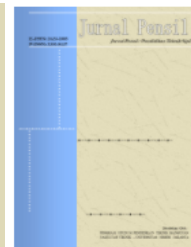


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STUDENTS' PERCEPTIONS ON THE USE OF E-MODULES IN BUILDING ENGINEERING EDUCATION STUDY PROGRAM

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Abstract

This study aims to examine student perceptions of the use of e-module teaching materials in the Concrete Stone Practice course, Building Engineering Education study program, Faculty of Engineering, State University of Jakarta. This research is descriptive-quantitative research, with the data collection instrument in the form of a questionnaire. There are four indicators that are measured in knowing students' perceptions of the use of e-module teaching materials, namely the presentation of the material, language, graphics, and usefulness. The research population is Building Engineering Education students batch 2021 who take the Concrete Stone Practice course in the even semester of the 2021/2022 academic year with a research sample of 74 students. The results showed that students' perceptions of the use of the Concrete Concrete Practice e-module as a whole obtained an average of 86.39% in the very good category. This can be seen from the majority of students' perceptions showing that they agree and strongly agree with the presentation of the material, language, graphics, and benefits contained in the Concrete Stone Practice e-module that can help in the learning process. There is also supporting data, which is student score data during the learning process for the Concrete Stone Practice course, where the overall average score of 81.35 is included in the good category. Based on these results, it indicates that the concrete stone practice e-module can be used as an excellent alternative to help the student learning process in the Concrete Stone Practice course in the Building Engineering Education study program, State University of Jakarta.

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Introduction

In the world of education, one form of advance in information and communication technology is shown by allowing educators to develop more effective and interactive teaching materials so that they can be used more easily and optimally in the learning process (Mawardi et al., 2019; Nurdyansyah & Mutala'iah, 2015). Another statement was expressed by Khoir et al. (2020) that the development of information and communication technology in the field of education can also motivate educators to continue to develop teaching materials used in delivering learning to students, so that educators are required to be able to master, understand, and take advantage of existing technological advances in order to create outstanding students and can learn independently and creatively. This is related to the ratification of the Indonesian National Qualification Framework (KKNI) and Presidential Regulation No.8 of 2012 and Law No.12 of 2012 concerning Higher Education, that with the situation of the development of technology and the dynamics of global development in the current industrial era 4.0, all universities are required to adjust their curriculum and teaching materials to be applied (Peraturan President Republik Indonesia Nomor 8 Tahun 2012, 2012).

The learning process will be more effective, if educators are able to apply the teaching materials needed by students (Akrim, 2018; Laili et al., 2019; Wartini et al., 2015). As the learning process that occurs today in the conditions of the Covid-19 pandemic, Jakarta State University applies a blended learning system that takes place online and offline. Where practical learning is carried out face-to-face (offline) with a capacity of 50% of students and theoretical learning is carried out remotely (online) (Pembatasan Activity Di Kampus Bagi Dosen, Tenaga Kependidikan Dan Mahasiswa Di Lingkungan Universitas Negeri Jakarta Selama Masa Pandemi Covid-19 Varian Omicron, 2022). Therefore, teaching materials play an important role in helping the learning process carried out by

educators and students (Hasanah et al., 2020; Nartiningrum & Nugroho, 2021; Nur Jannah et al., 2020).

Teaching materials that are widely used along with the development of the technological era and the current conditions of the Covid-19 situation, one of which is e-modules (Purnamasari et al., 2020; Serevina et al., 2022). The use of e-modules is felt to be able to support the learning process carried out in blended learning and online, because e-modules are teaching materials resulting from the development of printed modules that utilize existing technological developments (Murtinugraha & Ramadan, 2020; Puspitasari, 2019; Wijayadi & Putra, 2019). This development aims to make it easy for students to learn and understand the material by themselves, because the e-module is systematically designed and presented into electronic format so that it can be used anytime and anywhere (Dzakwan et al., 2021; Elvarita et al., 2020; Tampubolon et al., 2017). The e-module also does not only contain text and images, but is equipped with audio, animated video access, and is enhanced with formative tests that make students more interactive with the meter presented (Indra & Saleh, 2021; Lastari et al., 2021; Puspitasari, 2019). The use of e-modules in the learning process is expected to help the learning process of students in accordance with the learning style they like, so that the learning objectives set can be achieved (Hasibuan & Andromeda, 2021; Ramadan et al., 2020; Rini et al., 2020).

