Acceptability of the e-Learning Module in Seamanship (Trim, Stability, and Stress)

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ABSTRACT

Purpose: *The acceptability level, strengths, and weaknesses of the Seamanship e-learning module were ascertained by this survey research study. It was found that the students and the experts found the e-learning module in Seamanship to have high acceptability in general and in terms of appearance, learning activities, evaluation procedure, ease of use, and usefulness. According to students, the strengths of the e-learning module in Seamanship were that it is: accessible, convenient, easy to understand, informative, relevant, has sufficient content, user-friendly, has several varied sources available, self-paced, well-organized, efficient, and systematic. Meanwhile, its weaknesses include the need for internet access, incomprehensive discussion of the contents, unreliable/unstable site, lack of human interaction, lack of hands-on experience, difficulty in using the site, misaligned lesson content and quizzes, excessive screen time, and availability of gadgets.*

Findings: *It is recommended that the e-learning module in Seamanship may be improved based on its strengths and weaknesses. Future researchers may conduct similar studies on other subject areas, look into longitudinal research or determine the effectiveness of the e-learning module.*

Key-words:
acceptability, e-learning module, information and communication technology, learning materials.

INTRODUCTION

Keeping up with new technological breakthroughs is one of the most frequently stated reasons why education needs to change. Nowadays, the internet is not only available through computers but also in our pockets in the form of smartphones which manifold faster than the first computer developed (De Bruyckere et al., 2016).

E-learning is one educational innovation that has responded to the quick advancements in technology. Education through the use of electronic devices and digital material is referred to as "electronic learning" or "e-learning." It includes anything from online universities to conventional classes with basic technology included. In addition, e-learning can come in a variety of formats. PowerPoint presentations and instructive films might be used in a conventional environment. The Classroom Performance System (CPS), on the other hand, offers a fully digital learning environment. Another popular type of e-learning is online education, where a lot of colleges and institutions let students use Moodle or other virtual learning environments to submit assignments, finish exams, and take part in online conversations. According to Christensson (2015), credits obtained for courses or subjects online are typically equal to those obtained in a regular classroom. In higher education, e-learning is a big part of the teaching process. It offers sophisticated methods that support the teacher's ongoing requirement to draw out and utilize each student's cognitive abilities to the fullest (Khazaal, 2015).

Numerous studies back up the use of online learning. The results of Harandi's (2015) investigation have validated that e-learning is among the factors influencing students' motivation during class. Furthermore, Afolabi (2017) discovered in her research that students scored very well on the achievement exam given to them and had a favorable opinion of the usage of Open Educational Resources (OER) in online learning.

This study illustrates the e-learning theory. E-learning, according to Clark and Mayer (2016), combines instructional techniques and content with the aim of promoting individual learning. This includes instructor-led instruction at a set time, known as synchronous e-learning, and learning intended for self-study that is available on demand, or asynchronous e-learning. Even though e-learning appears appealing, they stress that the advantages of technology still rely on how they are applied. It must, therefore, be appropriate for and consistent with human cognitive learning processes and be based on instructional design concepts. Furthermore, it has been suggested by Mayer et al. (2015) that students can learn effectively

if teachers use educational technologies to construct assignments that reduce superfluous cognitive load and control relevant and intrinsic load at levels that suit them. Thus, early evaluative assessment of e-learning content is seen to be crucial for establishing a framework for subsequent tool enhancements, according to Martinez-Torres et al.'s (2008) study.

E-learning modules in a variety of areas, for both general and professional courses, have been developed recently by instructors at John B. Lacson Foundation Maritime University (Arevalo), Inc. It has not yet determined whether using the online learning module in Seamanship is acceptable. Hence, this study was carried out.

This study sought to ascertain the degree of acceptability of the Seamanship (Trim, Stability, and Stress) e-learning module for the school-year 2021–2022. This study aimed to give a more in-depth analysis and interpretation of the usual descriptive information that quantitative data can give. Specifically, this study sought answers to the following questions:

1. What is the level of acceptability of the e-learning module in Seamanship as a whole and in terms of (a) appearance, (b) learning activities, (c) evaluation procedure, (d) ease of use, and (e) usefulness as perceived by the students?

2. What is the level of acceptability of the e-learning module in Seamanship as a whole and in terms of (a) appearance, (b) learning activities, (c) evaluation procedure, (d) ease of use, and (e) usefulness as perceived by the experts?

