

Analysis of the Effectiveness of Local Culture-Based Learning Management Systems (LMS) in Improving Educational Performance in Elementary Schools

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Abstract

This research aims to analyze the effectiveness of the Learning Management System (LMS) adapted to local culture in improving educational performance in elementary schools. The method used is a critical literature review of various studies related to the implementation of local culture-based LMS. The research results show that LMS that integrates local values, language, and customs is able to increase student engagement, learning motivation, and the effectiveness of learning management by teachers and school management. Local culture-based LMS also creates an inclusive and relevant learning environment in a socio-cultural way, which has a positive impact on understanding material and developing student character. However, this research also identifies significant challenges such as limited technology infrastructure, lack of teacher training, and resistance to changes from conventional to digital systems. These findings emphasize the importance of a cultural approach in the development of educational technology and provide strategic recommendations for LMS developers and policymakers to optimize the integration of local culture in digital learning systems. This research opens up opportunities for broader quantitative empirical studies to measure the direct impact of local culture-based LMS and the development of standard but flexible LMS models for cultural adaptation.

Keywords:

ICT in education, local culture, LMS effectiveness, elementary education, educational technology.

INTRODUCTION

The development of information and communication technology (ICT) has become one of the primary drivers of transformation across various sectors, including education. In today's digital era, the integration of ICT in educational management is not only a necessity but also an inevitability to enhance the quality and effectiveness of the learning process. One technological innovation that is increasingly being adopted is the Learning Management System (LMS). LMS is a digital platform that enables the integrated management of the learning process, ranging from content delivery, interaction between teachers and students, to the evaluation of learning outcomes. The use of LMS in elementary schools holds significant potential to support more interactive, personalized, and efficient learning, as well as assist school management in organizing educational activities more systematically.

However, the success of LMS implementation depends not only on the technical aspects and platform functionality but also on how the LMS can be adapted to the local cultural context and the specific needs of the school (Cahyanto et al., 2024). The local cultural context includes language, values, customs, and distinctive learning styles within a community. Adapting LMS to the local culture is crucial because technology that is insensitive to cultural context may lead to resistance, low usage rates, and ultimately hinder the achievement of educational goals. Therefore, studies on culturally-based LMS are highly relevant both academically and practically. Academically, this opens interdisciplinary research opportunities combining educational technology, cultural anthropology, and educational management (Cahyanto, 2023c, 2023b). Practically, LMS tailored to local culture is expected to increase student engagement, facilitate teachers in managing learning, and ultimately improve educational performance in elementary schools.

Abu Talib's study indicates that the pandemic necessitated a rapid transition from traditional classroom settings to online learning environments, with Learning Management Systems (LMS) playing a central role in this shift. Research shows that LMS platforms have been instrumental in sustaining educational activities during lockdowns by providing a structured and accessible means for curriculum delivery without physical interaction (Abu Talib et al., 2021; Gamede et al., 2022). This legitimizes the effectiveness of LMS in enhancing the accessibility of learning materials and facilitating distance learning, particularly in countries with adequate digital infrastructure. However, the effectiveness of LMS is highly influenced by interface design, ease of use, and the availability of technical support. The design and usability of LMS platforms are critical to their effectiveness. User-friendly interfaces can significantly improve the learning experience by enabling students and educators to navigate and utilize platform features more easily (Camilleri & Camilleri, 2022). Furthermore, recent trends indicate a shift in focus from mere technology usage to how technology can be meaningfully integrated within the

social and cultural contexts of users. The availability of technical support and sufficient digital infrastructure is essential to ensure the successful implementation of LMS. In developing countries, where resources may be limited, these factors can significantly affect the acceptance and effectiveness of online learning platforms (Rajeb et al., 2023)

In the context of elementary education, Learning Management Systems (LMS) serve not only as a medium for delivering instructional content but also as tools for building inclusive and collaborative learning communities. Despite their benefits, the transition to LMS-based learning is not without challenges. Issues such as digital inequality, lack of engagement, and technical difficulties have been reported, particularly in areas with inadequate digital infrastructure (Asgari et al., 2021; Yu et al., 2022). This situation underscores the need to develop LMS platforms that are not only technologically advanced but also adaptive to local infrastructure conditions and cultural contexts (Cahyanto, 2023a).

