

Integrating Gamification in LMS as an Effort to Increase Kinesthetic Learner Engagement

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ABSTRACT

Background: Digital education transformation demands learning systems that are adaptive to the diversity of students' learning styles. The Learning Management System (LMS) as an online learning platform has been widely used to support learning flexibility; however, it still inadequately accommodates the needs of kinesthetic learners who require physical activity and direct engagement.

Objectives: This study aims to examine the potential of integrating gamification into LMS as a strategy to enhance the engagement of students with kinesthetic learning styles.

Method: This study employed a literature review method, drawing on various sources and prior studies addressing LMS, gamification, and kinesthetic learning styles.

Result: The review findings indicate that gamification incorporating interactive elements such as challenges, points, badges, and simulations is effective in increasing kinesthetic students' motivation and active engagement in digital learning environments.

Conclusion: The integration of gamification into LMS has the potential to serve as a personalized and contextually responsive solution for kinesthetic learners, while also providing a conceptual foundation for the development of gamification-based LMS models as a more inclusive and effective digital learning innovation.

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INTRODUCTION

In the era of Revolution 4.0, advances in technology and information have become the primary drivers of transformation in the world of education, particularly in the digitalization of the learning process. The use of technology in education has had a significant impact on the implementation of modern education. The use of information and communication technology in education, especially in schools, is

one effort to improve the quality of education in Indonesia. One example is packaging teaching materials as information and communication technology-based media, such as an LMS. An LMS is a system that manages and supports the learning process, distributes instructor materials, and fosters collaboration between instructors and students (Fitriani, 2020). LMSs typically provide features such as discussion forums, chat forums, learning content management features, and assignment submission. An LMS allows for flexible learning without the constraints of space and time. Furthermore, LMS features provide a variety of personalized approaches that accommodate each student's learning style. Some approaches found in LMSs include learning content, student data analysis, and real-time monitoring. However, a less common approach in LMSs is gamification, which incorporates game elements into learning. Gamification features can increase student motivation and engagement in learning, especially for students with kinaesthetic learning styles, who tend to be more active through direct practice. However, LMSs often pay less attention to students with kinesthetic learning styles, providing only theoretical learning materials such as videos, modules, explanatory texts, and quizzes. One solution to facilitate students with kinaesthetic learning styles is to integrate gamification into the LMS.

Learning Management System (LMS)-based gamification offers a flexible, interactive platform that allows educators to design engaging learning. By integrating gamification into an LMS, educators can incorporate various game elements such as challenges, points, and rewards into learning materials. This can address low student engagement and increase intrinsic motivation, especially among kinesthetic learners. For example, the use of learning media, such as puzzles or simulation games, including Minecraft Education Edition, can positively impact student engagement and intrinsic motivation in learning (Elham Daliranfirouz, Mohammad Amiryousefi, Renata Geld, 2024).

Through these gamification features, students can experience situations that resemble real life, so simulation-based game platforms not only provide contextual learning but also increase learning engagement. Research conducted by Wardana and Sagoro at SMK Koperasi Yogyakarta showed that implementing gamification through Kahoot increased learning activities, enhanced student motivation, and improved learning outcomes (Wardana & Sagoro, 2019). This research underscores that gamification has a positive impact on learning and can increase students' intrinsic motivation.

Furthermore, Arifin's research on LMS features states that LMS features include a Google Meet platform linked to the LMS, an assignment upload feature, and a journal or learning history (Einggi Gusti Pratama & Andhyka Kusuma, 2021).

Arifin's research reveals that LMS features lack a focus on gamification and practical simulations to support students with kinesthetic learning styles who require an active, interactive approach. Both studies demonstrate a link between gamification and potential positive impacts on student learning outcomes. On the other hand, LMS features do not facilitate kinesthetic learning, which requires an active approach and a supportive learning environment. Therefore, one feasible solution is to implement LMS-based gamification to increase engagement among kinesthetic learners.

The integration of gamification into an LMS has great potential, so an in-depth analysis of its effectiveness is needed. However, most research in this area still does not highlight this aspect. Although LMSs are widely used, studies on integrating gamification effectively to support kinesthetic learning styles remain limited. Therefore, this study focuses on a conceptual review to analyze LMS-based gamification features as a real effort to increase student engagement in learning, especially students with kinesthetic learning styles. Thus, the purpose of this study is to examine the potential of integrating gamification into an LMS to increase student engagement among kinesthetic learners.