The Concrete Stone Practice course is a practical course that must be followed by students of the Building Engineering Education Study Program. In the learning process, the Concrete Stone Practice course explains the relationship between procedures or work steps that can help students understand the process of service work as implementers of Building building workers (Yunika et al., 2020) such as studying tools and materials, occupational health and safety (K3) procedures, as well as theories and procedures in the installation of

brick walls, installation of floor tiles, installation of wall porcelain, plastering, sprinkling, and lighting the walls, as well as making structural reinforcement, which is also a competency achievement that must be carried out by students in following the learning process in the Concrete Stone Practice course. Thus, teaching materials are needed that are able to provide interactive simulations by involving many body senses, such as eyes, ears, and others (Aydin & Aytekin, 2018; Hafisah et al., 2016) so that it can facilitate students' understanding of the Concrete Stone Practice course in applying the procedures or steps of the work.

Therefore, to help the learning process in the Concrete Stone Practice course, (Indra et al., 2021) developed e-module teaching materials to help learn the Concrete Stone Practice course. The e-module teaching materials in the presentation of the material are very attractively designed using Photoshop and Microsoft powerpoint software. In addition, the e-module is also equipped with a QR-Code feature, learning video hyperlinks, and navigation features so that it can be used easily and optimally in the learning process. The teaching materials have been validated by media experts and experts. material with successive assessment results of 81.15% and 88.41% which means that the e-module is worthy of use. Therefore, the purpose of this study is to find out how students' perceptions until the end of learning using the e-module so that it can be used as an evaluation for educators in improving and perfecting the learning program in the course.

Perception itself according to Walgito, (2010), is a process preceded by sensing, that is, the process of an individual obtaining a stimulus through his senses, also called a sensory process, after which the stimulus is extended and the process of perception begins. Where the stimulus in this study is the provision of e-module teaching materials to be used in the learning process of the Concrete Stone Practice course and then accepted by students to learn the content of the e-module which

involves many senses in its use in the learning process. The result of this perception can later be a measure of the success rate of whether the teaching material can be used next or there must be an evaluation first so that the teaching material becomes better used in the learning process.

Based on the background above, the researcher will conduct research with the title Student Perceptions of the Use of E-Modules in the Concrete Stone Practice Course of the Building Engineering Education Study Program, Faculty of Engineering, State University of Jakarta. The results obtained can be used as a measure of perception related to the assessment of the use of e-modules in the learning process of the Concrete Stone Practice course. Student perceptions in terms of the content contained in the e-module can help in the learning process or not.

Literature review and hypothesis development

Perception

Perception is a stimulus process that can come from outside the individual self, but can also come from within the individual in question. In perception contains intergrated activities, then everything in the individual such as experience, thinking ability, and other aspects that exist in the individual will play a role in the perception (Algahtani et al., 2020; Arends, 2008). According to Walgito, (2010), perception is a process preceded by a sensing process, that is, it is the process of receiving a stimulus by an individual through a sensory apparatus or also called a sensory process. Perception is also an integred activity in the individual. According to Slameto, (2010), perception is a process that concerns the entry of messages or information into the human brain. Through perception, man constantly establishes a relationship with his environment. This connection is carried out through his senses, namely the senses of sight, listener, touch, taste, and smell.

E-Module

E-module is an independent teaching material that is systematically arranged into the smallest learning units to achieve certain learning objectives presented in electronic form containing animation, audio and navigation which expects students to be more interactive with the teaching materials (Misbah et al., 2021; Prasetyowati & Tandyonomanu, 2015). In addition, e-modules can be interpreted as one of the digital-based learning facilities that are systematically packaged and interesting which contain material, methods, and ways of evaluating, and are equipped with exercises to support the achievement of competencies in accordance with the curriculum (Asrial et al., 2019; Laili et al., 2019; Samiasih et al., 2017).

