Utilization of Learning Management System: A Case Study on Junior High School Level

Akbar Syah Ichwanda Burham, Burhanuddin, Ahmad Yusuf Sobri, Djum Djum Noor Benty, and Desi Eri Kusumaningrum(✉)

Universitas Negeri Malang, Malang 65145, East Java, Indonesia
desi.eri.fip@um.ac.id

Abstract. This study aims to describe: (1) the management of the learning management system (LMS); (2) supporting factors for LMS utilization and optimization efforts; and (3) the inhibiting factors of LMS and how to overcome them. This qualitative research method uses a case study design at SMP Negeri 3 Malang City. Data was collected using observation, interviews, and documentation. Data analysis in research is data condensation, data presentation, and conclusions or data verification. The results of this study are: (1) the stages in LMS management starting from the readiness of human resources (HR) and quality facilities and infrastructure, the existence of a development team, various implementations, and supervision; (2) supporting factors in terms of adequate facilities and infrastructure from hardware, internet, and web-hosting; and superior HR capabilities and supported by their optimization efforts; (3) Inhibiting factors are also reviewed in terms of: facilities and infrastructure, namely limited school internet access, server down, and damage to gadgets, and in terms of human resources where there is a decrease in commitment and difficulty in utilizing development features in the LMS and how to overcome the obstacles.

Keywords: Learning Management System · Online Learning · E-learning

1 Introduction

The development of technology and science reinforces the learning process that is less than optimal through the use of a learning management system (LMS) as a form of online learning innovation. LMS offers extensive features to facilitate the learning process, ranging from large-scale distribution of teaching materials, virtual classroom management, and facilitating interaction between teachers and students or peers, to learning evaluation [1]. All system that takes place through the internet can be said to be e-learning and every teacher can use technological means to implement e-learning [2]. The convenience facilitated by this system is an advantage for teachers and students regarding the distribution of teaching materials that are more effective and efficient. LMS itself has been recognized as a system that provides high-quality learning that provides more flexible access to learning materials with low utilization costs [3]. The use of LMS is also relevant to the condition of education around the world, namely the restrictions on

B. B. Wiyono et al. (Eds.): ICEMT 2022, ASSEHR 727, pp. 96–106, 2023.
https://doi.org/10.2991/978-2-494069-95-4_12

school activities caused by the Covid-19 pandemic, thus encouraging the government to issue a policy on distance learning as a solution for providing education during the pandemic.

The implementation of LMS is part of the use of information and communication technology (ICT) to maximize educational services, especially learning. The need for ICT in education provides a better impact on the education system, both in terms of facilities, teacher competence, and quality of students [4]. Utilization of ICT in learning can provide learning changes to more flexible instruction [5]. Unfortunately, there are still many schools that have not been able to apply ICT to optimize learning well, so it has an impact on the low level of education in schools. It is often found that teachers find it difficult to manage time due to limited learning time which requires teachers to deliver a lot of subject matter in a short time. This can make it difficult for students to understand the material presented by the teacher, so it is necessary to use ICT in learning that can facilitate more flexible learning times and can provide wider learning resources.

Online learning utilizing information and communication technology (ICT) also needs to be concern about the availability of adequate facilities and infrastructure. Supporting facilities for the implementation of online learning in the use of LMS, such as internet and electricity networks have an important role in the implementation of online learning. It is also related to the feasibility of information and communication technology which is getting better along with the times that are needed to be implemented in educational institutions [6]. Schools organizing online learning need to have mature readiness to allocate the facilities needed in online learning, so that LMS management is needed to achieve learning objectives effectively and efficiently.

