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EKLE: Development of Learning Management System (LMS) Application Based on Hybrid Learning

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Abstract

The aim of this research to development of Learning Management System (LMS) application based on hybrid learning. The research method using the 3D+1I design (Defining, Designing, Developing and Implementing). The instrument used was a questionnaire given before and after using EKLE. The subject is 40 teachers in one secondary school in Kudus. Data were analyzed by descriptive analysis whose results were included in five categories, namely very effective, effective, and effective enough, less effective, and ineffective. The results show at the final evaluation, the EKLE positive response is very effective with a percentage of 92%. Thus, the EKLE is very effective as a hybrid learning application.

Keywords: Learning Management System (LMS), hybrid, learning.

1. Introduction

The Industrial Revolution Era 4.0 brought a very rapid movement in all fields, one of which was in the field of education. The separation between the physical and digital world through a combination of technology trends requires educators to be able to integrate electronic-based learning into conventional learning. E-learning as increased both in terms of usage and research in recent years. The use of e-learning is inseparable from the concept of learning in the 21st century, which refers to patterns of learning in 4.0 era which have the characteristics in developing the 4C concept (Collaboration, communication, creativity, critical thinking, and problem-solving) in 21th-century skills [1-4]. That is plus networking, artificial intelligence, heutagogy, infinite learning and new literacy, including digital literacy, technology literacy, and human literacy [5-7]. But in fact, there are still many obstacles in managing e-learning.

Based on the phenomena that occur in survey January 2019 with the number of respondents 40 teachers in one secondary school in Kudus, the general information is obtained that the e-learning knowledge that has been obtained from the training, has not been fully implemented in an ongoing manner. The results received are 70.8% teacher responses answered actually e-learning is effective, but cannot be used optimally and is not effectively used for all subjects, especially subjects related with the count. The observation results were strengthened by the response of the teacher 56.3% answered sometimes using e-learning. This is due to the teacher's perception that e-learning structuring is not yet effective, the teacher's perception that the existing e-learning on Learning Management System (LMS) structuring system is still considered to be less than simple, not all teachers fully understand ICT, especially e-learning management, not all subjects can make learning online, thereby expecting an e-learning needs to be managed by the admin. The most basic thing about teachers' perceptions of e-learning has been effective, but the management is still not optimal so that the implementation is not optimal due to personal weaknesses, namely forgetting of g-mail and password accounts. Existing LMS for g-mail accounts and passwords are managed by themselves. Thus, the

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application is needed that can make it easier for the content provided by course designers and instructors in the LMS based on the hybrid.

Today, hybrid learning an inclination has been established as a learning model that can be in the procedure of education by means of games, simulation, videos, web and additional [8-11]. For some people, hybrid learning is equated with blended learning [12-14]. Hybrid learning combines virtual classes with conventional classes in which there are instructional designs that are ready to be used as part of the learning provides that will be carried out by the learner independently [15-17]. On the other hand, blended learning combines offline and online learning, but the instructional design is not yet available and must be managed when learning takes place [18-21].

Hybrid learning is learning with the web that can be accessed through the internet. This is helpful in considering that Indonesia is a country with quite a lot of internet users [12,13,22]. The aim is to facilitate meaningful learning and build knowledge for students. The prototy rehybrid system application supports the wider application [23]. Thus, it fun handle the content provided by course designers and instructors in the LMS. Thus, the aim of this research is to develop of LMS application based on hybrid learning.

2. Methodology

The method used in this research is $\overline{3D}$ + 11 design (Defining, Designing, Developing and Implementing). This design has been utilized by several researchers in research, development [24-26]. The defining step has been done to field studies (observation and studies literacy). The designing step is designing and manage the layout of hybrid-based LMS applications in the form of prototypes. The developing step includes the development of model design, product revision, hypothetical models. And, the implementing step of using EKLE application by the teacher, and the results will be analyzed to identify the effectiveness of using the EKLE application.