Concrete Stone Practice Course

The Concrete Stone Practice course is one of the practical courses in the Building Engineering Education study program, Faculty of Engineering, Jakarta State University. The Concrete Stone Practice course requires the skills of students in carrying out the practicum learning process. The material contained in the Concrete Stone Practice course, has learning outcomes that include the preparation of 1/2 brick wall pairs, the preparation of 1 brick wall pairs, plastering, scavenging, and embodiment of walls, installing floor tiles, installing wall porcelain, and assembling reinforcement of column structures, beams, and sloofs. By taking the Concrete Stone Practice course, students are expected to be able to understand the theory and have skills in the practice of wall arrangement, and structural reinforcement assembly.

Research Methods

This research was carried out at the Building Engineering Education Study Program, Faculty of Engineering, Jakarta State University. This research took place in the even semester of the 2021/2022 academic year starting from March to June 2022. The subject of the study is students in

the even semester of the 2021/2022 academic year who take the Concrete Stone Practice course. The population in this study is students of the Building Engineering Education study program, Faculty of Engineering, Jakarta State University who are taking the Concrete Stone Practice course in the even semester of the 2021/2022 academic year. A total of 20 students have been taken as instrument trials. Therefore, the total population used in this study amounted to 74 students. The samples used in this study were students who took concrete stone practice courses in the even semester of the 2019/2020 academic year totaling 74 people.

The method used in this study is quantitative descriptive research. The trial of this instrument was carried out by providing instruments to respondents who were part of the research sample, namely 20 (twenty) Building Engineering Education students who took concrete stone practice courses in the even semester of the 2021/2022 academic year. Instrument trials are carried out to obtain valid and reliable instruments through instrument validity and reliability tests. The test of the validity of the instrument items used is to use the product moment formula as follows (Suharsimi, 2006):

$$r_{xy} = \frac{N \sum XY - (\sum X)(\sum Y)}{\sqrt{\{N(\sum X^2) - (\sum X)^2\}\{N(\sum Y^2) - (\sum Y)^2\}}}$$

Information:

- r_{xy} = Product Moment Correlation
- N = Number of Respondents
- $\sum X$ = Number of item scores
- $\sum Y$ = Total number of scores obtained by respondents
- $\sum X^2$ = Sum of squares of grains
- $\sum Y^2$ = Total squared number of scores obtained by each respondent
- $\sum XY$ = The number of multiplication results between the item score and the number of scores obtained by each respondent

And to determine the reliability used the alpha formula Cronbarch (Suharsimi, 2006):

$$r_{11} = \left(\frac{k}{k - 1} \right) \left(\frac{\sum \sigma_b^2}{\sigma_t^2} \right)$$

Information:

- r_{11} = Reliability sought
- $\sum \sigma_b^2$ = Number of grain variances
- σ_t^2 = Total variance
- k = Number of items

Data collection techniques are carried out by giving a set of questions or written statements to respondents to be answered (Sugiyono, 2019) data from the Building Engineering Education study program in the form of student name data, student value data in the Concrete Stone Practice course, and learning activities in the Concrete Stone Practice course. The data analysis technique in the study used in this study is a descriptive statistical technique.

Results and Discussion

Table 1. SPSS descriptive analysis test results indicators of material presentation on plastering, creating, and imaging materials

Student perception on linguistic					
		Frequency	Percent	Valid percent	Cumulative percent
Valid	Good enough	2	2.7	2.7	2.7
	Good	6	8.1	8.1	10.8
	Very Good	66	89.2	89.2	100.0
	Total	74	100.0	100.0	

Table 2. SPSS descriptive analysis test results of linguistic indicators on plastering embodiment, and imaging materials

Student perception on linguistic					
		Frequency	Percent	Valid percent	Cumulative percent
Valid	Good enough	2	2.7	2.7	2.7
	Good	11	14.9	14.9	17.6
	Very Good	61	82.4	82.4	100.0
	Total	74	100.0	100.0	

Table 3. SPSS descriptive analysis test results graphic indicators on plastering, creating, and imaging materials

Student perception on linguistic					
		Frequency	Percent	Valid percent	Cumulative percent
Valid	Good enough	2	2.7	2.7	2.7
	Good	9	12.2	12.2	14.9
	Very Good	63	85.1	85.1	100.0
	Total	74	100.0	100.0	

Table 4. SPSS descriptive analysis test results of benefit indicators on planning, embodiment, and imaging materials

