

Conference Paper

Analysis Implementation Gamification Massive Open Online Course for Student Motivation Learning

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ABSTRACT

The State Polytechnic of Malang has created a learning system that uses gamification as one method to improve student motivation in their academic work. Massive Open Online Courses, or MOOCs for short, are one of the learning strategies used. They are open to everyone and offer online learning opportunities with no cap on the number of students who can enroll. Gamification has been implemented in the State Polytechnic of Malang MOOC system for teaching web programming design to overcome concerns with the online learning system. To make learning more interesting and motivating, the MOOC system implements the concept of gamification. Research and development (R&D) techniques were employed in this study to validate the gamification design process. The study was conducted using two types of scenarios to test the level of student motivation from the use of MOOCs. Using gamification and MOOC is a new phenomenon in open learning and is known as a good strategy di Independent Campuses. Gamification consists of the show that badges, leader boards, and performance graphs positively affect competence need satisfaction. The calculation of the change in motivation is obtained by the activeness of students in answering quizzes, uploading the results of the Job sheet, and claiming rewards in each activity. The reward is one of the important points in gamification that can be used as a parameter to increase student motivation in studying any given material.

Keywords: Gamification, MOOC, Motivation, Online Learning, System

Introduction

The COVID-19 pandemic is currently hurting many people, including those in the educational sector. The government has issued a stay-at-home/work-from-home program to encourage individuals not to frequently engage in activities outside the home in light of the COVID-19 pandemic that has spread across the globe, including in Indonesia. Developments in information technology have a significant impact on developments in all disciplines, particularly in education, to comply with these government initiatives. To ensure that students may still exercise their right to education and avoid being impacted by the outbreak, learning is moved to online or virtual environments.

An open online learning system can provide one of the means to attract learners from different backgrounds, cultures, and locations. In the world of education, online-based learning is not a new thing to connect learners (Nurakun, 2021). Online learning must also have structured materials to achieve learning objectives. Online learning with valid and structured materials is important for learners in achieving learning objectives (Prastiyo, 2018). State Polytechnic of Malang is one of the universities that has implemented one of its online-based learning processes with learning media using web learning whereas in its academic activities it uses e-learning media, namely LMS. In the learning model, students must be enrolled in courses according to the study program taken. Students from other study programs cannot take courses outside the study program and cannot follow the learning process of these courses (Sudaryanto et al., 2021). Unlike

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the MOOC where participants are free to choose the courses to be followed outside the study program that has been taken because of the open nature of the MOOC.

Massive Open Online Course or what is often referred to as MOOC is one of the online learning systems that is massively implemented and can be accessed openly where the number of participants does not have a maximum limit with the aim of connecting subjects with one another with an unlimited area coverage and can be accessed through websites and mobile. Massive Open Online Course (MOOC) is online learning aimed at mass interactive participation and open access through websites and mobile (Aris, 2016). The Massive Open Online Course (MOOC) was first published in 2008 in conjunction with the launch of Connectivism and Connective Knowledge (CCK08), MOOCs can be accessed at any time without being limited by time and anywhere as long as they are connected to the internet. In addition, MOOCs are offered at low prices and even some of them can be accessed for free. However, MOOCs themselves also have weaknesses, namely a lack of understanding to know their goals and less interactive learning can make users bored quickly and reduce their interest. MOOCs have the disadvantage of a low completion rate compared to the number of registrations to MOOCs (Nugroho & Rini, 2021). If the learning method used is less interesting, it makes participants less enthusiastic and feels saturated during lectures, and lecturers feel that there are too many theoretical lecture activities rather than communication practices. One way that can be used in dealing with this is to use the gamification learning method.

Gamification is the integration, game thinking, game design, and game mechanics in non-game contexts to make it much more interesting (Takahashi, 2010). Gamification is different from Game Based Learning where gamification transforms the learning process into a game by adding elements contained in the game such as points, levels, badges, and leaderboards in non-game contexts to engage participants and encourage the desired behavior, while Game Based Learning is a game application designed to help the learning process. Gamification in learning has a very positive impact and fun learning for the world of education (Aini et al., 2019). If someone does something happily, it will not be easy to feel bored because they are interested in doing things they like.

The purpose of this study is to apply gamification to the MOOC system so that the system is more interactive, where participants who use the system to download materials, upload tasks, and so on, but are associated with interactive menus or features to participants by the design of the gamification that has been designed. So with the application of gamification to the State Polytechnic of Malang MOOC system for web programming learning, it is hoped that it can be useful to increase the motivation of participants in participating and motivate them to study hard.

