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Towards the Model of Learning Management System for Elementary and Secondary Education

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ABSTRACT

This study aims to evaluate teachers' perceptions of the platform X as the Learning Management System (LMS) that is used during and after the Covid-19 pandemic. The Platform X is claimed as a better platform than other LMS because it becomes a solution for many schools in terms of easy implementation, integration, and response to the needs of the students as digital natives. Using the Technology Acceptance Model (TAM), the research evaluates the perception of the 110 teachers in some provinces in Indonesia regarding the usefulness (perceived usefulness), and the ease of use of the LMS. The researchers use the quantitative and qualitative (mixed) method in the design of the research. The researchers surveyed the self-efficacy (the mastery of the LMS) and the features of the LMS to see the teachers' perceived usefulness. The researchers also surveyed the quality of the system and the quality of the service to evaluate the ease of use of the LMS. The interview with the 4 respondents is conducted to clarify and complete some responses in the survey. The result of the study said that the teachers have a good perception regarding the usefulness and ease of use of the LMS. The result stresses the easy implementation of the LMS, the integration of the application, and the ability of the LMS to respond to the needs of the students as digital natives.

Keywords: *Technology, platform, learning management system.*

1. INTRODUCTION

This research attempts to look at the educational situation during the Covid-19 pandemic and after. The Covid-19 pandemic has hit all parts of the world and caused problems in many fields, including the field of education. Because of this situation, many educational institutions have almost no choice but to conduct distance learning or online learning [1], [2]. Some institutions have difficulties to use technology because it is related to readiness, such as systems, infrastructure, human resources, and software or platform to carry out distance learning [3].

Educational institutions claim to be in a blessing-in-disguise situation because the pandemic situation has pushed them to work very hard and make big leaps in the use of technology. Nonetheless, related to the implementation of learning using learning software, problems still arose, especially in the era of school preparation for face-to-face learning after a long pandemic. Some problems arose regarding the difficulties of technology implementation, the integrated platform (one platform can serve all school needs), and

the suitable platform to the students as the subject in the schools.

The platform in the case study is a Learning Management System (LMS) in the form of a mobile application and website that accommodates learning activities in the modern era. This application seeks to build its advantages compared to other LMS, by trying to answer the three main problems above, namely (1) an LMS that is easy to implement; (2) integrated and not separate applications; and (3) solutions for the younger generation who needs application with digital pedagogy concepts that help students become more critical, innovative, and better in social life [4].

This platform provides solutions for the field of education by (1) face-to-face learning is more practical; (2) making schools more modern; (3) high technology; (4) keeping abreast of digital developments; (5) and paperless. The LMS features include (1) school and class data, (2) schedules, (3) school assignments and work, (4) attendance, (5) school exams, (6) score recap, and school reports. This application also supports data and activities for new admissions, finance, and human resource development.

With platform that is easier to implement, integrate, and carry the mindset of students as learning subjects, the Application in the case study is expected to overcome parental problems in terms of (1) monitoring teaching and learning activities; (2) controlling of school assignments; and (3) knowing the achievements and learning outcomes of children. Solutions for teachers include (1) ease of use including assessment, (2) system support that saves time for teachers, and (3) support for teaching methods that are flexible and creatively active. This application supports schools in the fields of (1) paperless, (2) high technology, and (3) technology that is easy for teachers to implement.

This application, which has only been used in mid-2021, needs to be evaluated to capture the effectiveness of its use. This application is still used in a limited number of schools and students but has spread far enough, namely in Jakarta, West Java, Banten, Yogyakarta, East Java, Maluku, and Papua. Technology Acceptance Model (TAM) is one method for evaluating the use of this technology.

The purpose of this research is to examine the level of acceptance of the Application (in the case study) by users concerning (1) knowledge, mastery, and usage; (2) Checking frequently used features; (3) examining perceptions of system quality; (4) examine the perception of service quality.

A few months ago, a research was conducted about the application but it only covered the respondents in Jakarta and surrounding areas.

Technology is a very important variable in the field of education related to the subject of education itself, namely students who are a digital generation and can hardly be separated from technology when carrying out their activities. Some terms are attached to the current generation, such as digital natives, millennials, net generation, or digital generation [5], [6]. These terms are used to describe how the current generation used technology when they were very young. Because the current generation, namely students, are the subject of education, the use of technology in educational institutions has become a necessity. Students who are central in a digital society need to be served according to their era, namely the era with a technological culture [7].