Student perception on linguistic					
		Frequency	Percent	Valid percent	Cumulative percent
Valid	Good enough	2	2.7	2.7	2.7
	Good	10	13.5	13.5	16.2
	Very Good	62	83.8	83.8	100.0
	Total	74	100.0	100.0	

Table 5. SPSS descriptive analysis test results material presentation indicators on material installing floor tiles

Student perception on linguistic					
		Frequency	Percent	Valid percent	Cumulative percent
Valid	Good enough	3	4.1	4.1	4.1
	Good	4	5.4	5.4	9.5
	Very Good	67	90.5	90.5	100.0
	Total	74	100.0	100.0	

Table 6. SPSS descriptive analysis test results linguistic indicators on material installing floor tiles

Student perception on linguistic					
		Frequency	Percent	Valid percent	Cumulative percent
Valid	Good enough	2	2.7	2.7	2.7
	Good	10	13.5	13.5	16.2
	Very Good	62	83.8	83.8	100.0
	Total	74	100.0	100.0	

Table 7. SPSS descriptive analysis test results graphic indicators on material installing floor tiles

Student perception on linguistic					
		Frequency	Percent	Valid percent	Cumulative percent
Valid	Good enough	2	2.7	2.7	2.7
	Good	6	8.1	8.1	10.8
	Very Good	66	89.2	89.2	100.0
	Total	74	100.0	100.0	

Table 8. SPSS descriptive analysis test results indicators of expediency in material installing floor tiles

Student perception on linguistic					
		Frequency	Percent	Valid percent	Cumulative percent
Valid	Good enough	2	2.7	2.7	2.7
	Good	9	12.2	12.2	14.9
	Very Good	63	85.1	85.1	100.0
	Total	74	100.0	100.0	

Table 9. SPSS descriptive analysis test results indicators of material presentation on material installing porcelain on walls

Student perception on linguistic					
		Frequency	Percent	Valid percent	Cumulative percent
Valid	Good enough	2	2.7	2.7	2.7
	Good	3	4.1	4.1	6.8
	Very Good	69	93.2	93.2	100.0
	Total	74	100.0	100.0	

Table 10. SPSS descriptive analysis test results linguistic indicators on material installing porcelain on walls

Student perception on linguistic					
		Frequency	Percent	Valid percent	Cumulative percent
Valid	Good enough	1	1.4	1.4	1.4
	Good	8	10.8	10.8	12.2
	Very Good	65	87.8	87.8	100.0
	Total	74	100.0	100.0	

Table 11. SPSS descriptive analysis test results graphic indicators on material installing porcelain on walls

Student perception on linguistic					
		Frequency	Percent	Valid percent	Cumulative percent
Valid	Good enough	1	1.4	1.4	1.4
	Good	11	14.9	14.9	16.2
	Very Good	62	83.8	83.8	100.0
	Total	74	100.0	100.0	

Table 12. SPSS descriptive analysis test results indicators on expediency on material installing porcelain on walls

Student perception on linguistic					
		Frequency	Percent	Valid percent	Cumulative percent
Valid	Good enough	1	1.4	1.4	1.4
	Good	8	10.8	10.8	12.2
	Very Good	65	87.8	87.8	100.
	Total	74	100.0	100.0	

Table 13. SPSS descriptive analysis test results indicators of material presentation on material making reinforcement structure

Student perception on linguistic					
		Frequency	Percent	Valid percent	Cumulative percent
Valid	Good enough	4	5.4	5.4	5.4
	Good	4	5.4	5.4	10.8
	Very Good	66	89.2	89.2	100.0
	Total	74	100.0	100.0	

Table 14. SPSS descriptive analysis test results of linguistic indicators on material making structural reinforcement

Student perception on linguistic					
		Frequency	Percent	Valid percent	Cumulative percent
Valid	Good enough	3	4.1	4.1	4.1
	Good	13	17.6	17.6	21.6
	Very Good	58	78.4	78.4	100.0
	Total	74	100.0	100.0	

Table 15. SPSS descriptive analysis test results graphic indicators on materials to make reinforcement structure

Student perception on linguistic					
		Frequency	Percent	Valid percent	Cumulative percent
Valid	Good enough	3	4.1	4.1	4.1
	Good	6	8.1	8.1	12.2
	Very Good	65	87.8	87.8	100.0
	Total	74	100.0	100.0	

