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The Effectiveness of Learning Management System in State University of Malang for Supporting Distance Learning

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Abstract

The COVID-19 pandemic requires distance learning to be carried out by all educational institutions. The learning management system plays a crucial role in supporting modern distance learning that is carried out online. However, the effectiveness of LMS in supporting distance learning at the State University of Malang has not been known. This study aims to measure the effectiveness of LMS SIPEJAR as a learning management system owned by the State University of Malang in supporting students' distance learning. The sample of this study was students of the Department of Educational Technology batch 2019. The approach used was descriptive qualitative, with the interview method used to collect data from selected participants using a purposive sampling technique. The results showed that LMS SIPEJAR is effective in supporting online distance learning for students at the State University of Malang, although several aspects must be improved. This research can be used as a reference and recommend State University of Malang and other institutions to improve the quality of their distance learning.

Keywords: Distance learning, Effectiveness, LMS, SIPEJAR

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INTRODUCTION

Education in Indonesia has a new challenge since the emergence of the COVID-19 pandemic in March 2020. COVID-19 is an infectious disease with a high mortality rate due to infection with the Severe Acute Respiratory Syndrome Coronavirus 2 (SARSCoV-2) virus that attacks the human respiratory system (Yang et al., 2020). To reduce the spread of COVID-19, the Minister of Education and Culture of the Republic of Indonesia issued a circular letter instructing the implementation of distance learning from home at all levels of education (Pelaksanaan Kebijakan Pendidikan Dalam Masa Darurat Penyebaran COVID-19, 2020). Distance learning is a solution to serve large-scale learning that can overcome distance, place, and time constraints in carrying out the learning process. Distance learning provides learning opportunities to students who do not gather with educators in one place regularly to receive lessons (Prawiyogi et al., 2020).

In this digital era, distance learning is conducted online. Online learning is defined as a group of learning arrangements consisting of three components, namely, information, communication technology, and internet (Laschewski, 2011).

The use of technology is intended to overcome the separation of distance and time in distance learning, so it requires media designed to present a series of materials independently and be able to achieve the expected learning objectives (Munawaroh, 2005). If the learning objectives are successfully achieved by managing the right situation, learning can be said to be effective (Miarso, 2004). In previous research findings, there are several factors that determine the success of online distance learning in higher education, namely (1) institutional management, (2) learning environment, (3) instructional design, (4) support services, and (5) learning evaluation (Al. Manhrawy, 2013; Arai et al., 2024; Cheawjindakarn et al., 2012; Roa et al., 2023). Thus, the technology used by educational institutions to support distance learning can be said to be effective if it meets certain indicators (Al.Manhrawy, 2013; Roa et al., 2023).

State University of Malang, as a higher education institution, also organizes online distance learning by utilizing a Learning Management System (LMS) called the Sistem Pengelolaan Pembelajaran (SIPEJAR). LMS is an application to create an integrated learning system and knowledge management system that allows an organization of learners to share and codify knowledge (Tampubolon et al., 2012). The basic activities of a LMS are user management, class administration management, and communication tool management (Barchino et al., 2005). SIPEJAR was created as a form of the State University of Malang's effort to facilitate online learning content in a digital learning environment (Praherdhiono et al.

SIPEJAR combines an academic information system and a learning administration system, as well as an online learning service system (Figure 1).

