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The Effectiveness of the Gamified LMS Platform to Increase Students' Motivation in Online Courses

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ABSTRACT

Gamified Massive Open Online Courses (G-MOOCs) is a Learning Management System (LMS) platform built on the gamification framework (MARC Gamification Framework) that has been proposed in previous studies based on various aspects of game elements, social learning, motivation and interactive theory learning environment (ILE). G-MOOC is a background element that can motivate them when taking courses in online learning. The purpose of this study was to know the effectiveness of gamified LMS platforms to increase learners' motivation on the level of online course completion. In this study involving students of Universitas Amikom Purwokerto in the information system study program to evaluate the G-MOOCs platform that had been built. Students were randomly selected from 142 student populations, 71 students to evaluate the G-MOOC and 71 other students to evaluate platforms without gamification. Tests are carried out using the experimental group method using two indicators, namely the level of mastery of the course (performance) and the status of learning courses (Done/Not Done). To produce data from used indicators, researchers gave four weeks to take the course. The courses are compared with the LMS platform which has no gamification element (SIMOOC), the performance indicators are tested in the participant values between the G-MOOCs platform and the SIMOOC platform, t-test used to determine if there is a significant difference between the means of G-MOOCs and SIMOOC. Based on the results of the test, there is an effectiveness of gamified LMS platform to increase learners motivation on the level of online course completion, because the scores generated in the G-MOOCs platform is better than the SIMOOC platform, as well as the number of learners on the G-MOOCs platform is greater than the SIMOOC platform.

Key words: G-MOOCs, Learning Management System, effectiveness, motivation.

1. INTRODUCTION

One of the right online learning platforms to help free and open distribution of learning is the Massive Open Online Course (MOOC). According to [1], MOOC gives freedom to students because of its open nature and not a limited number of participants [2]. MOOC has features that distinguish it from other online learning platforms, including the MOOC providing an opportunity for anyone to be able to take courses offered without being limited by the number of participants, age, gender, nationality and level of education. In addition, MOOC is free and can be accessed from anywhere via the internet by adopting conventional instruction-based learning methods and content provided within a certain period.

Although MOOC has various advantages, the MOOC platform also has weaknesses. One disadvantage of MOOC online-based learning is the low level of willingness of students to complete the course compared to the number of students taking courses [3][4][5]. One of the factors that influence the low level of completing the course is the problem of lack of motivation [6][7][8]. This is due to the assumption that online-based learning media as electronic media is passive which only presents images, videos and text, so it is not much different from independent learning using books [9].

The efforts used by researchers to increase motivation for online-based learning are very diverse. One of them is by using the gamification approach. Gamification is a method that utilizes game elements and designs to be adopted into non-game contexts [10]. However, efforts to use gamification as an approach to encourage increased motivation are not easy. If it is not designed properly, it will cause a decrease in user motivation. The use of gamification elements, especially elements of rewards such as points, badges, leaderboards (PBL) in online-based learning will lead to the emergence of demotivation of learners [11][12][13][14]. The reason is that the side effects of element rewards only affect student motivation in the short term if students have got all the rewards they will not be motivated again [15][16][17].

Therefore, caution is needed in determining the types of game elements to be used, as well as the mechanism for using game elements by referring to the motivation theory approach.

Gamified Massive Open Online Courses (G-MOOCs) is a LMS platform built to solve motivational problems in online learning. Learning Management System (LMS) is a software that helps the teaching and learning process of teachers and students in higher education institutions [18] G-MOOCs are built based on the MARC framework (Meaningful Purposes, Autonomy, Relatedness & Competence to Mastery) proposed by [19] which focuses on efforts to increase the motivation of course participants in completing online courses. But the platform that has been built has not been tested directly, so that the effectiveness and up to date of G-MOOC has not been well measured. Therefore, it is necessary to do a testing process on the G-MOOCs platform so that the effectiveness and usefulness of the platform can be tested and measured properly. So, the purpose of this study is to test the G-MOOCs platform that has been built to determine the effectiveness and usefulness of the platform in dealing with the problems of low motivation and high dropout rates in online courses.

1.1. Hypotheses

Hypotheses about the effectiveness of a Gamified LMS platform to increase learner's motivation on the level of online course completion. The effectiveness criteria of the LMS platform is that it can motivate learners to complete the course and learners get good grades from the courses that are followed.

Hypotheses 1:

H0: The percentage of students completing courses on the G-MOOCs platform is greater than the LMS platform without the gamification framework.

H1: The percentage of students who complete the course on the G-MOOCs platform is less than the LMS platform without the gamification framework.

Hypotheses 2:

H0: Students in learning on the G-MOOCs platform are more effective in terms of value compared to the LMS platform without the gamification framework.

