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Analyzing MOOC Features for Enhancing Students Learning Satisfaction

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Abstract—This research goal is to identify MOOC features (edX and Coursera) that affect and support students learning satisfaction. The objectives of this research for lecturers are to become an alternative way to conduct learning activity by using the features recommendation and as for students is to support their learning satisfaction that can increase their participation in learning process. The main objective of this research is to find features of Learning Management System (LMS) on Massive Open Online Course (MOOC) based on students learning satisfaction indicators and give feature recommendations for higher education LMS. Data collection method for this research is by spreading 130 questionnaires to students who have participated in MOOC. As for the data analysis, the authors use multiple regression model for analyzing the relationship between the dependent and independent variables and using SPSS Statistics 22 software as a tool for analyzing the collected data. The result from this research shows that communication, lecture and study material, quiz, assignment, and grading features are the features that support students learning satisfaction.

Index Terms—Learning Management System (LMS); Massive Open Online Course (MOOC); Students Learning Satisfaction.

I. INTRODUCTION

In Indonesia, there are many education institutions that can be chosen by prospective students who want to continue to higher level of education, which is university. There are many universities including public and private universities all over Indonesia provinces. One of them which are private university that is funded by private organization has offered a spot in 3.092 universities [1] with many different methods of learning.

Many universities have implemented e-Learning for one of their method of students learning, because e-Learning is one of the most promising and growing application that is essential to give knowledge to society. The growth of the Internet is approaching online education to people in corporations, institutions of higher education, government, and other sectors. Many online learning courses are now available and distributed freely to be accessed via Internet for larger geographically participations scale everywhere and anytime. It is shown by the top 10 growth rates country that adopt e-Learning in Figure 1.

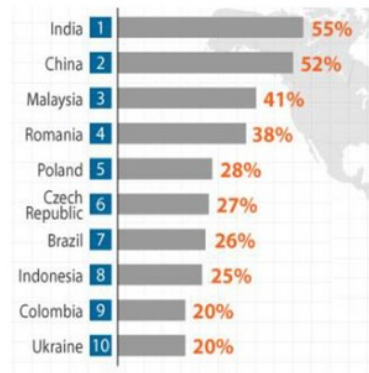


Figure 1: E-learning growth rates by top 10 countries from 2010-2015 [2]

Inside e-Learning, there are courses that are known as MOOC (Massive Open Online Courses). MOOC is a way to connect, collaborate, and engage in the learning process. Figure 2 shows the growth of MOOCs from 2012 – 2014:

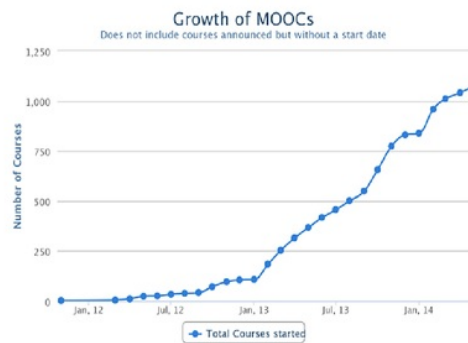


Figure 2: Growth of MOOCs [3]

MOOC can be run on a platform called LMS (Learning Management System). LMS (Learning Management System) itself is a platform for hosting a course (MOOC) [4]. LMS allows anyone to create, distribute, manage, and track training or learning materials anywhere, anytime, on any device. The usage of MOOC and LMS itself is different. LMS is used as software for managing complex databases that has been combined with digital frameworks for managing curriculum, training materials, and evaluation tools. On the other hand, MOOC is focusing on course that will be taken by its users.

There are many technologies using MOOC platform inside LMS that have similarities in its features, such as Coursera, edX, FutureLearn, and so on. From those similarities, researchers want to find features that can provide optimal learning satisfaction for higher education students.

XYZ University is one of private university that has different types of learning method, which include the most common technique called face-to-face learning. Face-to-face learning method is considered as the most effective way to improve college students' study motivation because they can talk directly with dynamic engagement with people that surround them, and also do a collaborative discussion [5]. Meanwhile, as the technology evolves, an electronic educational technology called e-Learning was implemented also in XYZ University. In the forum, learning activities are conducted by lecturer and consist of discussions, materials download, and assignment completion [6]. By seeing data from year 2012 until 2014, students' participations were low rather than the lecturer posting activities.

Table 1
Lecturers and Students Posting Total in XYZ Forum

Period	Semester	Total Lecturers Posting	Total Students Posting
2012	3	303	7
	1	3844	204
2013	2	274	0
	3	686	4
2014	3	15	18

Seeing this importance, this research wants to identify which features of LMS that are suitable to be adopted for XYZ University students which can support their learning satisfaction. Learning satisfaction may be applied to explain the motivation of student's participation in learning activity [7]. Through a cross-comparison of features aspects in LMS, the courses provided by edX and Coursera are to be observed in line with the evaluation criteria. This paper only focus in comparing these two MOOC platforms; edX and Coursera because starting in 2012, three organizations - Udacity, edX and Coursera - started to dominate conversations about MOOCs [8]. Coursera is the largest online course (MOOC) provider in the world, last year Coursera added 7 million new students to its user base, and so now, it has 17 million students in total [9]. As for edX, it achieved 370,000 students in its first classes [10, p. 3].

