

Systematic Literature Review: Utilization of E-learning Moodle in Schools

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Abstract. Online education and learning frequently use the Moodle Learning Management System (LMS). The purpose of this study was to ascertain how E-learning and moodle were used. The SLR (Systematic Literature Review) method was the research methodology used in this study. By cataloguing all publications with comparable research in the report, data is gathered. 20 journal papers from the period of 2020 to 2022 were used in this study. They were retrieved from the Google Scholar database using Harzing's Publish or Perish tool. According to this study, it was discovered that e-learning moodle was frequently employed to facilitate creative, inventive, adaptable, and reflective learning processes. To encourage student learning outcomes, learning quality, and student motivation. This study concludes that more quantitative research is needed to measure the effectiveness of using e-learning moodle in all subjects and it is necessary to incorporate supporting educational theories.

Keywords: E-learning, Moodle, School

1 Introduction

The Covid-19 pandemic affected all nations on the planet. The Indonesian government issued a call in 2020 to conduct learning from home in response to the COVID 19 epidemic. The Covid 19 pandemic emergency period prompted the government to establish a policy by making an appeal to conduct learning from home. Covid-19 also has a significant impact on the sector of education. This has led to a number of developments, such as the replacement of the traditional offline classroom teaching method with an online one.

At first, the phrase "online teaching model" was only applied to learning platforms that make use of computer-based internet technologies (ICT). However, along with the development of the era, online teaching is not only possible via a computer but can already be accessed via a smartphone [1]. Based on the assertion made by the Big Indonesian Dictionary (KBBI) that the online learning system uses the internet network for learning (e-learning) [2]. The transition from conventional learning to online learning is not an easy thing in schools, adequate facilities and infrastructure are needed.

An advanced learning tool for online learning that may be created throughout the teaching process is Moodle (Modular Object-Oriented Dynamic Learning Environment). Moodle is a web-based service that assists in online learning activities and acts as a dynamic learning space [3]. Online learning is an electronic learning process by utilizing communication and information technology, for example the internet [4]. This is in line with [5] the use of technology as a tool and a network as a system in online learning. Additionally, he asserted that online education is a breakthrough in education that incorporates communication and information technology into a lesson [6].

Under these conditions, as a teacher, you must be able to choose the right learning media for use in online learning. This is because learning media is useful for generating motivation to learn, and student creativity. To assist in the online learning process, effective media is needed to improve student learning outcomes. Using moodle e-learning to support at-home learning so that it is engaging and can enhance student learning outcomes is one of the advancements in learning media that can be implemented.

According to Asroni, Slamet Riyadi and Asep Setiawan (2019) [7] research, the use of e-learning moodle is helpful for facilitating the administration of tests at schools and aids in the process of assessing and enhancing student performance. Online learning has benefitted greatly from the adoption of Moodle E-Learning. This piqued researchers' interest in undertaking a review of the literature on the application of Moodle E-Learning in online instruction. so that scholars can finally use e-learning learning media in the academic learning process.

2 Research Methods

This study uses the Systematic Literature Review (SLR) method which aims to identify, review, and evaluate all relevant research so as to answer a set research question. This study consisted of several stages, namely the formulation of research questions, literature search, determination of inclusion and exclusion criteria, literature selection, data presentation, data processing and drawing conclusions. Research that uses tools and materials, it is necessary to explain the sophistication of the specifications of the tools and the types of materials used. For qualitative research, it is necessary to explain the functions of the presence of researchers, subjects, informants, and data collection methods and describe the quality/reliability of the data.

Using the Publish or Perish app, researchers gathered academic articles from the Google Scholar database to support their findings. The important phrase is moodle for e-learning. Because there was a government proposal for online learning in that year, only articles from the years 2020 to 2022 were collected. E-learning moodle is one of the media that is widely used. The researcher selected 65 articles from a variety of publications that were closely linked to the keywords utilized. In the following phase, the researcher compiled 20 publications that were pertinent to the topic under discussion, reviewed them, and then carefully researched them. The author's name, title, publication year, journal name, research kind, and research findings are listed in a table with the metadata for the publications. The researcher then carefully read and examined the article, paying particular attention to the research findings discussed in the discussion and conclusion sections. The researcher compared the findings provided in the paper and provided conclusions at the end of the investigation.

