

# Students' Online Learning Satisfaction on Learning Management System

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## ABSTRACT

In the Covid-19 pandemic situation, face-to-face learning had to be eliminated and replaced with online learning. To support this online learning, Andalas University encourages the use of the Learning Management System (LMS) which has been adopted from the Modular Object-Oriented Dynamic Learning Environment and is named iLearn. In this study, iLearn is used as a platform to assess the level of satisfaction in online learning. This platform allows students to access material online and also collect assignments at predetermined times. To compile this research model, we use three main factors in measuring e-learner satisfaction, namely; "Learner interface", "learning community", and "personalization" with the mediating variable "intention to use". Subjects are 274 students of the Faculty of Economics, Andalas University who are taking Operational Management courses in 2020. The results of the structural equation modeling (SEM) analysis show that 'learner interface', and 'personalization' affect 'intention to use' which in turn affects intention to use. 'satisfaction'.

**Keywords:** *LMS, Satisfaction, Structural equation Modelling*

## 1. INTRODUCTION

Learning using a learning management system (LMS) has been widely used in universities [1] [2], including in Indonesia. LMS is software in the field of education for distributing, tracking, and managing courses via the internet. In general, there are three ways to take advantage of the LMS [3]. First, the LMS can be used as a support for face-to-face learning, where the LMS functions as a storage area for the lecture material delivered. Furthermore, LMS can be used as a means of blended learning by combining conventional learning with online methods. Third, LMS can be used for distance learning where lectures as a whole are given via the internet. The three methods can be adjusted based on the situation and the type, of course, being held [4].

Delivering material online has the potential to reduce students' level of understanding. Currently, there are several tools used to support this learning, such as Whatsapp, Zoom, Google Classrooms, and Modular Object-Oriented Dynamic Learning Environment (Moodle). In this research, we used the

modified Universitas Andalas Moodle platform named iLearn. This platform allows lecturers and students to interact asynchronously. Lecturers will usually upload learning materials for one semester along with the assignments, and students will access the content periodically.

The Covid-19 pandemic has forced massive changes in people's lives and education. The application of social distancing has caused face-to-face offline classes to be eliminated and replaced with online methods. LMS, as a system specifically designed for education, is very crucial to be utilized. However, the massive use of LMS suddenly became a problem where both lecturers and students were not too comfortable using it. Students, as the majority of LMS users, need to measure their level of satisfaction in the learning process they are participating in.

The purpose of this paper is to support the effectiveness of the use of LMS in improving the quality of online learning for the Operational Management course at the Faculty of Economics, Universitas Andalas. To achieve the objective, we use

a model offered by DeLone and McLean [6] and Wang [7] to discuss the factors that influence online learning satisfaction for students of economics faculty. The findings from this study will become a reference for online learning using iLearn for economics faculties, and evaluation for iLearn Unand providers. A good system will support students in understanding operational management learning materials. 1.1. Learning Management Systems (LMS)

The LMS platform is used by lecturers or instructors to create and organize courses [8], [9]. There are many features in the LMS that allow online learning to be carried out well, such as; discussion through forums or chat, providing course content (syllabus or subject matter), creating quizzes and automatic exams, submitting assignments, surveys, and students' activity records. Among many LMSs, Moodle is the most widely used service in Indonesia both by higher education and government because it is open source. Moodle also allows users to customize the software based on user characteristics.

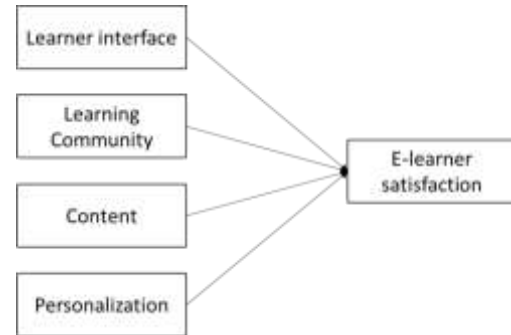
The potential positive impact of using LMS has made LMS spread throughout the world. In 2007, the use of LMS in 994 educational institutions in the US reached 97.5% [10]. This figure is even higher when grouped at the university level. However, the use of LMS is not always in line with student satisfaction [11]. This is because the teaching and learning process remains an important aspect because LMS is mostly used as a tool for sharing learning material [12], [13].

