



Measuring User Satisfaction: Open Source LMS Mobile Application as a Learning Technology

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ABSTRACT

Online learning has become the choice to be implemented in various schools, due to the development of IT technology and the post-covid 19 pandemic making online learning increasingly popular to implement. Mobile Learning Management System is the most dominant used in online learning. This study aims to analyse the level of satisfaction of SMA and SMK teachers in West Sumatra in using the open source Mobile LMS in learning. Currently, teachers in supporting the learning process in their respective schools are still using the open source Mobile LMS with different platforms, some are using Google Classroom, Edmodo, and WhatsApp. Measuring satisfaction with the application of open source Mobile LMS was carried out using the use questionnaire method and structured interviews, to measure useability which consists of four categories, namely usefulness, ease of use, ease of learning and satisfaction. The analysis uses descriptive statistics, where the data is described in the form of tables and diagrams. From the results of data processing, it was found that on average teachers using open source LMS did not support learning at school because the LMS used did not accommodate learning and was not yet integrated, so that monitoring of the learning process of each teacher had not been carried out optimally. Shown by the results of each usefulness category 63%, ease of use 65%, ease of learning 60% and satisfaction 64%. They gave an unfavourable response because they were not as needed (usefulness), they were not easy to use (ease of use), they were not understood to be used (ease of learning) and they did not feel satisfied (satisfaction) while using the open source LMS.

1. Introduction

The obligation to continue learning after the Covid 19 Pandemic has forced teachers to use online-based learning media. Online-based learning has become a new habit and choice during the pandemic and after the pandemic, given its effectiveness and efficiency. However, the quality of online-based learning must be able to match or be expected to exceed the effectiveness of direct learning in achieving predetermined learning objectives. The Mobile Learning Management system

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(LMS) is one of the media which is the main tool in online-based learning [1]. The use of Edmodo-based mobile LMS on dynamic fluid material can increase high school students' interest and achievement in learning physics [2]. The results of students' abilities on the multiplatform LMS, Google Meet and Google Classroom are in a pretty good category [3]. In the use of mobile LMS student involvement is very important in creating quality learning. The teacher's involvement is in directing the correct use either for the nature or level of use [4].

The use and integration of technology is one of the main challenges of the 21st century, regarding how to achieve learning goals [5]. Online learning can support student independence, commitment, communication and collaboration as an effort to build the effectiveness of active and meaningful learning, although this cannot run optimally [6]. Therefore it is hoped that every education provider can prepare educators who are able to use various types of technology to achieve target content effectively and create more learning opportunities for students [7]. Through mobile LMS, users can access learning content anywhere and anytime, without having to visit a certain place at a certain time. The use of mobile devices among students can have a positive impact on achieving learning goals [8].

Mobile learning is very promising in the development of education in the future. Mobile technology has a very promising potential in order to create new experiences in learning [9]. Mobile learning can facilitate communication between educators and students to be active in class by helping students build the necessary communication [10]. Mobile LMS provides an opportunity to combine and connect technology and education in learning [11]. Thus, it is hoped that teachers can work together with various parties to be able to create a learning environment that can create a good learning atmosphere for students in the future Mobile LMS can be carried out by nomadic students, institutions, children and adult users and various independent learning environments so that a new generation of distance learning (Mobile LMS) will be awakened. Mobile LMS can be used to solve traditional learning system problems. When using mobile technology, the user plans, organizes, executes and evaluates his learning because he is the controller of mobile-based activities. Thus, the learner is not a passive person who takes the information needed but he is a person who uses cognitive and mega-cognitive abilities to achieve tasks. Thus, the user improves higher order thinking skills [12]. The designed Mobile LMS includes complete and well-defined technical quality aspects for the development of mobile learning [13]. The quality of the mobile learning system according to the views of 392 university students influences the success of mobile learning [14].

The advantage of the LMS used by teachers after the Covid 19 pandemic is to provide supplements to students, so that students are able to understand learning. After the covid pandemic, most high school and vocational teachers are still using open source LMS as a supplement in the learning process. The LMS used is an LMS that has not been integrated and each uses a different platform so that institutional control cannot be carried out. Based on the survey, there are several weaknesses in the platform used by teachers, namely not all LMS accommodate the learning process, besides not all teachers are able to use LMS properly.

The LMS used by teachers today is still open source with a variety of different platforms and operates only on certain operating systems so that there are limitations in use. Currently the use of the device operating system used is very diverse, starting from Android and IOS. Previous research also discussed a lot about the quality of learning using the LMS. While this research was conducted to determine the level of teacher satisfaction in the use of learning technology using the LMS, so that it can produce online or e-learning models or platforms that are easy to use and understand by all teachers. This research was conducted in high schools and vocational schools in the regency and city of West Sumatera. To achieve the objectives of this study, the following are research questions that

must be answered, what is the level of teacher satisfaction in using open source LMS? and how is the teacher's response to using open source LMS?

