



# The Study of User Responses to the Quality of E-Modules in Blended Learning

Destya Waty Silalahi<sup>1</sup>, Wiyun Philipus Tangkin<sup>2</sup> and Siskawati Dewi Purba<sup>3</sup>

<sup>1,2</sup> Department of Biology Education, Universitas Pelita Harapan, Tangerang 15811, Indonesia

<sup>3</sup> Department of Master of Educational Technology, Universitas Pelita Harapan, Jakarta

<sup>1</sup> desty.silalahi@uph.edu; <sup>2</sup> wiyun.tangkin@uph.edu;  
<sup>3</sup> siskawati.purba@uph.edu

**Abstract.** E-modules are teaching materials that have a significant influence on student's learning processes and outcomes in blended learning. E-modules are very adaptive to technological developments and provide users convenience. This is inseparable from its characteristics such as self-instruction, self-contained; stand-alone, adaptive, and user-friendly. In fact, in the Instructional Alignment course, not all students use the e-module provided by the lecturer. Therefore, this study aims to find out why some students did not use the E-module and how the quality of the E-module provided was based on the characteristics of a good e-module. This study uses a mixed-method approach that combines qualitative and quantitative methods. This method will be used to describe the results of questionnaires and interviews with 130 students participating in the course. The results of the data analysis show that 94% of students always used the e-module provided and 6% didn't always use it. The reasons why some students do not always use e-modules are the habit of procrastinating work and lack of self-regulation skills. The results of data analysis on the fulfillment of e-module characteristics based on user ratings are 98% self-instruction, 98% self-contained, 58% standalone, 94% adaptive, and 91% user-friendly. Based on this, it can be concluded that the quality of the e-module based on user ratings is categorized as good but still needs to have improvements to meet the stand-alone characteristics.

**Keywords:** E-module, Blended Learning, Teaching Materials, Students Responses.

## 1 Introduction

The development of the world today is characterized by technological developments. Technological developments also affect the field of education. Especially during a pandemic, learning must use media to accommodate social distancing needs, known as online learning. But after the pandemic, online learning has not been abolished but has become alternative learning or even a complement to onsite learning. In the

2022/2023 academic year, the implementation of learning at the Faculty of Education, Universitas Pelita Harapan, changed from an online system in the previous year to a blended learning using a flipped classroom model. Students will conduct learning in two phases, namely outside the classroom (asynchronous learning) and in the classroom (synchronous learning).

Asynchronous learning is carried out before face-to-face activities by following activities designed by lecturers in LMS Moodle or teams and synchronous learning through face-to-face in the classroom. Graham Brent Johnson says that the flipped classroom learning model minimizes the amount of direct instruction but maximizes one-on-one interaction [1]. In asynchronous learning, the use of technology supports accessing learning materials and can be accessed online and offline anytime and anywhere. While the phase in the classroom is used to collaborate with both fellow students and teachers related to the topic studied.

This change in the learning system encourages the need for learning resources that can be used in a blended learning context with a flipped classroom model. This learning resource is expected to facilitate teachers and students, to achieve Course Learning Outcomes effectively and systematically, in a blended learning system. The teaching materials used in the 2022/2023 school year are then arranged in a more structured form in the form of e-modules. This change also occurred in the instructional alignment course, a compulsory subject for second-semester teacher candidate students in the Faculty of Education, Pelita Harapan University. This course provides students with an understanding of the principles of lesson planning and how to implement them in learning designs. The application of learning with a blended learning approach must pay attention to the use of ICT, which is necessary for organizing Asynchrony activities [2]. For this reason, the lecturer compiled an e-module by utilizing the Moodle LMS which is an LMS provided by Pelita Harapan University.

There has been extensive research on the development of e-modules in general, the use of Moodle LMS specifically for e-modules at the university level is relatively rare. Based on searches conducted using the Publish or Perish (PoP) software on Google Scholar, there are 64 articles that have been published in the last 10 years related to e-module using the keywords Moodle, higher education, and course. Among those, only one publication focused on implementing e-modules with Moodle LMS in design instructional courses. This article is a study conducted by Sugihartini and Jayanta. They developed an e-module for a CAI-based learning strategy course using Moodle LMS. Their research utilized the EDIE development model to create the teaching materials [3]. The results of this development are in the form of an e-module using Moodle LMS where each learning activity is packaged by following the syntax of the project-based learning process. However, this e-module has not been tested.