METHODS

This article uses a literature review approach based on 9 journal articles from Google Scholar and other online sources that discuss LMS, gamification, and kinesthetic learning styles during the 2021-2025 period. This literature study is narrative and analytical, focusing on integrating gamification into LMSs to increase kinesthetic student engagement. This article presents an analysis and summary of research in table form that summarizes the journal title, author, journal source, and a summary of research results that are relevant to the research topic.

RESULTS AND DISCUSSION

This study, based on a literature review, identified several relevant findings to support research on integrating gamification into Learning Management Systems (LMS) to increase engagement among kinesthetic learners. The table below summarizes the key findings found in the analyzed literature, covering the various features available in LMSs, the effectiveness of gamification in learning, the use of simulation games in learning, and the characteristics of kinesthetic learner tendencies.

Table 1. Research Synthesis on LMS, Gamification,
and Kinesthetic Learning Styles

No	Author	Jurnal	Judul Jurnal	Hasil Penelitian
1.	(Hamim , 2022)	Jurnal Pendidikan dan Kebudayaan	Understanding Various Learning Management Systems (LMS) as Distance Learning Media in Madrasahs During the Covid-19 Pandemic	Learning Management Systems (LMS) such as Google Classroom, Schoology, Rumah Belajar, and Madrasah E-learning have been shown to improve Madrasah students' motivation and learning outcomes during distance learning during the Covid-19 pandemic. Madrasah e-Learning provides key features such as discussion forums for teacher-student interaction, material uploading and downloading for flexible learning access, and student progress reports that facilitate monitoring of learning outcomes.
2.	(Muhai minin et al., 2025)	Jurnal Pendidikan Sains & Biologi (Jurnal Jeumpa)	Feasibility Study of LMS Media for Biology Learning in Grade X High School Based on Digital Literacy	the development of Learning Management System (LMS)-based learning media using the WordPress platform for the fungi kingdom topic at SMA Negeri 3 Langsa was deemed feasible and practical for use in the learning process. Validation by media, material, and digital literacy experts demonstrated a high level of feasibility, with media feasibility reaching 96% and digital literacy reaching 92%. While the material

			aspect increased from 60% to 96% after revision. Featured features such as uploading and sharing materials, discussion forums, quizzes, and user help pop-ups support an effective and interactive learning process.
3.	(Wibowo et al., 2025)	JP2M (Jurnal Pendidikan dan Pembelajaran Matematika)	Development of an Education-Based Learning Management System (LMS) to Improve Students' Understanding of Algebra Concepts
			The development of an interactive, education-based LMS by adding various features to the LMS, such as visualizations of images, videos, audio, simulations, and feedback on practice questions at SMP Muhammadiyah 1 Kartasura, has proven to show positive and effective results in improving the quality of mathematics learning in the algebra chapter.
4.	(Hadnista Darman et al., 2024)	Pendas: Jurnal Ilmiah Pendidikan Dasar	Development of Genially-Based Learning Media with Gamification to Improve Student Learning Outcomes in Elementary Schools
			Genially-based learning media with gamification was found to be suitable, with 100% material validation and 77.5% media and language validation, and received a very positive response from teachers and students. The gamification development consisted of 10 stages: needs analysis, data collection, product design, design validation, design revision, product creation,

product testing, product revision, product usage testing, and product distribution. The integration of animation, video, and interactive quizzes within the gamification structure, such as levels, challenges, and direct feedback, successfully increased student motivation, active engagement, and conceptual understanding. This research also addresses the limitations of conventional teaching media, which are less engaging and less contextual.

