

Development Of Learning Management System For Nava Dhammasekha Teachers In Indonesia

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Abstract

This study aims to develop and evaluate a Learning Management System (LMS) at STAB Negeri Raden Wijaya as part of higher education digital transformation. The research employed the ADDIE model (Analysis, Design, Development, Implementation, Evaluation). The results indicate that the developed LMS achieved a media validity score of 86.67%, categorized as highly valid. The system demonstrates strong design quality, well-structured learning content, and evaluation features that support learning transparency. The needs analysis score of 65.2% suggests the necessity for further development, particularly in terms of system personalization and flexibility. The LMS also implements a scaffolding strategy in content organization, which enhances students' cognitive engagement. The integration of security systems through SSO and LDAP strengthens academic accountability. Overall, the LMS is considered feasible for implementation without major revisions. Nevertheless, its long-term sustainability depends on continuous support, including digital literacy improvement, ongoing training, and the optimization of learning analytics to support data-driven decision making.

6936



Keywords: Learning Management System, ADDIE, e-learning, learning analytics

INTRODUCTION

Quality and competitive human resources depend on education. As the center of education, teachers have an important role in determining the success of learning. However, teacher expertise is still a big problem in Indonesia, especially amid the demands of a changing curriculum and a digital era that demands technological adaptation (Hammond et al., 2017). This is also experienced by *Nava Dhammasekha* teachers, who are not only responsible for teaching education, but also teaching students Buddhist values as a moral and spiritual foundation. Therefore, to improve the ability of *Nava Dhammasekha* teachers in Indonesia, an efficient and integrated learning management system is needed (Islam et al., 2020).

Education based on Buddhist values. Teachers of *Nava Dhammasekha* performs two tasks which are to carry out teaching and spiritual guidance. The teacher is not only responsible for imparting academic knowledge, but also responsible for shaping the character of students based on Buddhist teachings. However, one of the main obstacles for teachers to improve abilities is not having access to an organized training and development system. Good involvement includes pedagogical and professional aspects, as well as the ability to incorporate spiritual principles into the learning process (Little, 2012). Without an adequate system, teachers have difficulty expanding their knowledge, skills, and professional attitudes (Nursa'ban & Hidayah, 2022).

Information and communication technology (ICT) has opened up new avenues for the world of education, one of which is the development of a learning management system (LMS). This system can serve as an inventive solution to support teacher training and continuous development (Xu et al., 2020). According to Newby (2011), A good learning management system can help teachers work together, allow students to learn independently, and monitor competency progress in real-time. However, this technology has not been used properly, especially in the context of education based on Buddhist values such as *Nava Dhammasekha*. This is due to a number of things, such as an understanding of technology, limited infrastructure, and a lack of support from relevant institutions (Jaeni & Basuki, 2020).

Previous studies have shown that *Nava Dhammasekha* teachers face a number of obstacles. These include limited resources to collaborate with peers, lack of time for face-to-face training, and lack of relevant training materials. The next obstacle is a busy schedule or long distances that make it difficult for many teachers to keep up with training. The educational resources available often do not meet the needs of students, especially when it comes to how the

6937



curriculum incorporates Buddhist values. This leads to teachers being less able to have the ability to organize learning effectively and meaningfully.

The learning management system will be a platform that makes it easier for teachers to access learning resources, collaborate with peers, and track competency progress independently. The LMS system allows *Nava Dhammasekha* teachers to obtain relevant and structured training without leaving their jobs as educators. The system can also help teachers share best practices, creating a supportive learning community. Theoretically, this research could help the development of educational science, particularly educational technology and teacher abilities. Buddhist values-based education such as *Nava Dhammasekha* is still under-funded, but research on learning management systems has been more focused on the context of general education. This is because Buddhist values-based education has unique characteristics that require a different approach to develop its learning system. It is hoped that the research can complement the existing literature and provide a new perspective on the creation of learning management systems (Samson et al., 2020).

The System Management System can practically improve the teachers of the *Nava Dhammasekha* educational institution. Using a learning management system to improve the quality of teachers, which has an impact on improving the overall quality of education. Teacher involvement not only makes it possible to deliver lessons well, but can be an example for students to apply Buddhist principles in daily life. In line with the Indonesian government's policy that encourages the use of technology in education. Regulation of the Minister of Education and Culture Number 22 of 2020 concerning the Strategic Plan of the Ministry of Education and Culture, which emphasizes the use of technology to improve the quality of education and access, especially in areas with limited resources (Kemendikbud Nomor 22, 2020).