Considering the instructional alignment course delivery changes at Pelita Harapan University, the utilization of Moodle LMS for e-modules represents an innovative and relevant step in supporting the learning of prospective teacher students at the university level. While the development of e-modules with Moodle LMS may be less common in higher education settings, its implementation can offer various benefits. Moodle provides a comprehensive educational process by offering various features and

functionalities that support the creation, delivery, management, and evaluation of educational content [4]. Moodle enables educators to maintain control over the educational process, monitor student progress, and evaluate the quality of knowledge acquired by students [5]. This contributes to a comprehensive and effective educational experience, promoting student engagement, and facilitating continuous improvement in teaching and learning [6]. By adopting Moodle LMS for e-modules, Pelita Harapan University can leverage the platform's features and capabilities to enhance the teaching and learning experience for students. It provides a centralized and user-friendly environment where students can access course materials, engage in interactive activities, participate in discussions, and submit assignments. Moreover, instructors can utilize Moodle's assessment tools to evaluate student progress and provide timely feedback. Overall, the use of Moodle LMS for e-modules at the university level has the potential to enhance the quality and effectiveness of teaching and learning, offering a more engaging and interactive learning experience for prospective teacher students at Pelita Harapan University.

In instructional alignment courses, E-modules are arranged according to the topic by meeting, with learning activities that accommodate the achievement of Learning Outcomes at each meeting. The assessment weight that has been set in the course is adjusted to the learning activities in the e-module. So, the e-module activity is a mandatory task for asynchronous activities for the student in the Instructional Alignment Course. But in fact, not all students use the e-module provided by the lecturer. Therefore, this study aims to find out why some students did not use the E-module in asynchronous activity and how the quality of the E-module provided was based on the characteristics of a good e-module.

## 2 Literature Review

Teaching materials are a set of facilities or tools that contain material methods, limitations, and ways of evaluation, which are designed systematically and interestingly in an effort to achieve the expected goals in learning [7]. One form of teaching material that utilizes technology in this digital era is the electronic module (e-module). Fausih said that an e-module is a teaching package that contains a concept unit of teaching materials presented in digital form [8]. E-module is also a module with an electronic format that is run through a computer device, and its presentation can be in the form of video, audio, animation, text, and images [9].

E-modules are very suitable to be applied in blended learning model-filled classroom learning in the Instructional Alignment course at the Faculty of Education, Universitas Pelita Harapan. Electronic modules are specifically and clearly designed based on the speed of understanding of each student so that students learn according to their abilities [10]. In addition, electronic modules affect student learning outcomes because they increase motivation with multi-products, and multi-sources and involve students through interactive features [10]. Based on this explanation, it can be concluded that e-modules can help students in learning both in the phase outside the

classroom and in the phase in the classroom whose use is adjusted to the characteristics and abilities of students.

Research on the development of e-module-based teaching materials has increased rapidly since the onset of the pandemic. Based on a search for publications on the Google Scholar page, there are around 4290 development research related to e-modules in the 2020–2022 time frame. This is inseparable from the rapid development of the digital world and the need for learning during the pandemic which inevitably must be carried out online. This need will continue post-pandemic because it is to answer the needs in the new normal that encourage blended learning.

Some of the research results on the development of e-module-based teaching materials include:

1. An e-module teaching material is said to be valid if it meets the criteria on the elements of the feasibility of presentation, media, language, material, and practical use, [11].
2. An e-module teaching material is said to be valid through validation results from material experts, learning design experts, and media experts. While feasibility is generated through trials, [8]
3. The development of e-module teaching materials is different from other teaching materials. E-modules are interactive by providing various reading materials, videos that can be played, quizzes and discussion forums, and other teaching materials and are suitable for online learning during Covid-19, [12].

The following are the advantages of using e-modules, namely: 1) it can motivate students to learn; 2) the evaluation of learning, so as to allow material that is not appropriate or unfinished can be maximized; 3) learning materials can be divided equally into several activities; 4) learning materials can be divided according to topics per meeting so that learning becomes more structured; 5) can use video, audio, or even animation to explain learning material, [9]. Not only that, but other advantages are also that students can learn independently, use learning time more flexibly, reduce the use of paper, are easily accessible anytime and anywhere, and can use smartphones.

### **3 Method**

This study uses a mixed-method approach that combines qualitative and quantitative methods. The type of mix-method research used is concurrent embedded. Concurrent embedded research combines qualitative and quantitative research methods simultaneously, but the weight of the method is different [13]. In this study, qualitative data is primary data, and quantitative as secondary data. Quantitative data collection instrument in the form of a questionnaire. While the qualitative data collection instrument is in the form of a list of interview questions. Statements in the questionnaire and interview questions refer to the characteristics of the e-module presented by Daryanto [14]. The questionnaire was prepared using the Guttman scale with statement items as in Table 1. While the interviews were conducted in a structured manner with open questions. The interview questions can be seen in Table 2. The data obtained

from the questionnaire will be analyzed using descriptive statistics while the interview results will be analyzed descriptively.