Table 16. SPSS descriptive analysis test results indicators of expediency in materials making reinforcement structure

Student perception on linguistic					
		Frequency	Percent	Valid percent	Cumulative percent
Valid	Good enough	3	4.1	4.1	4.1
	Good	8	10.8	10.8	14.9
	Very Good	63	85.1	85.1	100.0
	Total	74	100.0	100.0	

Based on the results of research that has been carried out by students' perceptions of the use of e-modules in the Concrete Stone Practice course, there are four indicators that are assessed, namely the presentation of the material, language, graphics, and expediency. The instrument was given to 74 respondents through a google form after the delivery of learning materials using the Concrete Stone Practice e-module assisted by the online learning management system platform of The State University of Jakarta (LMS UNJ). The material provided is material after Mid-Exam, namely plastering, scavenging, and embodiing, installing floor tiles, installing porcelain on walls, and making structural reinforcement.

Students' perception of the first indicator, namely the presentation of material in the Concrete Stone Practice e-module, obtained based on the results of descriptive statistical calculations that have been carried out using the help of the SPSS version 25 program, shows that students' perceptions fall into the very good category. In detail, the results of descriptive statistical calculations that have been carried out on the material of plastering, sifting, and realization obtained a value of 89.20%, in the material of installing a floor tile obtained a value of 90.50%, in the material installing porcelain on the wall a value of 93.20%, in the material making structural reinforcement obtained a value of 89.20%. As for the results, it was found that the majority of students' perceptions of the use of e-

modules can help in the learning process with the completeness of the material presentation contained in the Concrete Stone Practice e-module which is packaged properly and completely, this is shown by the dominance of students who can easily understand and carry out practical activities well on every material learned after Mid-Exam, namely plastering, sifting, and embodiing, installing floor tiles, installing porcelain on the walls, and making structural reinforcement with the completeness of the material presentation on the e-module in the form of work steps, animated videos, working drawings, and summary learning materials. This is in line with what was revealed by the (Helmi, 2017; Ramdani et al., 2021) that good teaching materials should contain material that supports the achievement of competency standards, conformity with the development of students, and conformity with the needs of teaching materials. Therefore, the aspect of presenting the material contained in the Concrete Stone Practice e-module is seen from the results of student perceptions that it is in good standards so that it can help in the learning process.

Students' perception of the second indicator, namely language in the Concrete Stone Practice e-module, obtained based on the results of descriptive statistical calculations that have been carried out using the help of the SPSS program version 25, shows that student perceptions fall into the very good category. In detail, the results of descriptive statistical calculations that have been carried out on plastering, scavenging, and realifying materials obtained a value of 82.40%, in the material installing floor tiles obtained a value of 83.80%, in the material installing porcelain on the wall a value of 87.80%, in the material making structural reinforcement obtained a value of 78.40%. As for the results, it was found that the majority of students' perceptions of the use of e-modules can help in the learning process with the language contained in the Concrete Stone Practice e-module so that students' interest in reading and understanding increases in learning the

material after Mid-Exam contained in the Concrete Stone Practice e-module, this is shown by the readability of the e-module is well packaged where a clear text and terms are presented used accompanied by explanations. In addition, the majority of students also get new insights related to studying material after Mid-Exam contained in the Concrete Stone Practice e-module, this is shown by the information presented on the material in the form of work steps, animated videos, and summary learning materials and the terms used in the e-module are packaged completely and clearly. Then, the majority of students are also not bored in studying the material after Mid-Exam contained in the Concrete Stone Practice e-module, this is shown by the use of language and sentences in the e-module packaged clearly, correctly, and communicatively. This is in line with what was revealed by the Ministry of National Education that good teaching materials have a language that is in accordance with the rules of good and correct Indonesian, namely in writing teaching materials must be in accordance with the KBBI spelling guidelines so that students have a good interest in reading in learning it, besides that also in the use of language must be effectively and efficiently so that students are not bored in learning it, then writing sentences in the material presented must also have clear clarity of information so that students can easily understand and add insight. Therefore, the linguistic aspects contained in the Concrete Stone Practice e-module are seen from the results of student perceptions are already in good standards so that they can help in the learning process.