Based on a preliminary study conducted the researcher through visiting several junior high schools in Malang City show that the school has adequate infrastructure facilities, it was found that very few junior high schools were optimizing the learning process using LMS. This is because the LMS principle itself is to facilitate students to learn independently, while the level of independence of students at the junior high school level is still relatively low and requires intense instruction from the teacher. In addition, the problem of LMS adoption by students is still at a low level. This can be related to the low usability of students regarding whether a system provides satisfaction and efficiency to users [7]. So that schools can adjust their own LMS that is suitable for use according to the needs and advantages of a school itself. Even in the Covid-19 pandemic situation which requires distance learning, online learning management is urgently needed to optimize the implementation of online learning. Researchers found SMP Negeri 3 Malang City which is a superior school that has innovated digital-based learning media for a long time and has an LMS developed by the school itself. The main difference in using LMS at SMP Negeri 3 Malang City with other schools is that it is oriented towards synchronous learning, so students learn online through LMS and still receive direct instruction from the teacher.

SMP Negeri 3 Malang City applies learning through LMS which was developed by itself as a manifestation of the school's vision of excelling in science, technology, and art. This is as explained by Mr. Fajar Imawan, the head of the system developer and administrative coordinator of SMP Negeri 3 Malang City who explained that SMP Negeri 3 Malang City emphasizes a culture of sensitivity to change and technology to

create superior students, teachers, and education personnel. SMP Negeri 3 Malang City is also familiar with the implementation of online exams and is very concerned about choosing the right LMS to apply. Technology plays an important role in disseminating information that provides a more interesting learning experience for students to help them understand learning [8]. The problem of compatibility with age is also the basis for choosing an LMS developed by the school itself. Most LMS circulating on the internet requires a requirement to create their account to enter the system. However, in using the LMS made by SMP Negeri 3 Malang, students do not need to create their email because it is directly provided by the school. The age of children when they enter junior high school is around the age of 11–12 years, which is still not independent in learning and the rules for creating an email account can be done if the child has entered the age of 13.

Based on that background, there are three problems in using a learning management system to optimize learning in schools including SMP Negeri 3 Malang, namely: first in terms of LMS management, considering that LMS itself provides extensive features and requires good management so that its implementation is by school goals. The school must also have experts who can manage LMS to achieve optimal online learning. Second, the use of LMS is influenced by the ability of teachers and students to operate LMS in online learning. This requires schools to make various pieces of training related to the use of LMS and provide consulting services for those who are constrained. Third, facilities and infrastructure have an important role to support the implementation of LMS in schools. Schools are required to allocate facilities and infrastructure to support the use of LMS in a targeted manner and by the conditions in the school.

Previous research related to the application of learning management systems (LMS) in schools has been carried out by Nina, Khopipah, Rahmalia, Ramadani, Mirawan, Chairunnisa, Herdianti, Ardilla, Wulandari [9] there are several conclusions obtained in this study, namely: (1) the role of supporting technology facilities and superior human resources affects the smooth implementation of LMS; (2) the school utilizes an LMS called BelajarBareng.id which has complete features for teacher administration, academic calendars, allows distribution of varied materials, tracking, discussion forums, and assessments; (3) the use of the BelajarBareng.id LMS has advantages and disadvantages. The advantages obtained are that it makes it easier for teachers to give assignments and makes it easier for students to collect assignments, chat forum facilities to facilitate learning discussions, there is a feature to track student activity for attendance, and learning becomes more interesting, effective, and efficient. The shortcomings that arise in the application of the LMS are the limited resolution of files that can be uploaded by the teacher in the LMS, the lack of interaction between teachers and students in real-time, and the need for devices to use the LMS, namely laptops or mobile devices.

Another study was conducted by Apriliani, Missriani, and Wardiah [10] who investigated the use of LMS Schoology at SMA Negeri 6 Palembang in learning Indonesian online. The results of the research obtained are that the use of LMS Schoology at SMA Negeri 6 Palembang has succeeded in increasing the effectiveness of the online learning process of Indonesian language online through the creativity and ability of teachers in designing the materials and learning methods used. Buono & Kusuma also researched the use of LMS at the University of Muhammadiyah Malang with the results showing that there are several things that need to be developed to minimize the impact of the less

effective use of LMS [11]. Several implementations are given to overcome problems related to the use of LMS, namely making an attractive LMS display to increase learning motivation, having a task reminder feature or learning schedule, increasing hosting power to avoid server downs.