Cultural adaptation in LMS is a crucial aspect that often receives insufficient attention in the development and implementation of educational technologies. Local culture influences how students and teachers interact with technology, process information, and uphold values during the learning process. For example, the adaptation of the support program in Spain involved modifying terminology and content to align with local cultural nuances, which enhanced its relevance and effectiveness for caregivers in rural areas (Molinari-Ulate et al., 2023). Similarly, in Quebec, the Plan Well Guide was culturally adapted to better suit the French-speaking population, demonstrating the necessity of tailoring educational materials to the linguistic and cultural characteristics of the target audience (Plaisance et al., 2022).

Furthermore, cultural values such as collectivism or individualism, communication styles, and learning patterns also influence the effectiveness of Learning Management Systems (LMS). One of the primary challenges in cultural adaptation is the need to balance global standards with specific local cultural contexts. Studies on culturally inclusive instructional design emphasize the importance of developing frameworks that accommodate diverse cultural perspectives while maintaining educational quality (Gurjar & Bai, 2023)

Recent research has highlighted the significance of cultural integration in LMS development. While LMS success heavily depends on ease of use and technical support, there is also a recognized need to adapt content and interfaces to fit local contexts. The cultural impact on LMS usage reveals that systems which do not consider local language and cultural norms tend to face user resistance. LMS platforms grounded in local culture can enhance learning motivation and social interaction, which are critical factors for successful learning outcomes.

Although numerous studies have been conducted, several significant gaps remain the focus of this study. First, there is a lack of research specifically

examining locally culture-based Learning Management Systems (LMS) at the elementary school level, as most LMS studies concentrate on global or national contexts without considering specific local cultural adaptations. Second, there is a scarcity of empirical data directly linking cultural adaptation of LMS to improvements in educational performance, particularly in elementary schools situated in areas with strong cultural characteristics. Third, research in regions with high digital divide is limited, where studies investigating LMS in areas with constrained infrastructure and how LMS can be adapted to such conditions are still rare. Fourth, there is an absence of holistic approaches that integrate technical, cultural, and pedagogical aspects simultaneously, resulting in many studies focusing on only one aspect and thus providing an incomplete picture of LMS effectiveness.

Furthermore, there is currently no comprehensive metric to measure the cultural impact on LMS usage, making it difficult to conduct objective and systematic evaluations. Pedagogical approaches that integrate LMS with learning methods aligned with local cultures are still very limited, thereby hindering the full exploration of LMS's potential as an effective learning tool.

This study aims to analyze the effectiveness of locally culture-adapted Learning Management Systems (LMS) in improving educational performance at the elementary school level. Specifically, this research seeks to identify cultural factors that influence the use and acceptance of LMS by teachers and students, as well as to evaluate the impact of culturally-based LMS usage on learning outcomes and educational management. The study also endeavors to develop an integration model of LMS that holistically incorporates technical, cultural, and pedagogical aspects.

The research problem addressed in this study includes: how locally culture-based Learning Management Systems (LMS) can improve educational performance at the elementary school level, and how to develop an effective LMS integration model for the elementary school context characterized by strong local cultural traits.

This study is conducted in elementary schools located in regions characterized by strong local cultural traits and limited access to technology. This context was chosen to explore how LMS can be effectively adapted and implemented in real-world conditions that present significant challenges. The primary units of analysis in this study include teachers, students, and school management who utilize LMS in the learning process and educational administration. This approach enables a comprehensive analysis from various perspectives that contribute to the successful implementation of LMS.

