, Semmel, & Semmel, 1974) (Thiagarajan et al., 1974). The stages of developing this Marketing Management E-Module can be described as follows:

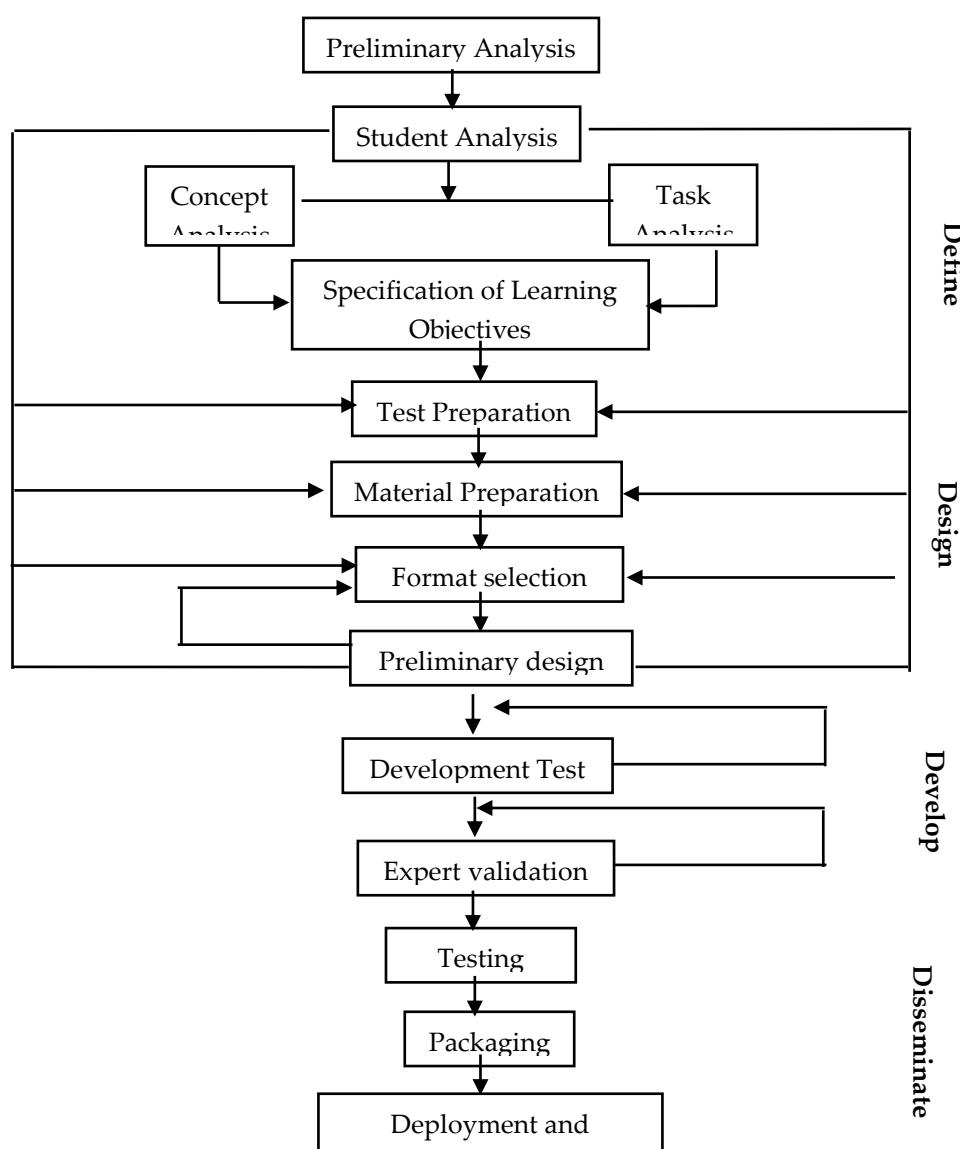


Figure. 2. Marketing Management E-Module Development Model

The subjects for the trial of Marketing Management E-Module were students of Higher Education with a sample of students in the 2017 class of Business education study program. Data collection techniques in this study were documentation, questionnaires, and the test score described as follows:

Table 1. Data Collection Techniques

Technique	Instruments	Output
Document Review	Marketing management courses Semester Learning Plan (RPS)	Curriculum review result
Questionnaire	Expert review and validation sheets	Review and validation sheet by material experts, media experts, and linguists
Question	Pre-test and post-test question sheet	Student Score

The data analysis was 1) Curriculum review, 2) Expert review, 3) Expert validation, and 4) Effectiveness measurement. The result of the curriculum review was the E-modules basis. The material of the E-modules follows the materials in the Marketing Management' Learning Plan. The inputs, responses, opinions, and suggestions from experts' narrative reviews were the basis for E-Module improvement. Moreover, the expert validation on the content of the Marketing Management E-Module under content, presentation, language, and graphic criteria was the basis to calculate the percentage of eligibility using the following formula:

$$\text{percentage} = \frac{\text{Score count (X)}}{\text{Maximum Number of Criteria Score(Y)}} \times 100\%$$

with Criteria Maximum Score = Highest score of each aspect x number of aspects x number of respondents. The percentage result from the calculations then interpreted into the feasibility category of very unfit (0% -20%), not feasible (21%-40%), enough (41% - 60%), worthy (61% - 80%), very feasible (81% -100%). Under these criteria, the Marketing Management E-Module is feasible if it gets $\geq 61\%$ (Riduwan, 2015).

Furthermore, to assess the effectiveness of the Marketing Management E-Module, the students' score from pre-test and post-test was analysed by t-test. Additionally, to get the representative result, experiments under control classes trials were conducted. There were two classes, students with Handout Marketing Management and the other with Marketing Management E-Module.

3. FINDINGS AND DISCUSSION

4-D development model (Thiagarajan et al., 1974) consists of 4 stages, namely Define, Design, Develop, and Disseminate. The development stages of Marketing Management E-Module are as follows:

a. Define

It set the necessity of E-Module development, as the learning medium, following the initial student, concept, and task analysis. The initial analysis aims to discover the fundamental problems in the Marketing Management learning process at the Business Education study program, in Higher Education. Marketing Management course is one of the prerequisites working skill courses. However, many students still do not have a Marketing Management textbook even though the lecturers require it. The in-class learning process is still teacher-centered, with lecture methods and PowerPoint media without various stimuli; thus, the students depend on lecturers.

b. Design

The Marketing Management E-Module designed stage prototype consists of three steps, i.e., composing material, determining format and layout, and designing the initial product. The material followed the Business Education Study Program' curriculum and the Marketing Management Study Plan. It consisted of materials, summaries, problem exercises, and assignments individually and in groups on each topic. Meanwhile, the format and layout are customized, following the student's character. Since Generation Z students are familiar with technology and gadgets in their daily lives; thus, the E-Module is developed to be applied to computers/laptops or gadgets. The E-Module prototypes were using 3D Page Flip application software. Furthermore, the initial design was designed following the layout, colour, and format. The picture below provides the front cover of the Marketing Management E-Module The results obtained from the research have to be supported by sufficient data. The research results and the discovery must be the answers, or the research hypothesis stated previously in the introduction part.

c. Develop

During the development stage, the expert reviewed the E-module and provided narrative input in the review form. Material, media, and linguist experts assessed the E-module feasibility. The material experts provided inputs, opinions, and suggestions regarding the material. In contrast, media experts provide input, opinions, and suggestions on display quality, audio-video and image presentation, and

management of the E-Module. At the same time, linguists provide inputs, opinions, and suggestions related to the language used in the Marketing management E-Module.