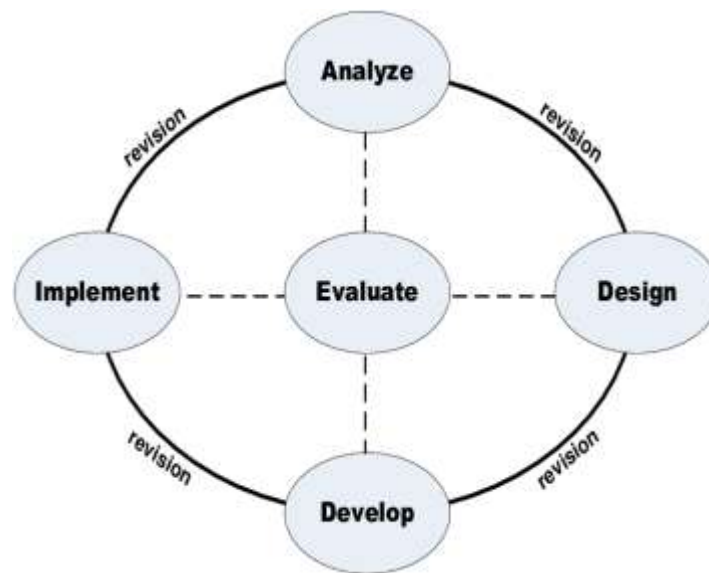
Vickers (2020), states that digital transformation in education includes not only the use of technology but also how technology can help teachers and students achieve more relevant learning goals. Thus, the learning management system developed by *Nava Dhammasekha* teachers is expected to serve as a model for other educational institutions in Indonesia, especially those with comparable features. The purpose of this research is to build a learning management system that can improve the capabilities of *Nava Dhammasekha* teachers in Indonesia and produce products that are not only theoretically effective, but also practical and in accordance with the needs of teachers in the field. Tujuan dari Penelitian ini adalah Menghasilkan Sistem Manajemen Pembelajaran untuk Guru *Nava Dhammasekha* di Indonesia.



RESEARCH METHODS

This research uses an R&D approach intended to develop a practical and viable product that will improve the effectiveness of LMS-based learning. Research and Development (R&D) is a research methodology used to create products and assess the effectiveness of such products in a given environment (Sari et al., 2020). This method not only involves product development, but also involves systematic evaluation and revision of products to ensure they meet consumer needs (Sugiyono, 2021).

In this study, the development model used is the ADDIE model, which consists of five main stages: Analysis, Design, Development, Implementation, and Evaluation (Branch, 2009). The ADDIE model is commonly used in development research because it provides a systematic approach to designing and executing educational projects (Sugiono, 2020). Each stage of the model is intended to produce a product that meets the teaching, learning, and user requirements. As a result, this approach is highly relevant in the creation of LMS as a medium of learning for Guru Nava Dhammasekha (Liu & Hallinger, 2018).



Picture 1: ADDIE

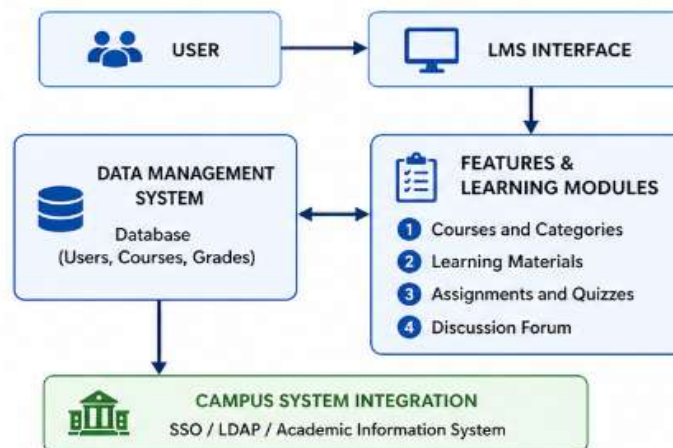
Sources: (Anggraeni et al., 2019)

