Edu Cendikia: Jurnal Ilmiah Kependidikan
Volume: 5 | Nomor 02 | Agustus 2025 |
DOI: 10.47709/educendikia.v5i02.5688

The Influence of Using Moodle-Based Learning Media on Informatics Subjects

Author:
Dwi Krisna Mukti[1]
Juan Mikhael Silaban[2]
Raja Sakti Arief D[3]

Afiliation:
Sekolah Tinggi Keguruan Ilmu Pendidikan Pangeran Antasari[1,2,3]

Corresponding email
dwikrisna872@gmail.com
Juanmikhael313@gmail.com

Histori Naskah:
Submit: 2025-03-16
Accepted: 2025-07-31
Published: 2025-08-01

This is an Creative Commons License
This work is licensed under a Creative Commons Attribution-NonCommercial 4.0 International License

Abstract:
This study aims to promote a more effective learning process through the use of the Moodle e-learning platform. Moodle was chosen because it can overcome the limitations of time and place in the teaching and learning process, as well as facilitate students in evaluating various completed learning activities. In addition, the platform offers features that support the implementation of online learning, such as delivering materials, submitting assignments, and providing structured academic information. This research employed a quantitative method based on observations conducted at SMA Dharma Pancasila Medan. The results showed that using Moodle as a learning medium significantly supported the students' learning process, particularly in a school that previously lacked an organized digital learning system. The implementation of Moodle has proven effective in addressing learning issues such as limited face-to-face interaction and challenges in distributing materials. Thus, the use of Moodle in teaching and learning activities has the potential to improve overall learning effectiveness. The findings also indicate that integrating technology into education, when done appropriately, can offer innovative solutions to various challenges in the educational landscape, especially in today's digital era.

Keywords: E-Learning; Influence; Informatics Subjects; Learning Media; Moodle

Introduction

Education is a fundamental human right and a crucial instrument for personal and societal development. It aims to actively foster students' potential through conscious, structured, and sustained efforts, enabling them to become informed, responsible, and productive citizens. In the 21st century, the integration of information and communication technology (ICT) into education has transformed how learning is delivered, assessed, and experienced (Pérez Pérez et al., 2020). As technology becomes increasingly embedded in daily life, its role in education—particularly in facilitating access, flexibility, and innovation—is more vital than ever.

To support these technological shifts, effective learning media are essential. Among the many digital platforms available, Moodle—an open-source Learning Management System (LMS)—has become one of the most widely adopted tools in educational institutions worldwide. Moodle, which stands for Modular Object-Oriented Dynamic Learning Environment, provides a variety of features such as pre-tests, learning materials, video content, discussion forums, post-tests, assignments, quizzes, and electronic journals. These features help create a flexible and interactive learning environment, allowing students and teachers to engage in meaningful educational experiences regardless of time or location (Parsons & Parsons, 2022).

Numerous studies have demonstrated the effectiveness of Moodle in enhancing learning outcomes. For example, Safitri (2022) found that Moodle-based e-learning significantly improved civic knowledge among high school students in Indonesia, with 64% achieving the targeted learning outcomes. In addition, a comprehensive review by the *International Journal of STEM Education* (2021) reported that Moodle is extensively used for curriculum development, blended learning models, digital assessments, and teacher-led innovations. Furthermore, learning analytics research conducted by Chango, Cerezo, and Romero (2024) emphasized that patterns of student engagement—such as frequency of forum participation and quiz attempts—can serve as reliable predictors of academic performance and can guide instructors in making timely pedagogical adjustments.

In the Indonesian context, qualitative findings support the view that students consider Moodle user-friendly, especially for accessing resources, submitting assignments, and navigating learning tasks during remote learning periods such as the COVID-19 pandemic (Suparjan et al., 2023). Moreover, the implementation of Universal Design for Learning (UDL) principles into Moodle platforms has been shown to improve accessibility, increase motivation, and support diverse learning needs, thereby enhancing students' certification rates (Montes et al., 2024).

