SUGISAKA MASANORI

Research Article

Analysis of Self Determination Factors for Continuance Intention on Online Learning Management System

Mochamad Chandra Saputra[1], Tetsuro Katayama[2], Yoshihiro Kita[3], Hisaaki Yamaba[2], Kentaro Aburada[2],
Naonobu Okazaki[2], Satrio Agung Wicaksono[1]
[1]*Faculty of Computer Science, Brawijaya University, Malang, Indonesia*
[2]*University of Miyazaki, Japan*
[3]*University of Nagasaki, Japan*

ARTICLE INFO

ABSTRACT

The COVID-19 pandemic outbreak transformed the paradigm of the educational process. Many educational institutions, including the University, mainly the Faculty of Computer Science, Brawijaya University, have experienced success with learning through the Internet. The continuance intention factor for using an online learning management system is important to ensure learning sustainability. This study investigates continuance intention factor by using self determination model as a research model. The objective of this study is to find the factor factors affecting students' continuance intention toward online learning management systems. The proposed model is useful for investigating continuance intention factors. The study finds that intrinsic regulation, external regulation, identified regulation, and introjected regulation significantly positive impact on continuance intention in learning management systems. Finally, this study provides suggestions for the Faculty to improve the continuance intention of the student in using an online learning management system.

1. Introduction

Beginning with the COVID-19 pandemic, the outbreak's continued throughout several nations is unexpected, consequently, university educational activities need to continue. The COVID-19 pandemic changed the model of the learning process from traditional to online. This condition enforces that the universities and all members of them are adaptive to improving the learning process. The students and lecturer are forced to learn online with limited facilities and strongly different learning processes from previous. With many problems, such as struggling with how to handle resources and participating in self-regulated learning, different profiles of adaptation emerged: the overwhelmed, surrenderers, maintainers, and adapters that needs to investigated in details [1].

Learning Management Systems, referred to as LMS, is a platform that assists in the delivery of content online for learning purposes [2]. Throughout both public and private educational institutions, learning management systems (LMS) are used to implement learner-centered instruction and to enable innovation processes. It has been proven that using an online LMS to achieve higher education institution objectives increases the efficacy and efficiency of enabling student learning.

Support from the university improves the relationship between the perceived impact of COVID-19 on degree completion and the future employment prospects of the students [3]. Faculty of Computer Science, the Brawjaya University implementing an online learning model on the learning process. During the Covid-19 Pandemic, Brawijaya University, especially the Faculty of Computer Science, uses online LMS to improve its learning process named ELING. ELING provides virtual classrooms that focus on quality online learning at the Faculty of Computer Science, Brwaijaya University. Until now, many lecturers and students have continuing to use the LMS for their daily courses.

The study of human motivations for using technology is a beneficial subject for research presently. Human motivation research analyzes how individuals feel more motivated to behave in the situation of how they believe and influence the result. Self Determination Theory is

one of the ways for studying human motivation and personality which consists of numerous perspectives on characteristics or variables from both internal and external people [4].

The study investigates the effect of the factor on self determination model to continuation intention for the learning management system during the pandemic COVID-19 and after in the instance of the Faculty of Computer Science, Brawijaya University, Malang, Indonesia. The results of this study confirm an improved understanding of the Self Determination Factor, which helps policymakers in providing better learning management system services.

2. Literature Review

2.1 Self Determination Theory

Self Determination Theory (SDT) is a theory of motivation that is well established [4]. SDT has two types of motivation such as intrinsic motivation and extrinsic motivation. Intrinsic motivation is related to doing something for its own purpose and extrinsic motivation refers to doing something for an external effect on the activity itself.

Self determination theory consists of four factors such Intrinsic Regulation, Identified Regulation, Introjected Regulation, and External Regulation. Intrinsic Regulation is defined as the activity with satisfaction that is motivated because of external prods, pressures, or rewards Intrinsic regulation is indicated by a sense of choice, volition, and self-determination, and it is related to increased tenacity, creativity, and well-being. Identified Regulation is defined as acceptance of regulation as being one's own. When people act in a certain way because they personally identify with it or because they understand its significance, this is known as identified regulation. Put another way, even if the activity may not be naturally entertaining or fascinating, they recognize and appreciate its underlying relevance or worth.

