

Engineering Students' Perspectives on Progress Tracking and Badge Features

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ABSTRACT

The purpose of this study was to examine the opinions of engineering students from various departments regarding the progress tracking and digital badge features applied in courses in the Learning Management System (LMS). The phenomenological design which is a qualitative research method is used in this study. Online forms with close and open questions were used to collect data. The study was conducted with a total of 226 students, who studied in 5 different departments. The data is subject to content analysis. According to the research results, students stated that the features tested triggered motivation to complete assignments and develop other students. As for the opinion of some students that these features should be held in every course in the LMS. Despite the general view of an LMS equipped with these features (Moodle), their general view of the features, especially the progress tracking feature and digital badges is quite good. What needs to be questioned is the willingness of lecturers and policymakers to apply it consistently in the campus environment.

1. Introduction

Engineering, especially in Indonesia today, really needs competitiveness in order to compete in the international world. Global free trade and international regulatory support have caused engineering graduates in Indonesia to be less competitive with engineers from abroad, even for companies in Indonesia. According to Persatuan Insinyur Indonesia (Association of Indonesian Engineers), in 2018 the number of engineering graduates in Indonesia is just around 14%, lower than those in Korea 38%, China 33%, and Malaysia 25% (Marwati, 2018).

Therefore, competitiveness is a point that must be improved in engineering education, especially in the Faculty of Engineering, Mulawarman University. The Covid-19 pandemic has made the learning process completely online. However, in a small survey distributed within the Faculty of Engineering, most students have easily adapted to this online learning. Even so, there are many challenges in this online learning system. Lecturers complain a lot about the distractions that cause students to be less focused on getting higher achievements in the online system. Many students go through morning teleconference courses with less enthusiasm because they do online activities at night, and one of these activities is online games. From the small survey conducted in our faculty, only less than 20% of students do not play online games. However, this does not mean that this situation cannot be advantaged. Competitiveness in games that have been owned by students should be used in online learning to encourage students to get better achievements.

Mulawarman University has its own Learning Management System (LMS), named Mulawarman Online Learning System (MOLS). This system has not been able to meet the needs of lecturers to develop more varied teaching materials. Therefore, we propose Moodle as an LMS that can complete all the needs of lecturers in managing classes and completing teaching materials with various formats and features.

1.1 Purpose of the research

Although progress tracking and digital badges are commonly used in online learning nowadays, the perspective of students, especially from the engineering field, still needs to be taken into consideration to develop and continue this feature in LMS. In order to achieve this general-purpose, answers were sought for the following sub-objectives :

1. What are your views on Moodle as LMS?
2. What do you think about the progress tracking feature on LMS?
3. What do you think about the digital badges feature on LMS?

2. Literature Review

Moodle has been implemented in universities and its use has experienced a significant increase in the era of the covid-19 pandemic (Morze et al., 2021; Polhun et al., 2021; Sugihartini et al., 2021; Zabolotniaia et al., 2020). Even before the lockdown period, it gives a great level of technological satisfaction for students (Garcia-Murillo et al., 2020). One of the features of Moodle is progress tracking. Using progress tracking, students can check which of their assignments have and have not been completed, and check the grade and feedback they've received for each assignment (Moodle, 2020). Digital badges are used as milestones of some completed tasks in learning progress. This badge is one of the features of e-learning that has been implemented at several levels of education and fields. The effectiveness of implementation at the elementary and secondary school levels as well as higher education is undeniable. In lower-level education, digital badges have been used to help motivate students in English subjects (Başal & Kaynak, 2020). In higher-level education, research has even been conducted on the implementation of this badge and the results are not bad (Delello et al., 2018; Hurst, 2015). In other fields besides engineering, such as nursing studies, digital badges have also been applied and used to analyze the characteristics of students who are motivated by digital badges (Garnett & Button, 2018; White & Shellenbarger, 2018). In addition to nursing studies, research that links learning motivation with the use of digital badges is also carried out on education, engineering, and human resources development students (Delello et al., 2018). In Indonesia itself, research on digital badges is still limited, although there are already those who have proven their effectiveness on their own campuses (Andhy & Lumenta, 2021).

3. Methodology

The aim of this research is to determine the perspectives of the students of the Faculty of Engineering of the university about the use of Moodle, progress tracking, and digital badges. For this purpose, a qualitative research method is used here because it allows us to explain students' views in depth. This study was designed with a phenomenological pattern, one of the qualitative research methods. Phenomenological design is a qualitative research design that aims to highlight the perceptions and experiences of individuals according to their own perspectives (Ersoy & Uysal, 2018).