Despite its advantages, the adoption of Moodle and similar platforms still faces significant barriers in many schools. At SMA Dharma Pancasila, for example, the information education program confronts several key challenges: limited classroom hours, a lack of appropriate media for instructional delivery, and time-management difficulties among teaching staff. These limitations are exacerbated by the fact that the program is only delivered to two classes each semester, restricting students' exposure to vital digital literacy skills. As a result, students' understanding of information-related topics remains inadequate.

To overcome these challenges and enhance the quality of education, it is essential to develop instructional materials that students can access independently and flexibly. This study proposes the use of Moodle-based teaching materials to enrich the learning process, facilitate greater student engagement, and ensure that information education is both effective and sustainable. By leveraging Moodle's capabilities, this research aims to contribute to the broader effort of integrating digital solutions into traditional education systems and promoting more equitable and meaningful learning opportunities.

Literature Study

The use of Moodle as an open-source Learning Management System (LMS) has been widely recognized for its flexibility and ability to integrate multimedia features such as animation, audio, and video to support effective learning (Wicaksana & Johan, 2020). As a customizable platform, Moodle allows educators to develop interactive and learner-centered materials that can be tailored to various educational needs. This aligns with current pedagogical approaches that emphasize self-paced and silent practice, which help students engage more deeply with learning content through exploration and repetition.

Numerous studies have affirmed Moodle's effectiveness in enhancing student engagement and learning outcomes. Gamage et al. (2022) found that Moodle significantly improved learning in STEM disciplines, especially in higher education contexts. Similarly, Rusmiyati et al. (2024) reported that Moodle-based e-learning successfully improved students' inductive thinking skills in integrated science projects. Wiliyanti et al. (2022) also demonstrated the feasibility of Moodle-based MOOCs in teaching physics, which fostered student autonomy and teacher creativity. Montes et al. (2024) further emphasized that applying Universal Design for Learning (UDL) principles to Moodle improved its accessibility and positively influenced motivation and certification rates. In addition, Suparjan et al. (2023) revealed that Indonesian students found Moodle easy to use, particularly during remote learning.

Edu Cendikia: Jurnal Ilmiah Kependidikan
Volume: 5 | Nomor 02 | Agustus 2025 |
DOI: 10.47709/educendikia.v5i02.5688

Despite these findings, previous research has primarily focused on higher education and STEM learning. There remains a lack of studies exploring the integration of Moodle in secondary-level information education, especially those incorporating silent or direct practice methods. Additionally, the development of Moodle-based teaching materials for schools with limited instructional time and scarce media resources—such as SMA Dharma Pancasila—has not been widely investigated.

The novelty of this study lies in its focus on designing Moodle-based teaching materials that embed silent-practice learning methods, tailored to address specific local challenges. These include limited class availability, weak time management among teachers, and a lack of digital infrastructure. By leveraging Moodle's adaptability and open-access nature, the study aims to provide practical and scalable solutions to improve teaching effectiveness and student comprehension in information education at the secondary level.

Research Methods

This research was conducted at SMA Dharma Pancasila Medan, located at Jl. Dr. Mansyur No. 71 C, Padang Bulan Selayang I, Kec. Medan Selayang, Medan City. This study involved class XI with 38 students and used the Rapid Application Development (RAD) method for software updates. The main objective was to validate the questionnaire used as a research tool. Validation was carried out using SPSS 26 with the criteria that the instrument was considered valid when the r_count value> r_table = 0.3202 & α = 0.05.

Results

The description of the results data:

Tabel 1 Moodle Learning Media Validity Test Results

Pernyataan	r_{hitung}	r_{tabel}	Keterangan
P01	0,558	0,3202	Valid
P02	0,382	0,3202	Valid
P03	0,558	0,3202	Valid
P04	0,621	0,3202	Valid
P05	0,428	0,3202	Valid
P06	0,476	0,3202	Valid
P07	0,351	0,3202	Valid
P08	0,429	0,3202	Valid
P09	0,413	0,3202	Valid
P10	0,693	0,3202	Valid
P11	0,329	0,3202	Valid
P12	0,693	0,3202	Valid
P13	0,739	0,3202	Valid
P14	0,852	0,3202	Valid
P15	0,785	0,3202	Valid
P16	0,852	0,3202	Valid
P17	0,785	0,3202	Valid
P18	0,591	0,3202	Valid
P19	0,739	0,3202	Valid
P20	0,591	0,3202	Valid