The participation is 40 teachers in one middle school in Kudus, Central Java, Indonesia. These locations can be seen in Figure 1.



Figure 1. The map of Kudus (Google Maps)

Considering that Indonesia is a country with a diversity of tribes and cultures [25], this research has the potential to be developed further. The development is like a wider scope or by applying to different tribes or regions.

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The instrument used in this study was a questionnaire sheet with a closed Likert scale. This means that the questionnaire used has answer choices for each question or statement, therefore, the respondent only has to choose. The aspects assessed are Effectiveness, Attraction, According to the needs, and Implementation. This instrument was filled out by the teacher after using the EKLE application.

The data in this study were analyzed with descriptive analysis. Previously, the questionnaire completed by the teacher was given a score as shown in Table 1.

Table 1. The score of Likert scale

9		
The Answer	Symbol	Score
Strongly Agree	SA	5
Agree	A	4
Uncertain	U	3
Disagree	D	2
Strongly Disagree	SD	1

The score that has been obtained will then be calculated using the following equation (1).

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$\frac{1}{20} = 1$	liscore	optainea)/	Maximum	score x	100%	(1.7)

The percentages obtained were then categorized based on the effectiveness criteria for using EKLE in Table 2.

Table 2. Interpretation of measure of effectiveness assessment criteria

No	Percentages (%)	Category
1.	$84 < \% \le 100$	Very effective
2.	$68 < \% \le 84$	Effective
3.	$52 < \% \le 68$	Effective enough
4.	$36 < \% \le 52$	Less effective
5.	% ≤ 36	Ineffective

3. Results and Discussion

3.1. Results

This section will be presented based on 3D + 1I design (Defining, Designing, Developing and Implementing).

3.1.1. Defining

At this step, a field study is conducted to find out the problems that occur regarding. LMS. The survey was conducted in January 2019 with the number of respondents 40 teachers in one secondary school in Kudus. Based on these results, we began to study what features could be used in the LMS application to be developed.

3.1.2. Designing

The design step is used to create a design regarding the layout that will be displayed in the LMS application. While there are 10 features to be used, including: 1) EKMS LMS; 2) Factual; 3) VR / AR / V360°; 4) Tutorial; 5) eBook & PPT; 6) Galle 5; 7) Worksheets; 8) Quiz; 9) Assessment, and; 10) RPP (Lesson plan). The design used can be seen in Figure 2.

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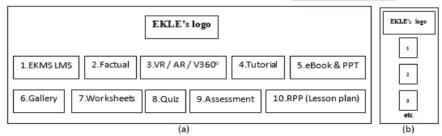


Figure 2. The initial design of the EKLE application display: a) by computer, and; b) by smartphone

Figure 2 shows that the main menu application EKLE, displays 10 main features directly by computer in Figure 2a, and by the smartphone in Figure 2b. This is done so that EKLE is easy to use, and when one menu is clicked, then it will enter the next menu display according to the features used.

3.1.3. Developing

This step is an improvement in the EKLE application, starting from the design, function, web address, and placement lanned in the design step. The EKLE display can after going through the development can be seen in Figure 3(a) and (b).



Figure 3. Display EKLE by computer: a) Main display; b) Main display after scrolling down

The EKIE application can be opened on the page (https://ekleApp.com) via a computer or smartphone. After opening the page through the computer, EKLE will look like in

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Figure 3a. When in the menu, scroll down, then EKLE will look like in Figure 3b. In addition, EKLE's appearance when opened via a smartphone is shown in Figure 4.



Figure 4. Display EKLE by smartphone

The appearance of EKLE on a smartphone is slightly different because of the appearance on the computer. On the smartphone screen, the menu displayed is slightly larger, thus, to select a menu from EKLE you must scroll down.