3 Result and Discussion

Technology-based learning, or e-learning, is increasingly being used in online and flexible learning delivery systems. The ability to communicate electronically is the main benefit of e-learning. E-learning is a type of teaching where students receive their lesson materials via information and communication technologies. With this approach, students are free to study whenever and wherever they want, with no restrictions on time or location. In order for students to access learning materials and interact with teachers and other students online, e-learning typically makes use of a platform called a learning management system (LMS). E-learning offers various benefits, including flexibility, increased cost effectiveness, and more student accessibility.

The learning management system (LMS) Moodle is popular in the e-learning sector. It is an open-source platform that enables educators and trainers to design and administer online courses, monitor student development, and streamline teacher-student interaction. Quizzes, forums, and assignments are just a few of the features and tools that Moodle offers that may be tailored to fit the requirements of a course or training program. Because it is simple to use, adaptable, and free to use, it is a preferred option among instructors and students. Moodle is an e-learning platform used by educators to build course websites. It is often referred to as a course management system (CMS), learning management system (LMS), virtual learning environment (VLE), and open source software (OSS). It is utilized by 400,000 individuals who are registered across 193 nations. The Moodle website features a big list of developers and offers information for them, as well as a roadmap, coding guide, and concurrent versioning system guide. It does not offer a defined framework for upcoming development. A medium-sized program, Moodle has 2331 PHP files and 625 473 LOC in total. According to the Moodle website, there are 39 412 496 users overall in 211 different nations [8].

Using Moodle can provide many benefits to educators and students. Some of them are as follows:

1. **Make course management easy:** Moodle enables educators to manage courses efficiently, by providing a variety of features and tools that can be personalized according to needs.
2. **Provide access to learning materials online:** Moodle provides a platform that allows students to access learning materials online, so they can study anytime and anywhere.
3. **Increase interaction and collaboration between students and educators:** Moodle provides features such as forums, chats, and assignments that allow students and educators to communicate and work together effectively.
4. **Improving learning performance:** By using Moodle, students can learn independently, according to their own learning style and pace. This can improve student learning outcomes and increase their motivation to study.
5. **Cost-effective:** Moodle is a free and open-source platform, so using it can save you the cost of managing courses traditionally.

Table 1 Research on the Effectiveness of Utilizing and Using Moodle E-Learning

Researchers and Research Years	Journal	Research Results
Seprina, I., & Yulianingsih, E. (2021)	Trick Scientific Journal: Information and Computer Technology	A quantitative descriptive methodology was used in this investigation. The study's findings support the teaching and learning process by showing that e-learning tools can boost the level of contact between instructors and students.
Damayanti, L., Subagiyo, L., & Syam, M. (2021)	Journal of Physics Education Literacy	Descriptive quantitative research methodology is employed. According to the study's findings, class XI IPA 5 pupils at SMAN 5 Samarinda benefit greatly from the adoption of a moodle-assisted problem-based learning model in terms of motivation and cognitive learning results.
Tapatab, M. F. (2022)	Journal of Syntax Admiration	A quantitative descriptive methodology was used in this investigation. A Moodle-based Learning Management System (LMS) is highly successful at boosting student learning activity, according to the study's findings.
Sinaga, Lastama, et al , 2022	Journal of Education, Science, Social and Religion	This study employs a particular style of classroom action research. The study's finding is that using lesson study-based moodle e-learning for learning communities at SMP Methodist 8 Medan results in a rise in student learning activities.
Asroni, A., Riyadi, S., & Setiawan, A. (2019)	Proceedings of the abdimas national seminar ii 2019	A quantitative descriptive methodology was used in this investigation. According