H1: Students in learning on the G-MOOCs platform are not more effective in terms of value compared to the LMS platform without the gamification framework.

2. METHOD

This section will explain in more detail the research methods in this research. Previous research carried out by researchers was the stage of investigation and design stage, so that in this study, the focus was on the last stage, namely the evaluation phase. In this study involving students of Amikom Purwokerto University in the information system study program to evaluate the G-MOOCs platform that had been built. The evaluation results from the G-MOOCs platform will be compared to platforms that are built without using gamification elements.

The number of students in the information system study program at Amikom Purwokerto University was 142 students, the population was randomly sampled, 71 student samples to evaluate the G-MOOCs platform, and 71 other student samples to evaluate platforms that were built without using gamification elements. Figure 1 shows an overview of student data based on sex on the two platforms that will be evaluated.

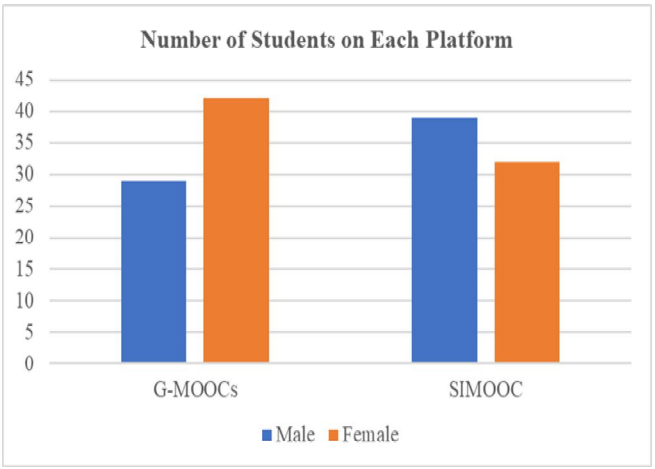

Figure 1: Number of students on each platform

Based on Figure 1 above, the number of male and female sex students who take courses on the G-MOOCs platforms is 29 and 42 respectively, while on the SIMOOC platform (platforms that do not contain gamification elements) the number of consecutive men and women according to 39 and 32. Students on both platforms get the same treatment, where they are given one month to take the course, in one month it is divided into four topics, each subject has ten sub-topics. The material they learned on each platform is about information system security, the material presented in the form of videos on each sub-topic. If students have completed the course in one subject, students are asked to complete the exam regarding the material that has been studied before. So each student will take the exam four times, and get a score of four on four subjects.

There is no compulsion to complete the course and rewards given to students if they can complete the course on each platform; students are asked to take courses according to their interest in platform use. The test results from the four subject matter topics on the G-MOOCs platform will be compared with the results on the SIMOOC platform. The comparison aims to determine the average value on the G-MOOCs platform whether it is significantly different from student grades on the SIMOOC platform. Inferential statistics such as independent t-test are used to determine the difference

between the averages of two groups in quantitative parametric variables; the group is the value generated from the G-MOOCs platform and the SIMOOC platform. So that it can be seen the level of effectiveness of the platform in terms of value.

3. RESULT AND DISCUSSION

Based on the results indicated that of 71 samples of students who took courses with information system security materials using the G-MOOCs and SIMOOC platforms for one month, not all students were interested in completing the courses offered on both platforms. However, there are differences in the percentage of students who have completed courses on the G-MOOCs and SIMOOC platforms. Figure 2 - 5 shows the number of students completing from week one to week four on the G-MOOCs and SIMOOC platforms.

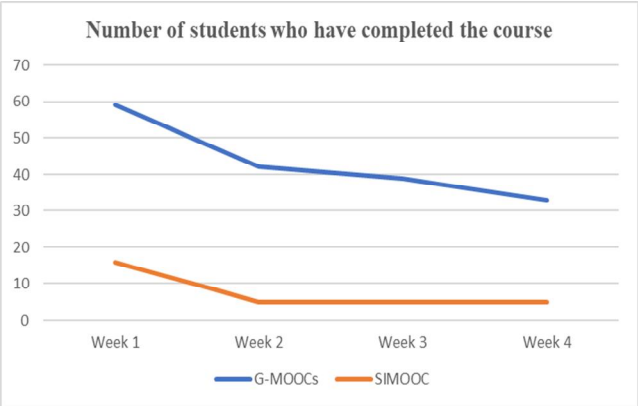

Figure 2: Number of students who have completed courses on the G-MOOCs and SIMOOC platforms

Based on Figure 2, the number of students completing courses from week 1 to week 4 has decreased, this has happened on the G-MOOCs platform, while on the SIMOOC platform it has only decreased from week 1 to week 2, from week 2 to week 4 there are no changes the number of students completing the course. However, judging by a large number of students who complete the course, the G-MOOCs platform is always higher every week. There are also many differences in the number of residents, the difference between students who completed the course in weeks 1-4 between the G-MOOCs platform and the SIMOOC platform respectively 43, 37, 34, and 28. Students who complete the course until week 4 each The platform is a student who has completed weeks 1, 2, and 3, because the system is designed so that students take courses in sequence, according to the material prepared. However, there are students who do not complete until Sunday 4. Figure 3 shows the process of students completing all material on the G-MOOCs and SIMOOC platforms.