Material and Methods

The research and development method used is the Research and Development method adapting from the Borg and Gall model. Educational research and development (R&D) is a process used to develop and validate educational products, in showing that the product meets the goals that have been set the steps of this process are usually referred to as the R&D cycle, which consists of studying the research findings related to the product to be developed, developing products based on these findings, testing it in the field on a limited basis with the settings that would later be used, and revising it to correct the deficiencies found at the field trial stage.

In the research and information collection stage, the author collects information in the form of problems and needs faced and designs data based on the results of data collection, namely from literature studies and field studies. At the planning stage, prepare a research plan that is carried out to determine what will be done and done from the beginning to the end of the research and the objectives that will be achieved in conducting this research. The stage of developing the preliminary form of the product is carried out by preparing supporting components and data to create a MOOC system where the MOOC system is designed with the application of gamification in it using the MDA framework which will be applied to field tests. At this stage, it also writes program code based on the design of the system that has been created.



Figure 1. Methodology

This study subject 20 students from informatics engineering at the State Polytechnic of Malang who participated as participants in the system trial. Participants should register first so that they can log in to the system. Furthermore, participants enrolled in web programming courses that were already available.

The indicators measure consist of 2 scenario activeness of participants in system trial activities based on points and levels:

The first testing scenario: testing was carried out using module 1–8 parameters, quizzes, attendance 1-2, and claim weekly rewards 1-2 by comparing the average points obtained by participants based on the status points of collecting module work results 1-8, quizzes, attendance 1-2, and claim weekly rewards 1-2.

The second testing scenario: the test was carried out using the parameters of modules 1–8, quizzes, attendance 1-2, and claim weekly rewards 1-2 by comparing the average total exp obtained by participants based on the average total exp of the activity of collecting the results of module work 1-8, quizzes, performing attendance, and claiming weekly rewards 1-2.

The points obtained by participants from the results of accumulated rewards and punishments will be used as a determinant of the rank on the leaderboards. Details of the rewards and punishment design in this gamification can be seen in table 1 as follows.

The level increase where the accumulated result of the exp value obtained by the participant will be used as a level increase. The level increase will occur if the participant manages to collect 1000 exp and the total number of levels in this gamification design is level 20.

Table 1. Point rewards and punishment design

Indicator	Type	Point
On-time attendance	<i>Rewards</i>	+500
Late attendance	<i>Punishment</i>	+300
No Attendance	<i>Punishment</i>	+0
On-time submission of assignments/quizzes	<i>Rewards</i>	+determined by the instructor
Late submission of assignments/quizzes	<i>Punishment</i>	Points that have been determined by the instructor - 100
No submission of assignments/quizzes	<i>Punishment</i>	+0
1 st ranked participant on the leaderboards every week	<i>Rewards</i>	+250
2 nd ranked participant on the leaderboards every week	<i>Rewards</i>	+200

To be continued...

3 rd ranked participant on the <i>Rewards</i> leaderboards every week	+150
4 th ranked participant on the leaderboards <i>Rewards</i> every week	+100

Results and Discussion

Result

Based on the results of the second test scenario using the system, a graph of points obtained by participants in the system trial activity was obtained as shown in Figure 2.