RESULT AND DISCUSSION

Learning Management System Design

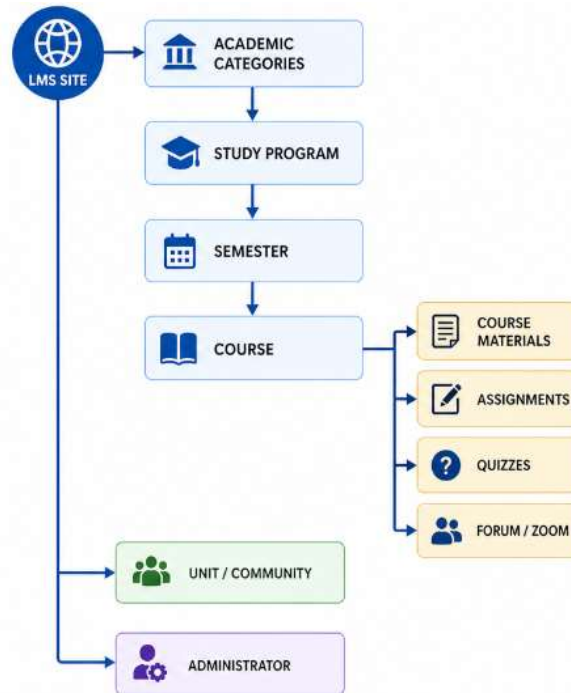
1. Blueprint LMS

The architecture of the Learning Management System (LMS) of STAB Negeri Raden Wijaya is designed to support an effective digital learning process through a systematic flow from users to institutional data integration. This system serves three main user groups, namely admins, lecturers, and students who interact through a web-based LMS interface and mobile application. In the LMS, there are various core features such as course and category management, provision of learning materials, access to assignments and quizzes, discussions through forums, attendance recording, and the issuance of grades and certificates as the final results of learning. All activities and data generated are stored in a data management system that includes user databases, courses, and file repositories for uploading materials and assignments, equipped with a logging and backup system to maintain security and continuity of services (Nuzli et al., 2023). At the bottom layer, the LMS is integrated with other campus information systems such as Single Sign-On (SSO), LDAP, and academic services through APIs so that academic data and user identities are consistent and centralized. With this structure, the LMS is not only an online learning platform, but also an integral part of the campus's digital ecosystem that is interconnected and supports the quality of the institution's education.



Picture 2: Processed by Researchers

2. Course Structure Diagram In LMS



Picture 3. Processed by Researchers

The architecture of the Learning Management System (LMS) of STAB Negeri Raden Wijaya was developed as part of the digital transformation in the implementation of Buddhist religious higher education. This system is designed to support the online learning process in a structured, effective, and integrated manner with the institution's academic services. At the user level, the LMS involves three main roles, namely administrators, lecturers, and students, each of whom has different authority in the management and utilization of learning resources. The interaction of these three roles is accommodated through a web-based LMS interface and mobile devices, thus allowing for flexibility of access and expansion of the range of learning services.

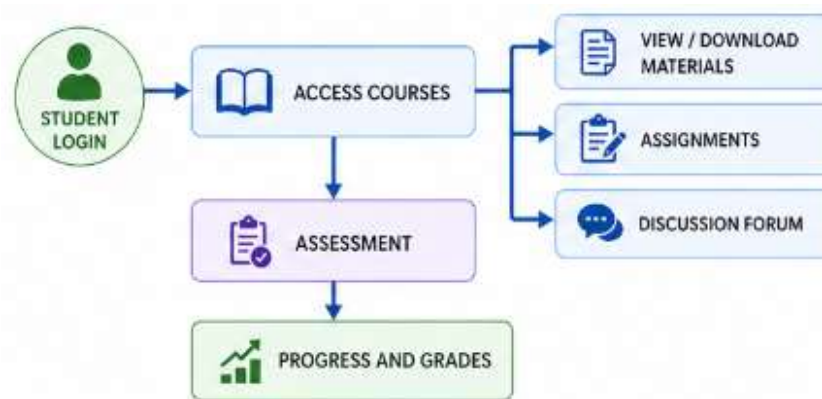
Functionally, the LMS provides various learning modules, including course management and course categories, distribution of teaching materials in various formats, evaluation services through assignments and quizzes, communication and interaction media in the form of discussion forums, and an integrated attendance and value processing system. All learning activities and data

6941

are organized and stored in a centralized data management system that includes user databases, course databases, and digital file storage repositories. Activity log mechanisms and backup systems are also implemented to ensure data security, process integrity, and service continuity.