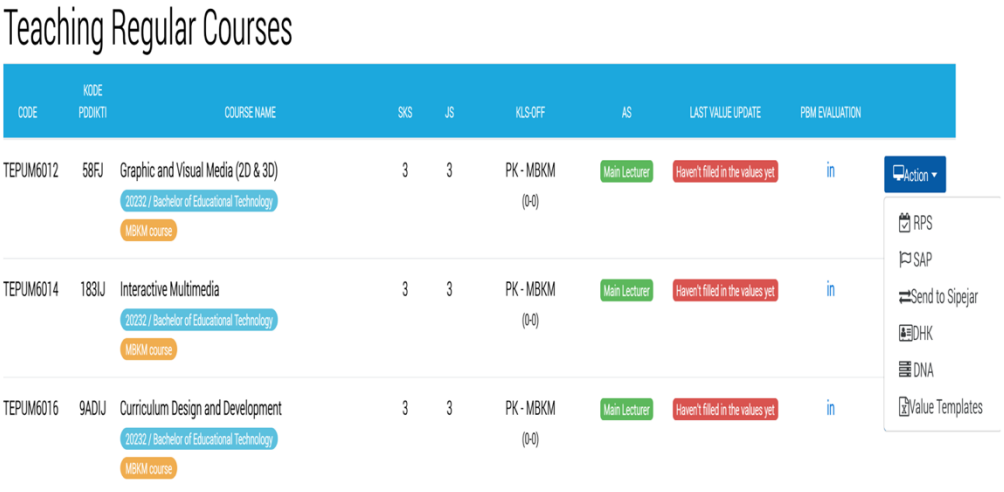

Figure 1. SIPEJAR from academic information system

The implementation of online distance learning with SIPEJAR at the State University of Malang involves the role of educational technology which has an impact on students. The role of educational technologists to create effective technology-based learning resources is expected to produce graduates who can compete (Surani, 2019). In addition, students are a crucial component in modern learning that is designed to be learner-centered, to meet the needs of individuals and

a rapidly evolving world (An & Mindrila, 2020). Based on observations made by researchers at the Department of Educational Technology, State University of Malang, for approximately four semesters since SIPEJAR was implemented in online learning, it was found that there was a lack of understanding of students in learning topics. In addition, learning activities are less likely due to the lack of interaction between students, lecturers, and fellow students. Ideally, SIPEJAR should be able to facilitate student learning activities effectively in online learning during distance learning in accordance with its development objectives. Therefore, research is needed to examine these problems more deeply and find solutions to them.

Based on observations in the field and literacy studies from several previous studies (Madyatmadja et al., 2023; Qonita et al., 2019; Raharjo, Widyaswari, & Dayati, 2022; Sutadji et al., 2020), it is deemed necessary to determine the effectiveness and factors that support and hinder SIPEJAR in supporting distance learning from the perspective of students as the center of learning. This research focuses on the effectiveness of using SIPEJAR as the State University of Malang's LMS in supporting distance learning at the Department of Educational Technology during the COVID-19 pandemic. The restriction aims to reduce bias in the research results because all departments at the Universitas Negeri Malang use SIPEJAR. This is supported by previous research, which found significant differences in the frequency of SIPEJAR use in each department and year of study (Wiyono et al., 2021). The results of this study can be used as a reference for the State University of Malang to improve the learning management system so that distance learning can be implemented optimally.

METHODS

This research was conducted using a descriptive qualitative approach with an interview technique to build knowledge based on an understanding of the effectiveness of SIPEJAR in supporting distance learning from students' perspectives. In qualitative research, the number of participants needed is between five and ten people or until a saturation point is found (Creswell & Poth, 2016). The subjects of this study were selected using the purposive sampling technique because the research topic refers explicitly to a group with certain conditions, namely students of the Department of Educational Technology, currently using SIPEJAR and having conducted face-to-face learning before the pandemic for at least one semester. Therefore, six students of the Department of Technology, State University of Malang class of 2019 were selected as research subjects.

Research Instrument

The research was conducted using an interview. The key instrument in this research is the researcher as a data collector to be interpreted. As a supporting instrument, interview guidelines were used (Table 1). The interview guideline was made based on indicators from previous research by Cheawjindakarn, Suwannatthachote, & Theeraroungchaisri in 2013 on the success factors of distance learning implementation in higher education.

Table 1. Interview Guidance

No.	Question
	Online Learning Environment
1.	To your knowledge, does SIPEJAR provide access with different user profiles between students and lecturers?
2.	Can SIPEJAR record your attendance and learning activities based on the classes you attend?
3.	During your time using SIPEJAR, did it allow its users to communicate with each other?
4.	Do you think students must have the facilities and infrastructure to learn through SIPEJAR?
5.	In your opinion, has SIPEJAR facilitated interaction between students and learning content, students and lecturers, and students and students?
6.	In your opinion, how easy is it to access SIPEJAR?
7.	What do you think about the SIPEJAR interface with regard to the ease of finding the content needed?
	Instructional Design
8.	How is the availability of RPS for students in SIPEJAR at the beginning of the lecture?
9.	In your opinion, how complete is the content of lecture material in SIPEJAR and how easy is it to understand?
10.	In your opinion, is learning in SIPEJAR student-centered?
11.	How is SIPEJAR's ability to generate student motivation and commitment to learning?
12.	During the implementation of PJJ, does SIPEJAR facilitate assignments during lectures?
13.	What do you think about assignments through SIPEJAR?
	Support Service
14.	To your knowledge, is there an instruction/guide for using SIPEJAR?
15.	Do you know the *tools* in SIPEJAR to communicate between users?
16.	Do you know the *helpdesk* in SIPEJAR to help students who are stuck?
	Learning Evaluation
17.	Is there an improvement in your learning outcomes when distance learning (online) uses SIPEJAR?
18.	How do you think learning using SIPEJAR compares to face-to-face learning?
19.	What do you think needs to be improved from SIPEJAR to enhance its ability to support distance learning?