Introjection regulation remains as controlling people to perform such actions under pressure to avoid guilt or anxiety or to achieve ego enhancements or pride. Introjected regulation is a kind of motivation that is reasonably regulated and partially internalized. When people act out of internal pressures or a desire to stay away from unpleasant emotions like guilt, shame, or anxiety, they are engaging in an introjection-regulated activity. External Regulation is defined as behaviors influenced by external conditions such as compliance, threat, punishment, external rewards, etc. When people participate in an activity due to external demands or rewards—like money, grades, or social acceptance—

they are said to be engaging in external regulation. This is typified by a feeling of external control.

2.2 Continuance Intention

Continuance intention is defined as a user's decision to continue using an Information Technology (IT) that they have previously used. Continuance intention is to explain people's decisions and motivation to use information technology in daily activities that help people solve their problems. Continuance intention is determined by user satisfaction and perceived usefulness to continue using the system [5]. User satisfaction related to information quality, system quality, service quality, perceived usefulness, perceived ease of use, and communication quality toward the learning management system [6]. Perceived usefulness is one of the main determinants of faculty members' behavioral intention to use a Learning Management System [7]. In the case of the learning management system in this research, continuance intention is important to improve the learning process. The continuance intention in this study refers to the behavioral motivations and attitudes of students to engage in the online learning management system.
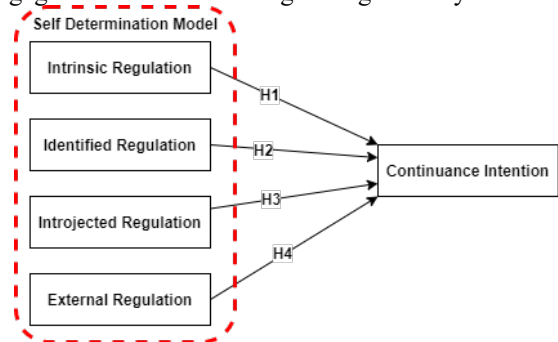

Fig. 1 The Research Hypothesis Model

3. Research Model and Hypothesis

Fig. 1 shows the research hypothesis model in this research. Current experiments focused on self determination models with continuance intention. The research model explains the result of investigating the factors from self determination model that have a strong relationship or impact on continuance intention. Investigating the factor by considering the hypothesis accepted or rejected.

This research drives the following hypotheses and every hypothesis will be measured by the questionnaire that should be answered by the student.

1. H1: The Intrinsic Regulation of the Learning Management System has a positive influence on user continuance intention of using the Learning Management System.

2. H2: The Identified Regulation of the Learning Management System has a positive influence on user continuance intention of using the Learning Management System.

3. H3: The Introjected Regulation of the Learning Management System has a positive influence on user continuance intention of using the Learning Management System.

4. H4: The External Regulation of the Learning Management System has a positive influence on user continuance intention of using the Learning Management System.

4. Methodology

4.1 Instrument for Data Collection

A questionnaire on self determination theory associated with the research on self determination and continuation intention was used to collect data for this study [8]. The questionnaire collects information by asking participants to answer a series of questions. The questionnaire gathered information on the respondent's demographics such as age, gender, department, and year of study. The following information on the questionnaire is the learning process (online, offline, or hybrid), as well as the software being used for online learning.

The respondents of the study are students in the Faculty of Computer Science at the Brawijaya University. Students answered the questionnaire by choosing the Likert scale with a maximum score of five (strongly disagree to strongly agree). Intrinsic Regulation, Identified Regulation, Introjected Regulation, External Regulation, and Continuance Intention are among the five variables included in the questionnaire that are related to the hypothesis model.

4.2 Data Collection and Analysis

The data gathered focuses on students who used online learning in their learning process during the COVID-19 pandemic. The questionnaire is distributed online using Google Forms. The number of respondents is 423 which 23 respondents answered offline learning process. The number of respondents used on this 400, respondents who answered offline learning process was not included. Data cleaning for the questionnaire removed responses that did not involve online learning, and data analysis through a method of statistical analysis.

The self-determination and continuation intention research on learning management systems is a type of social science research that uses quantitative methods and statistical analysis techniques to assess data gathered

through questionnaires in an effort to investigate and explain the social condition.