Research related to the effectiveness of LMS explains LMS success involving student performance, teaching design, student satisfaction, economic levels, and prevention of dropouts [14]. However, despite the massive use of LMS, the fact that students and instructors use LMS is limited for formal academic purposes [15]. Thus, exploring the determinants of LMS success is worth doing.

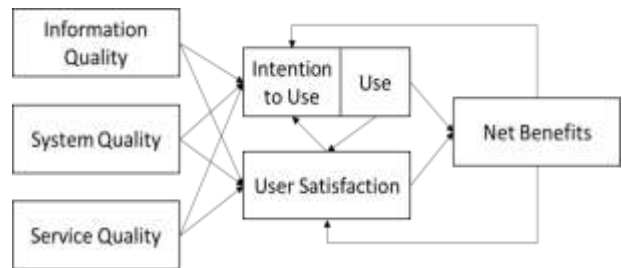
**1.2. LMS users' satisfaction**

Learning using LMS is an innovation in the field of education [5]. However, implementing an LMS requires a high level of IT infrastructure, and users must be ready and ready to accept the system before they can experience the benefits. Therefore, the benefits of technological innovation should be based on actual use [16], [17]. However, based on the Technology Acceptance Model (TAM) theory, 'intention to use' will affect actual use [18]. Referring to the IS Success Model by DeLone and McLean, 'intention to use' also affects 'user satisfaction' (Figure 1) [6]. Moreover, based on user satisfaction, which is the result of several factors such as content, user interface, learning community, customization, and learning performance, Wang identified four factors namely - 'learning

community', 'learning community', 'content', and 'personalization' (Figure 2) [6]. Based on the IS Success Model and the e-learner satisfaction model [7], the researcher uses a research framework combining the two models. This model was also used by Chen et.al [5]. However, in their research, personalization and content are statistically the same. Therefore, in this study, we combine content and personalization into full personalization.



**Figure 1** D&M IS Success Model (DeLone and Mclean) [6]



**Figure 2** E-Learner satisfaction model (Wang) [7]

From the literature previously mentioned, we used the four main factors of student satisfaction and the relationship between "intention to use" and "satisfaction" of the IS Success Model to summarize a research framework that can determine the satisfaction level of students in the economics faculty. The framework is illustrated in Figure 3. Based on this framework, a four hypothesis was formed, namely: H1: The design of the LMS interface affects intention to use

H2: The learning community of LMS will influence the intention to use

H3: Personalization of LMS will influence the intention to use

H4: Intention to use the LMS will influence users' satisfaction

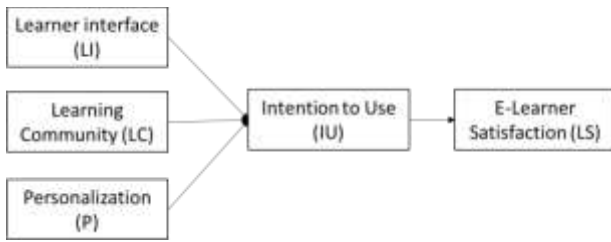


Figure 3 Research framework [5]

2. METHODS

2.1. Case Operations Management

Operations Management course, in general, is an effort to manage optimally in the use of various production factors, ranging from human resources (HR), machines, tools, raw materials, and other production factors in the process of turning them into various product or service.

The Operational Management course (EKM 209) focuses on the systematic planning, design, and operation of all processes required to produce goods and services. Operations management covers nearly all of the value-added activities of an organization, including product and process design, customer order management, production, and service. Also, operations management includes several other supporting activities such as project management, process improvement, inventory management, and material requirements planning (MRP).