Data Collection Procedure

Data collection in this study used in-depth interviews to explore participants' experiences in using SIPEJAR. Therefore, interviews were conducted using open-ended questions so that participants could express their opinions about the effectiveness of SIPEJAR in supporting distance learning with rationalizations. The estimated interview time is 30 to 45 minutes for each participant.

In its implementation, the researcher determines the research subject by looking for participants who are willing to be interviewed. The researcher met with participants according to the predetermined time and place to conduct interviews based on the interview guidelines. The researcher asked the main questions and

allowed participants to answer. The researcher responded to participants' answers by developing new questions in accordance with the scope of the main question. The researcher recorded the participants' answers and non-verbal language during the interview process. The recordings were then transcribed for analysis.

Data Analysis

In this study, the data obtained from the interviews were analyzed using the Miles and Huberman technique, which consists of data reduction, data presentation, and conclusions and verification (Miles & Huberman, 2014).

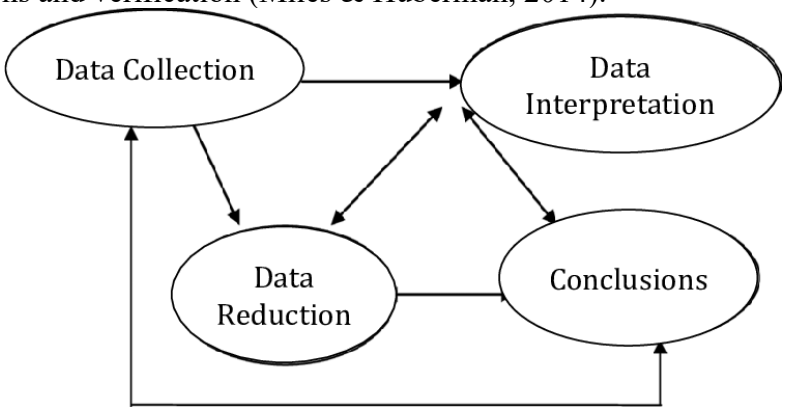

Figure 2. Miles & Huberman Data Analysis Process

After the data is collected, data reduction is then carried out. Data reduction is the process of summarizing and sorting data into specific categories, concepts, or themes (Rijali, 2019). The interview results were selected and categorized based on the indicators in the interview guidelines. Furthermore, the data is presented in the form of descriptive text that describes the whole of a group of data obtained so that it is easy to read and understand. Data presentation is written in the results section of the article. Conclusions can be drawn from the data that has been presented so that the meaning can be found and discussed in the article. Then the conclusion is verified by ensuring its accuracy to the expert who guided the research.

RESULTS & DISCUSSION

RESULTS

The data collection process using the interview method lasted for one week. The participants who are the source of data for this research are six students of the Department of Educational Technology, State University of Malang class of 2019 from class A (2 people), class B (2 people), and class C (2 people). The interviews were conducted online via Zoom because not all participants were in the same area as the researcher. After the interviews were conducted, the results were described as follows.

Online Learning Environment

The interview results show that SIPEJAR provides different types of accounts between students and lecturers based on student knowledge. Each account

has access to different features and controls, such as lecturer accounts that can create and manage courses or classes. In contrast, student accounts can only access content in the course if authorized by the lecturer. SIPEJAR can record student attendance by providing attendance information for each course that students and lecturers can fill in. In addition, the SIPEJAR system can record student learning activities by providing check boxes on each content and learning activity in the course that can be monitored by students and lecturers. SIPEJAR also allows its users, namely students and lecturers, to communicate with each other. In terms of communication, most students argue that the communication features in SIPEJAR are less than optimal and underutilized by fellow students and lecturers.

