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Understanding Pre-Service Elementary Teachers' Expectations for a Culture-Integrated Learning Management System

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Abstract: The increasing demand for learning platforms that effectively integrate local wisdom and cultural content necessitates an understanding of user expectations, especially among pre-service elementary teachers (PSETs) who will utilize these tools. This study aims to identify the expectations of PSET students regarding the design and implementation of a culture-integrated Learning Management System (LMS), and to explore the challenges they encounter in its use. This study employs a mixed-methods approach, collecting data through a survey administered to 30 PSETs and in-depth interviews with four participants (two male and two female) from the Elementary School Teacher Education Study Program at Yogyakarta State University. The findings reveal seven main aspects that affect the LMS user experience: ease of access, clarity of navigation, material management, speed of assignment collection, technical problems, timely notification, and discussion features. The survey and interview results indicate that technical issues and accessibility remain the primary challenges, while aspects of material management and speed of assignment submission receive positive ratings. Students emphasize the importance of interactive features, culturally relevant content, and an improved LMS interface design. This study concludes that continuous improvements in accessibility, technical support, and the strategic integration of culturally relevant content are crucial for enhancing the learning experience of PSETs. These findings contribute to the body of knowledge by providing specific, empirically-driven design and implementation recommendations for developers and educators seeking to create culturally sensitive and effective digital learning environments for future elementary school teachers.

Keywords: learning management system, elementary, culture-integrated learning

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Introduction

Amidst the crucial role of technology in 21st-century learning, the integration of Learning Management Systems (LMS) still faces significant challenges in effectively accommodating specific pedagogical and cultural contexts. LMS has been proven to have a positive impact, increasing flexibility, interactivity, and student academic outcomes, especially when attention is given to content and service

quality (Aldabbas et al., 2025; Gunawan et al., 2020). However, in countries with rich cultural diversity, such as Indonesia, the use of generic LMS often fails to utilize the potential of local wisdom. Although LMSs are widely used in higher education institutions (especially post-COVID) for blended learning, a gap exists between standard LMS design and the specific needs of pre-service elementary teachers (PSETs) to teach culturally relevant content.

This study focuses on the effectiveness of LMSs in the context of Primary School Teacher Education, particularly in integrating culture-based learning. Previous studies have confirmed that LMS features, such as communication, content, and assignments, have a direct impact on satisfaction, engagement, and learning outcomes of pre-service teachers (Aulianda et al., 2023). However, most studies on LMS focus on technical features or their general impact, without delving into how LMS content and design should be explicitly modified to deeply integrate cultural context. In fact, learning resources that integrate culture are very important; they help students understand the material in its cultural context, which iselevant to their social environment, and encourage active participation (Singh, 2025; Sukmadinata & Alexon, 2012). The main gap that needs to be addressed is the lack of empirical understanding of PSET's specific expectations as a key user regarding the design and implementation of LMS that deliberately integrates culture-based learning.

To bridge this gap, this study focuses on BeSmart, an LMS-based digital learning platform developed by Yogyakarta State University. BeSmart was developed to support blended learning in elementary school strategy courses, with a focus on culture-based learning, and is equipped with features and content that integrate local culture. The integration of culture into digital systems can increase students' appreciation of local culture, strengthen identity, and improve motivation, engagement, and academic outcomes (Almonte et al., 2024; Anyichie & Butler, 2023; Balkaya & Akkucuk, 2021). This integration transforms the LMS from a mere content-delivery tool into an interactive space that fosters appreciation for local wisdom, but its effectiveness depends heavily on acceptance and alignment with user needs.

Therefore, in developing a prospective LMS, it is important to go beyond lecturers' thinking and actively involve the needs analysis of pre-service elementary teachers, the main users. Understanding the expectations and needs of PSETs regarding features, user experience and the challenges they face in using a culture-based LMS is crucial. This user-based approach ensures that LMS development is truly relevant, adaptive, and capable of supporting the learning process in line with students' social and cultural contexts, while strengthening their motivation and engagement in learning. Thus, this study aims to answer the following questions: “What are the expectations of pre-service elementary teachers regarding the design and implementation of an LMS that integrates culture-based learning, and what challenges do they face in its use?”

Methods

This study adopted a mixed methods approach with an exploratory sequential design. This approach was chosen to gain a holistic, in-depth understanding of preservice elementary teachers' expectations regarding the design and implementation of a culturally integrated Learning Management System (LMS). The research subjects were students at the Elementary School Teacher Education Study Program at Yogyakarta State University. The data collection procedure was carried out in two consecutive stages in July 2025. The first stage involved 30 students who participated in quantitative data collection through a semi-open questionnaire/survey instrument. This questionnaire focused on the LMS's functionality, ease of access, interaction features, and culture-based content, aiming to identify general user trends and preferences. The second stage was qualitative data collection through semi-structured in-depth interviews with four selected participants (two women and two men). This balanced interview sample was selected through purposive sampling to ensure depth and diversity of perspectives, thereby providing a richer and more detailed picture of their views, experiences, and challenges.