3. What are the strengths and weaknesses of the e-learning module in Seamanship as perceived by students and experts?

METHODOLOGY

Research Design

A survey research design was used in this study. Survey research, according to Jhangiani et al. (2015), is a quantitative and qualitative method distinguished by two key features: using self-reports to measure variables of interest and giving careful consideration to sampling. It is an adaptable method that can be used to investigate a broad range of fundamental and practical research issues. Despite the fact that statistics are frequently used to examine survey data, many research issues may call for the use of qualitative analysis. Additionally, Ponto (2015) notes that a variety of approaches to participant recruitment, data collection, and instrumentation are possible with

survey research. It might be as simple as approaching people on the street with a few targeted questions or as complex as conducting a multi-instrument study that is both valid and reliable.

Respondents

Of the 600 students enrolled in the school-year 2021–2022, 286 Bachelor of Science in Marine Transportation (BSMT) students who took Seamanship in the first semester were the respondents. Cluster random sampling was used to select them. To further assess the degree of acceptability of the e-learning module in Seamanship, five experts in the fields of maritime education, ICT, and learning material creation were purposefully chosen as respondents.

Instrument

A 32-item researcher-made acceptability questionnaire was utilized in this study. The questionnaire consisted of two parts. Part I was a 4-point Likert-type questionnaire with options for the responses as strongly disagree, disagree, agree, and strongly agree. It was further divided into five categories: (1) appearance, (2) learning activities, (3) evaluation procedure, (4) ease of use, and (5) usefulness. In each of the items, strongly disagree corresponded to 1 point, disagree was 2 points, agree was 3 points, and strongly agree corresponded to 4 points. Part II was an open-ended questionnaire that is composed of two questions. Both the students

and experts were allowed to answer the second part of the questionnaire in whatever language they were comfortable with. Research and IT specialists evaluated the acceptance questionnaire, which underwent a pilot test with a reliability level of 0.97 using Cronbach alpha.

Data Collection

Before answering the acceptability questionnaire, the students were allowed to access the e-learning module online. The researchers asked permission from the Administrator to use the university's computer laboratory so that students could access the module. The questionnaire was administered personally by the researchers. Results were tallied and tabulated. The quantitative data came from the first part of the questionnaire, while the qualitative data were taken from the second part.

Data Analysis

To examine the information acquired, both quantitative and qualitative methods of data analysis were applied. Mean and standard deviation were employed in the quantitative section. Means were employed to assess the overall acceptability of the Seamanship e-learning module and its acceptability in terms of appearance, learning activities, evaluation procedure, ease of use, and usefulness. The scale shows the mean scale, descriptive rating, and indicators for the acceptability in the e-learning module for Seamanship.

Table 1. Mean Scale, Descriptive Rating, and Indicators for Interpreting the Acceptability of the e-Learning Module in Seamanship

Mean Scale	Descriptive Rating	Indicators
3.51 – 4.00	Very High Acceptability	The e-learning program was deemed excellent overall by the experts and students, and very few adjustments were necessary.
2.51 - 3.50	High Acceptability	Although the e-learning module still needs a few to a moderate number of adjustments, the students and experts thought it was very good overall.
1.51 - 2.50	Low Acceptability	The e-learning module's general features were deemed adequate by professionals and students, although they still require extensive improvements.
1.00 – 1.50	Very Low Acceptability	The e-learning module's general elements were deemed inadequate by the experts and students, and they require a thorough revision and overhaul.

The homogeneity or heterogeneity of the expert and student responses was assessed using the standard deviation. Thematic analysis was employed for the qualitative portion. Thematic analysis is a technique used to examine and present themes or patterns found in the collected qualitative data (Braun & Clarke, 2006). The recurrent themes in the descriptive answers to the second section of the acceptability questionnaire were determined using this method in the study.

RESULTS AND DISCUSSION

Acceptability of the e-Learning Module in Seamanship

Table 2 shows the level of acceptability of the students and experts towards the e-learning module in Seamanship in general and in various aspects. This study found that the students generally view the e-learning module in Seamanship as having "high acceptability" (M=3.31, SD=0.39). Furthermore, the results also show that it has also "high acceptability" in terms of

appearance (M=3.29, SD=0.44), learning activities (M=3.38, SD=0.40), evaluation procedure (M=3.32, SD=0.44), ease of use (M=3.24, SD=0.44), and usefulness (M=3.30, SD=0.41).