At the integration level, the LMS is connected to the Academic Information System (SIKAD), centralized authentication services such as SSO or LDAP, and the institution's Application Programming Interface (API), so that the alignment of academic data and user identities can take place automatically. Thus, the LMS not only functions as a means of implementing digital-based learning, but also becomes an important subsystem in the campus academic management ecosystem that supports the improvement of educational governance, learning quality, and the fulfillment of national standards for higher education.

3. LMS Usage Flow for Students



Picture 4. User Flow

The process of using the Learning Management System (LMS) by students begins through the account authentication stage to gain access to the digital learning environment. After successfully logging in, the system will display a list of courses that have been determined based on the study plan for the current semester (Ajanaku, 2025). Access to the course provides opportunities for students to obtain learning resources, participate in learning activities, and conduct online academic interactions (Pan et al., 2021).

In each course, there are various learning activities that can be accessed, including downloading or broadcasting teaching materials to support the understanding of scientific substance, participation in assignments as a form of competency evaluation, and involvement in

discussion forums as a vehicle for scientific communication and academic collaboration. These activities are an integral part of the learning process that is documented directly in the system (Leo et al., 2019).

Furthermore, the assessment of learning outcomes is carried out based on the evaluation provisions applied to each course. The LMS manages all grades obtained from assignments, quizzes, and other activities assessed by lecturers. The results of the assessment are displayed in the form of learning achievement progress so that students' academic progress can be monitored transparently and continuously. Thus, the flow of using LMS ensures the orderliness, traceability, and effectiveness of the digital learning process in the Raden Wijaya State STAB environment.

The Learning Management System (LMS) is designed as a digital learning platform that provides various features to support the effectiveness of higher education implementation. These key features are developed based on the needs of academic, operational, and structured learning governance (Kim & Park, 2023).

1. Course and Course Management

This feature supports the management of all learning activities in each study program. The preparation of course structures, material units, and semester learning plans (RPS) is carried out systematically to facilitate the implementation of a curriculum based on learning outcomes.

2. Distribution of Learning Materials

The system provides means of uploading and accessing materials in various formats, such as documents, presentations, audiovisual, and interactive multimedia. The existence of this feature allows the learning process to take place flexibly and oriented towards independent learning (Pribadi et al., 2021).

3. Academic Evaluation Management

The assignment, quiz, and formative and summative assessments can be done online by setting deadlines and assessment rubrics. Evaluation results are recorded automatically in the system to ensure transparency of academic achievements.

4. Communication and Collaboration Forum

Communication features such as discussion forums, internal messages, and comments on assignments serve to strengthen academic interaction between lecturers and students. Learning



collaboration can also be improved through group discussion activities and digital project work.

5. Learning Progress Monitoring

System Features and Content Categorization. The system provides an academic progress dashboard that displays material completion status, activity participation, and grades periodically. This monitoring supports the learning reflection process and follow-up actions for competency enhancement (Anwar, 2021).

6. Account Management and User Roles

Access rights management is conducted based on functions, including administrators, lecturers, and students. Role differentiation aims to maintain data security, ensure orderly learning implementation, and preserve the integrity of academic records.

7. Learning Reporting and Analytics

The presentation of statistical data regarding learning activities and outcomes serves as material for educational quality evaluation. These analytics support decision-making to improve the effectiveness of digital learning strategies.

4. Learning Content Upload Procedure



Picture 5: Content Upload

The procedure for uploading learning materials onto the Learning Management System (LMS) is an integral part of the digital content management mechanism aimed at ensuring the availability of learning resources in a precise, structured, and documented manner. The process begins with the user authentication stage, where lecturers access the system using official credentials verified by the LMS authentication system. This stage functions as an access control measure to ensure that only authorized users have the mandate to upload and manage learning

6944

materials (Elihami, 2021).

Upon successful login, users select the course relevant to the materials intended for publication. This selection is performed through the course dashboard interface to ensure the accurate placement of teaching materials in accordance with the curriculum structure and the Semester Learning Plan (RPS). The subsequent stage involves accessing the learning material management menu, which enables users to add new content in various system-supported digital formats, such as PDF, PPT, and other supporting documents (Sova et al., 2022).

During the upload process, the system performs file processing for storage within the database and content repository. Following this, lecturers are required to finalize the process through a save or publish action to make the materials accessible to students. The system then processes the change in content status to "available to students," thereby ensuring the accessibility of materials within the online learning process.