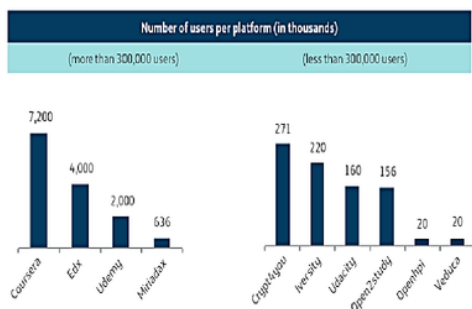


Figure 3: Numbers of MOOC users on April 2014 [11]

In the education field, course grades are often used as an indicator of student achievement in online instruction. There is another indicator that also affects student achievement,

which is an affective factor. Affective factors can be as important as cognitive factors in explaining and predicting student learning in online settings. Among the attitudinal constructs, student satisfaction, referring to student perceptions of learning experiences and perceived value of a course, may be particularly worthy of investigation [12]. Student satisfaction is one of several variables influencing the success of online learning programs [13]. Student satisfaction is the subjective perceptions, on students' part, of how well a learning environment supports academic success. Strong student satisfaction implies that appropriately challenging instructional methods are serving to trigger students' thinking and learning [14, p. 48]. Therefore, learning satisfaction may be applied to explain the motivation of student's participation in learning activity and the results of participating in the learning process [7].

This research would like to identify features that can support XYZ University students learning satisfaction by comparing the two MOOC platforms, edX and Coursera, by its features.

II. RESEARCH METHOD

This research conducted through paper-based questionnaires to 116 students who have already enrolled in MOOC systems (Coursera and EdX). The following (Figure 4) is the research model for this paper.

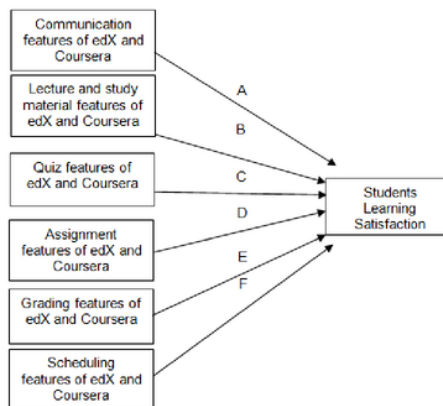


Figure 4: Research model

A. Hypotheses

Based on identified problems, hypothesis that will be tested in this research are as following:

Variable A

H₀ : MOOC communication features utility don't affect students learning satisfaction.

H₁ : MOOC communication features utility affect students learning satisfaction.

Variable B

H₀ : MOOC lecture and study material features utility don't affect students learning satisfaction.

H₁ : MOOC lecture and study material features utility affect students learning satisfaction.

Variable C

H_0 : MOOC quiz features utilities don't affect students learning satisfaction.
 H_1 : MOOC quiz features utility affect students learning satisfaction.

Variable D

H_0 : MOOC assignment features utilities don't affect students learning satisfaction.
 H_1 : MOOC assignment features utility affect students learning satisfaction.

Variable E

H_0 : MOOC grading features utilities don't affect students learning satisfaction.
 H_1 : MOOC grading features utility affect students learning satisfaction.

Variable F

H_0 : MOOC scheduling features utilities don't affect students learning satisfaction.
 H_1 : MOOC scheduling features utility affect students learning satisfaction.

B. Multiple Linear Regressions

This research uses multiple regression model formula for analyzing the relationship between the dependent and independent variables as the following Equation (1):

$$SLS = \beta_1 CM + \beta_2 LS + \beta_3 QZ + \beta_4 GA + \beta_5 SC + \varepsilon \quad (1)$$

where:

- SLS : Students learning satisfaction
- CM : Communication features
- LS : Lecture and study materials features
- QZ : Quiz features
- GA : Grading features
- SC : Scheduling features
- ε : 5% residual term / error rate

III. RESULTS AND ANALYSIS

There are 116 students participated in using edX and Coursera as their learning platform. The first half of the students tried using edX and the other half was using Coursera for two weeks. All results were gathered to obtain outcome for answering the purpose of this research by conducting testing using measurement tools. All results were valid, reliable, and have normal distribution. The hypothesis for testing the significance of any individual regression coefficient is:

$$H_0 : \beta_i = 0$$

$$H_1 : \beta_i \neq 0$$

If $H_0 : \beta_i = 0$, this indicates that one or more variables (x_i) can be removed from the model.

A. T-Testing of edX

Each independent variable has different value of significance which can show which features have the significant relationship with the students learning satisfaction.