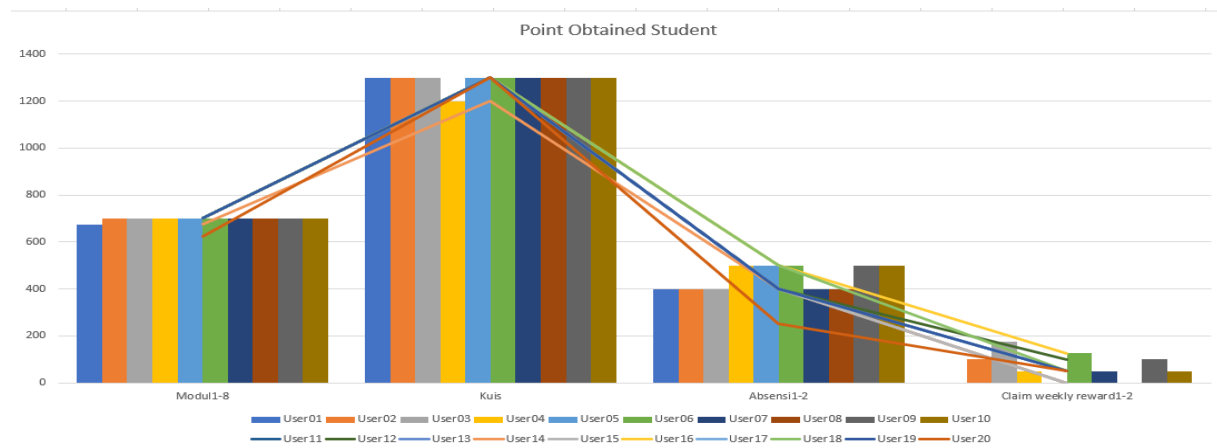


Figure 2. Graph of points obtained by participants of the results of the first test scenarios

Figure 2 above is a graph of the average points obtained by participants in each activity. In module 1-8 collection activity, the average point obtained by participants was 694. In the quiz collection activity, the average point obtained by the participants was 1290. In attendance activities, 1-2 the average point obtained by participants was 428. In the weekly reward1-2 claim activity, the average point obtained by participants was 56. Furthermore, the average point obtained by participants in all system trial activities was 601. From the average points obtained by participants during the system trial, it proves that there is motivation in web programming learning activities using a MOOC system with gamification.

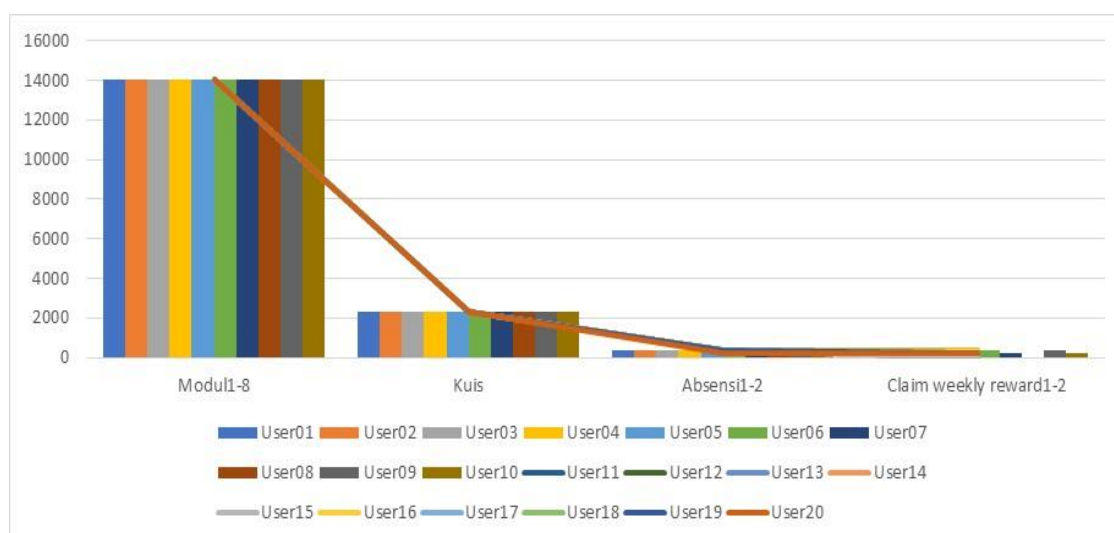


Figure 3. Graph of total exp obtained by participants of the second test scenario results

Based on the results of the second test scenario of the use of the system, a graph of the total exp obtained by participants in the system trial activity was obtained as shown in the following Figure 3.

In the picture above, 20 participants have collected modules 1-8. The average total exp earned by participants during learning modules 1-8 is 14000 where 20 participants have reached level 14 and obtained a gold badge. In the quiz collection activity, 20 participants won exp with an average of 2300, where when accumulated with the exp obtained by participants from the collection of Module 1-8, 20 participants had obtained a total exp of 16300 or reached level 16 and obtained a Diamond badge. In the attendance activity, participants learned exp with an average of 390, where when accumulated with the exp processed by participants from the collection of Modules 1-8, and on the quiz, 19 participants had obtained 16700 exp or reached level 16 and obtained a Diamond badge. In the claim weekly reward activity, 1-2 participants achieved an average exp of 190, where if accumulated with the exp obtained by participants from collecting modules 1-8, quizzes, and attendance 1-2 t, 13 participants had obtained exp of more than 16880, and there were 5 participants among them reaching the level 17 to prove that there is motivation in web programming learning activities using a MOOC system with gamification.

