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PRELIMINARY EVALUATION OF THE USE OF EDLINK AND SIAKAD LEARNING MANAGEMENT SYSTEMS AS THE BASIS FOR DEVELOPING A MOODLE- AND GATHER.TOWN-BASED LMS FOR CIVIC EDUCATION

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ABSTRACT

Online learning requires the utilization of Learning Management Systems (LMS) that are not only administratively functional but also support the enhancement of students' digital literacy. This study aims to evaluate the use of existing LMS platforms, namely EdLink and SIAKAD, as the foundation for the subsequent design and development of a Civic Education LMS. A mixed-methods descriptive approach within the initial stages of a Research and Development (R&D) model was employed. Data were collected through questionnaires administered to 20 students and in depth interviews with 4 students focusing on accessibility, interactivity, user interface design, and instructional support. The evaluation results indicate that, overall, EdLink and SIAKAD scored highly in terms of accessibility and administrative management but remain limited in discussion forum interactivity, notification quality, and interface design. These findings highlight the need for designing a more adaptive and interactive Civic Education LMS integrating gamification and artificial intelligence features. This research serves as a preliminary foundation for subsequent expert validation and student trials in the development of the new LMS.

ABSTRAK

Pembelajaran berbasis daring menuntut pemanfaatan Learning Management System (LMS) yang tidak hanya fungsional secara administratif tetapi juga mendukung penguatan literasi digital mahasiswa. Penelitian ini bertujuan mengevaluasi pemanfaatan LMS yang telah digunakan, yaitu EdLink dan SIAKAD, sebagai dasar perancangan pengembangan LMS PPKn pada tahap berikutnya. Penelitian menggunakan pendekatan deskriptif kuantitatif dan kualitatif dengan model Research and Development (R&D) tahapan awal. Data dikumpulkan melalui penyebaran angket kepada 20 mahasiswa dan wawancara mendalam terhadap 4 mahasiswa terkait aspek kemudahan akses, interaktivitas, tampilan antarmuka, serta dukungan pembelajaran. Hasil evaluasi menunjukkan bahwa secara umum EdLink dan SIAKAD mendapat skor tinggi pada aspek kemudahan akses dan manajemen administrasi, tetapi masih terbatas pada interaktivitas forum diskusi, kualitas notifikasi, dan tampilan antarmuka. Temuan ini mengindikasikan perlunya perancangan LMS PPKn yang lebih adaptif dan interaktif dengan integrasi fitur gamifikasi dan kecerdasan buatan. Penelitian ini menjadi pijakan awal untuk tahapan validasi ahli dan uji coba mahasiswa pada pengembangan LMS berikutnya.

Kata kunci: *Literasi Digital, Learning Management System, EdLink, SIAKAD, Evaluasi Awal*

INTRODUCTION

In the digital era, digital literacy has become a foundational competence in higher education, as essential as reading, writing, and numeracy (OECD, 2024). This competence encompasses the ability to understand, manage, and critically evaluate digital information an indispensable skill for the 21st century (Kayyali, 2024). Although today's university students have grown up with technology, not all possess the adaptive skills necessary to maximize the potential of online learning (Western Governors University Survey, 2023).

In the Indonesian context, a national survey conducted by the Ministry of Communication and Information Technology (Kominfo, 2022) reported that the country's digital literacy index reached only 3.49 out of 5 (moderate). UNESCO (2023) also highlighted that students in developing countries continue to face a digital divide, both in the use of technology for learning and in understanding digital ethics. This directly affects learning outcomes, particularly in character-based disciplines such as Civic Education (PPKn), where digital literacy skills are closely linked to civic responsibility, ethical media use, and democratic participation. Thus, strengthening digital literacy is not merely a technical issue but also relates to cultivating informed, critical, and responsible citizens in the digital sphere.

Learning Management Systems (LMS) such as Moodle, EdLink, and SIAKAD have been widely employed to facilitate access to course materials and academic administration. The initial evaluation of these platforms in this study revealed generally positive perceptions (average score of 86%). However, in-depth student interviews exposed fundamental weaknesses, including limited interactivity, monotonous visual design, and less responsive notification and discussion forum features. This context underscores the need to enrich LMS platforms to make them more functional and more engaging for students' active participation in learning.

Numerous studies have identified the potential of integrating gamification and artificial intelligence (AI) into LMS as an effective strategy for enhancing student engagement and motivation. A systematic review demonstrated that gamification in e-learning fosters user interactivity and engagement (Khaldi et al., 2023). Likewise, AI applications in adaptive learning systems have been shown to strengthen personalization and support reflective learning for instance, the SRLAgent module, which has improved learners' self-regulation (Ge et al., 2025).