2 Methods

This study uses a descriptive qualitative approach to conduct in-depth observations related to the research phenomenon. The subject of this research is the use of learning management system in optimizing learning in SMP Negeri 3 Malang City. This research site is SMP Negeri 3 Malang City with the status as one of the leading schools and consideration of adequate infrastructure and the sensitivity of school residents to technological developments to maximize learning. The proof is that SMP Negeri 3 Malang City itself has innovated digital-based learning media for a long time, starting from using online exams to developing its own LMS that adapts to school needs.

Data collection techniques in this study used interview, observation, and documentation techniques. The subjects of this informant are people who are related, involved, and know an activity in the research subject that is expected to provide information. The informants are: (1) the vice principal of the curriculum section, (2) the head of the system developer; (3) teachers; and (4) students. The objects of observation in this study are the appearance of the learning management system, the features in the learning management system, school preparation in planning the learning management system, teaching and learning activities in the learning management system, supporting factors and inhibiting factors for the use of the learning management system. Obtaining data through documentation in the form of supporting documents or photos related to the use of the learning management system at SMP Negeri 3 Malang City.

Data analysis was conducted to interpret the data obtained through interviews, observations, and documentation into valid and easy-to-understand information. This study uses data analysis using the Miles, Huberman, and Saldana model, namely there are three streams of activities that are carried out repeatedly, namely data condensation, data presentation, and conclusion drawing and verification [12].

3 Results and Discussion

E-learning is complex and requires efficient management that includes the establishment of strategies and mechanisms to ensure that the system works effectively so that the educational goals set are achieved [13]. The management of the learning management system (LMS) has several stages as implemented in SMP Negeri 3 Malang, namely the planning, organizing, implementing, and supervising stages. The success of the online learning process is determined by the quality of teachers and infrastructure, so schools need to prepare carefully in improving teacher skills and procuring supporting infrastructure [14]. The planning stage is related to school preparation in preparing several important elements before the LMS is implemented, namely: (1) preparation of human resources; (2) preparation of supporting infrastructure; and (3) preparation of system design. As for preparing human resources, SMP Negeri 3 Malang City takes two

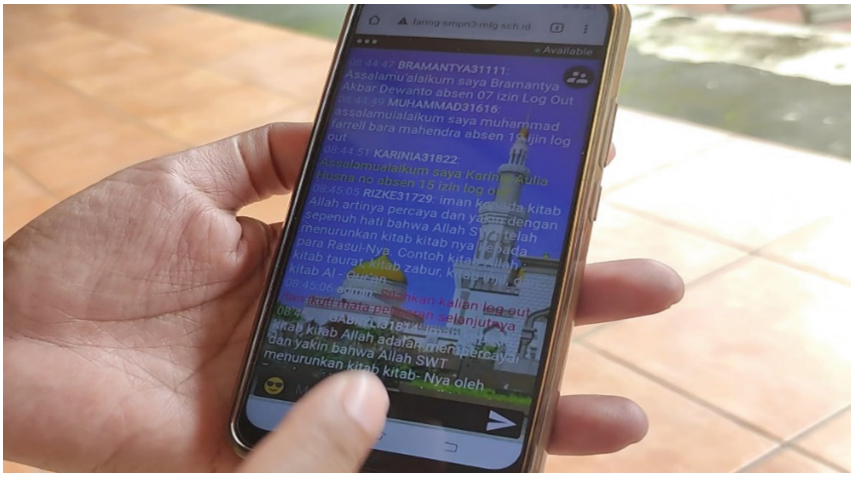

Fig. 1. Chat-based learning in LMS Bintaraloka.

