



From Conventional Management to Digital Learning Ecosystem: Moodle-Based LMS Capacity Building for Teachers and Operators at Darul Muklasin High School

Muhammad Hudhel Sidqi ¹

¹ Institute Badri Mashduqi, Indonesia

Correspondence: m.hudhelsidqi@ibama.ac.id

Abstract : This community service program aimed to strengthen digital learning management capacity among teachers and operators at Darul Mukhlisin High School, Tegalsiwalan, Probolinggo, through Moodle-based Learning Management System (LMS) capacity building. The program was initiated in response to limited utilization of digital platforms for managing learning activities, particularly in online content management, assessment, and student administration. The activities consisted of needs analysis, preparation of training modules, implementation of theoretical and practical sessions, monitoring, and evaluation. Participants were trained to manage Moodle features, including course creation, learning material integration, student account management, quiz development, and discussion forums. The evaluation results indicated that the training improved participants' understanding and practical skills in utilizing Moodle as a digital learning management platform. Although challenges remained in infrastructure availability and differences in technological competence, continuous mentoring supported the adoption of Moodle in classroom practices. This program contributes to developing a more adaptive digital learning ecosystem and enhancing technology-based educational management at Darul Mukhlisin High School.

Keywords : Moodle-Based LMS; Digital Transformation; Educational Technology; Teacher Training; Learning Management Capacity.

Article History	Received	Revised	Accepted
	October 2025	November 2025	December 2025

How to Cite (APA Style) : Sidqi, Muhammad Hudhel. (2025). From Conventional Management to Digital Learning Ecosystem: Moodle-Based LMS Capacity Building for Teachers and Operators at Darul Muklasin High School. *Gemeinschaft: Journal of Social and Community Engagement*, 3(2), 132-141.

DOI : <https://doi.org/10.71392/gjsce.v3i2.157>

Copyright © 2025 Gemeinschaft: Journal of Social and Community Engagement, All Rights Reserved



INTRODUCTION

The development of information and communication technology (ICT) has significantly influenced educational practices by transforming conventional learning systems into more flexible and technology-driven environments (Beck, 2017; Weber, Krehl & Büttgen, 2022). Digital transformation in education provides opportunities for schools to improve learning quality through more effective management, wider access to resources, and interactive learning experiences. The integration of technology is no longer limited to supporting teaching activities but has become an essential component in developing sustainable educational ecosystems. However, successful technology implementation requires more than infrastructure availability. It also depends on the readiness, digital competence, and continuous support of educational personnel who directly manage and utilize digital learning systems.

One of the technological innovations supporting digital transformation in education is the Learning Management System (LMS). LMS platforms enable educational institutions to organize learning materials, manage assessments, facilitate communication, and monitor student progress systematically (Munna et al., 2024; Veluvali & Suriseti, 2022). Among various LMS platforms, Moodle is widely recognized because it provides flexible and comprehensive features that support online and blended learning environments (Martin et al., 2022). Through Moodle, teachers can design digital classrooms, distribute learning resources, create assessments, and encourage student interaction. Nevertheless, the effectiveness of Moodle implementation depends greatly on users' ability to understand and optimize its available features according to their educational needs.

Although LMS technology offers significant benefits, many educational institutions still experience challenges in maximizing its utilization. The main obstacle is often not the absence of technological facilities but the limited capacity of users in operating and managing digital platforms effectively (Chen et al., 2022; Gupta et al., 2023; Khatib et al., 2023). Teachers may have basic digital skills but still encounter difficulties in integrating advanced technological features into learning activities (Del Mundo, 2022). Similarly, educational operators may face challenges in managing system administration and supporting platform sustainability. Therefore, improving digital competence through structured training and mentoring becomes an important strategy to ensure that technology adoption contributes meaningfully to improving educational quality.

SMA Darul Mukhlisin Tegalsiwalan, Probolinggo, is one of the educational institutions that has shown commitment to integrating technology into the learning process. The school has provided technological infrastructure and implemented Moodle as a platform to support digital learning management. However, the utilization of this platform remains limited because several users have not fully understood how to operate and manage its features. The existing condition indicates a gap between technological availability and human resource readiness. Without adequate competence among teachers

and operators, Moodle cannot function optimally as a tool for improving learning efficiency, interaction, and academic management.