This course is a compulsory subject for undergraduate students majoring in management and elective courses in accounting. After studying operational management, students are expected to be able to: 1) understand and explain the concept of Operations Management, 2) understand and analyze operational function problems, 3) be able to complete decisions related to operations management.

The subjects of this study were students taking operations management courses in 2020, where lectures were conducted online. The methodology used is a survey. Questionnaires were distributed to students online at the end of lectures after the final semester exams. From 314 respondents who filled in, the total that could be processed further was 274.

2.1. Instruments

The questionnaire refers to Chen's research model [5] which combines the IS success model [6], and learner satisfaction [7]. The questionnaire was then adapted to the conditions of the Universitas Andalas Faculty of Economics student. The questionnaire

consists of two parts, namely demographics and questions related to research variables such as "satisfaction", "intention to use", and LMS. Demographic information includes gender, laptop ownership, internet quality, and entry points for using e-learning. LMS-related questions include "learner interface", "learning community", "content", "personalization", "intention to use" and "e-learner satisfaction". The question is measured using a 5-point Likert scale where 1 represents strongly disagree and 5 strongly agrees. The questions are structured to cover six variables. The number of variables and questions is presented in Table 1. Questions are submitted in Indonesian after being peer-reviewed to assess the appropriateness of the context.

Table 1. Variables, questions quantity, dan references

Constructs	Q	Reference
Learner Interface (LI)	5	Wang [7] & Chen <i>et al.</i> [5]
Learning Community (LC)	4	
Personalization (P)	8	
e- Learner Satisfaction (LS)	3	
Intention to use (IU)	2	DeLone and Mclean [6] & Chen <i>et al.</i> [5]
Total	22	

3. RESULTS AND DISCUSSION

3.1. Demographics

More than half of the survey (61.3%) were women, and almost all respondents who filled out the questionnaire owned a laptop (92.7%). Internet connection quality 59.1% of respondents sometimes good or bad or unstable, followed by good internet quality of 30.7% of respondents. The majority of respondents have the first experience doing online learning while at university (63.9%). Regarding LMS management, participants thought that user convenience was the responsibility of the university (70.4%). More details regarding the demographics of the respondents are presented in Table 2.

Table 2. Demographics of participant

Profiles	Item	Q	%
Sex	Male	106	38,7%
	Female	168	61,3%
Laptop/PC owner	Yes	254	92,7%
	No	20	7,3%

Internet Connection	Good	84	30,7%
	Bad	19	6,9%
	Sometime good or bad	162	59,1%
	Very bad	3	1,1%
	Very good	6	2,2%
First time using E-Learing	Elementry School	7	2,6%
	Junior High School	25	9,1%
	Senior High School	67	24,5%
	University	175	63,9%
LMS Resposibiliy belongs to	University level	193	70,4%
	Faculty level	45	16,4%
	Lecturer	36	13,1%

**3.2. Goodness of Fit Outer model (First)**

To test the goodness of fit outer model, researchers used the loading factor, cross-loading, composite reliability (table 3), and composite reliability and average variance extracted (AVE) (table 4). Based on the results of preliminary data processing, five indicators are candidates for elimination. Furthermore, referring to AVE, the variable learner interface (LI) has a value below 0.5. Therefore, we omitted the smallest learner interface indicator (LI4).

**Table 3.** Loading factor, cross loading, composite reliability

Indicators	Loading factor >0.5	Crossloading > other indicators value	
COM1	0,794	0,794	Yes
COM2	0,767	0,767	Yes
COM3	0,810	0,810	Yes
COM4	0,792	0,792	Yes
INT1	0,724	0,724	Yes
INT2	0,883	0,883	Yes
INT3	0,857	0,857	Yes
LI1	<b>0,661</b>	0,661	Yes
LI2	0,801	0,801	Yes
LI3	0,751	0,751	Yes
LI4	<b>0,593</b>	0,593	Yes
LI5	<b>0,691</b>	0,691	Yes
PER1	<b>0,598</b>	0,598	Yes