approaches, namely the paradigm related to the school's perspective that the use of LMS is a need and ability of teachers and students who are already accustomed to the use of ICT in learning. In addition, SMP Negeri 3 Malang City has the support of ICT personnel who can develop their own LMS according to the needs of the school. Preparation in terms of supporting infrastructure, namely providing hardware loans (computers and tablets), web-hosting services, and internet services. While the preparation of system design is related to reviewing the features and flow of the system according to the needs of the school, namely online learning that is suitable for students at the junior high school level. A technically well-designed and managed LMS has a great impact on the quality of education in schools [15] (Fig. 1).

Organizing is the stage of dividing the roles of each party involved in the management of the LMS, namely: (1) the principal, as the person in charge and coordinating the overall tasks of the development team; (2) the curriculum, as a facilitator between LMS and learning; (3) the head and program developer, as system developers and ensuring the system can run properly; (4) the graphic/content design team, as product developers and adding features to synchronize with the school website; (4) publication team, as representatives in publishing product updates to users and stakeholders; (5) technicians, as providers of supporting facilities for the use of LMS, both in terms of hardware, software, and netware; and (6) subject teachers, as users who have access to manage online classes and provide feedback to the development team regarding the use of LMS. The use of e-learning requires management from parties who support the implementation of learning in schools, such as principals who make policies, curricula who make learning schedules, and teachers as implementers to distribute materials to students [16].

Several things need to be considered in online learning, namely: (1) learning tools, such as identification of learning objectives, time allocation, determination of indicators, and composition of materials; (2) students, as the main target to achieve learning targets in online learning; (3) learning methods, which need to be done in various ways

to make online learning more interesting; and (4) learning evaluation [17]. The implementation of LMS in SMP Negeri 3 Malang is divided into several processes, which include: (1) learning schedule, the allocation of learning time is scheduled and flexible; (2) learning media, students and teachers can upload various file formats, both documents, PowerPoint, audio, and video; (3) learning models, including full online learning which includes learning activities without direct interaction from the teacher (viewing learning videos, learning modules, and assignments), and blended learning which allows direct interaction between teachers and students (question and answer discussions in chat forums). And video conferencing); (4) learning methods, including lectures (teacher instructions in chat forums, learning videos, and reading modules), discussions (chat forums and room features), assignments, and gamification (the existence of elements of levels, points, characters) games, and challenges); and (5) learning evaluation, including knowledge evaluation in the form of daily tests conducted on the ThatQuiz platform, attitude evaluation carried out by observing discipline and politeness during online learning, and skill evaluation of collected tasks or practice video conference.

LMS supervision is related to activities to match the suitability between the implementation in the field and the planning that has been determined. There are several sections in the LMS supervision, namely: (1) the supervising parties, namely people involved in supervising the use of LMS in schools, such as school principals, vice principals of the curriculum section, head developers, and teachers; and (2) the method of supervision, carried out in the form of direct field observations, discussing the use of the LMS with the people who supervise the LMS, and making written and oral reports. The principal supervising learning at the LMS can enter at any time without prior notification because the principal has a special username and password (Fig. 2).