		to the study's findings, using an online learning platform like Moodle significantly improves students' motivation and academic performance in TKA and TPA courses. Kasihan District.
Perangin, R. H., & Sebayang, K. (2021)	CURERE Journal	A quantitative descriptive methodology was used in this investigation. The study's findings indicate that the use of Moodle LMS (Learning Management System) media in the classroom has a favorable effect on the activities and results of student learning.
Ridha, R. (2021)	Sikola Journal: Journal of Education and Learning Studies	It uses a descriptive quantitative approach. The study's finding indicates that using the Moodle-based Blended Learning learning model can improve Sociology class XII IPS 2 SMA Negeri 4 Pariaman students' learning involvement and outcomes.
Fakhri, M. Miftach, et al (2022)	Chemistry Education Review	This study employs a quantitative descriptive methodology, and its findings indicate that partial and simultaneous learning motivation, Moodle LMS-based E-learning media, and other factors affect students' learning outcomes.
Ngatiman, N., Hendradi, P., & Prabowo, N. A. (2019)	Journal of Komtika (Computing and informatics)	The conclusion of this study, which employs a qualitative descriptive methodology, is that this e-learning system can significantly enhance SMP Negeri 2 Gombon's educational quality.

According to the findings of the research, which are presented in Table 1, using Moodle E-Learning can intensify teacher-student interaction, which enhances the teaching and learning process[9], increase motivation and cognitive learning outcomes of students[10], increase student learning activity[11], improve student learning activities [12] and increase student learning participation[13]. Additionally, according to research by Asroni, A., Riyadi, & Setiawan, moodle has an impact on students' motivation and academic performance in TKA and TPA courses in the TKA-TPA Kasihan District[7]. Additionally improving student learning outcomes and activities in college is moodle [14]. Additionally, employing Moodle E-Learning in higher education has advantages for both simultaneous and partial learning motivation for student learning results [15]. According to research by Ngatiman, N., Hendradi, & Prabowo, N.A., the adoption of Moodle E-Learning has a positive effect on raising educational standards in classrooms [16].

E-Learning Moodle has received a positive response in the field of education because Moodle has several advantages including:

1. Flexibility: With the aid of Moodle, students are free to pursue their education on their own schedule and in any location. Due to this, students who are time-constrained or live in remote locations may find Moodle e-learning to be an appealing alternative.
2. Accessibility: Students can access the learning materials on Moodle from anywhere and at any time because it can be accessible online. This makes Moodle e-learning a fantastic option for learners who want to pursue online coursework.
3. Efficiency: Moodle provides a variety of features and tools that enable educators to manage courses efficiently, such as managing learning materials, assessing student learning outcomes, and communicating with students.
4. Interaction and collaboration: Moodle provides features such as forums, chat, and assignments that allow students and educators to communicate and work together effectively. This can increase interaction and collaboration between students and educators, thus improving student learning outcomes.
5. Free: Moodle is a free and open-source platform, so it is free to use. This makes Moodle e-learning an attractive option for educators and students who want to learn online without paying high fees.

Based on the study's findings, Table 2 lists the benefits of Moodle E-Learning.

Table 2 The advantages of E-learning Moodle

Researcher and Research Year	Journal	Research Result
Hasanah, F. F., Setiawati, Y. F., & Sulaeman, O. F. (2020).	Madrosatuna (Jurnal Pendidikan Guru Madrasah Ibtidaiyah)	This study employs a qualitative descriptive methodology, and SD IT's adoption of completely online e-learning built on Moodle serves as the study's culmination. Lukman Al Hakim conducted his

		research online starting with the initial step of the learning process and ending with the final stage.
Desi, Bambang dan Diat, 2020	PINTER: Jurnal Pendidikan Teknik Informatika dan Komputer.	An approach of research and development is used in this work (Research and Development). The third iteration of Moodle-based e-learning is suitable and well approved to be used to the topic of Computer Networking Practice, it can be inferred from the results of these tests.
Simanjuntak, C. N. S., & Puspasari, D. (2020)	Jurnal Pendidikan Administrasi Perkantoran (JPAP)	With the conclusion that e-learning moodle media is a learning media or auxiliary media for learning activities, in addition to facilitating learning activities outside the classroom but also facilitating learning activities in the classroom, the descriptive qualitative research methodology was used.
Fanda, Y. (2022).	JURTEII: Jurnal Teknologi Informasi	Descriptive qualitative research methodology is employed. This study's conclusion is that e-learning enables the teaching and learning processes to be conducted online, but it does not fully replace the traditional teaching and learning methods; rather, it serves as an addition to the existing learning system.
Fajrin, H. R., Widadi, S., & Raharja, A. B. (2021)	MARTABE: Jurnal Pengabdian Masyarakat	With the conclusion that the availability of an e-learning platform can make it easier for teachers or teaching staff to generate IT/e-learning based teaching material content, the descriptive