In EKLE application, there is an LMS feature for communication between teachers and students, which is done online (on Figure 5). For supervisors to monitor the activities of teachers and students. In the LMS there is also a chat room option using WhatsApp's and telegram social media networks. For LMS specifications as follows:

- 1) LMS is managed by the admin so that the teacher, students only carry out the learning process as needed.
- Log in teachers and supervisors use the Employee Identification Number (NIP) for the username and password, while for students use the Student Identification Number (NIS).
- 3) Content Features are available with a simple but attractive appearance according to the teaching needs of the teacher.
- 4) Virtual classes, subjects, academic years and semesters are set according to the admin teaching task of the teacher.
- 5) Classrooms are based on the class that the teacher is teaching according to subjects.
- 6) Modules, in the form of readings or videos that are designed and uploaded by the teacher, also utilize web search.
- 7) Real chat room Group discussions and personal messages as a means of communication between teachers, students.
- 8) Questions and assessments made by teachers simply.

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Figure 5. LMS homepage display: a) by computer; b) by smartphone

The EKLE applications aside from having advantages in structuring design that are different from most other LMS, EKLE also has several special characteristics such as:

- 1) Closed Group Collaboration System.
- 2) The application is packaged like an educational startup.
- 3) Is dynamic and adaptive if opened on a computer, laptop, notebook, tablet, iPad, Android smart-phone.
- 4) For LMS, only one school institution can be used because it is vulnerable to the personal confidentiality of teachers.
- 5) Only those who have a password from the admin can use the EKLE application.
- 6) To enter the e-learning EKLE application, there is no need to register.

In addition, development is also carried out so that the use of EKLE can facilitate users, both administrators, teachers, and students. In general, there are three stages for each user, namely Planning, Implementation, and Supervision which will be explained as follows.

For administrators

Planning: Administrators as virtual classroom administrators who prepare a username and password for each teacher and supervisor using NIP and students using NIS, creating virtual classes according to conventional classes taught by the teacher, creating link drives for content of teaching materials, media, learning resources, student worksheets, assessment and assignments for one semester for teachers.

Implementation: Manage, manage hybrid learning-based applications (offline and online).

Supervision: The admin acts as an evaluator to evaluate the weaknesses of the learning application

For teachers

Planning: The teacher waits for the username and password for each teacher by using NIP, managing virtual classes according to conventional classes created by the admin. Provide files for the content of teaching materials, media, learning resources, student worksheets, assessment and assignments for one semester given to the admin.

Implementation: Offline learning (face to face) does not use a username and password. Teaching materials, media, learning resources, student worksheets, assessments and

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assignments are available on the official application and the teacher only directs students to choose a menu by clicking on the learning administration menu button.

Online-based learning (e-learning) teachers use the NIP username and password created by the admin to enter (LMS) as an e-learning application, the teacher uploads teaching materials, media, learning resources, student worksheets, assessment and assignments for students during the implementation process learning

Supervision: The teacher and administrators evaluate the learning activities and learning outcomes.

For students

Planning: Prepare a username and password for each student using the NIS from the admin. Waiting for direction from the teacher to choose teaching materials, media, learning resources, student worksheets, assessment and assignments.

Implementation: Based offline (face to face) does not use a username and password. Teaching materials, media, learning resources, student worksheets, assessment and assignments are available on the official application and students chosen the menu on the official application by clicking on the button according to the teacher's direction.

Online-based (e-learning) students use a username and password in the form of NIS that the administrators create to enter (LMS) as an e-learning application. Students download teaching materials, media, learning resources, student worksheets, assessments and assignments uploaded by the teacher.

Supervision: Students and teachers evaluate the learning process and results.

3.1.4. Implementing

This step is an analysis of the results of using EKLE to identify how effective this application can help teachers. While, the results based on data analysis are shown in Table 3.