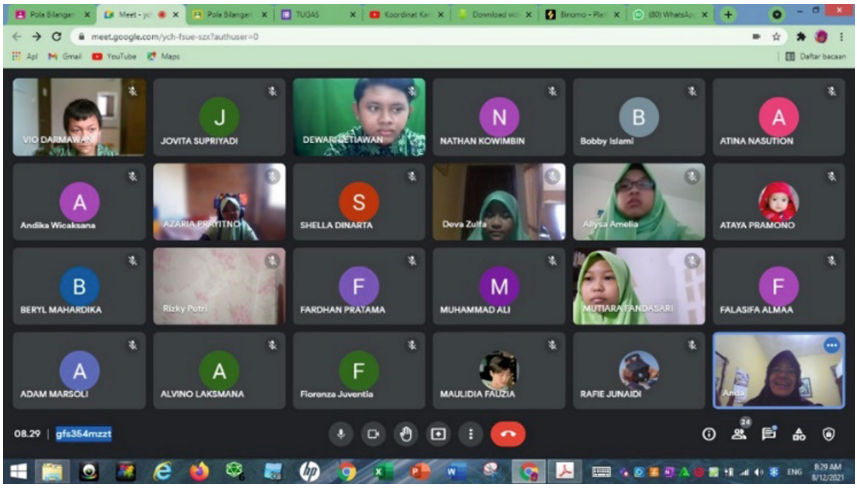

Fig. 2. Learning in Google Meet video conference

The supporting factors that have been found can be seen in terms of facilities and infrastructure and human resources. The implementation of online learning through e-learning is determined by the quality of human resources and infrastructure in schools [18]. Facilities and infrastructure to support the use of learning management systems (LMS) at SMP Negeri 3 Malang City are related to information technology (IT) infrastructure, namely: (1) hardware, including laptops, tablets, and computer labs; (2) internet, including local area network (LAN) cables in computer labs and school wifi networks; and (3) web-hosting, including hosting and domains rented by the school itself. The quality of the IT infrastructure owned by the school seems adequate for the utilization of the LMS Bintaraloka. In addition to using the wifi provided by the school, the school also collects data to allocate internet quota assistance from the Ministry of Education and Culture to students and teachers (Fig. 3).

Furthermore, the supporting factors in terms of human resources relate to the ability of teachers and students to use LMS, including: (1) the habits of teachers in the learning process using ICT; (2) learning in LMS can be followed well by students; and (3) the school has ICT personnel who can develop applications. The ability of teachers to use LMS in SMP Negeri 3 Malang City can be said to meet the standards, because teachers can provide a variety of teaching materials through LMS, provide varied learning methods through LMS, and evaluate learning online. Teacher support in online learning in the form of direct guidance, consulting services, and video guidance has a major impact on the implementation of online learning [19]. Meanwhile, the student's abilities can be said to be quite good, because they can participate in learning activities through LMS, such as accessing teaching materials, interacting through virtual chat, collecting assignments, and taking exams at ThatQuiz. The school also has ICT personnel who can develop their own LMS and are named LMS Bintaraloka (Fig. 4).

The use of LMS by students and teachers can be more effective when schools can provide needed support resources and technical assistance, such as training, documentation, and consulting services [20]. Optimization efforts in terms of infrastructure carried

Fig. 3. Game-based learning in the use of LMS.