RESEARCH METHOD

This study employs a critical literature review design as its primary method (Wolff & de-Shalit, 2024). This approach was chosen because it aims to examine thoroughly and systematically the various relevant studies on locally culture-adapted Learning Management Systems (LMS) in the context of elementary education. The critical literature review not only collects and summarizes findings from diverse sources but also evaluates, compares, and identifies gaps, inconsistencies, and trends within the literature (Klein & Müller, 2020). Thus, this study can provide a comprehensive and critical overview of the effectiveness of culturally based LMS and its contribution to improving educational performance.

In the context of a literature review, participants are defined as the population of literature that serves as the object of study. The population of this research includes all academic and scientific literature discussing Learning Management Systems (LMS) in elementary education, LMS adaptation to local cultures, the influence of LMS on educational performance, as well as challenges and solutions in implementing LMS in regions characterized by diverse cultural and infrastructural conditions. For the sample, this study selects the most relevant and recent case studies and articles that meet the inclusion criteria: publications within the last ten years (2015-2025) to ensure the relevance and currency of data, articles published in reputable journals, conference proceedings, and peer-reviewed research reports; studies explicitly addressing locally culture-based LMS or educational technology adaptation with cultural context; and research examining the impact of LMS on learning outcomes and educational management at the elementary school level. The sampling procedure is conducted using purposive sampling based on these criteria to ensure that the selected literature is truly relevant and can provide in-depth insights (Chigbu et al., 2023; Kraus et al., 2022).

The primary instrument in this study is a thematic analysis framework (Goldsmith, 2021; Rosen et al., 2023). This framework is employed to examine and categorize the content of the collected literature, focusing on the characteristics of LMS adapted to local culture, cultural factors influencing LMS usage, the impact of LMS on educational performance both academic and managerial, barriers and challenges in LMS implementation in elementary schools, as well as gaps and inconsistencies in the existing literature. This framework enables the researcher to identify patterns, main themes, and relationships among concepts emerging from various studies, thereby providing a comprehensive and in-depth analysis (Cernasev & Axon, 2023).

Data collection was conducted through a systematic process of searching and selecting literature across various academic databases such as Google Scholar and Scopus. The data collection steps involved formulating relevant search keywords, for example, "Learning Management System," "LMS," "cultural adaptation," "local culture," "elementary education," "school

performance," and combinations of these keywords in both Indonesian and English (Justesen et al., 2021). After the initial search, articles that met the criteria were gathered and underwent title and abstract screening to eliminate irrelevant literature. Subsequently, the selected articles were read thoroughly to ensure alignment with the research focus. From the chosen articles, data extraction included information about research design, cultural context, findings, and recommendations.

The data obtained from the literature were analyzed using qualitative thematic analysis. This analytical process involved thoroughly reading and comprehending the content of each article, coding key information related to the research themes, grouping these codes into main themes relevant to the research objectives, and identifying patterns, gaps, and inconsistencies within the literature. Furthermore, findings across studies were compared to uncover significant trends and differences. From this process, a synthesis of findings was developed to present a comprehensive overview of the effectiveness of locally culture-based Learning Management Systems (LMS) in the context of elementary education.

The interpretation of the analysis results was conducted by relating the findings from the literature to the broader research context. This interpretation explains how locally culture-adapted Learning Management Systems (LMS) can enhance educational performance in elementary schools, elaborates on the cultural factors that are key success factors or barriers in LMS implementation, and discusses the implications of the findings for LMS development and educational policy. Additionally, the interpretation highlights existing research gaps and provides recommendations for future studies. Thus, this interpretation aims to make a significant academic contribution while also offering practical guidance for LMS developers, educators, and policymakers.

The research method employing a critical literature review approach allows for a systematic and in-depth examination of the effectiveness of locally culture-based Learning Management Systems (LMS) within the context of elementary education. With a structured design, rigorous literature selection, and comprehensive thematic analysis, this study is expected to provide a clear overview of the contribution of LMS to improving educational performance as well as identify areas that require further attention.