Students of the Department of Educational Technology, State University of Malang, must have the facilities and infrastructure to access SIPEJAR. According to students, the SIPEJAR site can be accessed easily using computers, laptops, and smartphones. However, some students argue that the SIPEJAR server often experiences interruptions that hinder access. Students are also often constrained by poor internet connections because network quality depends on the location of each student.

Regarding interactivity, according to students, SIPEJAR has facilitated interaction between students and students, students and lecturers, and students with learning content. This interaction is carried out by providing access to learning content, discussion forums, and chat features. However, the SIPEJAR interface is still considered poor because it makes it difficult for students to find courses that are being followed. This is due to the absence of a search feature, and all courses completed and still being followed are displayed in the same place. In addition, the SIPEJAR interface becomes less attractive when accessed via smartphone because it is mostly text.

Instructional Design

The interview results show that according to students, SIPEJAR has facilitated the uploading of learning content in various formats, such as text, images, videos, and *power points*, so that it can support the completeness of lecture material. SIPEJAR has also provided access to the RPS at the beginning of the lecture. However, the completeness of the learning content and the availability of the RPS in the *course* depends on the lecturer as the uploading party, not all *courses* have complete RPS and learning content. Learning content in SIPEJAR becomes difficult for students to understand if there is no additional explanation from the lecturer. Students understand learning content in the form of videos better than just text.

Based on information from students, SIPEJAR can facilitate students to learn independently. Students can access learning content and do assignments independently with direction from the lecturer. However, some students argue that learning in SIPEJAR is not fully learner-centered. This is caused by students who do not play an active role in learning when there is no discussion forum held by the lecturer.

SIPEJAR's ability to generate student motivation and commitment to learning is considered poor. The factors that cause this are the SIPEJAR *interface* which is less attractive and makes it difficult for students to find *courses that are*

being followed, as well as the lack of supervision so that students' attention is easily distracted. Some students stated that they only access SIPEJAR if there is an assignment. In addition, there are also students who feel more comfortable attending lectures with face-to-face meetings.

In terms of learning evaluation, according to students, SIPEJAR has facilitated assignments well during online distance learning. Students can submit assignments flexibly in terms of time and place. In addition, SIPEJAR supports collection in various formats such as *word*, *pdf*, *power point*, images, and direct text making it easier for students. However, sometimes students are constrained by the SIPEJAR *server* which often experiences interruptions so that tasks are not *submitted*. The *file* size limit also makes collecting assignments less practical because the *files* must be uploaded on another *platform first*.

Support Service

Based on the results of the interviews, it was found that most students did not know the existence of guides and *help desks* in SIPEJAR. Others know, but have never used the service. This happened because students never received socialization related to SIPEJAR. Students learn to use SIPEJAR independently by asking friends or seniors if they experience difficulties. When there is a disruption in the SIPEJAR system, students immediately contact the lecturer to get a solution. In terms of communication tools, students already know that there is a *chat* feature that can be used to contact other SIPEJAR users.

Learning Evaluation

The interview results show that during distance learning using SIPEJAR, students experienced an increase in their learning outcomes when compared to face-to-face learning before using SIPEJAR. Some students stated that at the beginning of the implementation of online distance learning, they had experienced a decline in grades because they were not yet familiar with the system used. According to students, distance learning using SIPEJAR has advantages in terms of flexibility because it can be accessed from anywhere and anytime. However, most students feel more able to understand the material during face-to-face learning. This happens because there are several *courses* with less diverse learning content so that not all student learning styles are facilitated in SIPEJAR. In addition, the interaction between students and students and fellow students is felt to be better during face-to-face learning.

Discussion

Distance learning is a solution to minimize physical contact in educational institutions during the pandemic. Distance learning is a form of teaching that occurs between educators and students at different times and/or places and uses various forms of teaching materials (J. L. Moore, Dickson-Deane, & Galyen, 2011). Today, distance learning focuses on pedagogy/andragogy, technology, and instructional system design that are effectively incorporated into delivering education so that educators and learners can communicate asynchronously and synchronously (Al-Arimi, 2014). Therefore, distance learning is implemented online using the internet,

software, and hardware. Online distance learning refers to access to information and extensive resources that are made easy without any difficulties (Samat et al., 2020). In higher education institutions, online distance learning involves different types of applications to create effective learning.