2. Method

In the first phase what was done was searching for literature, then making research instruments, after that making questionnaires and making interview questions. In the second phase carried out in this study was data collection, then distributing questionnaires, and conducting interviews, while the third phase carried out in this study was analysing data and making a summary of the results of the interviews. Figure 1 shows the research design.

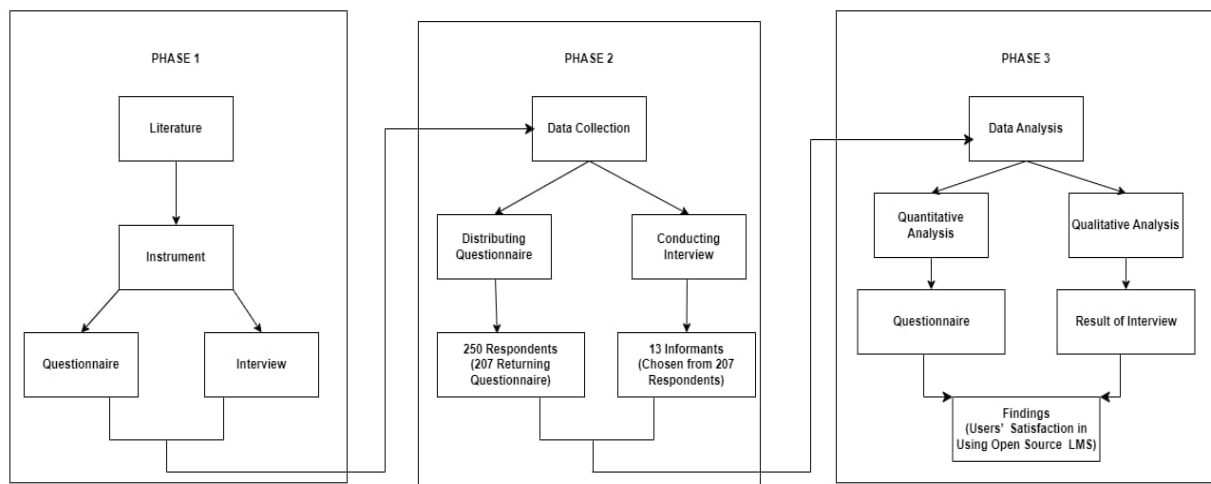


Fig. 1. Research design

The research methodology was carried out by measuring the level of useability using a use questionnaire and interviews. The use questionnaire method consists of four categories, namely usefulness, ease of use, ease of learning and satisfaction. Each category has its own statement. The list of statements can be seen in the following Table 1 [15].

Table 1

Measurement criteria

No.	Details which rated
Usefulness	
1	M-LMS can accessed with easy
2	M-LMS can accessed with easy through, Androids, MOBILE PHONE, And Smart Phone
3	Method use M-LMS easy
4	Arrangement menu on M-LMS easy understood
5	Amenities/features Which There is easy for used
6	convenience use M-LMS expedite job/task teach
7	Easy in upload material and task
8	Simplify interaction with fellow students and Teacher
Ease of use	
1	Increase effectiveness in work
2	Minimize loss information
3	Get information Which needed
4	Get information addition Which needed
5	Faster in do tasks Work
6	Easier in do tasks work
7	Save deep time look for information about education
8	Save cost in look for information around education
Ease of learning	
1	I learned to use it quickly
2	I can easily remember how to use it
3	It's very easy to learn to use
4	I quickly became skilled with it
Satisfaction	
1	I am satisfied with it
2	I will recommend it to friends
3	It's a pleasure to use
4	Works the way I want
5	I feel the need to have it
6	Comfortable to use

In an effort to collect data, an instrument was used in the form of an analysis questionnaire using the LMS (refer Table 2). The questionnaire has been validated by two experts by stating that the questionnaire given to the teacher is valid and feasible to use [16]. The reason underlying the use of this research tool is that questionnaires can make it easy for respondents to understand and answer the questions asked properly. This is because respondents have long enough time to think and complete the questionnaire. In addition, the questionnaire makes respondents more comfortable and flexible in answering questions [17]. The total population is 250 SMA and SMK teachers in the province of West Sumatra. Samples are taken as a whole to get more accurate data. Of the 250 respondents, 83% or 207 teachers filled out and returned the questionnaire. Analysis of the data obtained used the percentage distribution. For the purposes of quantitative analysis the research provides five alternative answers to respondents, the measurement scale used in the questionnaire is the Likert scale [18].