The main challenge experienced by teachers at SMA Darul Mukhlisin is the limited ability to utilize Moodle features for developing interactive and structured digital learning. Although teachers are familiar with computers and internet-based applications, most of them have not maximized Moodle functions such as creating online courses, organizing digital learning materials, developing automated assessments, providing feedback, and facilitating discussion forums. This limitation affects the effectiveness of technology integration in classroom activities. Therefore, teachers require practical guidance that not only introduces Moodle concepts but also develops their skills in applying the platform to support meaningful learning experiences.

In addition to teacher competencies, school operators also require capacity strengthening because they have an essential role in maintaining the sustainability of Moodle implementation. Operators are responsible for managing user accounts, organizing system access, monitoring platform activities, and preparing reports related to digital learning implementation (Hidayah et al., 2024). However, limited knowledge of Moodle administration creates difficulties in providing technical support for teachers and students. This condition may reduce the effectiveness of LMS utilization because successful digital learning requires collaboration between teachers as content managers and operators as system administrators. Strengthening both roles is necessary to create an integrated digital learning ecosystem.

Based on these challenges, a Moodle-based LMS capacity-building program was developed to improve the competence of teachers and operators at SMA Darul Mukhlisin. The program aims to transform existing technological facilities into effective learning management practices by strengthening participants' theoretical understanding and practical skills. Teachers are trained to develop digital learning content, manage online classrooms, create assessments, and utilize interactive features. Meanwhile, operators receive training related to account management, system administration, user monitoring, and learning activity reporting. This approach ensures that Moodle implementation is supported by competent human resources who can independently manage and develop digital learning practices.

The implementation of this program consists of several systematic stages, including needs analysis, preparation of training materials, implementation of training activities, monitoring, and evaluation. The training combines theoretical explanations with direct hands-on practice to ensure participants can immediately apply Moodle features based on their respective responsibilities. During practical sessions, teachers are guided to create digital courses, upload learning resources, design quizzes, and manage student interactions. Operators are guided to configure user accounts and monitor system activities. This participatory approach allows participants to experience real applications of Moodle and understand its potential in supporting technology-based learning management.

To measure the effectiveness of the program, evaluation activities are conducted to assess participants' understanding and practical abilities after the training. Evaluation focuses on participants' capability to operate Moodle features, develop learning resources, and manage digital learning administration. Furthermore, follow-up mentoring is provided to assist teachers and operators in implementing Moodle consistently within school activities. This continuous support is important because technology adoption requires adaptation and problem-solving after initial training. Through mentoring, participants are expected to overcome technical challenges and gradually develop confidence in utilizing Moodle as part of their daily educational practices.

The implementation of Moodle-based LMS capacity building is expected to strengthen the digital learning ecosystem at SMA Darul Mukhlisin Tegalsiwalan. By improving the competence of teachers and operators, the school can optimize the use of technology to create more interactive, efficient, and adaptive learning environments. This program contributes to institutional capacity development by bridging the gap between digital infrastructure and human resource readiness. Furthermore, the experience of SMA Darul Mukhlisin can serve as a practical example for other schools seeking to integrate technology into learning management. Ultimately, strengthening digital competence becomes an important foundation for achieving sustainable educational transformation.

METHOD

This community service program employed a participatory capacity-building approach aimed at strengthening the digital learning management competence of teachers and operators at SMA Darul Mukhlisin Tegalsiwalan, Probolinggo. The implementation was designed based on the identification of partner needs related to the limited utilization of Moodle as a Learning Management System (LMS) for supporting technology-based learning. The participants of this program consisted of teachers and school operators who are directly involved in managing learning activities and digital administration. Through this approach, participants were positioned not only as recipients of training but also as active partners who participated in the process of understanding, practicing, and implementing Moodle features according to their respective responsibilities.

The program was conducted through several stages, including needs analysis, preparation, implementation, monitoring, and evaluation. The needs analysis stage was carried out through initial discussions and observations with school stakeholders to identify participants' technological readiness, existing problems, and the specific Moodle features required to support learning management. Based on the results of this analysis, training materials were developed focusing on practical competencies, including Moodle introduction, digital classroom creation, learning material management, online assessment

development, discussion forum utilization, user account management, and learning activity monitoring. The preparation stage also included the development of training modules and practical exercises to ensure that the activities were relevant to participants' needs.