Discussion

The use of the scenario above aims to obtain a predetermined gamification measurement scale. The average points obtained and the level achieved by participants based on the test scenario show an average percentage of 92% for active participants in participating in a series of system testing activities and prove that there is motivation in participating in system testing activities. Details of the participants' activities in using MOOC with gamification during system testing are shown in Figure 4.

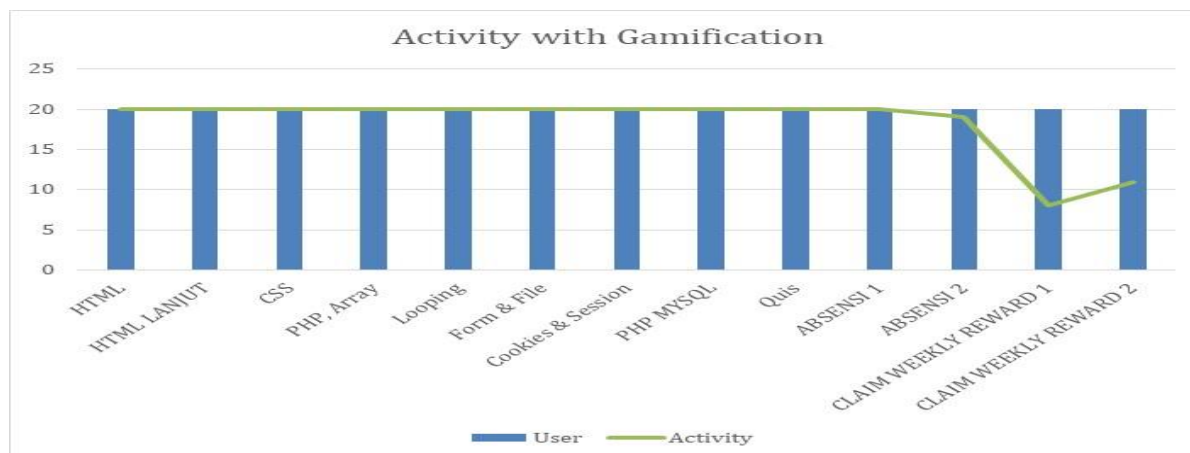


Figure 4. Participants' activities in using MOOCs with gamification during system testing

The assessment of motivation in measuring gamification is seen from the level of student activity in working on modules from weeks 1-8, quizzes, attendance, and claiming weekly rewards. Gamification is a learning method that uses games in it. By doing quizzes or by collecting the results of activities from weeks 1-8 because this gamification can reduce boredom in the following subjects. One example is to increase student interaction in taking lessons by using quizzes, quizzes are carried out in groups and individually. Another advantage of using gamification is to increase student concentration to be able to be motivated to follow each lesson well or in other words, to encourage students to follow each lesson well. One example of the use of this gamification is when the material is given from weeks 1-8. Rewards and points earned will encourage students' efforts to further increase their concentration in attending lectures. Another gamification activity is to increase the desire for students to understand the material or motivate

themselves to study harder. It can be seen in Figure 4 that the average percentage of activities is 92%, which is obtained from the points earned and the average level of students in this MOOC gamification activity. The goal is clear, they don't want to lose to other students who can maximize each question to push their ranking on par with the others.

In this study, the field of improving education in Indonesia applying for Independent Campus programs. Using gamification and MOOC is a new phenomenon in open learning and is known as a good strategy di Independent Campuses. Gamification consists of the show that badges, leader boards, and performance graphs positively affect competence need satisfaction, as well as perceived task meaningfulness, while avatars and teammates affect experiences of social relatedness. The samples in this research were one class; an experimental class consisting of 20 students from the second semester.

In the future, there MOOC system with gamification can be used for courses in web programming at the Polytechnic of Malang and can add game elements developed in the system, such as obtaining badges based on the criteria that can improve participants abilities, types of points other than points and exp community forums as an incentive for participants to be more active in the discussion.

Conclusion

The conclusions from the above research are Gamification learning methods are made to follow the era when students prefer to play games rather than learn, therefore the gamification method can be applied to the management of education at a higher level of education.

The increase in student motivation lies in giving rewards and points for each activity. Learning that occurs because of a desire that arises from within is much stronger and more meaningful than learning that occurs for the sake of obtaining rewards. The purpose of giving this reward is that students can increase their desire to learn each material so they don't want other students who can maximize each question to boost their ranking in this gamification learning method.

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