The main instruments used were survey questionnaires and interview guidelines for in-depth interviews. Quantitative data analysis from the survey was conducted using descriptive statistics (averages and percentages) to identify dominant trends and rankings of key aspects of LMS. Meanwhile, qualitative data were analyzed using thematic analysis, including transcription, open coding, and the development of main themes to reveal the reasons behind users' specific preferences and needs. Finally,

the results of these two approaches were integrated and compared to provide a comprehensive understanding, with quantitative findings explained and enriched by qualitative data, ensuring that LMS development recommendations were grounded in the real needs of pre-service elementary teachers.

Results and Discussion

Results

The results of this study provide a survey involving 30 elementary school pre-service teachers and in-depth interviews with four students from the same group. The survey collects quantitative data on student perceptions and expectations of a Learning Management System (LMS) that integrates culture into learning. The survey method uses seven aspects, with the following results.

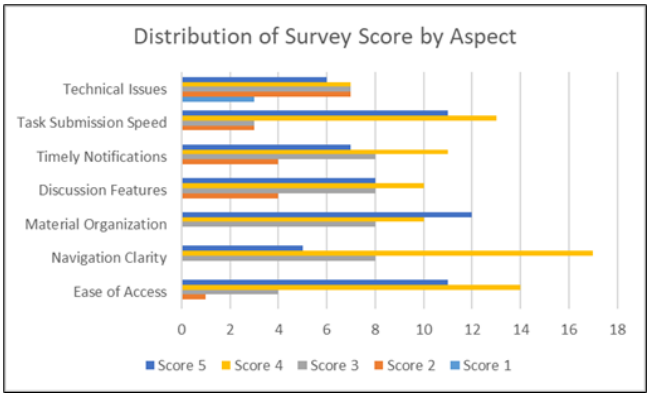

Figure 1. Distribute of Survey Score by Aspect

The diagram above provides a comprehensive overview of students' perceptions of various aspects of the current Learning Management System (LMS) in use, based on survey responses. The 'Task Submission Speed' and 'Material Organization' categories emerged as the highest-scoring across the respondent group. This indicates general satisfaction with how efficiently assignments can be submitted and with how well the learning materials are structured and made available on the platform. The LMS's ability to facilitate smooth, timely assignment submission is essential to students' academic workflow, enhancing their ability to meet deadlines and reducing procedural anxieties associated with timely coursework completion. Moreover, well-organized material presentation contributes significantly to students' learning autonomy, ease of study, and overall motivation by providing clear pathways through course content.

In contrast, the aspects related to 'Navigation Clarity' and 'Ease of Access' received lower scores, indicating substantive barriers students face when using the LMS intuitively. Navigation clarity refers to how straightforward it is for users to find and move between important sections, such as lecture notes, assignments, and discussion forums. If navigation paths are confusing or overly complex, students may experience frustration, increased cognitive load, and wasted time merely trying to locate essential resources. Ease of access further expands this concern by addressing how easily users can log in to and interact with the LMS, including system responsiveness, platform compatibility across devices, and accessibility features for users with disabilities. Low scores in these areas reveal that technological or design shortcomings still hinder the user experience, preventing full and effective engagement with the digital learning environment.

Other aspects, such as 'Technical Issues', 'Timely Notifications', and 'Discussion Features' cluster around medium scores. These indicate a more mixed perception among the student body, with some users recognizing these areas as adequate or strength points, while others experience difficulties or unmet expectations. Technical issues often involve system instability, server disruptions, software bugs, or compatibility glitches, impacting usability and causing interruptions during critical learning moments. Timely notifications address the system's capacity to inform students promptly about deadlines, announcements, and changes, which are crucial for self-regulated learning. Meanwhile, discussion features include tools within the LMS to foster communication, peer interaction, and active

learning through forums, chat rooms, and collaborative spaces. The middling evaluations suggest that while these features are functional, they lack polish or depth, underscoring room for improvement to enhance interactivity and communication.

In addition to examining the pattern of survey scores, this study conducted a more detailed statistical analysis to examine the consistency and diversity of students' perceptions of each LMS aspect. Key measures, including standard deviation, variance, coefficient of variation, and range, were used for each indicator. These statistics provide deeper insights into how student opinions about different LMS features vary beyond the simple average score.