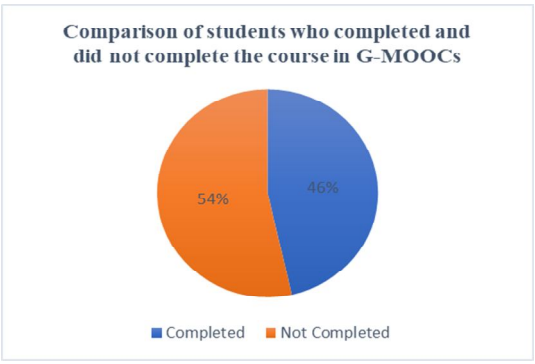

Figure 3: Comparison of students who completed and did not complete the course in G-MOOCs

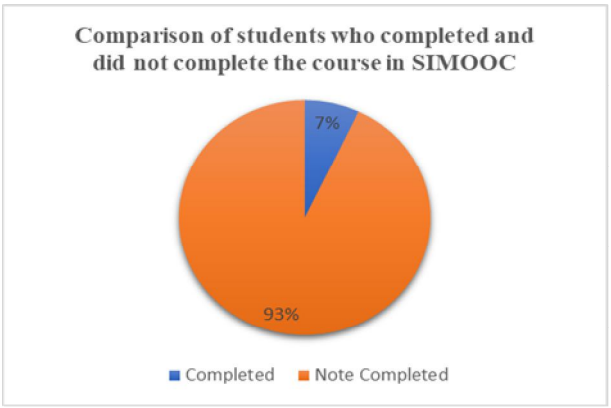

Figure 4: Comparison of students who completed and did not complete the course in SIMOOC

Based on Figures 3 and 4, the percentage of students completing courses on the G-MOOCs and SIMOOC platforms is less than students who do not complete the course. There are several factors that cause there are still many students who do not complete the course, based on the results of interviews with students who did not complete the course; the researchers concluded several factors that could cause students to only complete some material.

A. Time

Too short time to complete the course with the amount of material offered, while as students there are still many activities or work that they have to complete, both college assignments and other additional activities.

B. Video quality

Because researchers are not focused on how to produce interesting learning videos, so the material presented by the researchers on both platforms is downloaded from yotube.com.

Even though this happens, the percentage of students who complete the course on the G-MOOCs platform is greater than the SIMOOC platform. The main factor of these results is, of course, because there is an element of gamification on the G-MOOC platform that makes students interested in exploring the platform by taking the courses provided. Unlike

the SIMOOC platform, the LMS has no gamification element at all, so students feel bored in running the platform and taking the provided course. Based on Figures 3 and 4 it can also answer and prove the first hypothesis, that H0 is accepted, so it is proven that the process of students completing courses on the G-MOOCs platform is greater than the platform that does not have gamification (SIMOOC), and H1 is rejected.

When viewed in terms of the value produced, the gamification element can also make students get grades from exams per week better than student grades on platforms where there is no element of gamification. Figure 5 shows the average scores of students on the G-MOOCs and SIMOOC platforms every week.

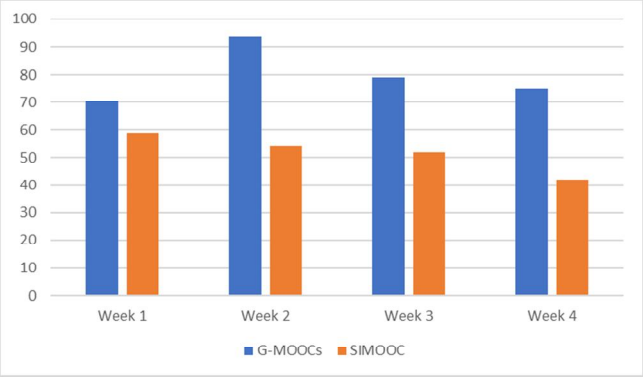

Figure 5: Comparison of average student scores on the G-MOOCs and SIMOOC platforms

Based on Figure 5, the average student score per week on the G-MOOCs platform is greater than the student score on the SIMOOC platform. The value of the G-MOOC platform has experienced an increase from week 1 to week 2 and has decreased from week 2 to week 4, while student grades on SIMOOC platforms from week 1 to week 4 have decreased. The highest and lowest average student scores on the G-MOOCs platform respectively at weeks 2 and 1, while on the SIMOOC platform occur at week 1 and 4. To prove the second hypothesis, an independent t-test was carried out. Testing for average differences is done every week. Table 1 - 4 shows the test results of differences in the average student scores on the G-MOOCs and SIMOOC platforms.