Table 1. Result of Regression Measurement

Hypotheses	Beta	Interpretation
Intrinsic Regulation to Continuance Intention	0.29	Positive Contribution (Hypothesis Accepted)
Identified Regulation to Continuance Intention	0.15	Positive Contribution (Hypothesis Accepted)
Introjected Regulation to Continuance Intention	0.06	Positive Contribution (Hypothesis Accepted)
External Regulation to Continuance Intention	0.26	Positive Contribution (Hypothesis Accepted)

5. Data Analysis

The demography of respondents in this survey consists of 65.7% male and 34.3% female. Respondents in this study also had an age range from 18 years to 25 years from various study programs at the Faculty of Computer Science, Brawijaya University. This research does not perform the validity and reliability test because the questionnaire that is used is standardized for self determination theory. This research uses normality test and homogeneity test to validate the sample of the respondents.

The Kolmogorov-Smirnov test produces test statistics that are used to test for normality [9]. The Kolmogorov-Smirnov test is used to determine if a collection of data actually originates from a normal distribution, corresponding to the null hypothesis. The result of the normality test by using one sample Kolmogorov Smirnov shows that the score of significance is 0.507 that larger than 0.05 which means passed the normality test.

6. Result and Discussion

Table 1 shows the result of statistical analysis using regression approach. The research at the Faculty of Computer Science, Brawijaya University effectively studied the influence of self determination factor on continuation intention of the learning management system by applying the research model hypothesis. The results of the study prove that every hypothesis is accepted. The value of the factor's contribution and its beta value are connected.

These findings showed that policymakers will be able to improve the development of learning management system services if they have a greater understanding of intrinsic regulation, external regulation, identified regulation, and introjected regulation. All percentage

impact from self determination with continuance intention is lower than 50% and the interpretation such as follows.

H1: The intrinsic regulation of the Learning Management System has a positive influence on user continuance intention of using the Learning Management System. According to the statement, when users of a learning management system have a natural motivation to use it that is, because they find it personally fulfilling or enjoyable their intention to continue using the system in the future is positively impacted. This hypothesis is accepted with 29% of the impact on continuance intention. To improve the percentage of intrinsic regulation the organization needs to focus to improve the service learning management system aspects such as user pleasure, satisfaction, and personal interest to continue using it.

H2: The identified regulation of the Learning Management System has a positive influence on user continuance intention of using the Learning Management System. This hypothesis is accepted with 15% of the impact on continuance intention. The statement implies that when users of a Learning Management System identify the value and reasons for using the system, even if their motivation is partially extrinsically motivated, their desire to continue using the system in the future improves. To improve the percentage of identified regulation the organization needs to ensure that the service learning management system improve the individual psychological feelings for acknowledgment and being owned to continue using it.

Individual psychological feelings for acknowledgement refer to an individual's particular emotions, sentiments, or psychological responses to obtaining recognition, praise, or acknowledgment. These emotions are frequently related to a sense of being respected, appreciated, or recognized for one's efforts or accomplishments. This idea is directly tied to motivation and well-being.

H3: The Introjected regulation of the Learning Management System has a positive influence on user continuance intention of using the Learning Management System. This hypothesis is accepted with 6% of the impact on continuance intention. This means that the introduced regulation, or the user's incentive resulting from internal pressures, has a favorable or beneficial influence on the user's decision to continue using the system. To improve the percentage of introjected regulation the organization needs to focus on the service learning management system aspects such as user confidence, feeling of worth, and prevention of guilt to continue using it.

H4: The external regulation of the Learning Management System has a positive influence on user continuance intention of using the Learning Management

System. It is feasible that in some circumstances, such as when there are considerable external rewards involved, external regulation might lead to positive continuity intention. This hypothesis is accepted with 26% of the impact on continuance intention. To improve the percentage of external regulation the organization needs to collaborate with external entities such as Student Organizations to inform the benefit of continue using the learning management system.

7. Conclusion

This research confirms the proposed self determination model successfully investigated the contribution of self determination factors to the continuance intention of the learning management system at the Faculty of Computer Science, Brawijaya University. The result shows that all hypothesis is accepted. All percentage impact from self determination factor to continuance intention is still lower than 50% which means that need to improve the service to increase the motivation of continuance intention on learning management systems.

To enhance the research methodology and the paper's contribution and reference value, consider the following improvements: Larger Sample Size, Improved Measurement, and Interdisciplinary Approach. These enhancements will make the paper more valuable to next research in self-determination theory and continuance intention in the context of Learning Management Systems.