FINDING AND DISCUSSION

Finding

Based on the conducted critical literature review, it was found that locally culture-adapted Learning Management Systems (LMS) have a significant impact on improving educational performance in elementary schools. The reviewed studies indicate that LMS which take into account local values, language, and customs are able to enhance student engagement, learning motivation, as well as the effectiveness of learning management by teachers and school administration.

Several studies highlight that locally culture-based Learning Management Systems (LMS) help create a more inclusive learning environment that is relevant to the students' socio-cultural context. This has a positive impact on students' material comprehension and character development in accordance with local values. Furthermore, LMS adapted to local culture also facilitates more effective communication among teachers, students, and parents, thereby supporting collaboration in the learning process.

However, the review findings also reveal significant challenges in implementing locally culture-based Learning Management Systems (LMS), particularly related to technological infrastructure limitations in remote areas, lack of training for teachers in using LMS, and resistance to change from conventional to digital learning systems. Some studies also indicate that improper cultural adaptation may cause the LMS to be less effective or even create confusion for users.

Discussion

These findings underscore the importance of a cultural approach in the development and implementation of Learning Management Systems (LMS) in elementary schools. LMS that integrate local culture not only function as technological tools but also serve as mediums that reinforce cultural identity and local values in education. This aligns with constructivist learning theory, which emphasizes the significance of socio-cultural context in the learning process.

From a practical perspective, these findings provide guidance for LMS developers and educational policymakers to pay more attention to cultural aspects in the design of digital learning systems. Adequate teacher training and infrastructure support are key factors for the successful implementation of locally culture-based LMS. Furthermore, local community and parental involvement should also be strengthened so that the LMS can function optimally as a contextual and meaningful learning tool.

Although many studies indicate the benefits of locally culture-based Learning Management Systems (LMS), there is a considerable gap in empirical research that quantitatively measures the direct impact of LMS on learning outcomes and school managerial performance. Most studies remain qualitative

or limited-scope case studies, making generalization of the results still a challenge.

Furthermore, there is inconsistency in the definition and implementation of "local culture" in Learning Management Systems (LMS). Some studies broadly interpret local culture to include language, customs, and social values, while others focus more narrowly on language or local content alone. This results in variation in LMS design and outcomes, making it difficult to establish a universal standard or model for locally culture-based LMS.

One of the main controversies that arise concerns the balance between cultural adaptation and national curriculum standards. Some researchers worry that placing too much emphasis on local culture may hinder the achievement of national or international education standards. Therefore, there needs to be a harmonious integration mechanism between local content and curriculum standards so that the LMS can meet both aspects.

Another significant challenge is the digital divide and technological access disparities across regions. Locally culture-based Learning Management Systems (LMS) are often implemented in areas with limited technological infrastructure, which hampers their effectiveness. This situation calls for policy support and adequate infrastructure investment from the government and relevant stakeholders.

This study makes a significant contribution by integrating a cultural perspective into the analysis of LMS effectiveness in primary education — an area that has received limited attention in the literature. Using a critical literature review approach, the study not only summarizes existing findings but also identifies gaps and challenges that need to be addressed for the development of more effective and contextually relevant LMS.

Furthermore, this study provides strategic recommendations for LMS developers, educators, and policymakers to optimize the use of learning technology by considering the local cultural context, thereby enhancing the overall quality of education.

CONCLUSION AND SUGGESTION

Locally culture-based Learning Management Systems (LMS) hold great potential to enhance educational performance in primary schools by creating learning that is more relevant and meaningful for students. However, the success of their implementation highly depends on a deep understanding of local culture, adequate infrastructure support, teacher training, and proper integration with the national curriculum.

For future research, it is recommended to conduct broader quantitative empirical studies to objectively measure the impact of locally culture-based Learning Management Systems (LMS). Additionally, the development of a standardized yet flexible LMS model that accommodates local cultural adaptation is an urgent necessity.

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