Edu Cendikia: Jurnal Ilmiah Kependidikan
Volume: 5 | Nomor 02 | Agustus 2025 |
DOI: 10.47709/educendikia.v5i02.5688

Tabel 2 Reliability Statistis

Cronbach's Alpha	N of Items
.901	20

Table 2 shows that all items in the initial motivation have a calculated r value > r table, so all items are considered valid and feasible in this study. Meanwhile, Table 2 shows that the Cronbach's Alpha value for the Moodle learning media variable is 0.901, which is higher than 0.60 and is categorized as good. This means that all items of the statement instrument are consistent and reliable.

Discussion

Analysis Prerequisite Test

1. Normality Test

One method of checking data normality is to use the Kolmogorov Smirnov Test, which is an initial analysis technique before carrying out a hypothesis test:

Table 3 Normality Test Results

Tests of Normality				
		Shapiro-Wilk		
Kelas		Statistic	df	Sig.
Hasil	Pretest (Kontrol)	.901	38	.063
	Post-test (Kontrol)	.951	38	.094
	Pretest (Eksperimen)	.954	38	.116
	Post-test (Eksperimen)	.946	38	.064

The Shapiro-Wilk test shows:

- The pretest of the control class has a significance of 0.063 (>0.05), indicating a normal distribution.
- The posttest of the control class is significant at 0.94 (>0.05), so the data meets the assumption of normality.
- In the experimental class, the significance value of the pretest is 0.116 and the posttest is 0.064 (both >0.05), proving a normal distribution.

2. HomogeneityTest

Edu Cendikia: Jurnal Ilmiah Kependidikan
Volume: 5 | Nomor 02 | Agustus 2025 |
DOI: 10.47709/educendikia.v5i02.5688

Verifying the equality of population variance. The homogeneity criterion is met if the significance is >0.05. The results of the analysis show that the data meets the homogeneity requirements (the significance value is in accordance with the provisions).

Tabel 4 Hasil Uji Homogenitas

Test of Homogeneity of Variance

		Levene Statistic	df1	df2	Sig.
Hasil	Based on Mean	.270	3	148	.847
	Based on Median	.441	3	148	.724
	Based on Median and with adjusted df	.441	3	132.025	.724
	Based on trimmed mean	.374	3	148	.772

Based on Table 4, the results of the homogeneity test on all data produce a significant value above 0.05. Based on these results, it can be concluded that both classes have the same variance (homogeneous).

3. Hypothesis Test

The author's T-test uses the SPSS 26 program. The T-test decision standards are:

1. accepted if the significance level is less than 0.05,

2. rejected if more than 0.05.

Tabel 5 Hasil Uji T test

		t-test for Equality of Means			
		t	df	Sig. (2-tailed)	Mean Difference
Hasil	Equal variances assumed	6.223	74	0.000	8.895
	Equal variances not assumed	6.223	73.996	0.000	8.895

Based on table 5, it can be concluded as follows:

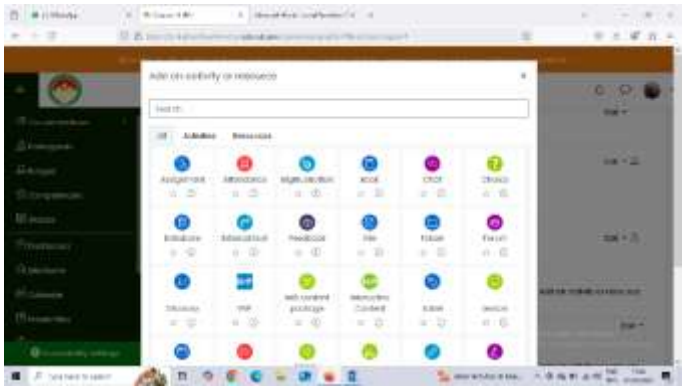
The t-value of the Moodle learning media is 6.223 with a significance level of 0.0000 <0.05. It can be summarized that the implementation of Moodle learning media has a positive and significant influence on the results of SMA Dharma Pancasila Class XI IPA 1 students in the information literacy course.