5. System Development

The development of the Learning Management System (LMS) was carried out by referring to the ADDIE model, which consists of five stages: Analysis, Design, Development, Implementation, and Evaluation. This development model was selected due to its systematic, adaptive characteristics and its relevance to the needs of digital learning innovation in higher education.

- a. **Analysis Stage:** This phase focuses on identifying learning needs, analyzing user characteristics (students, lecturers, and administrators), and mapping the available information technology infrastructure. This stage ensures that every feature in the LMS aligns with learning achievement standards and the institution's digital transformation strategy.
- b. **Design Stage:** This includes designing the system workflow, course structure, user interface, accessibility standards, and technical specifications of the platform. The design also encompasses the selection of learning methods, digital content formats, and mechanisms for interaction and academic evaluation.
- c. **Development Stage:** This is conducted through the process of creating, configuring, and testing digital learning modules within the LMS. The application of data security standards, integration with the Academic Information System (SIK), and the development of learning analytic features are included in this stage.



- d. **Implementation Stage:** This involves managing the LMS launch strategy for users, including technical training for lecturers and students, academic data migration, and the provision of operational support to ensure the sustainability of digital-based learning services (Bahrowi, 2022).
- e. **Evaluation Stage:** This is conducted both formatively at each development phase and summatively after the system is operational. Evaluation aims to assess the effectiveness of the LMS in supporting learning quality and determining continuous improvements based on service performance data and user feedback (Rosadi & Herawan, 2021).

Overall, the ADDIE model provides a comprehensive and measurable framework for developing an LMS that is responsive to academic needs, technological advancements, and the enhancement of higher education service quality.

6. Media Expert Results

Based on the results of the initial analysis of the nine *Nava Dhammasekha* teachers, the following findings were obtained:

Table 1. Percentage of initial analysis

No	Aspect	Item	Percentage
1	Performance Analysis	5	71,6%
2	Need Analysis	5	65,2%
3	User Analysis	5	72,8%
4	Context Analysis	5	70,4%
5	Goal Analysis	5	81,6%

Based on table 1, it shows that the performance of the nava dhammasekha teacher is good, although there is still room to improve so that the time is more optimal and relevant. In the second indicator, it can be explained that the needs analysis recorded a score of 65.2%, which indicates that some user needs have not been fully met, so additional data collection is needed to increase satisfaction. On the other hand, the user analysis received a score of 72.8%, indicating a fairly good understanding of the user, but there are still aspects that need to be clarified through further research. The context analysis recorded 70.4%, which indicates a good understanding of the external factors that affect the user experience, although a deeper analysis would be useful. Finally, the analysis of learning objectives achieved the highest score of 81.6%, indicating that the



goals have been clearly defined. Overall, these results show good achievements, but there are still some aspects that need to be improved to optimize the user experience.

Table 2. Media Expert Eligibility

No	Remarks	Value
1	Total Score ($\sum^x$)	52
2	Maximum Score (Xmax)	60
3	Percentage of Validity (p)	86.67%
4	Category Validitas	Highly Valid
5	Remarks	No revision required

Based on Table 2 the Media Expert Feasibility shows that the total score obtained from the evaluation of the design aspects is 52 out of a maximum score of 60. Thus, the percentage results result in a value of 86.67%. These results place the validity category in the category of "Highly Valid," which indicates that all aspects assessed have been well met. Therefore, no revision is required, which indicates that the design has met the expected standards and is functioning effectively.



Picture 6. Course View

DISCUSSION

The development of a Learning Management System (LMS) at STAB Negeri Raden Wijaya represents a strategic initiative in integrating technology into higher education curricula. Based on the research findings presented, several critical aspects require in-depth analysis regarding the system's effectiveness and sustainability.



1. Design Validity and Media Feasibility

The media expert validation result of 86.67% (categorized as *highly valid*) indicates that the LMS interface design and technical structure meet established standards for instructional media quality. This finding aligns with (Al-Adwan et al., 2022), who emphasize that *system quality* and *information quality* are key determinants in the successful adoption of e-learning in higher education (Komalasari et al., 2020).

The high validation score suggests that navigation, consistent visual design (e.g., the use of professional blue tones), and feature layout have been carefully designed to minimize users' cognitive load. Consequently, students are able to focus more on learning content rather than on system operation. This is consistent with cognitive load theory, which highlights the importance of reducing extraneous cognitive processing to enhance learning effectiveness.