Standard deviation and variance measure the extent to which student ratings for each feature differ from the average response. A low standard deviation indicates that most students rated the aspect similarly, suggesting a uniform experience—either positive or negative. Conversely, a high standard deviation indicates markedly different experiences, suggesting inconsistent functionality or satisfaction levels across the user base.

The coefficient of variation offers an additional perspective by expressing variation relative to the mean; this allows comparison of variation across aspects with different average scores. Aspects with a high coefficient of variation are more polarized among students, even if their average scores are not the lowest. Similarly, the range (the difference between the highest and lowest ratings) highlights the span of experiences—whether the LMS performs unevenly across different groups of students or under specific conditions within the same aspect.

Together, these statistical tools provide a nuanced picture of which LMS features are consistently effective versus which ones lead to divided or variable user experiences. Identifying aspects with high variability is important because it helps decision-makers prioritize improvements and target further investigation. By focusing not just on mean scores but also on variability, the study ensures that recommendations for LMS development are based on real patterns of use rather than just headline statistics. The full results of these variability analyses are presented in the following table.

Table 1. The Results of the Variability Analysis

Aspect	Standard Deviation	CV	Variance	Range
Ease of Access	6.205	1.034	38.500	14
Navigation Clarity	7.036	1.173	49.500	17
Material Organization	5.657	0.943	32.000	12
Discussion Features	4.000	0.667	16.000	10
Timely Notifications	4.183	0.697	17.500	11
Task Submission Speed	5.657	0.943	32.000	13
Technical Issues	1.732	0.289	3.000	4

The analysis shows that Navigation Clarity has the highest level of variation among all aspects, with a standard deviation of 7,036 and a coefficient of variation of 1.173. Its mean indicates that the clarity of navigation on the LMS is highly diverse. In contrast, the Technical Issues aspect showed the lowest variation, with a standard deviation of 1.732 and a coefficient of variation of 0.289. It means that respondents tended to have almost uniform assessments of the technical problems they experienced. This finding shows a significant difference in the level of perception of the navigation aspect, whereas the technical issues aspect shows consistent assessment among students.

Further below is the data from the interviews. Interviews aimed to deepen understanding of students' experiences, needs, and expectations regarding the LMS's features and functions. Four students were interviewed under the codes S1 (first student), S2 (second student), S3 (third student), and S4 (fourth student). The excerpts of the interview results are described as follows.

Table 2. The Interview Results

Participant	Quotes of the Interviewees' Answer	Thematic Code
S1	"Discussion and interaction features are still limited... discussions are less lively"	Discussion features
S2	"As far as using the LMS... I found difficulties with the server."	Server issue
S2	"...it would be useful to have more responsive interactive features available...."	Interactive learning
S4	"I want varied learning content such as videos, PDF material descriptions, PowerPoints, online quizzes..."	Learning sources
S2	"Difficult to access via mobile app"	Accessibility
S4	"The font is not comfortable to read... the display is not characterized by culture-based courses..."	User interface
S3	"...add examples from daily life and a video simulating culture-based learning in elementary school..."	Cultural content integration

After the interviews were collected and coded, the interviewees' quotes with the identified thematic codes were presented in a table with participant, quote, and thematic code columns. Based on the table, seven thematic codes were identified from the interviews with the four students. Based on the interpretation, it shows that server errors when accessing the LMS are one of the main challenges. On the content side, students emphasized the importance of learning sources, integrating cultural content, and interactive learning. They want features that can trigger interactive learning, such as the provision of varied content-including videos, material explanations, PPTs, and quizzes-as well as the addition of daily life examples relevant to culture-based learning in elementary schools. In addition, user interface and accessibility are also challenges for LMS development. To clarify the flow and relationships between the source quotes and the main themes from the coding results, the data were visualized in the following Sankey diagram.

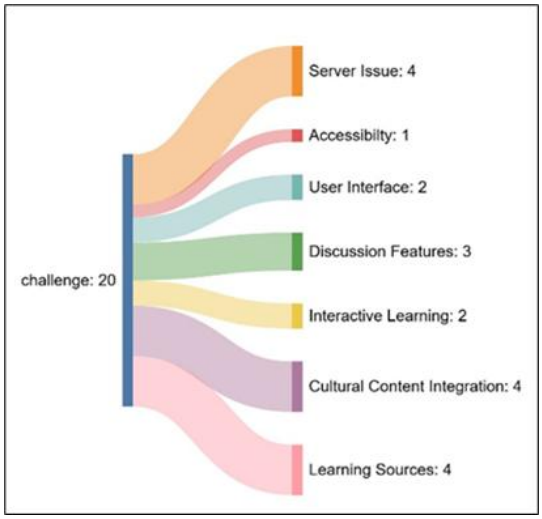

Figure 2. The Sankey Diagram of Coding Based on Interview

The Sankey diagram above provides a visual summary of the distribution and frequency of key challenges students encounter when interacting with a Learning Management System (LMS), based on qualitative interview data from 4 participants. Each flow in the diagram represents the number of citations associated with each identified challenge, giving a transparent, data-driven overview of issues that most significantly impact the user experience.