Learning effectiveness is one of the quality standards of education that can be measured by achieving goals and accuracy in managing situations_(Miarso, 2004). Learning effectiveness is the result obtained after teaching and learning activities are carried out (Al-Tabany, 2017). The success or effectiveness of online distance learning implementation in higher education can be viewed from the aspects of institutional management, learning environment, instructional design, support services, and learning evaluation (Al.Manhrawy, 2013; Cheawjindakarn et al., 2013; Roa et al., 2023). Of the five aspects, the learning environment, instructional design, support services, and learning evaluation are the ones that can be directly felt by the learners as the learning targets. Learners' experience can explain how the effectiveness of online distance learning implementation as well as the factors that support and hinder it.

SIPEJAR as the LMS of State University of Malang has facilitated during online distance learning. Learning management is an educator's way of managing his class, developing desired learner behavior and reducing or eliminating unwanted behavior, developing interpersonal relationships and a positive socio-emotional climate, and developing and maintaining an effective classroom organization (Erwinsyah, 2016). The development of SIPEJAR aims to meet central policies related to accreditation and the internal needs of institutions, especially during the pandemic. Praherdhiono (2022) as a the development team, explained that SIPEJAR was created using the Moodle *platform* which is *open source* so it is legal without requiring a paid license. To support distance learning, SIPEJAR is designed to be accessed flexibly, *single sign on,* and integrated with academic information systems. The effectiveness of SIPEJAR to support online distance learning can be seen from the extent to which SIPEJAR fulfills indicators of learning environment aspects, instructional design, assistance services, and learning evaluation.

SIPEJAR as the LMS of State University of Malang has facilitated learning management during online distance learning. Learning management is an educator's way of managing his class, developing desired learner behavior and reducing or eliminating unwanted behavior, developing interpersonal relationships and a positive socio-emotional climate, and developing and maintaining an effective classroom organization (Erwinsyah, 2016). The development of SIPEJAR aims to meet central policies related to accreditation and the internal needs of institutions, especially during the pandemic (Samat et al., 2020).

Online Learning Environment

SIPEJAR, as an LMS, is an online learning environment for students of the Department of Educational Technology. The interview results show that, according to students, SIPEJAR has accommodated user management by providing different access profiles according to status, class administration management by recording attendance and learning activities for each class, and communication management by facilitating communication between users. This is in line with the theory of basic LMS activities, and that the existence of an LMS must facilitate learner registration,

delivery and tracking of courses and learning content, testing, as well as enable the management of classes taught by educators (Cheawjindakarn et al., 2013). The first aspect that indicators the success of online distance learning is the online learning environment and how to remote learning environment (Matz et al., 2023). The online learning environment refers to where learners access online resources, use the system to access online courses and communication, get help from educators, and receive assessments. (Lennon & Maurer, 2003).

The institution's provision of an online learning environment must consider the availability of facilities and infrastructure as well as the interactivity of learning for students. To ensure the success of online learning, software, hardware, and internet connection are required to provide, deliver, and receive learning content (Selim, 2007). SIPEJAR has fulfilled this by providing easy access through various devices, such as laptops and smartphones, that students must own. Regarding interactivity, SIPEJAR provides learning content, discussion forums, and chat features that students can access and utilize. Thus, SIPEJAR has facilitated learning interactions consisting of interactions between students and each other, students and educators, and students with learning content. (M. G. Moore & Kearsley, 2011).

However, there are still shortcomings in the learning environment in SIPEJAR that need attention. Students who attend lectures from their respective residences cause problems with the instability of the internet connection which hinders learning activities. According to students, the SIPEJAR server also often experiences interruptions that hinder access. In addition, the SIPEJAR interface design still makes it difficult for students to find the desired learning content. In fact, a good and user-friendly interface design is needed to create a comfortable online learning feel (Wands & Le Blanc, 2001). Therefore, during the implementation of online distance learning, SIPEJAR needs to improve performance to provide an ideal online learning environment for students.

Instructional Design

The second aspect that needs to be considered in the implementation of online distance learning is instructional design. Instructional design is the practice of systematically designing, developing and delivering instructional materials and experiences, both digital and physical, in a consistent and reliable manner towards efficient, effective, engaging and inspiring knowledge acquisition. (Merrill, Drake, Lacy, Pratt, & Group, 1996). Instructional design aims to assist the learning process of learners with short and long term stages (Gagne, 1985). Based on previous research, indicators of the success of online distance learning from the instructional design aspect are: LMS provides access to the lesson plan so that learning objectives are clear, learning content is complete and easy to understand, student-centered learning, LMS generates student motivation and commitment to learning, and learning assessment (Cheawjindakarn et al., 2013).