The implementation stage combined theoretical explanations and hands-on practices using a workshop-based learning model. During the theoretical sessions, participants were introduced to the concept of LMS, the role of Moodle in digital learning ecosystems, and strategies for integrating technology into learning management. The practical sessions allowed teachers to directly create online courses, upload learning resources, design quizzes, provide feedback, and manage student interactions through Moodle features. Meanwhile, operators were guided to manage user accounts, configure system access, monitor platform activities, and prepare reports related to learning implementation. This practice-oriented approach was applied to ensure that participants gained functional skills rather than only conceptual understanding.

Monitoring was conducted throughout the training process to observe participants' engagement, identify technical difficulties, and provide immediate assistance during practice sessions. Facilitators provided guidance and feedback to ensure that each participant could complete the assigned Moodle tasks according to their roles. After the training activities were completed, an evaluation stage was conducted to measure the achievement of program objectives. The evaluation included practical assessments and discussions to determine participants' ability to operate Moodle features, manage digital learning activities, and apply the knowledge gained during the program.

To support the sustainability of Moodle implementation, follow-up mentoring was provided after the training activities. This mentoring aimed to assist teachers and operators in solving technical problems encountered during the initial implementation phase and encouraging continuous use of Moodle in school activities. Through this systematic method, the program was expected to strengthen the capacity of educational personnel, optimize the utilization of existing digital infrastructure, and contribute to the development of a sustainable digital learning ecosystem at SMA Darul Mukhlisin Tegalsiwalan.

RESULT AND DISCUSSION

The implementation of Moodle-based Learning Management System (LMS) capacity building at SMA Darul Mukhlisin Tegalsiwalan, Probolinggo, demonstrated positive changes in the digital competence of teachers and operators in managing technology-based learning. The program was conducted through a series of activities consisting of training, practical implementation, monitoring, and follow-up mentoring. The results indicated that participants not only gained a better understanding of Moodle concepts but also developed

practical abilities to utilize LMS features according to their respective roles. The findings of this program are discussed into three main aspects: strengthening digital literacy and LMS understanding, improving practical skills in Moodle utilization, and developing a sustainable digital learning ecosystem within the school environment.

1. Improvement of Participants' Understanding of Moodle-Based Learning Management System

The first result of the program was the improvement of participants' understanding regarding the function and role of Moodle as a Learning Management System for supporting digital learning management. Before the implementation of the program, Moodle utilization at SMA Darul Mukhlisin was still limited because most teachers and operators viewed the platform mainly as a digital storage medium rather than as an integrated learning management system. Teachers had not fully understood how Moodle could support various learning activities, including material distribution, assessment management, student interaction, and learning monitoring. Similarly, operators still required additional understanding regarding their role in maintaining system accessibility and supporting users.

Through the training sessions, participants were introduced to the fundamental concepts of LMS implementation, Moodle architecture, and the relationship between technology utilization and effective learning management. The theoretical sessions helped participants understand that Moodle is not merely a platform for uploading learning materials but also a comprehensive system that supports planning, implementation, assessment, and evaluation of learning activities. This understanding became an important foundation for participants before moving into practical activities.

The improvement in participants' understanding reflects that digital transformation in education requires a balance between technological availability and human resource readiness. Previous studies have emphasized that the success of educational technology adoption depends largely on users' digital competence and their ability to integrate technology into pedagogical practices. Therefore, the capacity-building approach implemented in this program was considered appropriate because it focused not only on introducing Moodle features but also on developing participants' awareness of how technology can improve educational management.

2. Development of Teachers' and Operators' Practical Skills in Moodle Utilization

The second result showed that the program successfully improved participants' practical abilities in operating Moodle features for learning management and academic administration. During the hands-on practice sessions, teachers were guided to create

digital classrooms, organize learning resources, upload teaching materials, develop online quizzes, provide feedback, and utilize discussion forums. These activities allowed teachers to directly experience the process of transforming conventional learning management into a more structured digital learning environment.

Before participating in the program, most teachers had not utilized Moodle's advanced features because they lacked technical experience and confidence in managing digital platforms. After the practical sessions, teachers demonstrated improved ability to independently manage basic Moodle functions based on their instructional needs. For example, teachers were able to organize learning materials systematically, design digital assessments, and utilize interactive features that encourage communication between teachers and students. This indicates that practical-based training is more effective in improving technological competence compared to theoretical explanations alone.

In addition to teachers, operators also experienced improvements in their technical competencies. Operators were trained to manage user accounts, organize teacher and student access, monitor platform activities, and support the technical operation of Moodle. This role is essential because the sustainability of LMS implementation depends not only on teachers' ability to use the platform but also on the availability of technical support within the institution. The collaboration between teachers and operators created a stronger foundation for implementing Moodle as an integrated learning management system.