A closer look at the diagram reveals that out of 20 coded references to challenges, server issues and learning source limitations are the most recurrent problems, each cited four times by the participants. The frequency with which server issues are mentioned underscores persistent concerns over LMS reliability. Students often noted that downtime or technical interruptions could disrupt lesson delivery, delay time-sensitive assignment submissions, and undermine overall trust in the platform. Stable and robust server infrastructure is repeatedly advocated as an urgent improvement area, consistent with prior literature highlighting technological reliability as foundational to effective online learning environments.

Equally prominent are concerns about learning sources, which were also cited 4 times. This signals ongoing difficulties regarding the diversity and availability of high-quality, relevant digital resources within the LMS. A limited variety of learning materials may reduce student engagement and limit opportunities for differentiated instruction. For an LMS to meet the needs of varied student cohorts, it must curate and distribute a wide range of multimodal resources that reflect different disciplines, learning preferences, and cultural backgrounds. This aligns with the literature's recommendations, emphasizing that content diversity is instrumental to sustaining learner interest and supporting comprehensive educational experiences.

Cultural content integration claims also recorded four citations, signifying that users strongly desire a system that embeds local or multicultural educational values. Interviewees expressed that the current LMS insufficiently reflects the local context or provides space for culturally meaningful engagement, potentially leaving learners from diverse backgrounds behind. This challenge aligns with the findings of Hasanah et al. (2021) and Rukmi et al. (2025), which highlight the positive effects of culture-attuned digital materials on promoting inclusivity, pluralism, and creativity in the classroom.

Discussion feature limitations, with three coded citations, represent the next most prevalent challenge. Respondents commented that forums and communication tools in the LMS often fail to foster rich, collaborative dialogue or critical debate, leaving peer-to-peer learning opportunities underexploited. The ability to exchange ideas and sustain online conversations is fundamental to the success of blended and remote education approaches. Thus, enhancing discussion interfaces and functionalities is a clear priority for future LMS refinement.

User interface issues, as cited in two sources, further highlight the need to streamline and modernize the LMS's design. Participants reported difficulties with navigation and accessing specific modules, which can lead to frustration and inefficiency. This finding is corroborated by broader literature on digital learning, which identifies intuitive, well-structured interfaces as a cornerstone of positive user experiences and efficient information retrieval. Similarly, interactive learning, also cited twice, refers to the perceived shortcomings in digital tools that facilitate active, engaging instructional practices.

Accessibility was mentioned once, but its low frequency does not diminish its importance. The reference points to ongoing concerns that some users, especially those with limited technological proficiency or disabilities, may struggle to access LMS features effectively. Universal design principles and accessibility audits remain vital to ensure fairness and equal access for all learners.

Collectively, the insights visualized in the Sankey diagram offer a multifaceted picture of the challenges students experience in LMSs. These findings suggest that future LMS development should prioritize improving server stability, providing diverse learning resources, integrating cultural content, and enhancing discussion features, interfaces, and interactive aspects to meet students' needs better. These findings provide actionable guidance for stakeholders seeking to improve LMS systems in diverse higher education settings.

Discussion

The Distribution of Survey Scores by Aspect diagram provides a nuanced picture of the current Learning Management System (LMS) in use, highlighting several notable strengths alongside areas for improvement. Among the evaluated aspects, Material Organization and Task Submission Speed emerge as clear advantages, garnering high satisfaction scores from the majority of respondents. This indicates that the LMS effectively facilitates students' access to well-structured learning materials and enables timely assignment submission, which are critical components for maintaining smooth academic

workflows and supporting student learning autonomy. These findings resonate with previous research emphasizing the need for clear, organized content presentation and efficient administrative features in LMS platforms to sustain student engagement and satisfaction (Almaiah et al., 2020; Al-Maroof & Al-Emran, 2018). This finding aligns with the literature, as effective material organization and timely assignment submissions are repeatedly identified as drivers of student satisfaction and learning autonomy in digital environments (Du et al., 2025; Fanshawe et al., 2025; Simon et al., 2025). Research highlights that structured and accessible content, coupled with prompt administrative features, play a pivotal role in supporting engagement, promoting positive learning experiences, and ultimately ensuring student academic success.