Program Development Results

Teacher Display Features

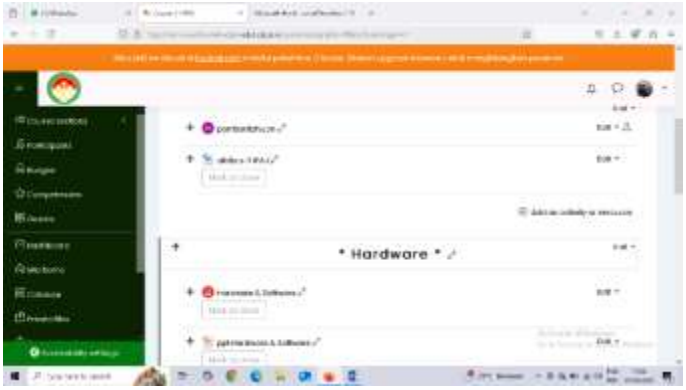
various tools such as quizzes, material magnifiers, and assignments to improve the quality of learning.

Edu Cendikia: Jurnal Ilmiah Kependidikan
Volume: 5 | Nomor 02 | Agustus 2025 |
DOI: 10.47709/educendikia.v5i02.5688



Teacher Assignment Feature

makes it easier for teachers to manage their profiles.

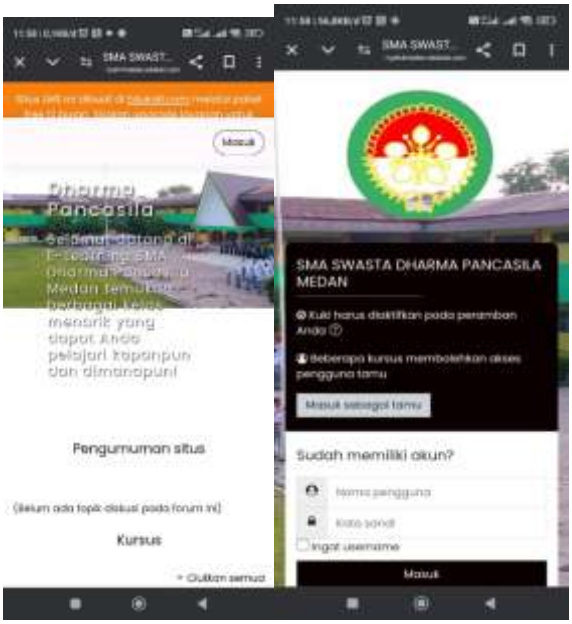


Login features on computers and laptops

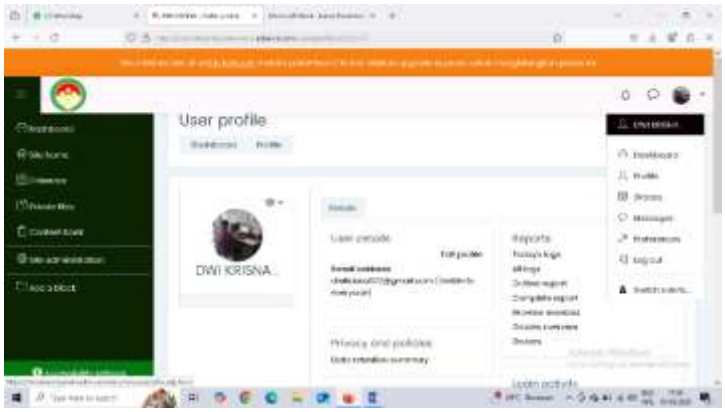


Login feature on smartphone

Edu Cendikia: Jurnal Ilmiah Kependidikan
Volume: 5 | Nomor 02 | Agustus 2025 |
DOI: 10.47709/educendikia.v5i02.5688



Admin or Teacher Profile Features



Conclusion

The results show that the implementation of Moodle-based e-learning can increase students' motivation and interest in learning, especially in schools that do not yet have an e-learning system. Thus, e-learning becomes a very useful learning tool for teachers and students.