Students' perceptions of the third indicator, namely graphics in the Concrete Stone Practice e-module, obtained based on the results of descriptive statistical calculations that have been carried out using the help of the SPSS version 25 program, show that student perceptions fall into the category of very good. In detail, the results of descriptive statistical calculations that have been carried out on the material of plastering, sifting, and realization obtained a

value of 85.10%, in the material of installing a floor tile obtained a value of 89.20%, in the material installing porcelain on the wall a value of 83.80%, in the material making structural reinforcement obtained a value of 87.80%. As for the results, it was found that the majority of students' perceptions are very good towards the use of e-modules that can help in the learning process with the graphicness contained in the Concrete Stone Practice e-module so that the majority of students feel easy to read the Concrete Stone Practice e-module on the material after Mid-Exam, this is shown by the use of letters in the e-module is considered appropriate and clear where the size and typeface contained in the e-module are presented. In addition, the majority of students can also be helped in the learning process of the material after Mid-Exam with the use of illustrations, graphics, photos contained in the Concrete Stone Practice e-module is well packaged, this is shown by working pictures, animation videos, and narration in animated videos on the e-module is clearly available, and the use of illustrations in images and animated videos on the e-module is also considered appropriate and clear. Then, it was also found that the majority of students' interest in learning material after Mid-Exam contained in the Concrete Stone Practice e-module, this is shown by the suitability of text colors and backgrounds and the design on the e-module is attractively packaged. This is in line with what was revealed by the Ministry of National Education that good teaching materials have a graphic aspect where the use of font types, font sizes, font colors and paragraph shapes must be easy to read and support the material. In addition, illustrations, drawings, photos must be attractive, simple and illustrative. Then the appearance design must be attractive, simple and illustrative which can attract interest in learning. Therefore, the graphic aspect contained in the Concrete Stone Practice e-module is seen from the results of student perceptions that they are in good standards so that they can help in the learning process.

Students' perception of the fourth indicator, namely expediency in the Concrete Stone Practice e-module, obtained based on the results of descriptive statistical calculations that have been carried out using the help of the SPSS version 25 program, shows that student perceptions fall into the very good category. In detail, the results of descriptive statistical calculations that have been carried out on the material of plastering, sifting, and realization obtained a value of 83.80%, in the material of installing floor tiles obtained a value of 85.10%, in the material installing porcelain on the wall a value of 87.80%, in the material making structural reinforcement obtained a value of 85.10%. As for the results, it was found that the majority of students' perceptions are very good towards the use of e-modules that can help in the learning process with the benefits contained in using the Concrete Stone Practice e-module so that the majority of students are found easy to use the Concrete Stone Practice e-module during the learning process, this is shown by the presence of navigation buttons on the e-module and the e-module can be accessed anytime and anywhere, this can make it easier for students to operate e-modules during the learning process. In addition, it was found that students felt it was easy to follow the learning process using the Concrete Stone Practice e-module, this shows that students can understand and carry out practical activities easily and correctly in each material after Mid-Exam. Then, it was found that students' learning motivation increased in learning material after Mid-Exam contained in the Concrete Stone Practice e-module, this was shown by students being able to try, practice, study independently and be more active in the learning process after using the Concrete Stone Practice e-module. This is in line with what was expressed by (Susilana & Riyana, 2008) that good teaching materials have an aspect of expediency where teaching materials can overcome the limitations of space, time and sensory power. Then it can overcome the passive attitude of students by generating desire to learn, allowing direct

interaction between students and the environment, and allowing students to learn independently according to their abilities and interests. Therefore, the benefit aspect contained in the Concrete Stone Practice e-module is seen from the results of student perceptions that they are in good standards so that they can help in the learning process.

The supporting data in this study is student value result data which is the overall average score of students in following the learning process on the material after Mid-Exam. From the score data, the results of each student's perindividu score were obtained, none of which were below the graduation standard, which was below 70 or B in each material. Then if the average value on each material, where the material plastering, sifting, and embodiing is obtained is 81.35, in the material installing the floor tile is obtained by 81.08, in the material installing porcelain on the wall is obtained by 81.96, and in the material making structural reinforcement obtained by 81.01. From these results, it can be said that student scores are included in the good category, this proves that the Concrete Stone Practice e-module can help students' abilities in the learning process in terms of learning outcomes in each material they study. It can also be a support that good student perceptions of the use of the Concrete Stone Practice e-module during the learning process can have a good impact on the value achieved by students.