This research was conducted in the Instructional Alignment course in the even semester of 2022/2023. Respondents in this study were 130 students who attended the Instructional Alignment class.

**Table 1.** User response grid questionnaires for e-module quality

Characteristics of e-modules	Indicators	Statement
Self-instruction	Clear instructions	<ul style="list-style-type: none"> <li>• I always access Moodle for asynchronous activities in this course.</li> <li>• Moodle helps me to learn asynchronously.</li> <li>• The instructions on Moodle made it easier for me to use it.</li> <li>• Instructions on Moodle help me to know the goals to be achieved.</li> <li>• <u>Instruction facilitates me to study independently.</u></li> </ul>
Self-contained	Material complete and intact	<ul style="list-style-type: none"> <li>• The materials presented are complete according to the objectives of asynchronous learning.</li> <li>• The material is presented in a structured manner.</li> <li>• Complete and intact activities and assignments to achieve asynchronous learning goals.</li> </ul>
Stand alone.	Stand alone.	<ul style="list-style-type: none"> <li>• When using Moodle, I don't need other supporting tools/media at the same time.</li> <li>• When using Moodle, I don't depend on other teaching materials.</li> </ul>
Adaptive	<p>According to the development of science and technology</p> <p>Flexible to use.</p>	<ul style="list-style-type: none"> <li>• Moodle is presented by utilizing various functions of electronic media.</li> <li>• The Moodle that is presented utilizes a wide selection of software applications.</li> <li>• Moodle is flexible to use.</li> <li>• Moodle is practical to use because it can be used anywhere.</li> <li>• The use of Moodle in this course is to my characteristics.</li> </ul>
User friendly	Helpful and friendly to users	<ul style="list-style-type: none"> <li>• Simple language and easy to understand.</li> <li>• Use terms I can understand.</li> <li>• Consistent use of fonts, spacing, and layout</li> <li>• Presented attractively.</li> <li>• High level of interactivity</li> </ul>

**Table 2.** A grid of interview questions regarding user responses to the use of e-modules

Characteristics of e-modules	Indicators	Questions
Self-instruction	Clear instructions	<ul style="list-style-type: none"> <li>• Do you always access Moodle for asynchronous activities in this course? If you don't, please give your reason!</li> <li>• What parts of Moodle help you to study, and which one is not?</li> <li>• The part of the instructions that was hard to understand was....</li> <li>• The part that helped me to know the purpose of asynchronous learning is ....</li> <li>• What to add so you can figure out the asynchronous goals?</li> <li>• The part of the instruction that didn't help me to learn independently was....</li> </ul>
Self-contained	Material complete and intact	<ul style="list-style-type: none"> <li>• Which part of the material do you think still needs to be completed?</li> <li>• What part of the material in Moodle is still lacking in structure?</li> <li>• Activities and assignments that are incomplete and intact to achieve asynchronous learning objectives include....</li> </ul>
Stand alone	Stand alone	<ul style="list-style-type: none"> <li>• Other supporting tools or media that I use to support the use of Moodle include....</li> <li>• Another teaching material that I use when using Moodle is ....</li> </ul>
Adaptive	According to the development of science and technology	<ul style="list-style-type: none"> <li>• The functions of electronic media that are utilized in Moodle include...</li> <li>• The only function of electronic media that is utilized in Moodle is ....</li> <li>• What software applications are used in Moodle in this course?</li> <li>• The only software application used in this course is ....</li> </ul>
	Flexible to use	<ul style="list-style-type: none"> <li>• Describe the part of Moodle that fits your characteristics!</li> <li>• Explain what part of Moodle does not match your characteristics!</li> </ul>
User friendly	<i>Helpful and friendly to users</i>	<ul style="list-style-type: none"> <li>• Do you understand the terms that are used in Moodle?</li> <li>• Do you agree that the fonts, spacing, and layout used in Moodle are consistent?</li> <li>• What parts do you think are interesting?</li> <li>• In your opinion, which parts are unattractive?</li> <li>• Which part is interactive according to you?</li> <li>• Which part is not interactive according to you?</li> </ul>

## 4 Result and Discussion

Based on the questionnaire, it was found that out of 130 students, eight students did not access the provided e-modules. This means that six percent of respondents stated that they did not always open the e-module provided for asynchronous activities and 94% of students stated that they always access the e-module in every meeting. To answer the first question of this research, it is necessary to carry out further analysis regarding the reasons that 6% of students do not always access e-modules. This question will be answered by analyzing the data obtained through interviews. It is known from the interview question data that three students chose to do another thing, three forgot, one used another resource, and one used it during synchronous learning. The data can be described in Figure 1.