Nevertheless, most of these studies have been conducted in specific contexts, such as self-directed learning or programming courses. There has been little application of an integrated approach combining Moodle, virtual spaces (e.g., Gather.Town), gamification, and AI for strengthening digital literacy in the context of civic education. A more comprehensive approach is therefore required so that LMS are not only technically efficient but also capable of improving interaction, ethical media practices, and students' digital competence.

The primary aim of the present research is to evaluate the use of existing LMS platforms EdLink and SIAKAD as a preliminary basis for the subsequent design of a Civic Education LMS integrating Moodle and Gather.Town with gamification and AI features to

enhance students' digital literacy. Employing the initial stages of a Research and Development (R&D) model, this study focuses on needs analysis and early evaluation rather than full-scale implementation. The key contribution of this research lies in providing an evidence-based foundation for designing an interactive, adaptive, and learner-centered LMS that addresses digital literacy needs in transforming higher education. By bridging technology, pedagogy, and civic responsibility, this study is expected to contribute to strengthening Indonesian students' digital literacy amid global educational transformation.

METHODS

This study employed a Research and Development (R&D) approach framed within the ADDIE model (Analysis, Design, Development, Implementation, and Evaluation), which is widely used in instructional design to develop and systematically evaluate digital learning systems (Branch, 2009; Molenda, 2015). Although the overall research is designed as a long-term project extending to the development of a new LMS, this paper focuses only on the initial Analysis stage of the existing LMS platforms used by students EdLink and SIAKAD. The emphasis on this stage is to identify the gap between administrative functionality and pedagogical needs for strengthening students' digital literacy.

2.1 Participants

The study involved 20 undergraduate students enrolled in the Civic Education (PPKn) program at a university in Indonesia. This relatively small, purposive sample was selected to gain an in-depth understanding of students' experiences with the existing LMS. Although formal expert validation of a new prototype has not yet been conducted, preliminary informal feedback was obtained from two PPKn lecturers and one information technology expert to enrich the interpretation of the early evaluation findings.

2.2 Research Procedure

This research followed the first stage of the ADDIE model Analysis implemented through the following steps:

1. Identifying students' needs regarding digital literacy and Civic Education learning via questionnaires and a review of the latest LMS literature (e.g., Martin et al., 2020; Khalil et al., 2023).
2. Evaluating the existing LMS (EdLink and SIAKAD) in terms of functionality, interactivity, interface design, and ease of access based on quantitative surveys and in-depth interviews.
3. Analyzing the survey and interview results to uncover patterns of strengths and weaknesses in the current LMS as a foundation for designing the new system in subsequent stages.

The subsequent stages of design, development, implementation, and full-scale evaluation of a new LMS will be carried out in future research once the analysis stage is completed.

2.3 Materials and Instruments

Because this study focused on the initial evaluation of existing LMS platforms, the materials and instruments included:

1. LMS evaluation questionnaire, adapted from online system usability scales (e.g., Ng, 2012; Eshet-Alkalai, 2012), to measure students' perceptions of functionality, interactivity, interface design, and system reliability.
2. Semi-structured interview guide to explore students' experiences in depth, including technical constraints, ease of use, and motivational aspects.
3. Field notes and documentation of EdLink and SIAKAD use during Civic Education learning activities.

2.4 Data Collection

Data were collected through:

1. A quantitative survey administered to 20 students to assess their perceptions of EdLink and SIAKAD.
2. In-depth interviews with 4 selected students to gather qualitative insights into LMS usage.
3. Documentation of learning activities (e.g., assignment submission, discussion forums) to complement the survey and interview data.

2.5 Data Analysis

Quantitative data were analyzed using descriptive statistics (means, percentages, and interpretative categories) to assess students' perceptions of LMS functionality, interactivity, and ease of use. Qualitative data from interviews were analyzed using thematic analysis to identify patterns in students' experiences (Braun & Clarke, 2021). These findings serve as the evidence base for the design of a new LMS in the next stage of the research.

This methodological design ensures that the study remains rigorous, contextually relevant, and aligned with international standards for digital education development (Martin et al., 2020; Sangrà et al., 2019), even though this paper reports only on the initial evaluation phase.

FINDINGS AND DISCUSSION

3.1 Initial Evaluation of the LMS (EdLink/SIAKAD)

Prior to designing a new system, an initial evaluation was conducted on the LMS currently used by the study program, namely EdLink and SIAKAD. Quantitative survey results show an average score of 86%, indicating that overall students perceive both platforms as functional and able to support basic online learning needs, particularly in terms of course material access, dissemination of academic information, and administrative management.