The Covid-19 pandemic described the absolute need for technology in education. Schools rely on online learning with technology to carry out distance learning [8], [2]. Some researchers describe how efforts to use technology in education are carried out in almost all countries in the world. [9], [10].

Many educational institutions stated that they were not ready to carry out teaching and learning activities when schools had to close and distance learning had to be carried out. Difficulties in applying technology have been mentioned even when the world had not yet entered the Covid-19 pandemic [11]. These challenges and obstacles are related to the lack of usable online teaching infrastructure, quality and experience of teachers, the existence of information gaps, and the complex learning environment at home [12], [13].

The Application in the case study is offered as a solution to address teachers and school complaints related to LMS that are usually offered, namely solutions related to (1) difficulties in implementing LMS; (2) LMS is not integrated so schools need more than one software; (3) LMS does not contain pedagogy to the fullest so that the existing LMS is not following the world of young people who are a digital generation [14].

The Application in the case study, which claims to be able to answer these problems, needs to be tested to ascertain how far this claim goes in implementation. The test uses the Technology Acceptance Model (TAM). Technology Acceptance Model (TAM) is a model built to analyze and explain the factors that make users accept and use technology [15], [16], [17]. The TAM model was first introduced by Fred Davis in 1996. Then, there were some modifications, for example by Vencantesh (2002), and Lui and Jamieson in 2003 [15], [18]. A number of these researchers say that TAM is very effective for seeing the implementation of technology.

Figure 1 describes some variables regarding a person's acceptance of technology.

1. External variables explain the things that determine a person has confidence in the use of technology to help his work and trust in the ease of technology in carrying out work (Alharbi & Drew, 2014).
2. Perceived Usefulness (PU) is the level where a person believes that when he uses certain technologies, his performance will increase.
3. Perceived Ease of Use (PEOU), namely someone who believes that he can get convenience and will not experience difficulties in using technology.
4. Behavioral intentions, that is, someone has a strong intention to use technology.
5. Actual system use explains the influence of PU and PEOU which generates intention and then implementation of technology.

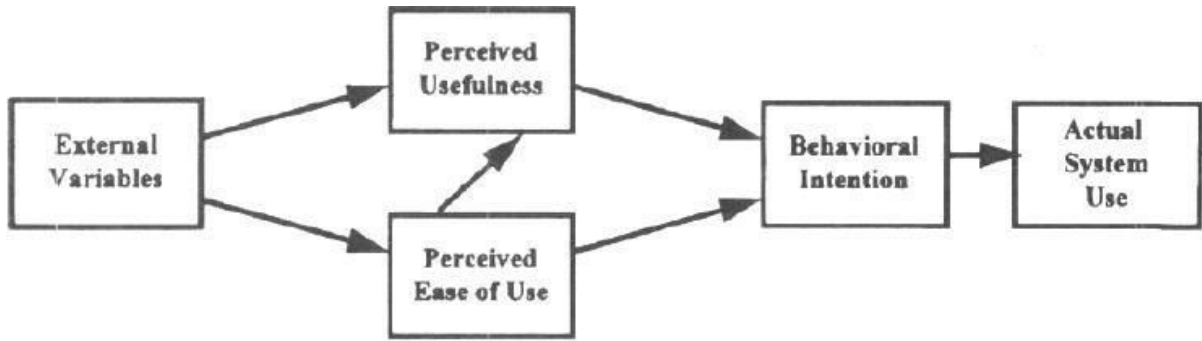


Figure 1. Final Model of Technology Acceptance Model

PU and PEOU are two determinants that will greatly affect people using certain technologies. For the first determinant (PU), people tend to use technology if they believe that the technology will make their job better. The second determinant is related to the ease of using the technology. Perceived usefulness and ease of use will affect one's acceptance, intention, and attitude toward to use of technology [19], [17], [20], [18], [19].