From these indicators, according to students, SIPEJAR has facilitated the availability of lesson plans, the completeness of the learning content format, and assignments as learning assessments. However, SIPEJAR's facilities are not always maximally utilized by lecturers as class managers. Some lecturers do not upload the RPS on the course at the beginning of the lecture. At the same time, the clarity of the learning flow is a necessary structure to enable students to choose the appropriate way of learning and reflect their learning needs. (Wands & Le Blanc,

2001). In addition, not all lecturers upload complete learning content in SIPEJAR. The incomplete learning content makes it difficult for students to understand the material. Learning in SIPEJAR should make it easy for students to understand the material by providing many sources and various content formats, such as text, images, audio, and video, to be adapted to each student's learning style. Well-designed and selected learning content can facilitate meaningful educational experiences essential for implementing online learning materials (Bhuasiri et al., 2012).

Meanwhile, the centering of learning in SIPEJAR on students and SIPEJAR's ability to generate motivation and commitment to learning are considered not optimal. Based on the research results, SIPEJAR allows students to learn independently by following instructions, but students play a less active role in learning when there is no discussion forum held by the lecturer. To create effective learning, a model that actively involves students in the learning process is needed (Baxter & Gray, 2001). Therefore, lecturers need to increase student involvement from just following instructions in the learning process to make learning more effective. In addition, the appearance of SIPEJAR needs to be improved and the tracking of student activities in SIPEJAR needs to be tightened by lecturers so that learning is maximized. This is in line with the theory that learners will learn better if they are motivated to learn from the beginning (Pawlowski, 2002).

Support Services

Online distance learning cannot run smoothly without the availability of support services. Services include administrative issues such as management, funding, maintenance, and delivery of resources that are positively related to learner and educator satisfaction (Ozkan & Koseler, 2009). From the aspect of assistance services, SIPEJAR already provides a guide or instructions for use, a chat feature as a communication tool, and a help desk connected to the administrator. In this case, SIPEJAR has fulfilled the indicators of the support service component in online distance learning, namely training, communication tools and help desk (Cheawjindakarn et al., 2013). However, limited socialization makes the assistance services on SIPEJAR less known and utilized by students. Therefore, SIPEJAR needs to improve the quality of assistance services, especially in terms of socialization. The quality of assistance services affects the satisfaction and comfort of students and educators in teaching and learning activities. (Bhuasiri et al., 2012).

Learning Evaluation

The last aspect that indicators the success of online distance learning is evaluation. Learning evaluation is a systematic process of collecting, analyzing, and interpreting information to determine the achievement of learning outcomes (Gronlund, 1998). The evaluation process covers all aspects of online learning, to ensure that the system used can achieve the objectives (Puri, 2012). Learning evaluation is a step to ensure that online learning applications do not become a barrier to learning.

In this study, the evaluation emphasized the comparison between learning before using SIPEJAR and after using SIPEJAR. Based on the results of the study, there was an increase in student learning outcomes after learning using SIPEJAR.

In addition, learning with SIPEJAR has advantages in flexibility of time and place. This shows that distance learning using SIPEJAR is more effective when compared to face-to-face learning, because effectiveness is closely related to success in achieving goals in terms of quality, quantity, or time (Setiawan, 2020). However, students stated that they could understand the learning material better in face-to-face learning. This is in line with previous research findings that face-to-face lectures are more optimal, and the delivery of material given by lecturers is more acceptable than online lectures (Dzalila et al., 2020). Thus, there is a gap between learning outcomes and students' understanding of learning materials.

CONCLUSION

SIPEJAR has effectively supported distance learning for students at the State University of Malang because it has fulfilled most of the indicators of successful implementation of online distance learning in higher education, especially when viewed from an increase in learning outcomes. The indicators in supporting distance learning are institutional management, learning environment, instructional design, support services, and learning evaluation features that have been provided in SIPEJAR by users, both lecturers and students, which can be realized through socialization, assistance, and supervision from policymakers. In addition, SIPEJAR needs to improve its server and interface design to make it more user-friendly.

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