On the other hand, results show that, overall, the e-learning module in Seamanship has "high acceptability" (M=3.35, SD=0.56), according to the experts. Furthermore, the findings of the study also show that it also has "high acceptability" in terms of appearance (M=3.37, SD=0.61), learning activities (M=3.50, SD=0.57), evaluation procedure (M=3.17, SD=0.46), ease of use (M=3.33, SD=0.61), and usefulness (M=3.40, SD=0.50). These results have resemblance to the research conducted by Encarnacion et al. (2021). According to their research, every parameter that they are evaluating has received higher ratings from both instructors and undergraduate program participants. Teachers attributed the better scores to well-designed instructional materials and highly interactive, engaging discussions. Students attributed the higher ratings to well-designed course materials, online assessment, and student-centered activities.

Table 2. Level of Acceptability of e-Learning Module in Seamanship According to Students and Experts

Category	Students			Experts		
	M	*Descriptive Rating*	*SD*	*M*	*Descriptive Rating*	*SD*
Overall	3.31	High Acceptability	0.39	3.35	High Acceptability	0.56
Appearance	3.29	High Acceptability	0.44	3.37	High Acceptability	0.61
Learning Activities	3.38	High Acceptability	0.40	3.50	High Acceptability	0.57
Evaluation Procedure	3.32	High Acceptability	0.44	3.17	High Acceptability	0.46
Ease of Use	3.24	High Acceptability	0.44	3.33	High Acceptability	0.61
Usefulness	3.30	High Acceptability	0.41	3.40	High Acceptability	0.50

Note. 1.00-1.50 – Very Low Acceptability; 1.51-2.50 – Low Acceptability; 2.51-3.50 High Acceptability; and 3.51-4.00 – Very High Acceptability.

Strengths of the e-Learning Module in Seamanship

All the experts have voluntarily given their responses about the strengths of the e-learning module, while only 139 of the 286 students have responded. Giving feedback is voluntary and observes the privacy of the respondents using the Privacy Notice Form (PNF) and Informed Consent Form (ICF)

Students' Point of View

The strengths of the e-learning module in Seamanship, according to students, are as follows: accessible, convenient, easy to understand, informative, relevant, has sufficient content, user-friendly, has several varied sources available, self-paced, well-organized, and efficient.

Accessible

Of the 139 students who responded, 71 students responded that the e-learning module in Seamanship is accessible. Students elaborated that they can access the module anytime if they have internet connection. A study has shown that one of the positive aspects of e-learning is the accessibility provided by the online environment (Gherheș et al., 2021).

Convenient

There were 20 students who expressed that it is convenient. Generally, the students could get the lesson, activities, and quizzes even in the comfort of their homes. This demonstrates that students can access these courses whenever it is most convenient for them by using the e-learning module (Encarnacion et al., 2021). Studies have even demonstrated that students view the convenience of staying at home as one of the benefits of online learning (Gherheş et al., 2021).

Easy to understand

There were also 20 students who found the e-learning module in Seamanship easy to understand. According to students, it enables them get experience in the maritime field through concise explanations and simply understood examples. Despite the lack of in-person interaction, the topics were clearly discussed and the explanations were easy to follow. In the study by Setiyani et al. (2020), the results were fairly low when they conducted an initial test on student knowledge because some had trouble understanding the learning material. However, after the digital module was developed according to the students' needs, their responses to digital teaching materials became "very good."

Informative

Twelve students found the module informative. They identified the abundance of knowledge that may be learned from the Seamanship e-learning module as a great asset. Similar findings were made in the study by Keskin and Yurdugül (2022), which showed that the instructional talks were the most crucial element of the e-learning process. Furthermore, according to Ivanii et al. (2020), the essence of competency heavily emphasizes theoretical preparedness. For this reason, both traditional and online learning must have information-rich debates and content.

Relevant

Eleven students stated that the e-learning module in Seamanship is relevant. It contains information that is relevant to their future professions and will serve as a foundation for deeper learning in the present and future. This is similar to the study of Hamid et al. (2021), one of the aspects that they checked is the relevance of the module as a part of the content validity. It was found that the experts agreed that all materials were relevant.