3.1 Data collection and analysis

The Faculty of Engineering, Mulawarman University consists of 9 departments and has a large number of students. A total of 226 students, who were selected on a voluntary basis and studied from 5 departments (electrical engineering, mining engineering, environmental engineering, and information system). This research only takes students in the entry year 2019-2021, because students from the class of 2018 and older are students doing internship and thesis research to graduate, and only a small number of them are still taking courses. The demographic information of the participants is given in Table 1.

Table 1. Demographic information

Variable	Group	f
Gender	Female	80
	Male	146
Smartphone user	Yes	216
	No	0
Game player (online or/and mobile)	Yes	183
	No	43

The students were chosen for the research group to fill out online questionnaires that are distributed via chat groups. Data was collected using an online form with closed and open questions prepared by the researcher. After the questions were prepared, some experts, who have research experiences in the e-learning field, were appointed to provide some opinions. A pilot application was conducted to measure the intelligence of the questions. As a result of the expert interview, the questions in the form are corrected and added.

3.2 Moodle preparation

A Moodle LMS was built specifically for research purposes and can be accessed for all students of Engineering Faculty via <http://iselearnlab.com/moodle/>. Moodle implementation can be seen in Fig 1.

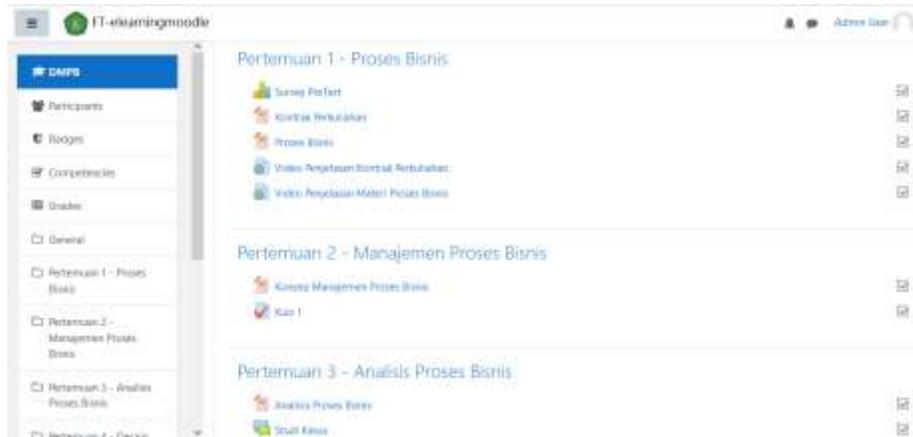


Fig. 1. Moodle implementation for the research

Digital badges are made by lecturers and implemented in Moodle. The badges enable specific courses that can be taken by students from all departments in the Faculty of Engineering. The example of this feature can be seen in Fig. 2

Name	Badge status	Criteria	Recipients
Baby Manager	Available to users	• Complete ANY of: "Survey - Survey PreTest", "File - Kontrak Perkuliahan", "File - Proses Bisnis", "URL - Video Penjelasan Kontrak Perkuliahan", "URL - Video Penjelasan Materi Proses Bisnis"	226
Kid Manager	Available to users	• Complete ANY of: "File - Konsep Manajemen Proses Bisnis", "Quiz - Kuis 1"	226
Teen Manager	Available to users	• Complete ANY of: "File - Analisis Proses Bisnis", "Forum - Studi Kasus", "URL - Case Study", "Quiz - Mid", "File - Desain Proses Bisnis", "Survey - Mana Desain terbaik dalam Studi Kasus Berikut", "Quiz - Kuis 2"	167
The Manager	Available to users	• Complete the course "Desain dan Manajemen Proses Bisnis" with minimum grade of 8	54

Fig. 2. Digital badges implementation for the research

4. Results and Discussion

4.1 Findings on students' perspective on Moodle

It aimed to determine the opinions of the engineering students about the use of Moodle for online learning. Surprisingly, it turns out that students prefer MOLS, a university LMS that was developed with a simple interface and features. Even so, most students feel that Moodle has good potential as long as the features in this LMS are used optimally.

Table 2. Findings regarding students' perspective on Moodle

Identification process	Opinion	f	%
I like Moodle better	It has a better interface	28	12.39
	It has more functionality	51	22.57
I like MOLS better	It has a better interface	96	42.48
	It has enough functionality	39	17.26
I don't have an opinion	I have no opinion	12	5.30

Opinions of some students about MOLS: *"MOLS has a better interface, it has our campus vibe, the other LMS (Moodle) is too stuffy and we have to register first to take courses on it. MOLS is simple but already integrated into our academic information system so we think it's more efficient"*.