References

1. Biwer, F. et al. Changes and Adaptations: How University Students Self-Regulate Their Online Learning During the COVID-19 Pandemic. Front. Psychol. 12, 2021, pp. 1–12.
2. Barreto, D., Rottmann, A. & Rabidoux, S. Learning Management Systems: Choosing the Right Path for Your Organization. (Ed Tech Books.org, 2020).
3. Plakhotnik, M. S. et al. The Perceived Impact of COVID-19 on Student Well-Being and the Mediating Role of the University Support: Evidence From France, Germany, Russia, and the UK. Front. Psychol. 12,2021 , pp. 1–13.
4. Ryan, R. M. & Deci, E. L. Self-Determination Theory and the Facilitation of Intrinsic Motivation, Social Development, and Well-Being. Am. Psychol. 55, 2000 , pp. 68–78.
5. Bhattacherjee, A. Understanding Information Systems Continuance: An Expectation-Confirmation Model. MIS Q. 25, 2001 , pp.351-36.
6. Ohliati, J. & Abbas, B. S. Measuring Students Satisfaction in Using Learning Management System. Int. J. Emerg. Technol. Learn. 14, 2019, pp. 180-192.
7. Lavidas, K., Komis, V. & Achriani, A. Explaining Faculty Members' Behavioral Intention to Use Learning Management Systems. J. Comput. Educ. 9, 2022, pp. 707–725.
8. Rahi, S. & Abd.Ghani, M. Integration of DeLone and McLean and self-determination theory in internet banking

continuance intention context. Int. J. Account. Inf. Manag. 27, 2019, pp. 512–528.

9. Massey, F. J. The Kolmogorov-Smirnov Test for Goodness of Fit. J. Am. Stat. Assoc. 46, 1951, pp. 68-80.

Authors Introduction

Dr. Mochamad Chandra Saputra

He received the Master's Degree from the University of Miyazaki, Japan, and Brawijaya University, Indonesia on Double Degree Program on 2014. In 2021 received the Ph.D. degree from the University of Miyazaki. Since 2015 has been a lecturer on the Faculty of Computer Science, Brawijaya University. The research interest includes software testing, software quality, and software project management.

Dr. Tetsuro Katayama

He received the Ph.D. degree in engineering from Kyushu University, Fukuoka, Japan in 1996. From 1996 to 2000 he has been a Research Associate at the Graduate School of Information Science, Nara Institute of Science and Technology, Japan. Since 2000 he has been an Associate Professor at Faculty of Engineering, Miyazaki University, Japan. He is currently a Professor with the Faculty of Engineering, University of Miyazaki, Japan. His research interests include software testing and quality. He is a member of the IPSJ, IEICE, and JSSST.

Dr. Yoshihiro Kita

He received a PhD degree in systems engineering from the University of Miyazaki, Japan, in 2011. He is currently an Associate Professor with the Faculty of Information Systems, University of Nagasaki, Japan. His research interests include software testing and biometrics authentication.

Dr. Hisaaki Yamaba

He received the B.S. and M.S. degrees in chemical engineering from the Tokyo Institute of Technology, Japan, in 1988 and 1990, respectively, and the Ph D. degree in systems engineering from the University of Miyazaki, Japan, in 2011. He is currently an Assistant Professor with the Faculty of Engineering, University of Miyazaki, Japan. His research interests include network security and user authentication. He is a member of SICE and SCEJ.

Dr. Kentaro Aburada

He received the B.S., M.S and Ph.D. degrees in computer science and system engineering from the University of Miyazaki, Japan, in 2003, 2005 and 2009, respectively. He is currently an Associate Professor with the Faculty of Engineering, University of Miyazaki, Japan. His research interests include computer network and security. He is a member of IPSJ and IEICE.

Dr. Naonobu Okazaki

3. He received his B.S, M.S., and Ph.D. degrees in electrical and communication engineering from Tohoku University, Japan, in 1986, 1988 and 1992, respectively. He joined the Information Technology Research and Development Center, Mitsubishi Electric Corporation in 1991. He is currently a Professor with the Faculty of Engineering, University of Miyazaki since 2002. His research interests include mobile network and network security. He is a member of IPSJ, IEICE and IEEE.

Mr. Satrio Agung Wicaksono

He received the Master's Degree from the Sepuluh Nopember Institute of Technology (ITS). Current activity is a lecturer on the Faculty of Computer Science, Brawijaya University. The research interest includes data and information mamagement.