PER2	<b>0,694</b>	0,694	Yes
PER3	0,715	0,715	Yes
PER4	0,750	0,750	Yes
PER5	0,778	0,778	Yes
PER6	0,713	0,713	Yes
PER7	0,719	0,719	Yes
PER8	0,704	0,704	Yes
S1	0,943	0,943	Yes
S2	0,922	0,922	Yes

**Table 4.** Composite reliability and average variance extracted (AVE)

Variables	Composite reability > 0.7	AVE > 0.5
Learning Community	0,863	0,626
Intention to use	0,863	0,68
Learner interface	0,863	0,495
Personalization	0,89	0,505
Satisfaction	0,93	0,87

**3.2. Goodness of Fit Inner model (First)**

The goodness of Fit (GoF) inner model is done to see the fit between variables in a model offered. To test the GoF inner model, we used R square, f square, and Q square (Table 4).

**Table 5.** R square, f square, dan Q square

R square					
Variables	R Square	R Square Adjusted			
Intention to use	0,540	0,537			
Satisfaction	0,584	0,583			
F square					
Variables	IU	LC	LI	P	S
Intention to (IU)					1,404
Learning Community (LC)	0,013				
Learning Interface (LI)	0,050				
Personalization (P)	0,282				
Satisfaction (S)					
Q square					
Variables	Q <sup>2</sup> (=1-SSE/SSO)				

Intention to Use (IU)	0,345
Learning Community (LC)	
Learning Interface (LI)	
Personalization (P)	
Satisfaction (S)	0,482

Based on the GoF inner model test results, we find that the variable "learning community" has a very small value for "Intention to Use". A value of  $F^2$  less than 0.02 is categorized as a weak influence of predictor latent variables (exogenous latent variables) at the structural level. Therefore, in the next process, the 'learning

community' variable will be removed, leaving 'learning interface', 'personalization', 'intention to use', and 'satisfaction'.

### 3.3. Structural Equation Modeling

Before performing structural equation modeling (SEM) analysis, we re-tested the goodness of fit for the proposed research framework. The second submission resulted in a good statistical value and was acceptable for further analysis.

The values examined in the SEM test are t-statistic (Figure 4), p-value, and original sample (o). The results of the three statistical values can be seen in Table 5.