Sufficient content

Eleven students also said that it has sufficient content. All aspects of the topics were given enough information. Similarly, the study of Pham and Tran (2020) found that the content and design of online courses were among the five factors that had a significant impact on the acceptability of e-learning. Thus, the content and design of the e-learning courses should be reviewed and updated to be suitable for an online environment.

User-friendly

There were nine students who shared that the e-learning module in Seamanship is user-friendly. The students could easily access and navigate all of the lessons and activities that were prepared. Regarding these, Pham and Tran's (2020) study noted that perceived utility and simplicity of use were two of the main factors contributing to e-learning's acceptability.

Several varied sources available

There were also nine students who said that the e-learning module provides several or varied sources. They can find more information on the internet and store it on their phone for later use or in the event of a bad or nonexistent internet connection. Encarnacion et al. (2021) claimed that the incorporation of technology allowed students to feel at ease utilizing a variety of devices, and that web-based resources allowed them to expand their knowledge and find new concepts.

Self-paced

Nine students said that it is self-paced, meaning students can learn at their own pace. They can advance at their own speed. If there was anything they missed during their virtual session, they could use it as a reviewer. Also, it helps them study independently, realize some things, and gain knowledge on their own. This demonstrates that students can learn through online courses at their own speed, which will support their development as self-directed learners (Encarnacion et al., 2021).

Well-organized

Seven students stated that the e-learning module is well-organized. The sources and the topics were easy to find and instructions were easy to follow. Based on a study, learners appreciated the range of resources offered in a well-structured way (Encarnacion et al., 2021). Therefore, the e-learning system administrator(s) should consider enhancing the LMS's design and incorporating certain cutting-edge features that will make it more practical and helpful for both instructors and students (Pham & Tran, 2020).

Efficient

Four students said that the module was efficient. It saves them time and money and makes it possible to cater to individual needs. Similarly, e-learning was acknowledged as an efficient, effective, and novel teaching and learning platform upon its acceptance, implementation, and delivery in Tanzania's higher education institutions (Almas et al., 2021). According to a study by Bachri et al. (2021), e-learning may even have lower expenses for academic staff, students, and universities through less commute time, cheaper transportation, and possibly lower parking costs. Table 3 summarizes the themes of the strengths of using the e-learning module in Seamanship from the students' point of view.

Table 3. Summary of Strengths on the Use of the e-Learning Module in Seamanship from Students' Point of View

Strengths (in themes)	f	%	Rank
Accessible	71	51	1
Convenient	20	14	2.5
Easy to understand	20	14	2.5
Informative	12	9	4
Relevant	11	8	5.5
Sufficient content	11	8	5.5
User-friendly	9	6	8
Several varied sources available	9	6	8
Self-paced	9	6	8
Well-organized	7	5	10
Efficient	4	3	11

Experts' Point of View

Of the five experts, three of them said that the e-learning module in Seamanship is accessible. The students could access the lessons anytime and anywhere. The study of Encarnacion et al. (2021) explained that teachers may have a favorable opinion of e-learning because it relieves them of extra work, like duplicating course materials, because students may access and use the learning resources. Meanwhile, experts also said the module could help students learn better. These results are consistent with the study of Encarnacion et al. (2021), which found that e-learning greatly advanced students' abilities to analyze and solve problems, complete online tests, and turn in assignments and projects. Additionally, experts said online learning is an efficient way to carry out the lessons. This aligned with the findings of Al-Anezi and Alajmi's (2021) study, which indicated that teachers perceived e-learning technology as an efficient tool in teaching and learning.

Weaknesses of the e-Learning Module in Seamanship

Students' Point of View

Only 129 of the 286 students have responded to the weaknesses of the e-learning module in Seamanship. The weaknesses of the e-learning module in Seamanship, according to students, are as follows: need for internet access, incomprehensive discussion of the contents, unreliable/unstable site, lack of human interaction, lack of hands-on experience, difficulty in using the site, misaligned lesson content and quizzes, excessive screen time, and requires the availability of gadgets.

Need for Internet Access

There were 61 students who said that the need for internet access is the weakness of the e-learning module in Seamanship. It is highly-dependent to the internet connection which varies from student to student thus, making it unfair for them. This situation hindered learning that extended beyond the classroom and could affect students' academic performance (Maphalala & Adigun, 2021).