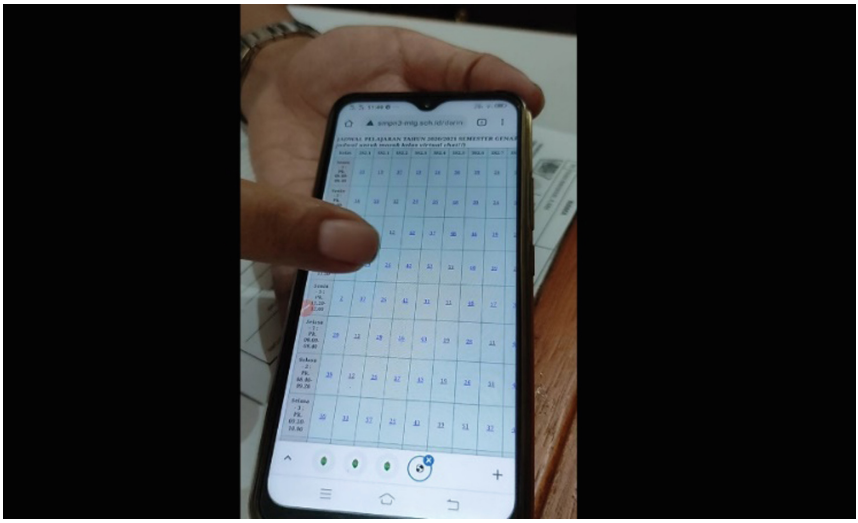

Fig. 4. Online learning schedule

out by schools include: (1) optimizing the performance of school computers, relating to activities for managing computer hard disk storage, updating operating systems, and scanning for viruses; (2) determining the priority of school internet bandwidth, for purposes that support online learning activities; and (3) optimization of files uploaded on the LMS so as not to burden the server. Meanwhile, efforts to optimize the supporting factors of human resources are: (1) involving teachers in workshops related to ICT skills and the use of LMS; and (2) providing non-formal meetings in the form of consulting services for teachers and students. The application of e-learning has several models and each model has its advantages, namely (1) web-enhanced learning, the implementation of e-learning which is interpreted as an additional learning resource to improve students' understanding of the material presented by the teacher; (2) blended learning, combining synchronous and asynchronous elements in online learning, such as chat and video conferencing; (3) full online learning, the implementation of e-learning which has a large proportion of asynchronous elements, so the interaction between teachers and students is minimal, such as assignments, exams, and reading modules [21].

Utilization of the learning management system also encountered obstacles that could be viewed in terms of infrastructure and human resources. There are several inhibiting factors in the use of LMS in terms of facilities and infrastructure related to information technology (IT) infrastructure owned by schools, namely: (1) limited internet access and cannot accommodate many gadgets at the same time; (2) sometimes the LMS server is down; (3) students experience hardware damage such as laptops and cellphones. The wifi service facilitated by the school should ideally only be used by one device for each student, if one student uses it for more than one device, it can disrupt the stability of the internet network. The biggest complaint in online learning is the internet connection, either the use of the internet is too wasteful due to the variety of online learning activities

or the weak internet signal because you live in an area that doesn't have good signal support [14].

Learning through LMS requires qualified teacher skills, so there needs to be a solution to overcome the low skills of teachers which can have an impact on the complexity of the learning process and students cannot understand the teacher's instructions clearly [16]. The inhibiting factors in terms of human resources are also related to the ability of teachers and students, including: (1) teachers have difficulty in utilizing the existing development features in the LMS; (2) decreasing teacher commitment to using LMS; (3) some teachers do not use the LMS developed by the school; (4) students still have not used internet subsidies wisely; and (5) difficulty entering username and password. Initially, the use of a school-made LMS known as the LMS Bintaraloka was used by all teachers, but now the school allows teachers to use other LMS. Teachers should use technology to strengthen courses which leads to higher teaching experiences in various aspects of pedagogy [22]. Students carrying out online learning also get internet quota assistance from the Ministry of Education and Culture, unfortunately, there are still many students who use it wastefully and not for learning purposes. In addition, it is not uncommon for students to make mistakes in entering usernames and passwords because if there is an incorrect input of one letter, they cannot enter online classes.

The school also makes various solution efforts to overcome various inhibiting factors in terms of human resources and facilities and infrastructure. As for how to overcome the inhibiting factors in terms of human resources, namely: (1) conducting intensive socialization to teachers related to LMS; (2) need to make clearer policies related to the use of LMS; (3) evaluation of LMS utilization through meetings held twice a month; (4) providing consultation services for teachers both offline and online; (5) providing direction and collaborating with parents regarding students' internet use at home; and (6) teachers are more patient to help their students' complaints. Meanwhile, the school's efforts to overcome obstacles in terms of school facilities and infrastructure include: (1) increasing the bandwidth of the school's internet connection; (2) increase hosting capacity; and (3) providing tablet lending services to students.