Figure 2 confirms that self-efficacy and facilitation conditions will affect PU. Self-efficacy in this study is related to mastery of the LMS. While the facilitation conditions are related to the completeness of the features available and used. Meanwhile, system quality and staff support affect PEOU. PU and PEOU influenced teachers' intention to use this LMS and encouraged them to implement it.

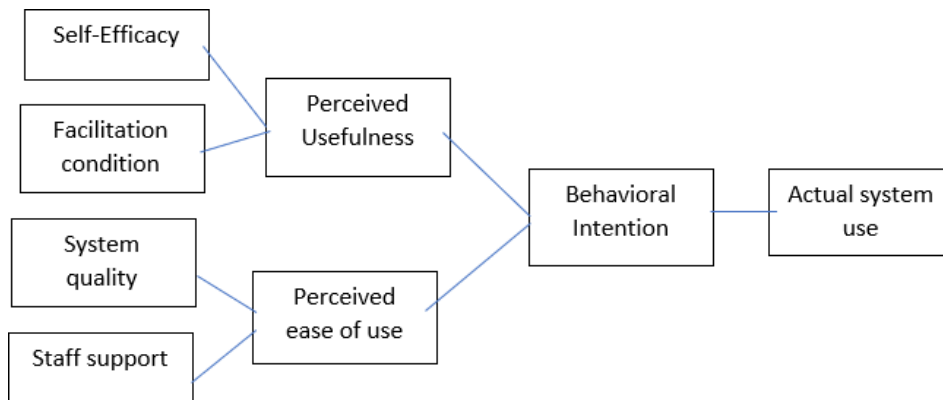


Figure 2. The Framework of LMS Evaluation in the Research

This study is limited to a descriptive analysis of self-efficacy and facilitation conditions that affect PU and system quality and support staff that affect PEOU which then affect intentions and LMS implementation.

2. METHOD

Research Design. This study uses a quantitative approach. The quantitative method is carried out using a survey. A total of 110 teachers responded to a survey sent via Google Forms. This survey provides a choice of answers on a Likert Scale. After that, interviews were conducted with 4 people to confirm and clarify the answers to the survey questions with the answer choices on the Likert Scale. The survey questions were divided into four sections, namely (1) related to knowledge, mastery, and use of the Platform X. (2) Groups of questions related to the features used; (3) Questions related to system quality; (4) Questions related to service quality, both software services and staff support. Data analysis was carried out by describing the percentage related to the teacher's perception of the group of questions above.

Population and Sample. Participants in this study consisted of teachers who had used this learning management system (the Platform X) in some provinces in Java, Sumatera, Maluku, and Papua islands, The 110 teachers who responded to the survey consisted of 11 Kindergarten teachers (10%), 45 Elementary teachers (41%), 25 Junior School teachers (23%), and 29 High School teachers (26%) (Table 2). They've been using the app for over a year now. The interview is conducted after the Google form was filled out by 4 respondents. The participants in the interview consisted of selected teachers who could be considered to represent each level. They are selected based on their position as one of the leaders and their readiness to respond to the researchers.

3. RESULT AND DISCUSSION

Table 1. The Level of Respondents

	Level	Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Kindergarten	11	10	10	10
	Elementary School	45	41	41	51
	Junior High School	25	23	23	74
	Senior High School	29	26	26	100
	TOTAL	110	100	100	

The survey via Google form has been distributed to five schools in Jabodetabek which are detected to have

used the Tegarmedia platform. A total of 110 teachers responded and filled out the questionnaire consisting of 11 Kindergarten teachers (10%), 45 Elementary teachers (41%), 25 Junior School teachers (23%), and 29 High School teachers (26%) (Table 1).

Table 2 The Ages of Respondents

	Level	Frequency	Percent	Valid Percent	Cumulative Percent
Valid	21-30	27	25	25	25
	31-40	29	26	26	51
	41-50	22	20	20	71
	>50	32	29	29	100
	TOTAL	110	100	100	

In Table 2, among the 110 respondents who answer the survey, 25% (27 people) were teachers aged 21-30 years, 29 teachers aged 31-40 years (26%), 22 teachers aged 41-50 years (20%), and teachers aged over 50 years amounted to 32 people (29%).