On the other hand, the survey reveals variability in responses regarding Ease of Access and Navigation Clarity. Such findings highlight ongoing challenges with the LMS interface design and technical architecture, underscoring user experience issues that affect overall accessibility and intuitiveness. The importance of an intuitive, user-friendly interface is widely recognized in the educational technology literature, as ease of navigation directly affects students' ability to engage with content and participate fully in online learning activities (Martin et al., 2020). Mismatches between interface design and user expectations can lead to frustration, reduce learning motivation, and ultimately hinder effective technology adoption. Moreover, the relatively even distribution of scores on the Discussion Features aspect further signals that this component is currently underperforming in facilitating dynamic and meaningful student interactions, a core function for fostering collaborative learning and critical discourse in digital environments.

Deficiencies in accessibility, interface, and discussion features were corroborated by interview data detailing the main challenges, including server reliability issues, a lack of cultural resources, and inadequate interface design. These qualitative findings are consistent with research emphasizing that technical infrastructure support and cultural content are key considerations in LMS implementation (Shukla & Pandey, 2025). The continued success of LMS requires not only solid technical support but also human support and adaptability to the local context (Hoffman et al., 2025; Shukla & Pandey, 2025). The combination of technological and human resources is particularly important in asynchronous environments as it can increase student participation and performance (Hoffman et al., 2025). In this context, factors such as instructor presence emerge as key drivers of teacher-student closeness and perceived learning outcomes (Belt et al., 2025; Dong et al., 2025), underscoring the importance of discussion features that facilitate in-depth conversations.

Pre-service elementary teachers' expectations of LMSs that integrate culture highlight three crucial dimensions: instructional support, equal access, and immersive methods for delivering cultural content. The challenges faced, such as accessibility issues, reflect broader issues of access equity and power dynamics in post-pandemic online communities (Mekheimer, 2025). To address this, perceived teacher support can increase intrinsic motivation and promote online learning engagement, where the fulfillment of basic psychological needs, especially autonomy, has the strongest influence (He et al., 2025). Pedagogically, students' demands for interactive features and culturally relevant content align with the need for creative,ctive distance learning management (Hariyanta et al., 2022; Malta et al., 2025; Yang & Liao, 2014).

The demand for culturally relevant content is strongly supported by evidence that multicultural-oriented digital teaching materials effectively improve pluralistic attitudes (Hasanah et al., 2021). The integration of local culture-based character education through digital learning media is important and feasible (Muhammad et al., 2021; Wulandari et al., 2022). Therefore, culture-based LMSs must adopt proven, effective media, such as interactive web-based learning, whichas had a significant impact on developing critical thinking skills in elementary school students (Saputra et al., 2025). The success of this integration greatly depends on educators' readiness to integrate Technological Pedagogical Content Knowledge (TPACK) (Makawawa et al., 2021), as well as the need to consider the flexibility of simple platforms (such as WhatsApp) for complete online learning (Noer et al., 2021). Overall, LMS platforms must be designed as media that facilitate the improvement of students' digital literacy, enabling them to find, evaluate, and utilize content responsibly (Ratri & Aviyanti, 2025).

The authors argue that sustainable LMS success requires not only solid infrastructure support, including robust servers and comprehensive technical training, but also adaptability to local educational and cultural contexts. Practical measures, such as ongoing technical support and culturally responsive

content integration, emerge as critical factors that enable users to optimize LMS use and enhance learning outcomes.

Indeed, the role of cultural integration is increasingly recognized as pivotal in technology-enhanced education. Rukmi et al. (2025) provide compelling evidence that embedding local cultural content into learning modules, such as those used in elementary education, meaningfully boosts student creativity and learning engagement. Hasanah et al. (2021) complement this perspective by demonstrating how accessible, user-friendly multicultural digital teaching materials serve as vital vehicles for instilling fundamental values and competencies in diverse classrooms, contingent upon teachers' technological readiness and institutional support. These studies reinforce that cultural considerations cannot be sidelined if LMS platforms are to serve as effective facilitators of inclusive education, especially in settings characterized by rich cultural heterogeneity.