No.	Aspect	Score	Average	%	Criteria
1.	Effectiveness	572	4.76	95	Very effective
2.	2. Attraction		4.50	90	Very effective
3.	According to the needs	372	4.65	93	Very effective
4.	Implementation	529	4.40	88	Very effective
	Total		18.31	366	Very effective
	Average	458.25	4.58	92%	Very effective

Table 3. The effectiveness of EKLE

Based on Table 3, it can be seen that each aspect has a different presentation. The effectiveness aspect has a 95% presentation, the attraction aspect is 90%, according to the needs is 93%, and the implementation aspect is 88%. So that the average of these four aspects is 9111 with very effective criteria. The skewness of EKLE application of these four aspects can be seen in Figure 6.

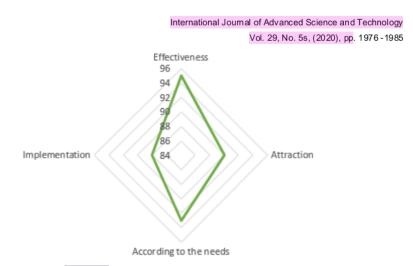


Figure 6. The skewness of EKLE application

From the four aspects assessed by the teacher, it can be concluded that the application of EKLE has a high effectiveness effect. While the implementation aspect has the smallest value, but based on Table 3 it is still safe because it is in the very effective category.

3.2. Discussion

The EKLE application with a fairly high level of effectiveness in management, as one way to overcome teacher weaknesses. Given the ease of structuring of the LMS structuring model, it is easier than other LMS, thus the EKLE application is believed by teachers to be a more effective and easier application to be carried out sustainably. The EKLE application that has practical characteristics, is simple, effective, flexible, dynamic, adaptive and in accordance with the needs. Agree with [27] by prioritizing the convenience aspects offered, it will affect the user's attitude in using the application. Strengthened by the results of the study by [28,29] the hybrid learning is one of the learning systems that use a software system with structuring that is quite simple, and intuitive so that it is easy to use by beginners, it will increase the user's usability.

In addition, the Ekle application menus provide convenience and interest for teachers of secondary school in Kudus to use it. The EKLE application combined with the LMS aims to help ease the teacher from the planning process for implementation and supervision because the management of the learning administration is well managed by administrators so that teachers do not bother running e-learning. Agreeing with [30] hybrid learning is used to synthesize face-to-face learning and online-based learning into an integrated mix so as to create a high impact on the use of hybrid learning systems. Thus, e-learning materials can be enriched with a variety of learning resources, including multimedia quickly updated by instructors through the administrators.

EKLE application is designed so that it can also be used on all mobile devices such as PC, laptops, notebooks, tablets, iPad and smartphones. Furthermore, the EKLE application can be used by installing it on a smartphone or other mobile device by clicking on the website address on the Google page or by installing the application.

With this learning structuring system, it is expected to help maximize teachers in learning activities. Structuring system conducted to make it easier for schools, especially teachers in managing the e-learning structuring model, an appropriate learning management system and in accordance with the needs teachers today, so that the

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implementation of e-learning systems can run effectively and sustainability through hybrid learning systems.

The hybrid learning systems (dynamic and adaptive) with an independent learning style that is self-determining learning with a heutagogy approach that emphasizes independence in learning. Agree with [31, 33] on the heutagogy approach also facilitates the learning process by providing guidance and resources as well as the freedom to choose what to learn and being able to analyze because of the demands for independent arring when running hybrid-based online classes. The learning methods that combine hybrid learning is a methodological learning approach that connects several approaches or learning methods so that it can be concluded that hybrid learning is suitable for use as an online and offline learning system. Thus, the EKLE application can be used as a support for conventional learning. This agrees with the results of research conducted by [5, 32, 34] that learning with e-Learning cannot be optimally applied in the teaching and learning process, but can be used as a medium to support learning based on hybrid learning to facilitate teachers in managing e-learning systems.

4. Conclusion

The EKLE is very effective to use as a Learning Management System (LMS) application based on hybrid learning. Apart from that, the EKLE is also effective, easy, simple, flexible and according to the needs of the teacher. Theoretical implications are the final model of hybrid-based e-learning structuring and practical implications in the form of EKLE applications that can be used by teachers with online learning and offline learning systems.

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