Table 3 The Teachers' Status

	Teacher Status	Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Honorary Teacher	16	14	14	14
	Permanent Candidate Teacher	14	13	13	27
	Permanent Teacher	80	73	73	100
	TOTAL	110	100	100	

Table 3 shows that the teachers who answered the questions consisted of 73% (80 people) permanent

teachers, 13% (14 people) prospective permanent teachers, and 14% (16 people) honorary teachers.

Table 4. Self-Efficacy (The Mastery of the Platform)

	N	Mean	Summary
Understanding	54	4,03	Good
Mastery	57	3,83	Good
Use	54	3,45	Good
CBT Help	43	3,89	Good

Table 4 shows that the mean and summary of the teacher's perception of the usefulness of the LMS are good. The teachers understand, master, and use the LMS. Especially, the teachers maximize the Computer-based-test (CBT) as the tool for their schools. In the interview, the leaders of the schools said that the range of the usefulness (understanding, mastery, use, and CBT help) is not at the maximum point because the respondents are not only permanent teachers who use the program maximally but also the honorary (part-time) teachers who aren't mandatory to use the LMS. Although the score can be biased because the honorary teachers take part in the survey, the result is still high, with a high good score on the scale, near the excellent.

Table 5. System Quality

	N	Mean	Summary
Easy to use	110	4,04	Good
Simple and understandable display	110	3,71	Good
Answer the needs	110	4,00	Good
Easy to access	110	3,94	Good
Good speed	110	3,65	Good
Not often error	110	3,32	Fair

Table 5 uncovers that the Mean of almost all variables in the system quality is still good. Some 5 of 6 variables get a good score (mean and summary) explaining that the system (PEOU 1) is qualified because easy to use, simple and understandable, answers the needs, is easy to access, and has good speed. Even though, the note is given to the

crash rate that gets fair in the scale. The table explains that the quality of the system correlates with the perception of the easiness of the usage of the system.

Table 6. Service Quality

	N	Mean	Summary
Instruction and training	110	4,08	Good
Online help	110	4,12	Good
Answer teacher's need	110	4,08	Good
Satisfied response	110	3,92	Good

Table 6 informs that the service quality of the LMS is good. The Mean and the Summary of the guidance and training, online assistance, helpful staff, response to needs, and satisfactory and timely response are good. In the interview, the respondents admire the role of the platform developer staff who stand by in some schools, are easy to contact, prepare some guidance, and conduct regular training.

Discussion

The platform is easy to implement because of its simplicity, good quality, and support. The results of this study indicate that teachers in Jabodetabek have a good perception of the Platform X which encourages them to have the intention and commitment to use this platform and then be able to use this platform optimally in their schools (good implementation). This good perception answers the first problem of using LMS in schools, (the platform is usually difficult to implement). This good perception can be seen in the survey results regarding self-efficacy (mastery of the Platform X as the PU1), facilitation conditions (features variation as the PU2), system quality (PEOU 1), and staff support (service quality as the PEOU 2).

Regarding self-efficacy (mastery of the platform as the PU 1), the survey uncovered the beliefs of the teachers about the platform, through understanding, mastery, and use. The variable for the platform mastery is good to explain the commitment and the actual use of the platform is good.

The rate of use of the features is also good (facilitation conditions as PU 2). The teachers use the platform because some features help them teach in the classroom easier. Some features relating to assessment get a good rate because it connects with principals and homeroom teachers. Through the platform, teachers get

help to arrange reports to the government, parents, and students in one click or one system. The researchers evaluate some features with a low rate of implementation. They are relating with the self-support to the teachers. Based on the interview, also shows that some teachers still have difficulty moving on and using the new tools and features. The school or principals have to use their authority to lead all teachers to use the platform.

System quality (as the PEOU 1) also supports the commitment and implementation of the platform. Almost all variables in the system quality (easy to use, simple and understandable, answer teachers' needs, easy access, and good speed) are good. Only 1 of 6 (error rate) gets fair in the summary.

Staff support (service quality as the PEOU 2) also help heighten the commitment and implementation of the platform in their schools. The teachers have a good perception of the system because they get help to know the system through training, get some modules relating to guidance, avail staff as the PIC, and get good and quick responses if they need help.