Besides the review form, there was an E-Module validation form. It used 5 scale Likert scale to assess the eligibility of the E-module. The material validation provided assessment and measure regarding the material content, learning concepts, and conformity of learning objectives. Media validation assessed and measured the display quality, presentation of audio-video and images, and the management of programs. Language validation assessed and measured the feasibility of the language, suitability, and language immortality. The validation results from the three experts are as follows:

Table 2. Recapitulation of Expert Validation Results

No.	Expert Validation	Percentage	Criteria
1.	Material	91,25%	very feasible
2.	Media	90,67%	very feasible
3.	Language	85,56%	very feasible
Average		89,16%	very feasible

The average results of the validation results assessment of the three experts are 89.16%, which suggests that the teaching materials Marketing Management E-Module is very feasible.

d. Disseminate

This stage is used to test the effectiveness of the Marketing Management E-Module in teaching and learning activities. Testing the effectiveness of the use of teaching materials Marketing Management E-Module is done by conducting experiments. This experiment uses quasi-experimental methods. The control class uses Marketing Management handout teaching materials, while the experiment class uses the Marketing Management E-Module. After the teaching materials, Marketing Management E-Module was completed, conducted testers on a group of a small number of students, at the Higher Education Business education study program. Effectiveness testing is done by comparing the learning results of pre-test and post-test scores. The pre-test value was from the initial value before students used handout teaching materials and Marketing Management E-Module. The post-test value was from the results of student learning value after using handout teaching materials and Marketing Management E-Module. Comparison of the results of the study value of pre-test and post-test students are as follows:

The normality test can be known through the Sig. Shapiro-Wilk value. If the Sig value > 0.05 , then it can be concluded that the data is normally distributed.

Table 3. Test Normality control class and experiment class

Class		Tests of Normality					
		Kolmogorov-Smirnov			Shapiro-Wilk		
		Statistic	df	Sig.	Statistic	df	Sig.
Learning outcomes	Pre-Test Control	,116	37	,200*	,973	37	,511
	Post-Test Control	,124	37	,165	,941	37	,051
	Pre-Test Experiments (Handout)	,179	37	,004	,967	37	,331
	Post-Test Experiments (E-Modul)	,107	37	,200*	,957	37	,166

Table 3 shows that the value of Sig. Control Pre-Test (Handout) $0.511 > 0.05$, which indicates that control pre-test data is Normally distributed. The value of Sig. Post-Test Control (Handout) $0.051 > 0.05$, which indicates that Control Post-Test data is Normally Distributed. As for the value of Sig. Experiment Pre-Test (E-Module) $0.331 > 0.05$, which indicates that The Experiment Pre-Test (E-Module) data is

Normally distributed. Moreover, the Post-Test Experiments (E-Module) score is $0.166 > 0.05$. Thus, it can be concluded that the data is normally distributed.

Furthermore, the control class and the experimental class was conducted an Independent Difference test using Sample T-test

Table 4. Control Class and Experiment Class Free Sample Test Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means						
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
								Lower		Upper
Result	Equal variances assumed	1,334	,252	-3,533	72	,001	-5,243	1,484	-8,202	-2,285
	Equal variances not assumed			-3,533	70,146	,001	-5,243	1,484	-8,203	-2,284

Based on the test results, the t-test obtained a sig value. (2-tailed) $0.001 < .05$ proves an average difference in student learning outcomes between handout teaching materials and Marketing Management E-Module. For more details, the post-test value of the control class with the experimental class is as follows:

Table 5. Statistics Groups of Control Classes and Experimental Classes Group Statistics

Class	N	Mean	Std. Deviation	Std. Error Mean
Post-test control	37	79,54	6,882	1,131
Post-test experiment	37	84,78	5,841	,960

The results showed that the average Post-test value of the control class (Marketing Management Handout) was 79.54, and the average Post-test value of the experiment class (Marketing Management E-Module) was 84.78.

Discussion

The electronic module is a form of presenting self-study material that systematically arranged into the smallest learning units to achieve specific learning objectives that are presented in an electronic format that is it contains animation, audio, navigation that makes the user more interactive with the program (Sugianto, Abdullah, Elvyanti, & Muladi, 2013). Electronic modules can also be used anywhere, so more practical to carry anywhere. And it can present information structured, attractive and have a high level of interactivity. This development research produces teaching material products in Marketing Management E-Module using the 4-D development model, define, design, develop and disseminate (Thiagarajan et al., 1974)(Thiagarajan et al., 1974).