Table 2
T-Testing of edX

Model	Unstandardized Coefficients B	Sig.
(Constant)	0.671	0.008
Communication Feature	0.144	0.018
Lecture Feature	0.209	0.019
Quiz Feature	0.005	0.915
Assignment Feature	0.150	0.005
Grade Feature	0.191	0.000
Schedule Feature	0.090	0.101

Significance values that are under 0.05 are:

- Communication features with 0.018
- Lecture and Study Material features with 0.019
- Assignment feature with 0.005
- Grading features with 0.000

This result shows that four features are significantly related to students learning satisfaction. It means that the null hypothesis or H_0 are rejected, but H_1 are accepted. The accepted hypotheses are shown in Figure 5.

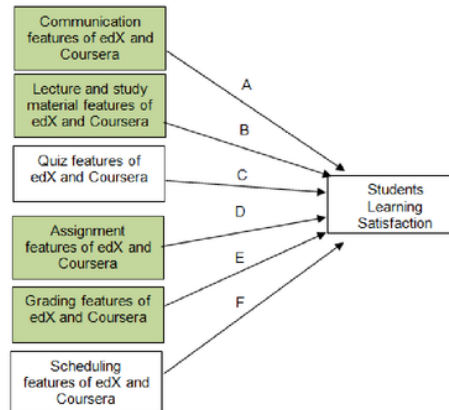


Figure 5: Accepted variables of edX in research model

Variable A

H_1 : MOOC communication features utility affect students learning satisfaction.

Variable B

H_1 : MOOC lecture and study material features utility affect students learning satisfaction.

Variable D

H_1 : MOOC assignment features utility affect students learning satisfaction.

Variable E

H_1 : MOOC grading features utility affect students learning satisfaction.

B. T-Testing of Coursera

Table 3 shows the result of t-test from Coursera data.

Table 3
T-Testing of Coursera

Model	Unstandardized Coefficients B	Sig.
(Constant)	1.146	0.000
Communication Feature	0.199	0.001
Lecture Feature	0.242	0.009
Quiz Feature	0.106	0.025
Assignment Feature	0.051	0.511
Grade Feature	0.008	0.810
Schedule Feature	0.017	0.753

This result shows that three features are significantly related to students learning satisfaction. It means that the null hypothesis or H_0 are rejected, but H_1 are accepted. The accepted hypotheses are:

- Communication features with 0.001
- Lecture and Material features with 0.009
- Quiz feature with 0.025

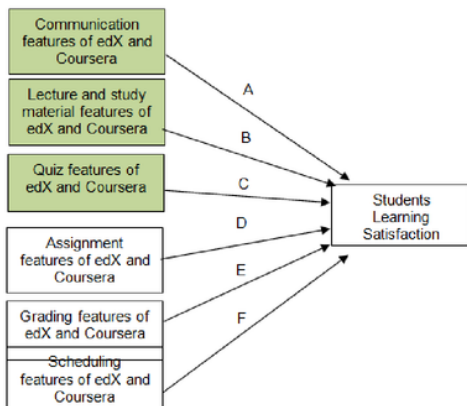


Figure 6: Accepted variables of Coursera in research model

Variable A

H_1 : MOOC communication features utility affect students learning satisfaction.

Variable B

H_1 : MOOC lecture and study material features utility affect students learning satisfaction.

Variable C

H_1 : MOOC quiz features utility affect students learning satisfaction.

IV. CONCLUSION

The purpose of this research is to identify features by analyzing from MOOC platforms, edX and Coursera. Both features were tested with the students learning satisfaction indicators to find which feature that has a relationship and affect students learning satisfaction to increase students' participation in XYZ University LMS and give it as a recommendation as additional features in XYZ University

LMS. From the hypotheses analysis, there are four hypotheses that are accepted from edX, include communication, lecture and study material, assignment, and grading features which affects and support students learning satisfaction. As for Coursera, the accepted hypotheses are communication, lecture and study material, and quiz features. The null hypotheses were rejected by the parallel result from [15].

Communication features contain discussion forum and email facility. On the discussion forum, the features are the text area for coding area that can preview the coding style and the language coding options, the discussion navigation pane that shows the discussion course topics and posts, and the filter of threads for the latest, top, and unanswered thread that can be sorted by student. On the email facility, the feature is a course notification email about course information, the deadline of assignment, the response of discussion forum, etc.

Lecture and study material features contain video lecture and reading material. On the video lecture, the features are the video transcript and video download. On the reading material, the feature is the material download. Assignment feature from edX contain self-graded assignment. On the self-graded assignment, the features are the video coding assignment instruction, the procedure of assignment, and the grading rubric that explains the criteria of marking.

Grading features from edX include progress grade report and assignment grade report. On the progress grade report, the feature is the progress bar that shows the measure from the assignments. On the assignment grade report, the feature is the completed assignment per content of course that shows the deadline of assignment and the score per content. Quiz feature from Coursera includes online test that has the retake quiz system and the review answers of the quiz.

These features can be used as feature recommendations for XYZ LMS and can be adjusted with the needs of course's lecturer as another way for lecturer to conduct their learning activities through XYZ LMS, particularly in learning process.

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