The convergence of interview and survey findings with recent scholarly work further illuminates the complex technical and experiential barriers that constrain LMS adoption in higher education. Research by Mhlongo et al. (2023) and Dewi et al. (2025) highlights the technical complexities of integrating disparate digital systems and platforms, a challenge that significantly constrains seamless LMS use. These technical problems make users even more frustrated, especially when the LMS is confusing to use or doesn't work in a practical way. The combination of complicated system connections and a design that is hard to navigate causes students and teachers to feel dissatisfied and makes it difficult for them to use the LMS effectively for learning, as highlighted in the works of some research findings (Fitrah et al., 2025; Ouadoud M et al., 2018; Shukla & Pandey, 2025; Tjong et al., 2018). Amid these challenges, the development of electronic learning modalities, such as LMSs, remains essential. Desyandri et al. (2024) emphasize that LMS tools empower students to construct knowledge actively through authentic, culturally grounded problems, thereby fostering autonomy and confidence. The strategic use of e-modules within LMS platforms can transform learning processes into engaging, innovative experiences closely aligned with learners' cultural realities, effectively bridging gaps left by conventional teaching materials that lack contextual relevance.

Furthermore, contextual and teacher readiness factors play a central role in the success of digitally mediated cultural education. Research by Rofiah et al. (2024)emphasizes that effective integration of technological and cultural pedagogies requires not only the availability of culturally appropriate modules and media but also comprehensive teacher training and ongoing support. This teacher preparedness enables effective LMS operation and cultural content delivery in elementary school contexts, where additional technology adaptation may be necessary to address local infrastructure constraints. The integration of culturally-responsive design into LMS platforms is thus not merely an ideal but an imperative for equitable, meaningful digital learning.

Taken together, these surveys, interviews, and research insights substantiate the critical imperative to develop an LMS that is not only attuned to the technical and pedagogical needs of pre-service elementary teachers but also responsive to their cultural backgrounds and learning preferences. A well-designed LMS should facilitate smooth access to diversified learning materials, encourage vibrant academic discussions, and foster a learning experience that sensibly accommodates cultural diversity. Attention to responsive technical design, enhanced user interfaces, and culturally integrated content are foundational pillars for maximizing the impact of LMS platforms. Continual iterative improvements informed by user feedback and emerging educational research will be the key to advancing the effectiveness and equity of technology-based learning initiatives in universities and beyond.

Conclusion

This research reveals that the development and use of LMS in higher education must address seven main aspects derived from survey and interview results: ease of access, clarity of navigation, material management, speed of assignment collection, technical problems, timely notifications, and discussion features. The survey results show that technical aspects, navigation, and ease of access remain the main challenges students often experience, while material management and the speed of assignment submission received positive ratings. In-depth interviews reinforced these findings and emphasized the

importance of an LMS that is responsive to user needs, especially in integrating culture-based learning and providing relevant interactive features.

In conclusion, it is clear that an LMS designed without a nuanced understanding of user needs, including responsiveness to cultural diversity and technical capability, will fall short of supporting optimal learning outcomes in higher education. The diverse challenges highlighted require a strategic, holistic approach that encompasses technological enhancements, cultural integration, user education, and institutional support. By continuously refining these areas, educational institutions can create LMS environments that not only facilitate access to and dissemination of knowledge but also empower learners to participate actively and meaningfully in their educational journeys. This comprehensive approach is essential for bridging gaps, promoting inclusivity, and realizing the full potential of digital learning platforms in the contemporary academic landscape.

References

Aldabbas, H., Elamin, A. M., Ahmed, A. Z. E., & Gernal, L. (2025). Assessing learning management system success in the UAE universities: How quality measures linked to students' academic performance. *Frontiers in Education*, *10*, 1554641. doi: 10.3389/feduc.2025.1554641

Almaiah, M. A., Al-Khasawneh, A., & Althunibat, A. (2020). Exploring the critical challenges and factors influencing the e-learning system usage during COVID-19 pandemic. *Education and Information Technologies*, *25*, 5261–5280. https://doi.org/10.1007/s10639-020-10219-y

Al-Maroof, R. A. S., & Al-Emran, M. (2018). Students acceptance of google classroom: An exploratory study using PLS-SEM approach. *International Journal of Emerging Technologies in Learning (Online)*, *13*(6), 112. https://doi.org/10.3991/ijet.v13i06.8275

Almonte, R. G., Montiano, A. M., Salili, P. B. C., Garcia, L. M., & Hipolito Ramil R, J. (2024). Design and development of culture-based learning management system for city college of Calamba: A qualitative approach. *Proceedings of the 2024 8th International Conference on Education and Multimedia Technology*, 184–190. https://doi.org/10.1145/3678726.3678766

Anyichie, A. C., & Butler, D. L. (2023). Examining culturally diverse learners' motivation and engagement processes as situated in the context of a complex task. *Frontiers in Education*, *8*, 1041946. doi: 10.3389/feduc.2023.1041946