Incomprehensive Discussion of the Lessons

According to 35 students, the module has an incomprehensive discussion of the lessons. Some of the information is not in the e-learning module and needed further explanation. These demonstrate the need for learning resources that might motivate learners more. In addition to being able to modify established learning theories for the digital era, educators and course designers ought to be able to apply connectivism's tenets to the creation of engaging instructional materials (Bismala & Manurung, 2021).

Unreliable/unstable site

There were 34 students who commented that the weakness of the e-learning module is the unreliable or unstable site. The e-learning platform itself keeps on failing. There were times that students tried to answer some quizzes, and the platform crashed. At times, the server cannot handle many users logging in at the same time. Like the research conducted by Lu et al. (2020), it was demonstrated that poor infrastructure has a negative impact on learning psychology, the teaching process, and the efficacy of course assessment. The LMS system and information storage services are just a couple of the components make up the infrastructure.

Lack of Human Interaction

According to 21 students, the e-learning module lacked human interaction. It may cause social isolation because students do not see their teachers and classmates face-to-face. Interaction is very limited. Similarly, the study of Al Rawashdeh et al. (2021) revealed that most students said that although e-learning makes it more likely for them to interact virtually with their teacher and other students, it also means that they spend more time in front of their devices—laptops, cellphones, and tablets—which causes them to become more socially isolated. This was corroborated by a study by Müller et al. (2021), which found that due to the little interaction, even teachers were worried about their own knowledge of student engagement and learning. Teachers believed they rarely knew how their students were actually performing, despite constant efforts to encourage contact. The study of Gherheş et al. (2021) found that, despite all of e-learning's benefits, in-person interaction was still necessary for learning. Lu et al. (2020) emphasized that an important and indispensable factor even in e-learning is the teacher. Since teachers' reputations, approaches, expertise, and knowledge aid students in achieving the best outcomes during their learning and research processes. The study's findings even demonstrated that the instructor has a bigger impact than the actual course.

Lack of Hands-on Experience

There were 18 students who said that the lack of hands-on experience is another weakness. Some of the topics are better understood if they have practical application or real-time access like in the face-to-face classes. It is difficult for them to apply the concepts they have learned because they do not have the equipment needed at home. A comparable drawback identified in the study of Gherheş et al. (2021) was the absence of real-world applications. This demonstrates that not all academic subjects can benefit long-term from e-learning. Furthermore, Müller et al. (2021) pointed out in their research that it can be difficult to transfer face-to-face learning experiences—which are typically more applied and practical—to online activities. It is nearly impossible to incorporate activities like role plays, discussions, field trips, and experiments into online learning. The absence of these opportunities would disadvantage students. Hence, Afghani (2021) suggested that there is potential for enhancing the execution of e-learning activities in subjects that often require greater hands-on experience. The intention is to provide the students with opportunity to practice, explore, and observe in ways that are similar to in-person interactions.

Difficulty in Using the Site

There were four students who said that the weakness of the e-learning module was the difficulty in using the site. They found that using the new LMS was quite difficult and the old LMS was better. It was harder for the students to find the activities and assignments. In fact, if there are modifications to the e-learning platforms, teachers and students need to be informed and taught again for e-learning to succeed. When teachers and students require technical assistance, it should be given to them as soon as possible (Maphalala & Adigun, 2021; Afghani, 2021).

Misaligned Lesson Content and Quizzes

There were four students who noted the misaligned lesson content and quizzes. Students said that there were times when the time the lessons or module given are far off from the quizzes and activities given. This needs to be prioritized and improved. Keskin and Yurdugül (2022) made sure that the formative assessment resources, discussion topics, and information were given in accordance with the objectives of each chapter. The e-assessment experiences were determined to be significant interaction experiences. In the end, their study's findings demonstrated that, in addition to content interactions, online assessments and discussion forums play a complimentary role in creating a successful e-learning environment.

EXCESSIVE SCREEN TIME

Three students commented that excessive screen time had become the e-learning module's weakness. Too much exposure to blue light from phones and other gadgets, which a module can be accessed, causes eye strain. It was established that these students' concerns regarding excessive screen time were legitimate. Excessive screen time, or using a computer for more than two hours a day, has been linked to high blood pressure, raised serum cholesterol, and overweight or obesity in young people. Furthermore, screen-time habits developed during youth may persist throughout adulthood. However, if e-learning is eventually implemented, it might not be practicable for youngsters to follow the suggestion to limit their daily screen time to no more than two hours (Herrick et al., 2014).