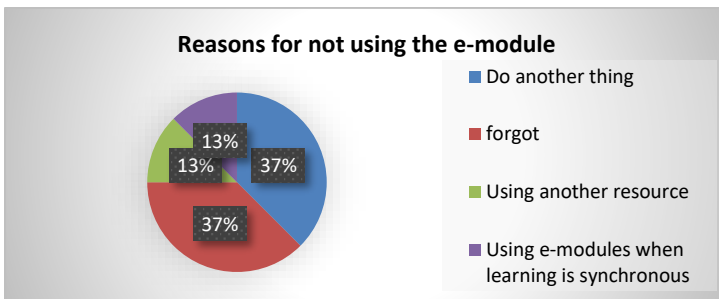


Fig. 1. Reasons for not using the e-module

The biggest reason students don't access Moodle is to forget and choose to do another thing. Students forget to access the e-module which is a mandatory task for asynchronous activities because they often delay doing it. The form of delay can be by doing other things first or requesting material in advance from friends who have previously accessed material in Moodle. This habit is known as procrastination. Procrastination is the act of delaying completing a task or job voluntarily even though you are aware that this can have a negative impact in the future[15]. Student procrastination can be caused by several things such as belief in abilities, distraction, social factors, initiative, laziness, and time management[15]. The cause of procrastination in this study is not yet known because it is not the focus of the research.

In addition to the habit of procrastinating, students are also unable to make good priorities, as a result, they have difficulty in time management. E-modules are provided as asynchronous learning resources. Asynchronous learning refers to online learning activities that demand student independence, due to its flexible nature [16]. Students are given the freedom to set personal time in accessing the e-modules provided before synchronous meetings. Zimmerman says that the personal choices of learners, and the controls they use, are aspects that determine learner autonomy, and therefore play an important role in education, particularly distance learning [17]. Based on a literature study, five self-regulation attributes influence the success of distance learning, namely: motivation, Experience with Internet Technology, Time Management

Skills, Learning Environment Management Skills, and Help-Seeking Skills [17]. Therefore, in this study, the inability of students to manage time and priorities so that they do not access the provided e-modules can be said to be related to students' self-regulation abilities.

The results of interviews regarding the fulfillment of e-module characteristic indicators, from the eight students can be seen in Table 3.

**Table 3.** Results of interviews with eight students who do not always access Moodle

Student name	E-module Characteristic Indicators				
	Self-instruction	Self-contained	Stand Alone	Adaptive	User Friendly
S1	Agree	Agree	Requires other supporting tools/media: Teams.	Agree	Agree
S2	Agree	Agree	Agree	Agree	Agree
S3	Agree	Agree	Requires other supporting tools/media such as YouTube and Google	Agree	Agree
S4	Agree	Agree	Agree	Agree	Agree
S5	Agree	Files, links, and documents provided must be completed.	Depending on other teaching materials: Journals and additional articles	Agree	Agree
S6	Agree	Agree	Requires other supporting tools/media such as YouTube and Google	Not interesting because there are a lot of long readings, Long Readings are not according to my characteristics.	Agree
S7	Agree	Agree	Requires other supporting tools/media: Teams.	Agree	Agree
S8	Agree	Agree	Agree	Agree	Agree

From the table, most students answered that the e-module criteria were still considered lacking, as the stand-alone criterion. When using the e-module, students still need tools, media, and learning resources other than those provided by the lecturer. This condition can also affect student motivation in using the e-module provided. Because in using e-modules, students should not need to depend on other learning resources, including for studying or doing assignments.

Based on the discussion above, it can be concluded that students do not always access e-modules for two reasons. The first comes from students, procrastination habits and lack of self-regulation skills. Second, from outside the students, the quality of the media is still lacking in the stand-alone criteria.