These findings reinforce the argument that digital transformation in schools requires institutional capacity development rather than individual skill improvement only. Teachers require pedagogical and technological competence to integrate LMS features into learning activities, while operators require administrative competence to maintain system functionality (Aini et al., 2025; Inci et al., 2024). The combination of these competencies contributes to creating a more effective digital learning environment where technology supports both instructional and administrative processes.

3. Strengthening a Sustainable Digital Learning Ecosystem through Continuous Mentoring

The third result of the program was the emergence of stronger institutional readiness in developing a sustainable digital learning ecosystem at SMA Darul Mukhlisin. This achievement was reflected in the increasing confidence of teachers and operators after participating in continuous mentoring activities. The mentoring process was not only intended to solve technical problems but also to strengthen participants' ability to adapt Moodle features based on their daily educational practices. During this stage, participants received assistance in improving course management, organizing learning

resources, adjusting assessment features, and optimizing communication tools within Moodle. This process ensured that technology utilization moved beyond initial training activities and became part of the school's ongoing learning management system.

The mentoring process revealed that sustainable technology adoption requires continuous assistance because participants experience different levels of readiness during implementation. Although the initial training improved participants' basic skills, several challenges emerged when Moodle was applied in real learning situations. Some teachers required additional guidance in adapting digital materials, designing assessments, and integrating Moodle activities into existing teaching methods. Similarly, operators needed further support in managing system configurations and assisting users. These findings indicate that technology integration is a gradual process that requires institutional commitment, continuous evaluation, and supportive environments to ensure that digital platforms can be implemented effectively.

The development of a digital learning ecosystem at SMA Darul Mukhlisin was further strengthened through improved collaboration between teachers and operators. Previously, technology management was often perceived as a technical responsibility handled mainly by operators (Mourtzis et al., 2022; Wang et al., 2022). However, through this program, teachers began to recognize their active role in developing and managing digital learning content, while operators became more aware of their function as facilitators who support the continuity of LMS implementation. This collaboration created a more integrated learning management system where technical support and pedagogical innovation worked together. Such collaboration is essential because successful digital transformation depends on the alignment between users, management processes, and technological infrastructure.

Furthermore, the mentoring activities contributed to institutional transformation by bridging the gap between available digital infrastructure and the actual capacity of educational personnel (Alomari, 2024). The existence of Moodle facilities alone does not guarantee effective digital learning implementation unless teachers and operators possess adequate competence to utilize and manage the platform (Makruf et al., 2022). Through capacity building and continuous assistance, SMA Darul Mukhlisin gradually developed stronger internal readiness to optimize technology for educational purposes. This finding emphasizes that digital transformation in schools should focus not only on technology adoption but also on strengthening human resources, organizational culture, and sustainable management practices that support long-term implementation.

Overall, the implementation of Moodle-based LMS capacity building successfully contributed to strengthening digital learning capacity among teachers and operators at

SMA Darul Mukhlisin Tegalsiwalan. The combination of structured training, practical activities, monitoring, and follow-up mentoring created a comprehensive approach to improving participants' knowledge, skills, and confidence in utilizing digital learning platforms. Although several challenges remained, particularly related to infrastructure limitations and differences in technological competence, the program provided a strong foundation for developing technology-based learning management. In the future, continuous improvement through institutional policies, regular mentoring, and expansion of digital learning practices will be necessary to maintain and enhance the sustainability of the digital learning ecosystem.

CONCLUSION

The Moodle-based Learning Management System (LMS) capacity-building program at SMA Darul Mukhlisin Tegalsiwalan, Probolinggo, successfully strengthened the digital learning management capacity of teachers and operators. Through a combination of needs analysis, theoretical sessions, practical training, monitoring, and follow-up mentoring, the program improved participants' understanding and skills in utilizing Moodle features for digital learning management. Teachers demonstrated improved abilities in developing online learning materials, managing digital assessments, and facilitating student interaction, while operators gained better competencies in managing user accounts, monitoring system activities, and supporting LMS implementation. These outcomes indicate that structured capacity building can effectively bridge the gap between technological infrastructure availability and human resource readiness in educational institutions.