Requires Availability of Gadgets

There were two students who said that the availability of gadgets is a weakness. E-learning indeed requires constant availability of gadgets and internet connection. Inequalities in student learning are frequently caused by problems with internet access and device availability. Educators have noted that although e-learning is highly lauded for its ability to serve all students, there are questions over whether this really happens when the majority of instruction takes place online. A camera, a computer that is suitable for learning, and a sufficiently fast and reliable internet connection are examples of technology that some have questioned if all students will have access to (Müller et al., 2021).

Other Responses Not Included in the Themes

Other students commented that the e-learning module might allow cheating. They observed that it is easy for online students to share answers knowing there is nobody watching. This matter was also brought up in Müller et al.'s study (2021). For written examinations and exams, they decided to use a variety of open-book assessment formats. To guard against dishonesty, it was also advised that students concentrate on higher-order learning and practical application. Some educators, however, continued to have doubts about the validity of the exams, so they used the Zoom teleconferencing software to do proctoring. Table 4 summarizes the weaknesses in the use of the e-learning module in Seamanship according to students.

Table 4. Summary of Weaknesses in the Use of the e-Learning Module in Seamanship from Students' Point of View

Weaknesses (in themes)	f	%	Rank
Need for internet access	61	47	1
Incomprehensive discussion of the lessons	35	27	2
Unreliable/unstable site	34	26	3
Lack of human interaction	21	16	4
Lack of hands-on experience	18	14	5
Difficulty in using the site	4	3	6.5
Misaligned lesson content and quizzes	4	3	6.5
Excessive screen time	3	2	8
Requires availability of gadgets	2	2	9

Experts' Point of View

Two of five experts said that the need for internet access is a weakness of the e-learning module in Seamanship. Without internet connection, the e-learning module cannot be accessed and used. Aside from the need for internet access, experts also said that technology issues are also a weakness because not every student and teacher is tech-savvy. Self-motivation is necessary, as is an individual's assessment of the need for learning, which could result in problematic outcomes and slow learning progress. In contrast, Encarnacion et al. (2021) discovered that students are more driven to learn on their own and do their coursework responsibly when they use e-learning.

CONCLUSIONS

During the pandemic, e-learning has become the norm. Because learner satisfaction has been shown to have a statistically significant impact on students' intention to continue with e-learning, it is crucial to evaluate students' acceptability and satisfaction with e-learning (Bashir, 2019).

The researchers were able to assess their e-learning module in Seamanship using the study's findings, and overall, it was determined to be highly acceptable in general and in terms of appearance, learning activities, evaluation procedure, ease of use, and usefulness for both students and the experts. Therefore, it can be said that the e-learning module is appropriate for

usage in the classroom. This is in line with the findings of the Encarnacion et al. (2021) study, which considered e-learning as a viable online tool to support efficient instruction and high-quality learning. Moreover, they concluded that e-learning might influence education in the future by bringing the traditional classroom online. Teachers and students felt that e-learning had an impact on teaching and learning since its use had risen, particularly during the pandemic. Using open-ended questions, the study also identified the benefits and drawbacks of the Seamanship e-learning module. While the weaknesses—such as the need for internet access, the incomprehensible discussion of the contents, and the unstable/unreliable site— provide room for improvement, the strengths—such as accessibility, convenience, and relevance—would indicate which areas and features of the e-learning should be retained and further supported.

RECOMMENDATIONS

It is suggested that the e-learning module in Seamanship be used going forward based on the analysis and study outcomes. Second, the teachers, course developers, the in-charge of the e-learning modules and LMS administrators may continue to support the e-learning module in Seamanship by maintaining its strengths. Third, the teachers, course developers, the in-charge for the e-learning modules, and LMS administrators may focus on addressing and improving the weaknesses of the e-learning module. They may find ways to lessen the module's dependence on internet access. The teachers and course developers may enhance the content of the module by providing a more detailed and comprehensive discussion of the lessons and aligning the content and its activities. Teachers may also find mechanisms to reduce the probability of cheating. The in-charge for the e-learning modules, and LMS administrators may find ways to make the site more reliable and stable, and more user-friendly. Finally, researchers in the future might carry out comparable studies on different topics, investigate longitudinal studies, or assess the effectiveness of the e-learning module.

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