Table 2
Likert scale measurement criteria

Statement	Score
Strongly agree	5
Agree	4
Neutral	3
Don't agree	2
Strongly disagree	1

Data collected through questionnaires were analysed to measure user satisfaction according to the Use Questionnaire method, the formula used to calculate the percentage of each item is as follows:

$$\frac{\text{€ Score Questionnaire} * \text{weight of choice}}{N * \text{Highest Weight}}$$

While measuring the level of satisfaction of LMS users ranges from 0 to 100, namely:

81 – 100% = Very good/Very suitable

66 – 80% = Good/Suitable

56 – 65% = Not good/Not suitable

0 – 55% = Very unfavourable / Very inappropriate

Data collection was also carried out using semi-structured interviews [19]. An outline of the interview was written to obtain information about teachers' opinions and experiences regarding the use of the Mobile LMS. As a goal, the interview questions were prepared based on what they thought and experienced while using the Mobile LMS.

3. Result and Discussion

This research is specifically aimed at analysing the level of teacher satisfaction in using an open source Learning Management System (LMS) which is a software application that automates administration, documentation, tracking, and reporting of training activities [20]. The use of LMS is a strategic action to improve the learning process and interaction between students and educators in tertiary institutions [21]. This research is specifically aimed at knowing the level of teacher satisfaction in using open source LMS. Use Questionnaire consists of four categories, namely usefulness, ease of use, ease of learning and satisfaction. The conclusions that can be drawn from the results of the analysis of the questionnaire that has been filled in by the teacher, include that overall, the level of satisfaction in using the open source LMS is not good. This can be seen from all the respondents who obtained disagree and neutral statements for each indicator question in each category. The distribution of the number of respondents' scores based on the average value of the entire statement can be seen in the following Figure 2.

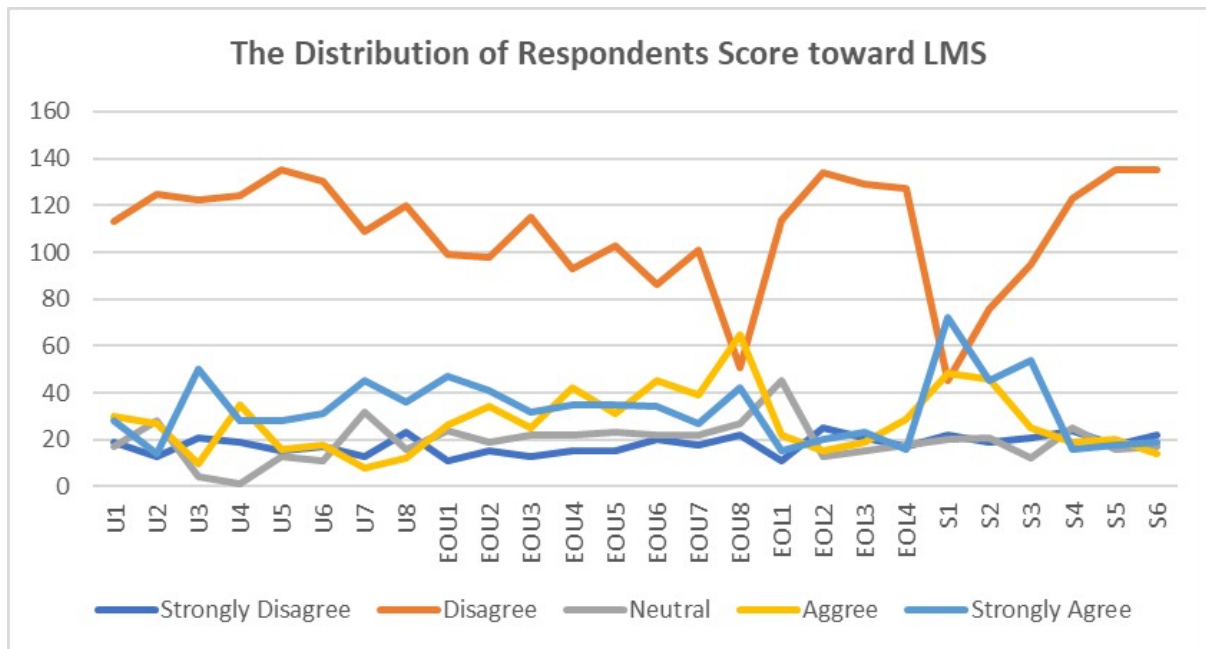


Fig. 2. Distribution of respondents' scores on LMS

Based on the results of the questionnaire, it can be seen in Tables 3, 4, 5 and 6, for each category of statements it can be concluded that LMS users feel uncomfortable enough in terms of:

- i. LMS does not meet the needs (usefulness)
- ii. The LMS used (ease of use) is not suitable and does not provide convenience
- iii. LMS which is not easy to understand (ease of learning) and does not encourage students to tend to active learning (active learning).
- iv. LMS is not enough to provide satisfaction for users