However, in-depth interviews with students revealed several significant weaknesses. For example, one respondent stated:

> "The notification feature feels unresponsive and less informative… its appearance is monotonous and unattractive." (OKW)

Another respondent emphasized the limitations of discussion forums and technical issues:

> "The discussion forum is not interactive… assignment uploads often fail during weak connections." (AE)

These findings highlight a clear contradiction between the generally positive quantitative survey results and the qualitative experiences of students who point to serious limitations in interactivity and user experience (UX). This aligns with the student engagement framework, which underscores that administrative satisfaction does not automatically guarantee students' academic engagement (Kahu, 2013; Bond et al., 2021). In other words, a technically stable LMS does not necessarily foster motivation, social connectedness, or active participation in online learning.

Recent studies have also emphasized that conventional LMSs tend to focus on managerial functions and content delivery but often overlook user-centered design and pedagogical engagement (Al-Fraihat et al., 2020; Muthuprasad et al., 2021; Martin et al., 2023). This directly affects the quality of students' learning experiences, particularly in discussion- and reflection-based courses such as Civic and Pancasila Education (PPKn).

The Indonesian context further underscores this urgency. The 2023 Indonesia Digital Literacy Index released by Kominfo stands at 3.49 out of 5 (moderate category), revealing significant gaps in digital technology use especially in terms of security, ethics, and online collaboration (Kominfo, 2023). In this study, issues such as slow notifications, passive discussion forums, and failed uploads due to weak internet connections are not merely technical problems but also challenges in ensuring equity of access and equal learning opportunities for all students.

Thus, the initial evaluation of EdLink and SIAKAD yields an important conclusion: although both systems are relatively functional in supporting administrative needs, their limitations in interactivity, user experience, and adaptability make them insufficient to meet 21st-century digital literacy demands. Therefore, the development of a new LMS should emphasize interactivity, responsiveness, and inclusivity, particularly through the integration of gamification and artificial intelligence (AI) to support more participatory learning, adaptive personalization, and the strengthening of students' digital literacy.

3.2 Student Trial

Evaluation was also carried out through students' perceptions of EdLink and SIAKAD. Questionnaire and interview results indicate that, in general, students appreciate the ease of access and integration with the academic system, which scored an average of 86%. However, students also highlighted several key obstacles.

As one respondent noted:

> "The discussion forum is not interactive, and assignment uploads often fail during weak connections." (AE)

Another student echoed concerns about notifications and interface design:

> "The notification feature is unresponsive, and the interface is monotonous, so I rarely open the application regularly." (OKW)

These findings are consistent with recent research emphasizing that students' satisfaction with LMSs is strongly influenced by the quality of interactivity, interface design, and technical reliability (Martin et al., 2022; Khalil & Ebner, 2023).

Table 1 summarizes students' perceptions of the strengths and weaknesses of EdLink/SIAKAD:

User Experience Aspect	Positive Feedback	Negative Feedback
Ease of Access	Easy login, directly linked to academic data	Dependent on network stability, slow during peak hours
Interactivity	Discussion forum available	Forum inactive, interaction feels one-way
Assignment Upload	Relatively simple process	Frequent failures during weak connections, no auto-save feature
Notifications & UI	Consistent appearance	Monotonous design, notifications not real-time
Overall Satisfaction	86% rate the system as sufficiently functional	Students expect more modern features (e.g., gamification, mobile integration)

Questionnaire results also show positive responses, particularly on interactivity, ease of navigation, and content variety. However, technical issues remain, such as dependence on internet stability and high access loads when using virtual room features. These can be seen in Table 2 below:

Table 2. Student Trial Results

Assessment Aspect	Average Score	Percentage	Category
Quality of PPKn Content	4.4/5	88%	Excellent
LMS Features & Services	4.3/5	86%	Excellent
Interface & Navigation	4.2/5	84%	Good
Digital Interaction & Participation	4.5/5	90%	Excellent
Technological Aspects (Accessibility, Integration)	4.1/5	82%	Good
Security & Accountability	4.4/5	88%	Excellent
LMS Development & Innovation	4.6/5	92%	Excellent
Total Average	–	87%	Excellent

Based on these results, it can be concluded that EdLink and SIAKAD still play an important role in supporting course administration but are not yet optimal as interactive and adaptive learning environments. These findings imply the need for an LMS transformation that is more responsive to students' needs, particularly in supporting active engagement, collaboration, and digital learning experiences aligned with the literacy of the current generation (Bond et al., 2023; Zheng et al., 2024).