Define stages set the requirements in developing Marketing Management materials as a learning medium. There are 4 steps in defined stages, i.e., (1) initial analysis, (2) student analysis, (3) assignment analysis, and (4) concept analysis. The first step is an early analysis of the main problems during the learning process. Marketing management is a prerequisite course with 4 credits. However, the in-class learning process is still teacher-centred, whereby the lecturer still uses lecture methods using

PowerPoint media without other stimulus variations. Moreover, even though the lecturer has required it, some students do not have the textbook yet.

After identification of the learning process problems, next is an analysis of the research subject. The research subjects were the Business Education class of 2017 students who were 17-19 years old. The age range is considered Generation Z, familiar with gadgets and technology, but did not optimally utilise it in the classroom learning activities. They are still very dependent on the explanation of lecturers (teacher centre). However, the learning process in the classroom has a limited time, so it demands the students to be independent learners. Moreover, many fundamental concepts require students to have a high cognitive understanding. Assignment analysis is the process of questions compilation to be assigned to the students during the learning process following the Marketing Management E-module. The questions aim to measure student understanding of the material (cognitive ability). The assignment questions are customized under student's characteristics. The cognitive ability is assessed thru writing test questions, assessments in their workbooks, and skill assessments containing case studies. The concept analysis is designing the learning media that facilitate students to understand the systematically arranged materials. The Marketing Management E-Module was adjusted to the learning objectives arranged in the Semester Learning Plan. The materials prepared were also following the materials in the Semester Learning Plan. The material designed in Marketing Management E-Module was arranged briefly to make it easier to understand, thus improving students' cognitive abilities and critical thinking.

The design stage selects and prepare the Marketing Management E-Module format, including materials, images, videos to add to the attractiveness and completeness of the E-Module, and test questions and assignments. The e-module development aims to coerce independent learners, and thus students do not rely much on the lecturers. Marketing Management E-Module is designed using 3D Page Flip application with doc. or pdf format, which is then saved in .3DP format for computer /laptop and converted in .apk format to be applied to gadgets. At this stage, the Marketing Management E-Module referred to as draft 1, which consists of three parts, a) opening (front cover, E-Module identity page, preface, table of contents, picture list, table of tables, E-Module position map, and glossary), b) content (introduction, learning, and evaluation), and c) closing (bibliography, answer key, author identity, and back cover)

In the development stage, the experts assess draft 1. In this study, there are three validators, i.e., material, linguists, and media experts. Assessments are conducted on the inert study provided. There suggestions or inputs from experts for the improvement of teaching materials Marketing Management E-Module were a) material experts provide advice for cover more highlighted the name of the course "Marketing Management", materials adapted to RPS and indicators, the materials are more specific to the competence of practitioners, psychomotor training measures should be shown by numbering b) media experts advise for the front cover should be using one font type and accent cover is not excessive, while for the back cover of the background of the writing is adjusted, for the content should be the appearance of the image is done with criteria 1/2 and Shapes do not need to be excessive, c) linguists advise others the need for correction related to spelling sentences, should pay attention to EBI (Spelling Bahasa Indonesia) and sentence drafting should use the Indonesian language first then a foreign language.

After the revision, the experts further assessed the feasibility of the Marketing Management E-Module. Material experts conduct an assessment based on presenting material content, learning concepts, and conformity of learning objectives. Media experts conduct assessments based on display quality, video and image audio presentation, and program management applied to E-Modules. At the same time, linguists conduct assessments based on the use of language, suitability, and language

immortality. The data of expert validation results are analysed with percentage techniques and then interpreted the results. The result validator of the material shown in table 2 is 91.25% which means 'very feasible'. This feasibility percentage is based on the analysis of the quality of content and objectives with indicators of accuracy, interest, interest/ attention, conformity with the consignment of the student's situation. The quality of electronic module material contents is very decent. In addition, assessing the feasibility of the material based on instructional quality analysis includes providing learning opportunities, providing assistance for the learning, motivating quality, and instructional flexibility. The value given by the media validator shown in table 2 is 90.67% which means it is very feasible. The category deserves to be used as a learning medium based on the quality of media (Fauzi & Wiyono, 2015)