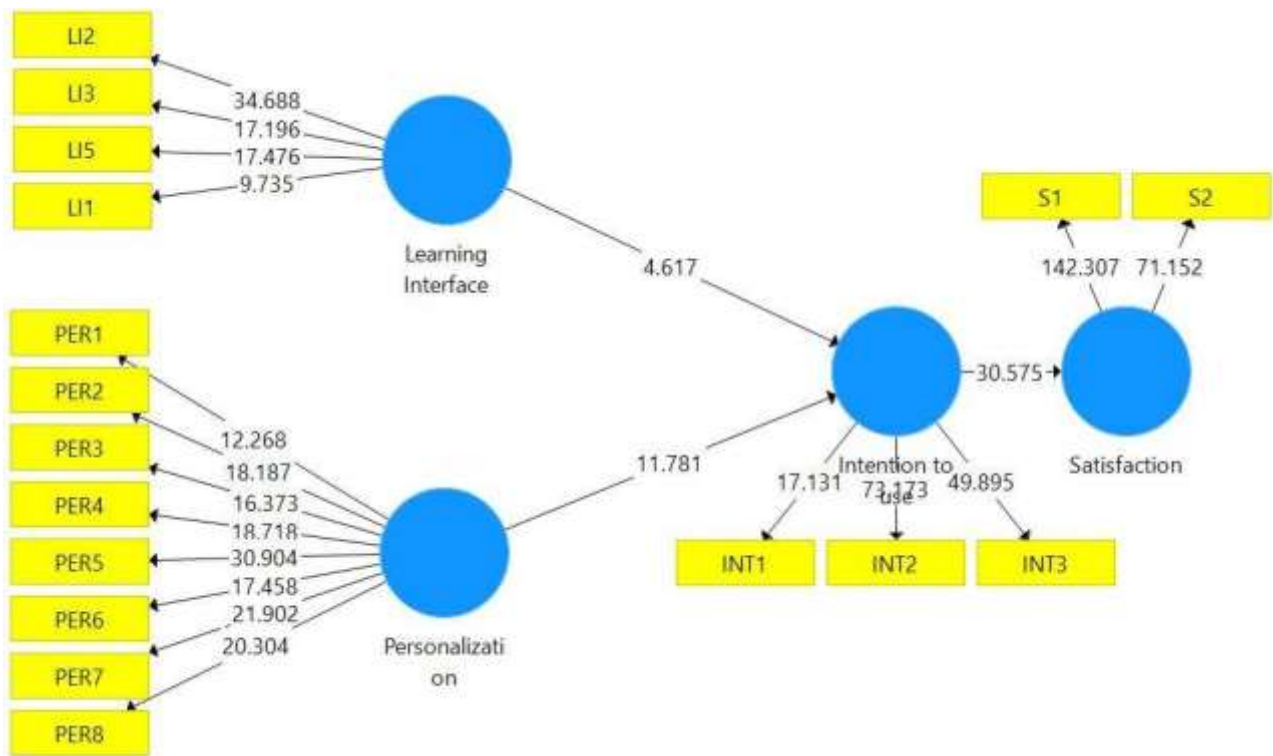


Figure 4 t-statistic value

Table 6. t-statistic, p-value, dan original sample

Path	Original Sample (O)	T Statistics	P Values
Learning Interface -> Intention to use	0,237	4,617	0,000
Personalization -> Intention to use	0,570	11,781	0,000

Intention to use -> Satisfaction	0,764	30,575	0,000
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Based on the SEM test, all the proposed hypotheses were accepted, except the H2 hypothesis which was cancelled because this variable was removed in the second stage analysis.

Learner interface is significantly related to intention to use ( $\gamma = 0.237$ ,  $t = 4.617$ ). Therefore, H1 is accepted. These results are consistent with that of Wang [7] and Chen et.al [5]. This information reveals that the learner interface from the iLearn LMS has increased students' desire to adopt the LMS system.

A learning community which was initially H2, could not be processed because the statistical values did not meet the standards ( $F_2 = 0.13$ ). Therefore, H2 is irrelevant. This case is contrary to the results obtained by Chen et al. [5].

Furthermore, personalization has a significant relationship with intention to use ( $\gamma = 0.57$ ,  $t = 11,781$ ), so that H3 is accepted. These results are consistent with studies by Wang [7] and Chen et. [5]. Finally, the intention to use has a significant relationship with satisfaction ( $\gamma = 0.764$ ,  $t = 30,575$ ). Thus, it can be concluded that H4 is accepted. These results are consistent with the results of previous studies [6], where students have a level of satisfaction that is influenced by the desire to use the system. The higher the desire to use the LMS, the higher the user satisfaction.

#### 4. CONCLUSION

Based on the results of this study, several conclusions can be drawn and their implications for the person in charge of LMS. First, the learner interface, an important variable to increase the desire to use an LMS. The beauty of the website or system is the key to this. University level ICT employees can increase user desires by always updating the university's LMS. For lecturers, it is hoped that the LMS content exposure will not be rigid so that it will attract students' interest to use it.

Second, personalization is needed by students to increase their desire to use LMS. Personalization is the system's ability to adapt its features to user needs. In the Moodle-based iLearn system, personalization can be done by arranging the order of the courses currently being taken.

Third, the learning community was found to be incompatible with this construct. This may be because students are not related to their colleagues in using LMS. Finally, students who have a high desire to use LMS have a high level of satisfaction. Therefore, academics need to cultivate the intention to use students so that the teaching-learning process is better.

#### ACKNOWLEDGMENT

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