Reference

Gamage, S. H. P. W., Ayres, J. R., & Behrend, M. B. (2022). A systematic review on trends in using Moodle for teaching and learning. *International Journal of STEM Education*, *9*, Article 27. https://doi.org/10.1186/s40594-021-00323-x

Herayanti, L., Habibi, H., & Fuaddunazmi, M. (2017). Pengembangan media pembelajaran berbasis Moodle pada matakuliah fisika dasar. *Cakrawala Pendidikan*, *2*, 86422.

Khasanah, M., & Musa, M. U. (2019). Pengaruh penggunaan media e-learning berbasis Moodle dan minat belajar terhadap hasil belajar prakarya dan kewirausahaan. *Akademika*, *8*(1).

Montes, R., Herrera, L., & Crisol, E. (2024). *Moodle usability assessment methodology using the Universal Design for Learning perspective*. arXiv. https://arxiv.org/abs/2403.10484

Muin, A., & Ulfah, R. M. (2012). Meningkatkan hasil belajar matematika siswa dengan pembelajaran menggunakan aplikasi Moodle. *Pythagoras: Jurnal Matematika dan Pendidikan Matematika*, *7*(1), 73–82.

Mukahar, A. (2020). Pengaruh media pembelajaran (Moodle mobile learning, LKS) dan minat peserta didik terhadap hasil belajar mata pelajaran administrasi server. *Teknologi dan Kejuruan: Jurnal Teknologi, Kejuruan, dan Pengajarannya*, *43*(1), 11–19.

Novianto, A. (2016). Pengaruh penerapan media pembelajaran Moodle terhadap motivasi belajar siswa XII TKJB SMKN 2 Surakarta pada kompetensi mengadministrasi server jaringan tahun pelajaran 2015/2016. *DutaCom*, *11*(1), 68–77.

Pangestu, Y., & Daulay, R. S. A. (2023). Penerapan pembelajaran e-learning berbasis Moodle pada mata pelajaran simulasi digital. *Jurnal Penelitian Teknologi Informasi dan Sains*, *1*(2), 32–40.

Pérez Pérez, M., Serrano Bedia, A. M., & García Piqueres, G. (2020). An analysis of factors affecting students' perceptions of learning outcomes with Moodle. *Journal of Further and Higher Education*, *44*(8), 1114–1129. https://doi.org/10.1080/0309877X.2019.1688258

Rusmiyati, A., Marwoto, P., Subali, B., & Rusilowati, A. (2024). The effectiveness of Moodle-based e-learning media to improve students' inductive thinking skill in an integrated science project course. *Unnes Science Education Journal*, *13*(1).

Safitri, et al. (2022). Effectiveness of Moodle-based LMS in improving students' civic knowledge on diversity materials. *Jurnal Civicus*, *10*(2), 135–142.

Sari, D. D., & Zulmaulida, R. (2021). Pengaruh media pembelajaran berbasis Moodle terhadap hasil belajar matematika siswa SMP kelas VIII. *Suska Journal of Mathematics Education*, *7*(2), 75–84.

Setyobudi, R. K. (2017). Pengaruh penerapan media pembelajaran Moodle terhadap hasil belajar siswa pada bidang kejuruan TKJ di SMKN 3 Buduran. *IT-Edu: Jurnal Information Technology and Education*, *2*(2).

Sindiani, P. (2023). Pengaruh penggunaan media pembelajaran Moodle terhadap hasil belajar peserta didik. [Skripsi, Universitas Sultan Ageng Tirtayasa].

Suparjan, S., Ismiyani, N., Mariyadi, M., Shintasari, D., & Kresnadi, H. (2023). Investigating students' perspectives on the use of e-learning Moodle. *Al-Ishlah: Jurnal Pendidikan*, *15*(2), 1627–1634.

Widodo, J. P., Musyarofah, L., & Slamet, J. (2022). Developing a Moodle-based LMS for slow learners. *Jurnal Inspirasi Pendidikan*, *12*(1), 22–32.

Wicaksana, E. J. (2020). [Judul referensi tidak tersedia lengkap – mohon dilengkapi untuk kutipan yang valid].

Wiliyanti, V., Destiana, A., & Shidqha, N. H. (2022). Development of MOOCs based on Moodle in high school physics static electricity. *Jurnal Pembelajaran Fisika*, *10*(2), 73–82.