Furthermore, the program contributed to the development of a more sustainable digital learning ecosystem at SMA Darul Mukhlisin by encouraging collaboration between teachers and operators in optimizing Moodle utilization. The findings highlight that successful digital transformation in education requires continuous support, institutional commitment, and improvement of users' competencies rather than relying solely on technology adoption. Although challenges related to infrastructure and differences in digital competence remain, the program provided a strong foundation for implementing technology-based learning management. Future initiatives should focus on continuous mentoring, strengthening digital policies, and expanding the integration of LMS-based practices to support adaptive, interactive, and sustainable learning environments.

BIBLIOGRAPHY

- Aini, T. N., Nugraha, L., Surbakti, A. H., Mundiri, A., & Sanjani, M. A. F. (2025). Value-based branding in Islamic boarding schools: Efforts to maintain identity in digitalization dynamics. *Al-Tanzim: Jurnal Manajemen Pendidikan Islam*, 9(2), 442-457. <https://doi.org/10.33650/al-tanzim.v9i2.10753>
- Alomari, A. M. (2024). Perceptions of Faculty Members on Using Moodle as a Learning

- Management System in Distance Education. *International Journal of Technology in Education and Science*, 8(1), 75-110. <https://doi.org/10.46328/ijtes.507>
- Beck, R. (2017). Technology-driven changes in the economy. In *The Routledge Companion to Management Information Systems* (pp. 481-489). Routledge.
- Chen, L., Tong, T. W., Tang, S., & Han, N. (2022). Governance and design of digital platforms: a review and future research directions on a meta-organization. *Journal of management*, 48(1), 147-184. <https://doi.org/10.1177/01492063211045023>
- Del Mundo, H. J. C. (2022). 21st century digital skills, technology integration in instruction and challenges encountered by senior high school teachers in Muntinlupa National High School. *International Journal of Multicultural Research and Analysis*, 5(5), 1159-1172. <https://doi.org/10.47191/ijmra/v5-i5-35>
- Gupta, S., Tuunanen, T., Kar, A. K., & Modgil, S. (2023). Managing digital knowledge for ensuring business efficiency and continuity. *Journal of Knowledge Management*, 27(2), 245-263.
- Hidayah, H., Qushwa, F. G., Munawwaroh, I., Putri, D. F., & Hasanah, R. (2024). Leadership Transformation and Organizational Strengthening in Improving Collaboration and Operational Effectiveness of Islamic Boarding Schools. *Journal of Social Studies and Education*, 2(1), 54-67. <https://doi.org/10.61987/jsse.v2i1.519>
- Inci, M., Çelik, Ö., Lashab, A., Bayındır, K. Ç., Vasquez, J. C., & Guerrero, J. M. (2024). Power system integration of electric vehicles: A review on impacts and contributions to the smart grid. *Applied Sciences*, 14(6), 2246. <https://doi.org/10.3390/app14062246>
- Khatib, M. E., Mehanna, R. A., Alharam, I., Alhajeri, A., & Ali, S. A. (2023). Digital platforms support projects and effective project management. *Journal for Global Business Advancement*, 16(6), 910-932.
- Makruf, I., Rifa'i, A. A., & Triana, Y. (2022). Moodle-Based Online Learning Management in Higher Education. *International Journal of Instruction*, 15(1), 135-152.
- Martin, F., Wu, T., Wan, L., & Xie, K. (2022). A meta-analysis on the community of inquiry presences and learning outcomes in online and blended learning environments. *Online Learning*, 26(1), 325-359.
- Mourtzis, D., Angelopoulos, J., & Panopoulos, N. (2022). Operator 5.0: A survey on enabling technologies and a framework for digital manufacturing based on extended reality. *Journal of Machine Engineering*, 22.
- Munna, M. S. H., Hossain, M. R., & Saylo, K. R. (2024). Digital education revolution: Evaluating LMS-based learning and traditional approaches. *Journal of Innovative Technology Convergence*, 6(2).
- Wang, Y., Fu, G., Lyu, Q., Wu, Y., Jia, Q., Yang, X., & Li, X. (2022). Reform and development of coal mine safety in China: An analysis from government supervision, technical equipment, and miner education. *Resources Policy*, 77, 102777. <https://doi.org/10.1016/j.resourpol.2022.102777>
- Veluvali, P., & Suriseti, J. (2022). Learning management system for greater learner engagement in higher education – A review. *Higher Education for the Future*, 9(1), 107-121.
- Weber, E., Krehl, E. H., & Büttgen, M. (2022). The digital transformation leadership framework: Conceptual and empirical insights into leadership roles in technology-driven business environments. *Journal of Leadership Studies*, 16(1), 6-22. <https://doi.org/10.1002/jls.21810>