Aulianda, N., Wijayati, P., Ebner, M., & Schön, S. (2023). The analysis of learning management system towards students' cognitive learning outcome: A systematic literature review. *International Journal of Emerging Technologies in Learning (IJET)*, *18*(23), 4–26. https://doi.org/10.3991/ijet.v18i23.36443

Balkaya, S., & Akkucuk, U. (2021). Adoption and use of learning management systems in education: The role of playfulness and self-management. *Sustainability*, *13*(3), 1127. https://doi.org/10.3390/su13031127

Belt, E. S., Friesen, N., Lowenthal, P. R., & Snelson, C. (2025). Teacher-student relationships in an online graduate program: a phenomenological analysis. *Online Learning*, *29*(3), 338–369. https://doi.org/10.24059/olj.v29i3.4604

Desyandri, D., Agustina, Y., & Lusiana, D. (2024). The development of problem-based learning model e-module integrated with multiculturalism in elementary schools. *Jurnal Prima Edukasia*, *12*(2), 183–193. https://doi.org/10.21831/jpe.v12i2.62368

Dewi, A. R., Siregar, A. S., & Rofiki, I. (2025). Development of a learning management system (LMS) based on canvas instructure to support students' critical thinking skills. *Jurnal Riset Pendidikan dan Inovasi Pembelajaran Matematika*, *8*(2), 109–127.

https://doi.org/10.26740/jrpipm.v8n2.p109-127

Dewi, D. T. (2020). Penerapan problem based learning untuk meningkatkan kemampuan berpikir kritis siswa. *Jurnal Pendidikan Ekonomi Undiksha*, *12*(1), 1–14.

Dong, L., Hsieh, C.-J., Watson, S. L., Yu, J. H., & Lowell, V. L. (2025). Revisiting the interrelationships between social and cognitive presences in asynchronous online courses: Insights from epistemic network analysis. *Online Learning*, *29*(3), 417–444. https://doi.org/10.24059/olj.v29i3.4672

Du, J., Liu, L., & Zhao, S. (2025). Empowering students in online learning environments through a self-regulated learning–enhanced learning management system. *Behavioral Sciences*, *15*(8), 1041. https://doi.org/10.3390/bs15081041

Fanshawe, M., Brown, A., & Redmond, P. (2025). Using an Online engagement framework to redesign the learning environment for higher education students: A design experiment approach. *Online Learning*, *29*(2), 269–297. https://doi.org/10.24059/olj.v29i2.4447

Fitrah, M., Setiawan, C., Widihastuti, W., Sofroniou, A., Rahmawati, N. A., Arina, A., Sari, S. R., & Iskandar, I. (2025). Impact of learning management systems and digital skills on TPACK development among pre-service mathematics teachers. *Qubahan Academic Journal*, *5*(1), 504–518. https://doi.org/10.48161/qaj.v5n1a1392

Gunawan. (2015). *Model Pembelajaran Berbasis ICT*. FKIP Unram Press.

Gunawan, I., Hui, L. K., Ma'sum, M. A., & Sukawati, N. N. (2020). Enhancing learning effectiveness by using online learning management system. *2020 6th International Conference on Education and Technology (ICET)*, 48–52. Doi: 10.1109/ICET51153.2020.9276553

Hariyanta, D., Hermanto, H., & Herwin, H. (2022). Distance learning management in elementary schools during the pandemic. *Jurnal Prima Edukasia*, *10*(2), 123–129. https://doi.org/10.21831/jpe.v10i2.47712

Hasanah, U., Marini, A., & Maksum, A. (2021). Multicultural education-oriented digital teaching materials to improve students' pluralist attitudes. *Jurnal Prima Edukasia*, *9*(1), 118–126. https://doi.org/10.21831/jpe.v9i1.35503

He, J., Wang, Q., & Lee, H. (2025). Enhancing online learning engagement: teacher support, psychological needs satisfaction and interaction. *BMC Psychology*, *13*(1), 696. https://doi.org/10.1186/s40359-025-03016-0

Hoffman, S., Darnell, M., & Moreira, P. (2025). Enhancing online mathematics learning: the cohesive work of an instructional platform and an instructional team. *Online Learning*, *29*(2), 168–187. https://doi.org/10.24059/olj.v29i2.4464

Makawawa, J. C., Mustadi, A., Septriwanto, J. Van, Sampouw, F., & Najoan, R. A. O. (2021). Primary school teachers perception of technological pedagogical content knowledge in online learning due to Covid 19. *Jurnal Prima Edukasia*, *9*(1), 86–96. https://doi.org/10.21831/jpe.v9i1.35245