		<p>qualitative research methodology was utilized to conduct the study. The installation, use, and maintenance of the equipment were all explained to the teachers.</p>
<p>Sara, K., Witi, F. L., & Mude, A. (2020)</p>	<p>ALIGNMENT: Journal of Administration and Educational Management</p>	<p>A quantitative descriptive methodology was used in this investigation. The study's findings support the use of Moodle-based e-learning to replace traditional learning activities that cannot be done out because of the Covid 19 pandemic. Additionally, the study found that the availability of facilities and infrastructure is crucial for achieving learning objectives.</p>
<p>ARYOTEJO, I. G. N. B. (2022)</p>	<p>EDUCATOR: Jurnal Inovasi Tenaga Pendidik dan Kependidikan</p>	<p>The descriptive qualitative method was employed in this investigation. The study's conclusion is that teachers and students have a good understanding of how to use e-learning programs such that assignments, tests, and other forms of assessment can be integrated into a learning management system (LMS).</p>
<p>Fauzi, A. (2020)</p>	<p>Jurnal Kajian Perempuan dan Keislaman</p>	<p>The descriptive qualitative method was employed in this investigation. The study's finding is that e-learning-based education can be utilized as a tool to stop the spread of Covid-19. E-learning has a number of benefits over traditional learning systems, not the least of which is the absence of the need for face-to-face</p>

		encounters to deliver subject content.
Gamaliel, F. (2021)	Jurnal Inkofar	The descriptive qualitative method was employed in this investigation. The study's finding is that the system is capable of functioning well. The system may summarize the total scores from the exam results completed by participants and show scores based on user access privileges.

Based on some of the research results in Table 2, it is revealed that Moodle E-Learning is a system that can display scores based on user access rights and can recap the overall value of the exam results that have been carried out by participants [17], used for material resources, assignments and evaluations that can be integrated in a Learning Management system (LMS) [18]. The Moodle e-learning platform can also make it simpler for instructors to produce content for IT- and e-learning-based instructional materials[19].

The use of e-learning in the educational process is particularly beneficial during the Covid-19 pandemic epidemic, and e-learning-based learning can be utilized as a tool to stop the disease's spread. E-learning is superior to traditional learning methods in a number of ways, not the least of which being that face-to-face encounters are not necessary to provide the subject content [20]. In order to replace traditional learning activities that cannot be carried out due to the Covid 19 epidemic, the use of Moodle-based e-learning is highly appropriate, and the availability of facilities and infrastructure is absolutely important so that learning outcomes may be accomplished[21]. With Moodle E-Learning, the teaching and learning process can be done online; however, it only serves to supplement the current learning system and does not completely replace it [22]. Moodle usage during the Covid 19 outbreak was also used as a learning medium or auxiliary media in learning activities, in addition to facilitating learning activities outside the classroom but also facilitating learning activities in the classroom after things returned to normal [3]. The data mentioned above demonstrates that Moodle E-Learning is very helpful for online learning. Additionally, research has found no connection between using Moodle E-Learning and improving learning, as seen in Table 3.

Table 3 Research Results Showing the Use of Moodle E-Learning Has No Effect

Researcher and Research Year	Journal	Research result
Junus, F. B., & Andula, N. (2020)	Journal of Information Technology and Computer Science (JTIK)	The conclusion of this study, which employed a quantitative descriptive methodology, was that the adoption of the Moodle LMS

		and the collaborative learning model approach had no impact on the improvement in student knowledge.
Solekah, N., & Umami, N. R. (2022)	Literacy Journal of Economic Education	Descriptive qualitative research methodology is employed. The study's findings indicate that preparation, implementation, and evaluation are the three components of learning activities involving the use of e-learning. Students cannot fully accomplish according to the active learning indicators in various modes of active learning.