4 Conclusion

The learning management system (LMS) at SMP Negeri 3 Malang City has been implemented optimally under the support of the school through effective management. The LMS management steps at SMP Negeri 3 Malang City consists of planning, organizing, implementing, and supervising. School readiness in forming quality human resources and adequate facilities and infrastructure is an important key in the smooth use of LMS to optimize learning. The school also has a development team in the organizing stage for the development of a better LMS. The implementation of LMS in SMP Negeri 3 Malang City includes: (1) allocation of scheduled and flexible learning schedules; (2) diverse learning media; (3) learning models in fully online learning and blended learning; (4) varied learning methods, namely lectures, discussions, assignments, and gamification; (5) learning evaluation to measure the achievement of learning objectives from the aspects of knowledge, attitudes, and skills. LMS supervision at SMP Negeri 3 Malang was carried out before and during the learning process which involved the principal, curriculum representative, head of the program development team, and teachers.

References

1. H. R. Budiana, N. A. Sjafirah, and I. Bakti, "Pemanfaatan Teknologi Informasi dan Komunikasi dalam Pembelajaran bagi Para Guru SMPN 2 Kawali Desa Citeureup Kabupaten Ciamis," *Dharmakarya J. Apl. Ipteks untuk Masy.*, vol. 4, no. 1, pp. 59–62, 2015.
2. D. Al-Fraihat, M. Joy, R. Masa'deh, and J. Sinclair, "Evaluating E-learning Systems Success: An Empirical Study," *Comput. Human Behav.*, vol. 102, no. 2020, pp. 67–86, 2020, doi: https://doi.org/10.1016/j.chb.2019.08.004.
3. Y. H. S. Al-Mamary, "Understanding the Use of Learning Management Systems by Undergraduate University Students Using the UTAUT model: Credible Evidence from Saudi Arabia," *Int. J. Inf. Manag. Data Insights*, vol. 2, no. 2, pp. 1–11, 2022, doi: https://doi.org/10.1016/j.jjimei.2022.100092.
4. F. Bouarab-Dahmani and R. Tahi, "New Horizons on Education Inspired by Information and Communication Technologies," *Procedia - Soc. Behav. Sci.*, vol. 174, no. 1, pp. 602–608, 2015, doi: https://doi.org/10.1016/j.sbspro.2015.01.589.
5. Burhanuddin, B. B. Wiyono, and A. Supriyanto, "Male and Female Student Perceptions on the Effectiveness of Online Courses at University," *1st Int. Conf. Inf. Technol. Educ. (ICITE 2020)*, vol. 508, no. 1, pp. 617–623, 2020, doi: https://doi.org/10.2991/assehr.k.201214.307.
6. S. Palvia *et al.*, "Online Education: Worldwide Status, Challenges, Trends, and Implications," *J. Glob. Inf. Technol. Manag.*, vol. 21, no. 4, pp. 233–241, 2018, doi: https://doi.org/10.1080/1097198X.2018.1542262.
7. M. Minović, V. Štavljanin, M. Milovanović, and D. Starčević, "Usability Issues of E-learning Systems: Case-study For Moodle Learning Management System," *Move to Meaningful Internet Syst. OTM 2008 Work.*, vol. 5333, no. 1, pp. 561–570, 2008, doi: https://doi.org/10.1007/978-3-540-88875-8_79.
8. Y. H. S. Al-Mamary, "Why do Students Adopt and Use Learning Management Systems?: Insights from Saudi Arabia," *Int. J. Inf. Manag. Data Insights*, vol. 2, no. 2, pp. 1–9, 2022, doi: https://doi.org/10.1016/j.jjimei.2022.100088.
9. N. Nina *et al.*, "Penerapan Learning Management System BelajarBareng.id di SMK Negeri 1 Leuwiliang pada Masa Pandemi Covid-19," *J. Educ. FKIP UNMA*, vol. 8, no. 1, pp. 116–126, 2022, doi: https://doi.org/10.31949/educatio.v8i1.1686.
10. Y. Apriliani, M. Missriani, and D. Wardiah, "Evaluasi Penggunaan Aplikasi LMS Schoology dalam Pembelajaran Bahasa Indonesia Secara Daring," *JRTI (Jurnal Ris. Tindakan Indones.*, vol. 6, no. 2, pp. 157–160, 2021, doi: https://doi.org/10.29210/3003988000.
11. B. G. Buono and W. A. Kusuma, "Analisa Penggunaan pada Learning Management System Umm untuk Meningkatkan Semangat Belajar," *PeTeKa (Jurnal Penelit. Tindakan Kelas dan Pengemb. Pembelajaran)*, vol. 4, no. 2, pp. 257–265, 2021.
12. M. B. Miles, A. M. Huberman, and J. Saldana, *Qualitative Data Analysis : a Methods Sourcebook, Edition 3*. Arizona State University, USA: SAGE Publication, 2014.
13. P. C. de Oliveira, C. J. C. de A. Cunha, and M. K. Nakayama, "Learning Management Systems (LMS) and E-Learning Management: an Integrative Review and Research Agenda," *J. Inf. Syst. Technol. Manag.*, vol. 13, no. 2, pp. 157–180, 2016, doi: https://doi.org/10.4301/s1807-17752016000200001.
14. U. Mukarromah and W. Wijayanti, "Implementation of The Online Learning at Vocational High School during Covid-19: Between Obligations and Barriers," *J. Pendidik. Vokasi*, vol. 11, no. 1, pp. 92–101, 2021, doi: https://doi.org/10.21831/jpv.v11i1.37110.
15. E. A. Alkinani and A. I. A. Alzahrani, "Evaluating the Usability and Effectiveness of Madrasati Platforms as a Learning Management System in Saudi Arabia for Public Education," *IJCSNS Int. J. Comput. Sci. Netw. Secur.*, vol. 21, no. 6, pp. 275–285, 2021, [Online]. Available: https://doi.org/10.22937/IJCSNS.2021.21.6.36.