Table 1: Test the difference in average value of week 1

	G-MOOCs	SIMOOC
Mean	70,50847458	58,75
Variance	301,4611338	238,3333333
Observations	59	16
Hypothesized Mean Difference	0	
df	26	
t Stat	2,628923641	
P(T<=t) one-tail	0,007095337	
t Critical one-tail	1,70561792	
P(T<=t) two-tail	0,014190673	
t Critical two-tail	2,055529439	

Table 2: Test the difference in average value of week 2

	G-MOOCs	SIMOOC
Mean	93,92857	54
Variance	42,11672	680
Observations	42	5
Hypothesized Mean Difference	0	
df	4	
t Stat	3,411293	
P(T<=t) one-tail	0,013498	
t Critical one-tail	2,131847	
P(T<=t) two-tail	0,026995	
t Critical two-tail	2,776445	

Table 3: Test the difference in average value of week 3

	G-MOOCs	SIMOOC
Mean	79,23077	52
Variance	53,25444	470
Observations	40	5
Hypothesized Mean Difference	0	
df	4	
t Stat	2,788958	
P(T<=t) one-tail	0,024682	
t Critical one-tail	2,131847	
P(T<=t) two-tail	0,049365	
t Critical two-tail	2,776445	

Table 4: Test the difference in average value of week 4

	G-MOOCs	SIMOOC
Mean	74,84848485	42
Variance	57,00757576	670
Observations	33	5
Hypothesized Mean Difference	0	
df	4	
t Stat	2,819560474	
P(T<=t) one-tail	0,023924745	

t Critical one-tail	2,131846786	
P(T<=t) two-tail	0,04784949	
t Critical two-tail	2,776445105	

Based on Table 1 - 4, the results of the test of the difference in average student scores on the G-MOOCs and SIMOOC platforms resulted that the p-value was below the predetermined p-value, ie 0.05. These results indicate that the average student scores on the G-MOOCs platform are larger and differ significantly from the average student scores on the SIMOOC platform. With these results, so that it can answer the second hypothesis that H0 is accepted and H1 is rejected. It is evident that students who take online courses using LMS that have gamification elements (G-MOOCs) are more effective in terms of value compared to students who take online courses on LMS that have no gamification element at all (SIMOOC).

The purpose of building an LMS is as a forum for people who want to learn something without meeting directly with instructors and other people who want to learn too, meaning that learning can be done anywhere by using tools that can be connected to the internet and the LMS platform. However, learning like this has a problem, which is explained in the introduction. In a previous study, a framework for building an LMS based on gamification was proposed, people studying in an LMS were brought into the play environment, not just learning the subject matter. In this study, it has been proven that the level of effectiveness of LMS that is built based on gamification is better than LMS without using gamification elements. The elements used to measure the level of effectiveness of the two LMS are the values obtained by students and the level of completeness of students in following the course. A good LMS is an LMS that can make students who have joined can take the course to completion, and the goal of learning is to get knowledge, to prove whether students have gained knowledge well is to give an exam, the test results are a benchmark for students who mastered the subject matter or not. In this study G-MOOCs were able to answer the challenges faced by most LMS, which were able to keep students motivated to complete the course and get good grades.

The most important component in Massive Open Online Courses (MOOCs) is the form of delivery of material to students, video is one of the forms of delivery of material that is often used in MOOCs. Likewise in G-MOOCs and SIMOOC, the delivery method is using video. However, this research does not pay attention to the question of how videos are designed, produced, and used in the context of online learning, specifically related to pedagogy and cost ?; What are the benefits and limitations of the standardization of the video production process ?. This has caused the course participants in the G-MOOCs and SIMOOC to complain about the quality of the learning videos that are presented and is one of the causes of learners who have not completed the course. If the video used on G-MOOCs is considered in terms of the process of designing, producing and limiting the standardization of the video production process, the results will be better than this research, because it combines the LMS based on gamification and video learning with clear standardization.

4. CONCLUSION

The LMS platform that was successfully built using gamification elements (G-MOOCs) was successfully tested to measure the percentage of success of students completing the course and the level of effectiveness in terms of value compared to the LMS platform that did not apply the gamification element (SIMOOC). Based on the results of test, there is an effectiveness of gamified LMS platform to increase learners motivation on the level of online course completion. For further research, it is necessary to pay attention to the testing time so that students can better explore the material and platforms, then regarding the video containing the material, it should be noted the content so that students are not only interested in the platform, but also interested in the material presented.

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