The data obtained through the questionnaire instrument will be analyzed with descriptive statistics. This analysis is to answer the second research question, how is the quality of the E-module given based on students' responses to fulfilling the characteristics of a good e-module. The results of the analysis for each criterion are calculated using the percentage formula:

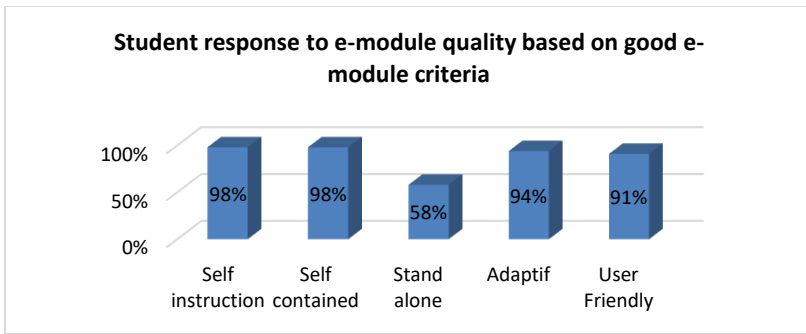


$$\begin{aligned} &\text{Percentage of e – module criteria fulfillment} \\ &= \left( \frac{\text{the number of students who agree}}{\text{the total number of students}} \right) \times 100\% \end{aligned}$$

Based on this formula, the results are obtained in Table 4. The data is then presented in the form of a bar chart in Figure 2.

**Table 4.** Percentage of e-module criteria fulfillment

Percentage of e-module criteria fulfillment Category	e-module characteristic indicators				
	Self-instruction	Self-contained	Stand Alone	Adaptive	User Friendly
	98%	98%	58%	94%	91%
	Very Good	Very Good	Not good	Very Good	Very Good



**Fig. 2.** Student response to e-module quality based on good e-module criteria

Data analysis showed that the student’s responses to the quality of the e-module for the self-instruction, self-contained, adaptive, and user-friendly criteria were categorized as very good. Meanwhile, the stand-alone category is still considered unfavorable. The results of this analysis are consistent with the responses given by eight students who do not always access the e-modules provided. Based on interviews, other supporting sources used by students when using e-modules include textbooks, teams, notebooks, WhatsApp, Microsoft applications, YouTube, and Google. Based on the theory, when using e-modules students should not depend on and not use other media to study or do assignments in the module. George said that the stand-alone criterion is what is needed to support students to study independently at home [18]. This means that this criterion should be fulfilled in this e-module because the e-module provided in the Instructional Alignment course is intended as a learning resource for students in asynchronous sessions in blended learning. This is also in line with what was conveyed by Iskandar, et al., that E-modules are digital learning media that are arranged systematically so that students can learn independently and solve existing problems [19]. Thus, it can be concluded that the e-module given to students needs to be improved in quality in a stand-alone aspect.

Improvements that can be made to improve the quality of the e-module on the stand-alone criteria according to student needs include: 1. changing the video link by uploading the video directly to Moodle; 2. Utilizing the book feature in Moodle so that students can directly read documents without having to download files and then open them using other applications; 3. Optimizing the use of the forum feature as a forum for communication between students and students, as well as students and lecturers; 4. Utilize the glossary feature to provide explanations for unfamiliar terms in courses so that students do not have to look for other sources; 5. Ensure that each assigned task is completed by utilizing the features available in the e-module that has been prepared. These five recommendations can be carried out in Moodle LMS because the characteristics of Moodle LMS are a good organization of online resources, their convenience and accessibility, structuring, efficiency of communication tools use [20], [21]. This solution also in line with what Evgenievich Egorov, et al., conveyed in their research on the advantages of the Moodle LMS including [22]: 1. Moodle through the forum feature can increase interaction and communication between participants; 2. Moodle facilitates the availability of all the materials needed in one system because teachers can upload various resources and assignments, as well as all the required training materials; 3. The glossary feature is considered important by teachers and students because it makes it easier for students to learn subjects when the educational load increases significantly. Optimizing the features provided by Moodle can improve the quality of e-modules. By leveraging the power of Moodle's features, educators can create engaging and effective e-learning experiences that align with stand-alone criteria and meet the needs of the learners.

## 5 Conclusion

Based on the data analysis and discussion, it can be concluded that some students do not use the e-module provided by the lecturer in asynchronous learning due to two factors, internal and external. Internal factors come from within the student, the habit of procrastinating and the lack of self-regulation. While the external factor is the need to improve the quality of the e-module on the stand-alone aspect. This is inseparable from the quality of the e-modules provided, where based on the opinions of students as users it is known that e-modules already have good quality for self-instruction, self-contained, adaptive, and user-friendly. While the criteria that stand alone are considered inadequate improvement is still needed. Among them is optimizing the use of features in Moodle LMS such as forum, book, assignment, and glossary features. In addition, the videos used in the course are uploaded directly to the Moodle LMS, not by providing a link or in the form of a URL.

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