16. H. Sanoto, "Online Learning Management in The Covid-19 Pandemic Era," *JETL (Journal Educ. Teach. Learn.*, vol. 6, no. 1, pp. 47–52, 2021, doi: https://doi.org/10.26737/jetl.v6i1.2358.
17. A. Afifah, "Implementasi Pembelajaran Jarak Jauh dengan Media E-Learning," *J. Kependidikan Dasar Islam Berbas. Sains*, vol. 6, no. 2, pp. 165–176, 2021.
18. A. Garad, A. M. Al-Ansi, and I. N. Qamari, "The Role of E-Learning Infrastructure and Cognitive Competence in Distance Learning Effectiveness During The Covid-19 Pandemic," *Cakrawala Pendidik.*, vol. 40, no. 1, pp. 81–91, 2021, doi: https://doi.org/10.21831/cp.v40i1.33474.
19. Firmansyah, "Pemanfaatan Learning Management System Space bagi Guru PAI dalam Pelaksanaan PPG DALJAB IAIN Pontianak," *J. Pendidik. Ris. Konseptual*, vol. 6, no. 2, pp. 205–213, 2022.
20. M. M. M. Abbad, "Using The UTAUT Model to Understand Students' Usage of E-learning Systems in Developing Countries," *Educ. Inf. Technol.*, vol. 26, no. 6, pp. 7205–7224, 2021, doi: https://doi.org/10.1007/s10639-021-10573-5.
21. M. Giatman, S. Siswati, and I. Y. Basri, "Online Learning Quality Control in The Pandemic Covid-19 Era in Indonesia," *J. Nonform. Educ.*, vol. 6, no. 2, pp. 168–175, 2020, [Online]. Available: https://journal.unnes.ac.id/nju/index.php/jne.
22. S. Mehrolia, S. Alagarsamy, and M. Indhu Sabari, "Moderating Effects of Academic Involvement in Web-based Learning Management System Success: A Multigroup Analysis," *Heliyon*, vol. 7, no. 5, pp. 1–12, 2021, doi: https://doi.org/10.1016/j.heliyon.2021.e07000.