Based on the discussion above, it can be concluded that the use of e-modules can be used as an excellent alternative to be used in helping the learning process in the Concrete Stone Practice course, which is shown by the excellent student perception of the use of the Concrete Stone Practice e-module which is described into several indicators, namely the presentation of the material, language, graphics, and expediency. In addition, it is also shown by the existence of supporting data, namely the average student learning outcomes in each material after Mid-Exam which is included in the good category.

Conclusion

Based on the description of the research results from the previous discussion regarding students' perceptions of the use of e-modules in the Concrete Stone Practice course for the even semester of the 2021/2022 Academic Year in the Building Engineering Education study program, State University of Jakarta, it can be concluded that students' perceptions of the use of the Concrete Stone Practice e-module on the material after Mid-Exam are plastering, sifting, and embodiment, installing floor tiles, installing porcelain on the wall, and making the overall structural reinforcement obtained an average of 86.39% is included in the excellent category. This can be seen from the majority of students' perceptions showing that they agree and strongly agree with the presentation of material, language, graphics, and benefits contained in the concrete stone practice e-module can help in the learning process. In addition, there is also supporting data, which is student value data during the learning process of the Concrete Stone Practice course on the material after Mid-Exam, where an overall average score of 81.35 is included in the good category.

Based on the results of this study, it shows that e-module teaching materials can be used as an excellent alternative to be used in helping the learning process of students in the Concrete Stone Practice course in the Building Engineering Education study program, State University of Jakarta. This is shown through students' perceptions of the presentation of material, language, graphics, and benefits contained in the Concrete Stone Practice e-module can help in the learning process of entering the excellent category, and the average value of student learning outcomes during the learning process of the Concrete Stone Practice course on the material after Mid-Exam is included in the good category.

With this research, there are suggestions given by researchers, namely as follows 1) To lecturers who teach concrete stone practice courses, the use of the concrete stone practice e-module should be

included in the learning planning of the Concrete Stone Practice course in the next semester. With good learning planning, it is hoped that the Concrete Stone Practice e-module can maximally help the learning process in the Concrete Stone Practice course. So that the learning outcomes and students' understanding of the Concrete Stone Practice course are better and more in-depth. 2) To determine policy in the field of Education, the use of the *Learning Management System platform* at Universitas Negeri Jakarta (LMS UNJ) should be combined with e-module teaching materials so that it can be used as a supporting component for lecturers in an effort to improve the quality of education, especially in the Concrete Stone Practice course in the Building Engineering Education study program, State University of Jakarta. 3) To students, students of the Building Engineering Education study program, especially at Jakarta State University, should take advantage of the Concrete Stone Practice e-module for maximum independent learning. The results of the development research product can make it easier for students, especially in the Building Engineering Education study program, because the e-module is equipped with learning resources such as work steps, animated videos, material summaries, work drawings, exercises and there are also formative tests that can help students measure their independent learning ability. 4) To other researchers, for subsequent similar research, it is better to conduct the research from the beginning of the lecture meeting. This aims to ensure that students' perceptions of teaching materials can be met in all materials contained in the e-module. As well as the research carried out still has not reached on the test for the effectiveness of the e-module in learning which is carried out on a daily basis. Therefore, for other researchers, there is still an opportunity to study further by testing the effectiveness of the e-module. 5) To Advanced Product Development, based on the results of the analysis of students' perceptions of the use of the Concrete Stone Practice e-module,

there are suggestions for the development of the next e-module so that it can be refined with the following several things: a.) In the indicators of presenting the material in the work steps, each work step is added with an image caption to make it easier for students to understand it. b.) In linguistic indicators, especially in the material to make structural reinforcement, it is more improved to present the text, sentences, and terms used to make it easier for students to understand it. c.) In the graphic indicators, it is more checked back on writing because there are still some wrong typings so that it can hinder the student's understanding process in learning it. d.) In the use of image illustrations, the original drawings of the work of each material studied as a true example are given. e.) On the availability of the working image, there is still an incorrect image in the description of the inappropriate size in the presentation of the work step text. So, this makes students feel confused in learning it. f.) In the formative test, the number of questions is increased in each material because the availability of five questions in each material is considered too small.

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