Table 3
Usefulness

Criteria	Scale					Total	Satisfaction level
	1	2	3	4	5		
U1	19	113	17	30	28	652	63%
U2	13	125	28	27	14	622	60%
U3	21	122	4	10	50	685	66%
U4	19	124	1	35	28	673	65%
U5	15	135	13	16	28	650	63%
U6	17	130	11	18	31	656	63%
U7	13	109	32	8	45	661	64%
U8	23	120	16	12	36	643	62%
Average usefulness							63%

Table 4

Ease of use

Criteria	Scale					Total	Satisfaction level
	1	2	3	4	5		
EOU1	11	99	24	26	47	695	67%
EOU2	15	98	19	34	41	688	66%
EOU3	13	115	22	25	32	662	64%
EOU4	15	93	22	42	35	681	66%
EOU5	15	103	23	31	35	669	65%
EOU6	20	86	22	45	34	672	65%
EOU7	18	101	22	39	27	656	63%
EOU8	22	51	27	65	42	699	68%
Average ease of use							65%

Table 5

Ease of learning

Criteria	Scale					Total	Satisfaction level
	1	2	3	4	5		
EOL1	11	114	45	22	15	606	59%
EOL2	25	134	13	15	20	613	59%
EOL3	21	129	15	19	23	629	61%
EOL4	17	127	18	29	16	630	61%
Average ease of learning							60%

Table 6

Satisfaction

Criteria	Scale					Total	Satisfaction level
	1	2	3	4	5		
S1	22	45	20	48	72	749	72%
S2	19	76	21	46	45	698	67%
S3	21	95	12	25	54	700	68%
S4	24	123	25	19	16	599	58%
S5	18	135	16	20	18	625	60%
S6	22	135	17	14	19	612	59%
Average satisfaction							64%

From the results of data processing, it was found that the average LMS user gave a less positive response, this was indicated by the results of each category of usefulness 63%, ease of use 65%, ease of learning 60% and satisfaction 64%. They provide poor responses to needs (usefulness), less easy to use (ease of use), less understandable to use (ease of learning) and less satisfied (satisfaction) while using open source LMS.

In collecting data using semi-structured interviews, the interviewers were careful not to direct participants' answers [22]. The 12 people interviewed were numbered R-1 to R-12. This amount is sufficient to provide the data needed in quantitative research [23] said that semi-structured interviews were used to gather information with twelve to fifteen people being interviewed. This is based on what [19] stated that to achieve comprehensive data and proper interpretation, data analysis must be carried out by more than one person [24].

The outline of the questions is as follows:

- i. What open source LMS do you use in learning (Edmodo, Google classroom and WhatsApp) during learning?
- ii. How do you understand the functions of the features or parts of the LMS?
- iii. What are your obstacles in using this feature?
- iv. How do you overcome these obstacles?
- v. Is it easier for you to use LMS after you overcome these obstacles?
- vi. Are you satisfied teaching using the LMS?

Table 7
Using LMS

LMS type	Informant (I)	Usefulness	Ease of use	Ease of learning	Satisfaction
Google Classroom	I-1, I-3, I-10 and I-7	all data cannot be stored and recorded properly and neatly	Initially using lms was considered easy during learning, but in fact through open source lms some of the feature functions were not understood	Students do not respond to the material provided by the teacher through LMS. And the teacher cannot supervise every student learning	Teachers and students are not too satisfied with Google Classroom in the learning process
WhatsApp	I-2, I-4, I-6 and I-8	The learning process is less effective, especially in making assignments where the teacher has to download and save files so it takes time to manage student assignment files	Learning cannot directly see the sincerity of students; the cell phone memory quickly fills with incoming documents	Students to be able to focus on learning because the home atmosphere is not conducive, limited packages, internet or internet quota which is a link in online learning	Lack of interaction between teachers and students, and not all students understand the tasks and material provided learning
Edmodo	I-5, I-9 and I-11 and I-12	Not all teachers understand the use of Edmodo and to understand this feature, workshops and training activities should be carried out	Most of the features used are not understood by teachers and failures often occur when accessing LMS	Teachers do not understand the features of Edmodo and need training and workshops	With Edmodo the learning process has not received a positive response

The results of interviews with 12 informants show that from different platforms, on average, teachers do not understand the features and do not have good skills in using the LMS and need training and workshops to understand all the platform features (refer to Table 7).

4. Conclusion

From the results of data processing, it was found that the average LMS user gave a poor response to what each of them used, this is indicated by the results of the respective scores.

The results of measuring the satisfaction level of LMS-based learning using LMS with an open-source platform have not been able to accommodate the learning process. On average the teachers gave less responses, they gave responses in that the use of the LMS was not as needed, not easy to use, not understood and did not provide satisfaction for learning tools.

Suggestions for further studies can be carried out with an integrated multi-platform-based LMS design and workshops so that it can support the learning process.

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