Online learning has been shown to benefit greatly from the use of Moodle E-Learning. However, there are some that actually do not have any effect as shown in table 3 which explains that the implementation of the Moodle LMS and the collaborative learning model approach do not affect the increase in student understanding [23] and furthermore based on research conducted by solekah N., & Umami, N. R. (2022) concluded that in forms of active learning students cannot be fully achieved according to indicators of active learning[24]. In using Moodle, there are several things that need to be considered so that learning can run smoothly and effectively and can be of good use. Some of them are as follows:

1. Good course design: Educators need to pay attention to the course design used, so that learning material can be presented in a systematic and easily understood by students.
2. Using the right features and tools: Educators need to choose the right features and tools according to the needs of the course, so they can be used effectively in the learning process.
3. Effective communication: In order to give students the support and help they need during the learning process, teachers must pay close attention to communication with the students.
4. Appropriate assessment: Educators need to pay attention to how to assess student learning outcomes, in order to provide appropriate feedback and help students to improve their learning outcomes.

Availability of internet access: Using Moodle requires stable internet access, so educators and students can seamlessly access the Moodle platform.

4 Conclusion

The utilization of Moodle E-Learning is highly appropriate for use in the classroom, both online and off, as an auxiliary learning tool that will benefit both teachers and students. This is because using Moodle E-Learning can improve student learning outcomes, interest, improve thinking skills, and student motivation. This is because Moodle E-Learning can be used as an interactive quiz learning medium that is very effective, fun, and makes students more enthusiastic about learning.

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References

- [1] N. M. Rosyid, I. Thohari, and Y. F. Lismanda, "Penggunaan aplikasi zoom cloud meetings dalam kuliah statistik pendidikan di fakultas agama islam Universitas Islam Malang," *Vicratina: Jurnal Pendidikan Islam*, vol. 5, no. 11, pp. 46–52, 2020.
- [2] Q. Hasanah, "Pemanfaatan Aplikasi Whastapp sebagai Media E-Learning Masa Covid-19 pada Mata Kuliah Biomolekul dan Metabolisme di Tadris IPA IAIN Bengkulu," *ISEJ: Indonesian Science Education Journal*, vol. 1, no. 3, pp. 225–236, 2020.
- [3] C. N. S. Simanjuntak and D. Puspasari, "Pemanfaatan media e-learning moodle untuk menunjang pembelajaran mahasiswa di fakultas manajemen dan bisnis Universitas Ciputra," *Jurnal Pendidikan Administrasi Perkantoran (JPAP)*, vol. 8, no. 1, pp. 169–179, 2020.
- [4] K. Arizona, Z. Abidin, and R. Rumansyah, "Pembelajaran online berbasis proyek salah satu solusi kegiatan belajar mengajar di tengah pandemi covid-19," *Jurnal Ilmiah Profesi Pendidikan*, vol. 5, no. 1, pp. 64–70, 2020.
- [5] N. Walter and J. Pyalski, "Lessons Learned from COVID-19 Emergency Remote Education. Adaptation to Crisis Distance Education of Teachers by Developing New or Modified Digital Competences," in *Digital Literacy for Teachers*, Springer, 2022, pp. 7–23.
- [6] Y. Fitriyani, I. Fauzi, and M. Z. Sari, "Motivasi belajar mahasiswa pada pembelajaran daring selama pandemik covid-19," *Jurnal Kependidikan: Jurnal Hasil Penelitian dan Kajian Kepustakaan di Bidang Pendidikan, Pengajaran dan Pembelajaran*, vol. 6, no. 2, pp. 165–175, 2020.
- [7] A. Asroni, S. Riyadi, and A. Setiawan, "Pemanfaatan E-Learning Moodle untuk Meningkatkan Kualitas Pembelajaran Di Tka-TPA Badko Kasihan," in *Prosiding Seminar Nasional Program Pengabdian Masyarakat*, 2019.