Moreover, the assessment given by the language validator shown in table 2 is 85.56%, which is very feasible. The percentage is obtained from indicators of accuracy, balance, and conformity with the student's situation based on feasibility indicators. E-Module using multimedia flipbook worth using in the learning process (Sugianto et al., 2013). Based on all the analysis and assessment results of the three material expert validators, media experts obtained an average percentage of 89.16% (at table 2) with very decent interpretation criteria. It shows that the development of Marketing Management E-Module teaching materials is feasible to continue at the trial stage in the learning process. Electronic media is an effective teaching tool (Areerachakul, 2015)

The fourth stage, dissemination, was conducted to test the effectiveness of the Marketing Management E-Module through experiments tested on the Business Education students' class of 2017, in Higher Education. Based on table 5, there is a difference in the value of learning outcomes between control classes that use Marketing Management Handouts and experiment classes that use Marketing Management E-Module. Student learning outcomes that use teaching materials Marketing Management E-Module are better than students who study without it. Academic achievement is one of the indicators of the success of the educational process. The learning outcomes can be in the form of knowledge/cognitive, attitude/affective, and psychomotor skills (Kumara, 1990) which is implemented by mastery of concepts, development of student attitudes, and improvement of student skills. The first factor is the mastery of the concept in question is; the students can define, describe and classify marketing management, the type of marketing strategy that can be applied in a business or at the time of new product development. Many studies have proven that cognitive ability and academic achievement were previously predictors of student success in the educational process. The second factor is the development of student attitudes/ affective, which are the description of materials and assignments designed by researchers intended to develop student attitudes in behaving by the indicators formulated in the Marketing Management Semester Learning Plan (RPS). So, when lecturers help students to obtain information on the material that is being discussed at the time of learning, then what is done by the lecturer is to throw a stimulus so that students can capture ideas, values, ways of thinking, and meaningfulness in a learning process. So, at that time, it is more critical for a lecturer to teach students how to learn. In other words, the learning process will be able to affect the development of students to be able to educate themselves (Joyce, 2009). The third factor is improving students' skills/psychomotor, which is intended to be an assignment designed in the Marketing Management E-Module encouraging students to explore their skills further. Examples include promotional mix strategy materials. In that material, students must develop a promotional strategy that suits the product they are promoting. So, students start exploring what promotional media is appropriate to use for product promotion

4. CONCLUSION

The result of this research is to produce teaching materials in the form of E-Module Marketing Management by utilizing the use of technology. Development of Marketing Management E-Module

adopts 4D development steps (Thiagarajan et al., 1974). Based on the assessment results from the validators, namely material experts, media experts and language experts, the average assessment of this E-Marketing E-Module teaching material is 89.16%, so the Marketing Management E-Module is very feasible and can be applied to learning activities. Meanwhile, based on the measurement of student effectiveness on the use of marketing management E-module teaching materials, it shows that there is an increase in student learning outcomes after using the Marketing Management E-Module in the learning process compared to the use of Hand out teaching materials. The average post-test score for the control class using the Marketing Management Handout was 79.54% and the post-test average for the experimental class using the Marketing Management E-Module was 84.78%. This shows an increase in student learning outcomes by 5.34% after using the Marketing Management E-Module teaching materials.

The implication of developing the Marketing Management E-Module is an alternative teaching material applied to electronic devices such as computers/laptops and cell phones. Through this Marketing Management E-Module, students can learn independently. Marketing Management E-Module is quite similar to the E-Book. Still, the content is packaged briefly with materials, summaries, problem exercises, and assignments individually and in groups in each course presented, which serves as learning material for reminding the substance of the material on each subject. However, this E-Module is not the only source of student learning but can be combined with other learning resources. E-Module developed are not a substitute for face-to-face class but integrate with the in-class, out-class, and virtual learning so that students are expected to be more independent.

This research is limited to developing the Marketing Management E-Module and testing the effectiveness of learning outcome is conducted on a small group of students in one college only. Further research is to disseminate further by conducting effectiveness tests on the Marketing Management E-Module in several universities. In addition, the E-module needs an improvement by adding content or case study online links to complete the content of learning materials. In this section, you have to provide the general conclusions of your paper followed by the your recommendations for future studies or your future prediction of the potential consequences of the conclusion of your study. You may also put your personal reflection after conducting your study.

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