3.3 Implications for Research and the Development of the New LMS Module

The initial evaluation of EdLink and SIAKAD shows that, although the quantitative scores obtained are relatively high in terms of ease of access and course administration management, there are consistent complaints from students regarding the lack of interactivity, non-intuitive interface design, and unresponsive notification features. These

findings indicate a fundamental gap between the current LMS's administrative functions and the needs of 21st-century digital learning pedagogy.

The implication of these findings is the necessity to design a new PPKn LMS that not only manages administration but also delivers a more interactive, adaptive, and collaborative learning experience. The new system is planned to be based on Moodle combined with Gather.Town to create a virtual classroom environment that simulates face-to-face interaction. The integration of gamification and adaptive AI feedback is also expected to enhance motivation, personalized learning, and students' digital literacy.

The initial design of the new LMS module is outlined in Table 3 below:

Innovation Component	Initial Design Description	Expected Pedagogical Benefit
Interactive Gamification (points, badges, leaderboard)	The module will provide mechanisms for earning points, achieving badges, and a leaderboard based on student activities.	Increase learning motivation, healthy competition, and active student participation.
Adaptive AI Feedback for quick and personalized responses	The system will include simple algorithms that automatically provide feedback on students' exercises or discussions promptly.	Provide personalized learning, save lecturers' time, and improve system responsiveness.
Integration of Gather.Town as a collaborative virtual classroom	Plan to use Gather.Town to create virtual classroom simulations supporting group discussions, presentations, and collaborative activities.	Deliver a learning experience closer to face-to-face interaction and enhance digital collaboration skills.

Expert validation and student trials (as described in subsections 3.2 and 3.3) will serve as the basis for refining the system design prior to large-scale implementation. At this stage, the study still focuses on evaluating the existing systems and designing the new module as a strategic response to the initial findings.

This approach is consistent with recent studies showing that LMSs integrating gamification, AI, and virtual collaborative spaces significantly improve students' learning motivation, personalized learning, and digital literacy (Khalil et al., 2023; Yilmaz & Karaoglan Yilmaz, 2023; Zheng et al., 2024). In addition, recent research confirms that integrating interactive virtual spaces such as Gather.Town into Moodle-based LMSs strengthens students' engagement and sense of community in online learning (Park et al., 2022; Song et al., 2023).

Thus, the main implication of this study is that the evaluation of EdLink and SIAKAD provides a strong empirical foundation for designing and developing a new LMS that is more responsive to 21st-century digital learning needs. The initial design also enables systematic iteration and refinement through expert validation and student trials in the next stage.

CONCLUSION

This study demonstrates that although EdLink and SIAKAD platforms achieved high scores in terms of functionality (average 86%), students consistently reported concerns regarding limited interactivity, interface design, and notification systems. These findings highlight a fundamental gap between the administrative functions of existing LMSs and the pedagogical demands of the 21st century, which emphasize active engagement, personalized learning experiences, and advanced digital literacy. Within the context of Indonesia's current educational policies promoting digital transformation and the "Merdeka Belajar" initiative, such a gap has the potential to hinder the attainment of 21st-century competencies if not addressed through systemic innovation.

Practically, the development of a Moodle and Gather.Town-based PPKn LMS integrating interactive gamification features (points, badges, leaderboards), AI-driven adaptive feedback, and virtual collaborative spaces represents a strategic next step. This approach is expected to enhance student motivation, personalization, and digital literacy while simultaneously strengthening the quality of pedagogical interaction. Theoretically, the study enriches the international literature underscoring the importance of integrating pedagogical, technological, and user experience design aspects in modern LMS development (e.g., Khalil et al., 2023; Yilmaz & Karaoglan Yilmaz, 2023; Zheng et al., 2024), while also providing an empirical foundation for an adaptive PPKn LMS model aligned with Indonesia's educational transformation policies.

This study is limited to the initial evaluation of existing platforms and has not yet reached the stages of expert validation or pilot testing of the new module. However, this limitation opens avenues for future research. The next planned phase involves designing a comprehensive new LMS module, conducting expert validation on pedagogical and technical aspects, implementing limited trials with students, and evaluating its effectiveness in enhancing motivation, digital literacy, and learning outcomes. The findings from these subsequent stages are expected to contribute not only to the institutional-level development of the PPKn LMS but also to serve as a policy reference for strengthening Indonesia's digital learning ecosystem.

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