Respondents said that the LMS facilitated the teacher's work when it could be integrated. The Platform X obtained very positive results from respondents for almost all items. Respondents confirmed that they were satisfied with the LMS, the features were attractive, the system developed was very helpful and the services provided, and the staff involved were highly qualified. Perceptions are related to the belief that this LMS can be captured from the comments of some respondents who said that during the Covid-19 pandemic, they were lucky because they were assisted by this integrated LMS.

Some schools highlight and feel very helped by the new student admissions program and financial programs that have been integrated into this program. "Previously, we had to buy a separate program for the admissions program and finances. The Platform X has integrated this program," said the Head of Education Operations from a school in North Jakarta."

The Platform X enhances digital pedagogy. The Platform X helps teachers to see the real needs of students (as the subjects in education). Respondents in this study acknowledged that Application X developed techniques that answered students' needs for technology. Application X, like other LMSs, emphasizes that technology can no longer be ignored in the field of education. Application X has a specialty because it develops studies related to appropriate answers to students' needs when using technology.

If you look at the existing features, apart from some features that help schools and teachers, Application X also helps students in terms of flexibility, practicality, and ease of use of technology. The developer has prepared some game features to explore certain materials. The Platform X also has connections with some

educational game-based platforms that can increase students' interest in using this platform.

In addition, the Platform X reveals another side of technology use among students. A vice principal mentioned the Exam feature in this application. The exam feature is quite special because it is very good in terms of appearance but can minimize cheating. For example, students may not open other tabs while in this app's exam feature. Also, there are features based on Artificial Intelligence that help teachers supervise students who are working on exam questions.

Toward the ideal educational platform model. The Platform X can be a platform model that *can be a solution for schools*, both those that are already using LMS and those that are just about to use LMS. The Platform X as the LMS model is easy to implement. The platform is developed with guidance, regular training, standby staff, and quick response to teacher questions and requests.

Integrated LMS model. Many LMSs only provide software that is a solution to only part of a school's problems. Generally, the existing LMS does not answer the needs of schools related to the acceptance of new students, financial management, and human resource management. Some LMSs only provide basic services in schools, such as assessments and materials, but do not answer the need for schools to make report cards from each teacher's reports, or provide comprehensive reports to the government, parents, and students, from only one teacher's report. An integrated platform has become a critical requirement for a quality LMS model.

The Role of the Principal or Foundation. A qualified LMS requires a strong role from the Principal or Foundation. Monitoring, evaluation, and leadership from the Principal so that all teachers use the existing platform is an absolute requirement for the existing platform to be fully implemented with good steps and planning. Of course, school or foundation leaders need to have confidence that the platform to be used has answered the problems that usually arise in the implementation of a platform. School leaders need to look again at matters related to teacher mastery (self-efficacy), feature variations (facilitation conditions), system quality (ease of use), and service quality (staff support, including guidance, regular training, staff who always present to help, and respond quickly to teacher needs and questions). School leaders need to choose the right LMS, and then make a policy regarding the platform to be used and what is the teacher's responsibility for using the LMS.

4. CONCLUSION

Researchers examined teachers' perceptions regarding the usefulness of the Platform X for schools in Jabodetabek. This perception is related to the

understanding and mastery of the application, the ease of using the application, how well the system is being developed, and how good the services provided are. The measurement was carried out through a survey in the form of a Google form for teachers using this application. The 110 teachers who answer the survey, work in schools in Jabodetabek that already use this application. In addition to the survey, interviews with 8 teachers were conducted to confirm some questions.

In general, teachers have the perception that the Platform X is understood, mastered, and used; they also have the perception that the application is easy to use and has interesting features. This application also has a good and integrated system. Moreover, respondents have a positive perception related to service quality in terms of features and helpful staff. Notes on this application must be made related to the thorough implementation of the teachers and the use of more features.

This study has limitations because it only describes the existing survey results. Further research needs to be conducted by conducting a more in-depth analysis related to a wider range of variables, for example comparing teacher perceptions based on school level (elementary, junior high, high school), or based on age, or based on gender.

This research can be a recommendation for schools to be able to compare and use applications that are easy to use but quite complete. Recommendations can also be given to governments that are actively developing LMS to pay attention to the advantages and uniqueness of the Application X application. For teachers, this research can recommend seeing what factors encourage teachers to be able to use LMS regularly and in-depth.

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