2. Implementation of the ADDIE Model in Digital Transformation

The success of this LMS development is closely linked to the application of the ADDIE framework. The *Analysis* phase, which recorded the highest score in *Goal Analysis* (81.6%), demonstrates a strong alignment between the system and institutional instructional objectives.

According to (Branch, 2009), the ADDIE model supports iterative development processes, allowing continuous refinement to ensure that the final product meets learner needs. However, the relatively lower score in *Need Analysis* (65.2%) indicates that certain user-specific needs have not yet been fully accommodated. This suggests a gap between general instructional goals and individualized user requirements. This finding is consistent with (Arinto, 2016), who argues that online learning design must be flexible to accommodate diverse user backgrounds, particularly in terms of digital literacy. Therefore, the development of personalized features—such as adaptive learning pathways or role-specific functionalities—is recommended for future system enhancement.

3. Content Structure and Scaffolding Strategy

The categorization of learning materials based on difficulty levels and educational stages reflects an effective application of scaffolding theory. This structured approach enables students to progressively build knowledge from fundamental concepts to more complex analytical levels (Sinaga et al., 2021).

Vygotsky's concept of the Zone of Proximal Development (ZPD) supports this approach,



emphasizing that learning is most effective when learners receive appropriate support according to their developmental level. In this LMS, the organization of content by study program and semester functions as a form of digital scaffolding, facilitating independent and structured learning.

(Garrison & Kanuka, 2004) highlight that well-organized digital learning environments enhance *cognitive presence*, allowing students to construct and confirm meaning through reflection and interaction. Thus, the LMS serves not only as a content repository but also as an active learning environment that supports knowledge construction (Hasnidar & Elihami, 2019).

4. Evaluation Transparency and Academic Accountability

The evaluation management features—such as assignments, quizzes, and learning progress dashboards—provide a high level of transparency regarding students' academic performance. This aligns with the concept of Assessment for Learning, where timely and structured feedback supports continuous learning improvement (Wekke et al., 2017).

Through real-time progress tracking, students can independently monitor their learning development, while instructors can utilize the data to implement appropriate pedagogical interventions (Holiver et al., 2020). Additionally, integration with SSO and LDAP systems ensures data security and academic record integrity.

(Dahlstrom et al., 2013) emphasize that data security is a critical component in digital learning systems, particularly in higher education institutions that manage sensitive student information. Therefore, the implementation of centralized authentication systems represents a significant strength of this LMS.

5. Implications and Sustainable Development

Overall, although the LMS has been categorized as highly valid and ready for implementation without major revisions, its long-term success depends on sustained institutional support. The context analysis score of 70.4% indicates the need for continuous improvement in infrastructure and digital literacy (Zhao et al., 2024).

According to (Johnson et al., 2016), successful adoption of educational technology requires ongoing support, including professional development, training programs, and adaptive institutional policies. Therefore, regular training for both lecturers and students is essential to maximize the utilization of LMS features (Mutiarra & Koesmawan, 2020).

Moreover, the optimization of learning analytics is crucial to support data-driven decision



making. (Siemens & Baker, 2012) argue that learning analytics can help identify learning patterns, predict academic risks, and design more effective instructional interventions.

CONCLUSION

The development of the Learning Management System (LMS) at STAB Negeri Raden Wijaya demonstrates highly positive outcomes in terms of design validity, instructional alignment, and implementation readiness. The media validation score of 86.67% indicates that the system meets high standards in interface design, navigation, and content organization. The application of the ADDIE model has proven effective in ensuring a systematic and goal-oriented development process aligned with institutional learning objectives.

However, the relatively lower score in the needs analysis (65.2%) highlights the necessity for further refinement, particularly in addressing specific user requirements through enhanced personalization and system flexibility. The implementation of a scaffolding-based content structure has effectively supported progressive learning and improved students' cognitive engagement. In addition, the integration of transparent evaluation features and secure authentication systems (SSO and LDAP) strengthens academic accountability and data integrity.

Despite being deemed feasible for implementation without major revisions, the long-term sustainability of the LMS depends significantly on institutional support. This includes strengthening technological infrastructure, improving digital literacy among users, and providing continuous training for both lecturers and students. Furthermore, the optimization of learning analytics is essential to enable data-driven decision making and to enhance the overall effectiveness of the learning process.

In conclusion, with continuous improvement and adaptive development, the LMS has strong potential to serve as an effective and sustainable digital learning model in higher education.

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