Malta, K., Glickman, C., Hunter, K., & McBride, A. (2025). Comparing the impact of online and in-person active learning in preclinical medical education. *BMC Medical Education*, *25*(1), 329. https://doi.org/10.1186/s12909-025-06846-z

Martin, F., Sun, T., & Westine, C. D. (2020). A systematic review of research on online teaching and learning from 2009 to 2018. *Computers & Education*, *159*, 104009. https://doi.org/10.1016/j.compedu.2020.104009

Mekheimer, M. A. (2025). Beyond text in the EFL digital landscape exploring power, identity, and

culture in post-COVID-19 online learning communities. *Discover Education*, *4*(1), 164. https://doi.org/10.1007/s44217-025-00496-5

Mhlongo, S., Mbatha, K., Ramatsetse, B., & Dlamini, R. (2023). Challenges, opportunities, and prospects of adopting and using smart digital technologies in learning environments: An iterative review. *Heliyon*, *9*(6). https://doi.org/10.1016/j.heliyon.2023.e16348

Muhammad, A. R., Suhaimi, S., Zulfikar, T., Sulaiman, S., & Masrizal, M. (2021). Integration of character education based on local culture through online learning in madras ahaliyah. *Cypriot Journal of Educational Sciences*, *16*(6), 3293–3304. https://doi.org/10.18844/cjes.v16i6.6559

Noer, R. Z., Wahid, S. M. Al, & Febriyanti, R. (2021). Online lectures: An implementation of full e-learning action research. *Jurnal Prima Edukasia*, *9*(1), 65–74. https://doi.org/10.21831/jpe.v9i1.35030

Ouadoud M, Nejjari A, Chkouri M.Y, & El-Kadiri K.E. (2018). Learning management system, learning theories, conceptual model, the modeling of LMS. *Innovations in Smart Cities and Applications, Springer*, *2*(1).

Ratri, S. Y., & Aviyanti, L. (2025). Unlocking Digital Literacy in Indonesia: Insights from the use of social media platforms. *Jurnal Prima Edukasia*, *13*(1), 191–200. https://doi.org/10.21831/jpe.v13i1.83433

Rofiah, N. H., Restiana, R., & Dewi, R. (2024). Promoting digital literacy: Assessing teachers readiness in utilizing information and communication technology for learning in rural area. *Jurnal Prima Edukasia*, *12*(1), 41–51. https://doi.org/10.21831/jpe.v12i1.63968

Rukmi, D. A., Nisa, A. F., & Zulfiati, H. M. (2025). Innovation of a project module based on the ajak temani mandiri learning model integrated with local wisdom to improve the creative dimension of elementary school students. *Jurnal Prima Edukasia*, *13*(1), 181–190. https://doi.org/10.21831/jpe.v13i1.78206

Saputra, A. R., Murti, R. C., & Hastuti, W. S. (2025). The effect of web-based interactive learning media on critical thinking skills of elementary school students. *Jurnal Prima Edukasia*, *13*(1), 159–168. http://dx.doi.org/10.21831/jpe.v13i1.75228

Shukla, P., & Pandey, Y. (2025). Unveiling issues and challenges: A Review of learning management systems (LMS) in higher education. *National Journal of Education, 23(*2), 170-180.

Simon, P. D., Jiang, J., Fryer, L. K., King, R. B., & Frondozo, C. E. (2025). An assessment of learning management system use in higher education: Perspectives from a comprehensive sample of teachers and students. *Technology, Knowledge and Learning*, *30*(2), 741–767. https://doi.org/10.1007/s10758-024-09734-5

Singh, A. (2025). *Culturally Responsive Learning Systems Using Neural Network-Based Learning Systems*.

Sukmadinata, N., & Alexon, A. (2012). The development of culture-based integrated learning model to improve students'appreciation on local culture (the study of elementary school social study subject). *International Journal of Education*, *6*(2), 129–142.

Tjong, Y., Sugandi, L., Nurshafita, A., Magdalena, Y., Evelyn, C., & Yosieto, N. S. (2018). User satisfaction factors on learning management systems usage. *2018 International Conference on Information Management and Technology (ICIMTech)*, 11–14. Doi: 10.1109/ICIMTech.2018.8528171

Wulandari, M. A., Farihah, Z. L., Samsudin, A., & Kuswendi, U. (2022). Instill character education

during online learning with developing whiteboard animation proclamation-based. *Jurnal Prima Edukasia*, *10*(2), 149–158. https://doi.org/10.21831/jpe.v10i2.48273

Yang, M.-T., & Liao, W.-C. (2014). Computer-assisted culture learning in an online augmented reality environment based on free-hand gesture interaction. *IEEE Transactions on Learning Technologies*, *7*(2), 107–117.