- [8] Z. F. Muhsen, A. Maaita, A. Odah, and A. Nsour, "Moodle and e-learning Tools," *International Journal of Modern Education and Computer Science*, vol. 5, no. 6, p. 1, 2013.
- [9] I. Seprina and E. Yulianingsih, "Pemanfaatan Moodle Dalam Implementasi E-Learning Di Sekolah Kejuruan (Studi Kasus: Smk Bina Jaya Palembang)," *Jurnal Ilmiah Betrik: Besemah Teknologi Informasi Dan Komputer*, vol. 12, no. 2, pp. 139–145, 2021.
- [10] L. Damayanti, L. Subagiyo, and M. Syam, "Penerapan Model Problem Based Learning dengan Media Moodle dan Pengaruhnya Terhadap Motivasi dan Hasil Belajar Kognitif Siswa," *Jurnal Literasi Pendidikan Fisika*, vol. 2, no. 1, pp. 53–62, 2021.
- [11] M. F. Tapatab, "Upaya Meningkatkan Keaktifan Belajar Siswa Melalui Penggunaan Learning Management System (LMS) Berbasis Moodle Pada Materi Hukum Hooke," *Jurnal Syntax Admiration*, vol. 3, no. 5, pp. 693–710, 2022.
- [12] L. Sinaga, L. Saragih, L. R. Manurung, L. N. Panjaitan, G. Purba, and R. O. Hutapea, "Pemanfaatan e-learning moodle berbasis lesson study for learning community untuk meningkatkan aktivitas belajar siswa," *Jurnal Pendidikan, Sains Sosial, dan Agama*, vol. 8, no. 1, pp. 374–385, 2022.
- [13] R. Ridha, "Peningkatan Partisipasi dan Hasil Belajar Daring Sosiologi Melalui Model Pembelajaran Blended Learning Berbasis Moodle," *Jurnal Sikola: Jurnal Kajian Pendidikan dan Pembelajaran*, vol. 3, no. 2, pp. 188–200, 2021.
- [14] R. H. Perangin and K. Sebayang, "PENERAPAN LMS (LEARNING MANAGEMENT SYSTEM) MOODLE TERHADAP HASIL BELAJAR IPA KELAS TINGGI MAHASISWA DI UNIVERSITAS QUALITY," *JURNAL CURERE*, vol. 5, no. 2, pp. 92–98, 2021.
- [15] M. M. Fakhri, D. Fadhilatunisa, R. Rosidah, M. A. Satnur, and F. Fajrin, "Pengaruh Media E-Learning Berbasis LMS Moodle dan Motivasi Belajar terhadap Hasil Belajar Mahasiswa di Masa Pandemi Covid-19," *Chemistry Education Review (CER)*, vol. 5, no. 2, pp. 157–169, 2022.
- [16] N. Ngatiman, P. Hendradi, and N. A. Prabowo, "Penerapan Rencana Pelaksanaan Pembelajaran TIK dalam E-Learning menggunakan Aplikasi Moodle," *Jurnal Komtika (Komputasi dan Informatika)*, vol. 3, no. 2, pp. 46–50, 2019.
- [17] F. Gamaliel, "Implementasi LMS Moodle Pada Tes Psikologi Online Tingkat SMA," *Jurnal Inkofar*, vol. 1, no. 2, 2021.
- [18] I. G. N. B. ARYOTEJO, "PEMANFAATAN E-LEARNING BERBASIS MOODLE SEBAGAI UPAYA INOVATIF UNTUK PEMBELAJARAN JARAK JAUH DI SMK NEGERI 1 TAMPAKSIRING," *EDUCATOR: Jurnal Inovasi Tenaga Pendidik dan Kependidikan*, vol. 2, no. 1, pp. 89–96, 2022.
- [19] H. R. Fajrin, S. Widadi, and A. B. Raharja, "IMPLEMENTASI LMS MOODLE UNTUK E-LEARNING SD MUHAMMADIYAH MAESAN DAN SD MUHAMMADIYAH BANGERAN, YOGYAKARTA," *Martabe: Jurnal Pengabdian Kepada Masyarakat*, vol. 4, no. 1, pp. 78–84, 2021.

- [20] A. Fauzi, "E-learning Berbasis Moodle sebagai Media Informasi dan Komunikasi Guna Mencegah Penyebaran Covid-19," *An-Nisa': Jurnal Kajian Perempuan dan Keislaman*, vol. 13, no. 1, pp. 28–39, 2020.