"MOLS is enough for me, in terms of functionality. We can get learning material, video, quiz, give feedback, and call the roll. We don't need more LMS, one is enough ".

On other hand, here are some opinions about Moodle: *" Depending on the lecturers, if they use it optimally, we think we will like it. Some lecturers have used it only as a place to post learning materials and this is no different from MOLS"*.

4.2 Findings on students' perspective on progress tracking feature

It aimed to determine the opinions of the engineering students about the use of the progress tracking feature in LMS. Even though Moodle didn't get a good impression, almost all students like the progress tracking feature in the LMS. Progress tracking provides the latest information, what course materials that they have read/ watched/ worked on, and how much more percent must be achieved to complete the course. In addition, it also gives students a positive view that the lecturer has prepared the course well.

Table 3. Findings regarding students' perspective on progress tracking feature

Identification process	Opinion	f	%
I like this feature	Increasing motivation to get a better grade	78	34.51
	Increasing motivation to finish the course faster	126	55.75
I don't dislike but I don't like it too	It doesn't motivate me to get a better grade	17	7.52
	It doesn't motivate me to finish the course faster	5	2.21

Opinions of some students about progress tracking feature: *"Like the stage in the game, information appears where we have arrived and what stages we have gone through. It helps to motivate us to reach the end of a course. Just like we want to finish some stages in the game"*.

"This feature lets us know where we are working and what we need to achieve. Indeed there should be a feature like this in every course".

"This feature lets us know what to do and achieve in each course. This also made me know that the lecturer had prepared all the study materials and used teaching methods well".

4.3 Findings on students' perspective on digital badges feature

It aimed to determine the opinions of the engineering students about the use of digital badges feature in LMS. Just like the progress tracking feature, this badge feature also has a positive view. The badge is like a milestone for students that can be shown to others and become a trigger for competitiveness among students. In addition, it also provides motivation for students to be faster in completing the course and not being left behind by the others.

Table 4. Findings regarding students' perspective on progress tracking feature

Identification	Opinion	f	%
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process			
I like this feature	Increasing motivation to get a better grade	33	14.60
	Increasing motivation to finish the course faster	145	64.16
I don't dislike but I don't like it too	It doesn't motivate me to get a better grade	46	20.35
	It doesn't motivate me to finish the course faster	2	0.88

Opinions of some students about progress tracking feature: *"Like the level in the game, information appears about what level we have become (beginner, medium or advanced characters). It's nice to get something from what we achieve"*

"It's like a symbol that we've accomplished something. And provide motivation especially when others have received badges but we haven't yet".

" This badge makes us want to achieve something that other people can recognize. And increase the competitiveness among students".

4.4 Limitations

The results and discussion of this study provide an overview of the perspective of engineering students in general towards learning with Moodle, progress tracking, and digital badges. Even so, a more in-depth study is needed on other factors that affect the perspectives of students. The use of other methods is needed to obtain more accurate results. Obtaining more data is also needed to ensure that the data used is valid and reliable for all cases of engineering students.

5. Conclusion

In this research, it can be seen that students' views on the progress tracking feature and digital badge are not bad. Although the correlation has not been tested, it seems vague that the use of this game, which during the lockdown period has increased, has some effects on student acceptance of these features. The effect of games that stimulate the brain and become an addiction has been widely studied by psychology experts (Guerada, 2021; Rosyati et al., 2020) as well as the positive influence it has on increasing learning motivation (Delello et al., 2018; Rachels & Rockinson-Szapkiw, 2018; Su & Cheng, 2015). Lecturers in universities should look for loopholes and take advantage of the positive effects of this gaming habit. Implementing the right features will have a good impact on increasing student learning motivation as well as their performance and competence, especially for engineering students during this covid-19 pandemic.

From the results of the study, it was found that the perspective of students in the engineering faculty about the progress tracking feature and digital badges was quite acceptable to students, but still more effort was needed in compiling the content in the LMS and determining the rules in this badges system. In addition, to support from lecturers, support from faculties and universities is also needed to socialize these features so that they can be widely applied in the higher education environment. Because when students are ready and easy to adapt to these features, it is from the lecturers and campus officials who don't even see this as a good opportunity to increase student learning motivation. In a sufficient support system, where all individuals in the university have the same knowledge, motivation, and opinion regarding online learning innovation, the features in this research or other promising features will be able to make a significant contribution to the development of student learning methods, especially students in higher education.

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