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| 5. (Mega Astuti Retnani, Esgi Afrista, 2024) | Jurnal Teropong Pendidikan | The Influence of Learning Styles on LMS-Based Adult Learning. | A study of 30 Master of Educational Technology students at Pelita Harapan University showed that kinesthetic learning style was the most dominant learning style and significantly correlated with the use of the Moodle LMS ($r = 0.409$). Kinesthetic students found the interactive features of the LMS helpful, but this style did not significantly impact learning outcomes ($r = -0.060$), so ease of use of the LMS does not guarantee higher academic achievement |
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| 6. | (Alisia Zahro'atul, 2025) | Jurnal Ilmuan Pendidikan, Matematika dan Kebumian | Case Study Analysis of the Use of Minecraft: Education Edition in Fifth-Grade Mathematics Learning at MIN 02 Batang | The use of Minecraft: Education Edition gamification in fifth-grade mathematics learning at MIN 02 Batang has proven effective in improving students' understanding of abstract concepts such as geometric shapes, measurement, and scale. The interactive virtual environment has been shown to facilitate students' viewing, building, and manipulating objects, transforming them from abstract to more concrete, understandable, and meaningful. This approach has been shown to encourage active engagement, increase learning interest, and positively impact the learning outcomes of fifth-grade students at MIN 02 Batang. |
| 7. | (Latifah, 2023) | Jurnal Inovasi Penelitian Pendidikan dan Pembelajaran | Analysis of Student Learning Styles For Differentiated Learning in Elementary Schools | A study of student learning styles at SDN Purwoyoso 04, grade 5B, showed that 52% of students had visual learning styles, 29% had auditory learning styles, and 19% had kinesthetic learning styles. Learning at SDN Purwoyoso 04 grade 5 was dominated by lecture methods without adjustments to learning |

styles, resulting in unmet needs for kinesthetic students. The results of the study suggest that learning style assessments should be conducted from the outset to design differentiated learning that accommodates all learning styles.

8.	(Wahyu ni, 2022)	Jurnal Pendidikan Anak Usia Dini	Journal of Early Childhood Education Analysis of Numeracy Literacy Skills Based on Learning Styles in Early Childhood Children	The results of the study indicate that early childhood numeracy literacy skills are influenced by differences in learning styles. Children with a visual learning style respond quickly and complete tasks completely. Auditory children respond more slowly and require verbal reinforcement, while kinesthetic children tend to lack focus and achieve suboptimal results due to the high physical activity requirements. This finding underscores the importance of considering learning styles in designing numeracy lessons to improve the effectiveness of early childhood learning.
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9. (Lestari & Widda Djuhan, 2021) HPSI:Jurnal Ilmiah Ilmu Pengetahuan Sosial Indonesia Analysis of Visual, Auditory, and Kinesthetic Learning Styles in Developing Student Learning Achievement of The implementation of learning tailored to student learning styles has been shown to help improve student achievement in social studies at SMPN 1 Purwantoro. Students with a visual learning style achieve optimal results when learning is presented through visual media such as LCDs, whiteboards, and videos. Auditory students achieve optimal results when learning uses discussion methods and audio-based learning. Meanwhile, kinesthetic students show more optimal learning development when they engage in physical activities such as reading while walking and using body language.

Source: Literature Review 2021-2025

A literature review indicates that Learning Management Systems (LMS) play a crucial role in enhancing the effectiveness and flexibility of learning in the current digital era. This aligns with research by Shafa (2024), which states that Learning Management Systems (LMS) are a popular and effective technology for educational transformation because they support flexible and interactive learning. However, many LMSs fail to accommodate learners' needs, particularly those with kinesthetic learning styles, making LMS-based learning challenging. To address this issue, gamification can be an alternative. It not only increases intrinsic motivation but also facilitates students with kinesthetic learning styles by integrating various interactive elements that make learning presentations more realistic and contextual (Garnisa et al., 2023). A literature review of 9 prior studies

found that integrating gamification into LMSs has significant potential to increase engagement and learning outcomes for kinesthetic learners. Based on research conducted by Hamim and Muhaimin et al., it can be seen that Learning Management Systems (LMS) have been proven to help and improve student motivation and learning outcomes. LMS platforms such as discussion forums, material uploads and downloads, quizzes, and user help pop-ups support more effective and interactive learning. However, neither study has found an LMS platform that explicitly provides features specifically designed to direct students toward personalized learning. Most available LMS features are still general and not designed to accommodate personalization needs based on learning styles, such as considering the needs, pace, and learning style of each individual student (Nasuha & Suryani, 2015). The principle of "Whole Person Personalization" classifies students into three learning orientation types: Conforming Learners, Performing Learners, and Transforming Learners (Pratiwi et al., 2022).

The personalization approach considers that each student has a different background, learning style, and motivation level. The personalization approach in LMS began to be seen in the third study by Wibowo et al., who developed an interactive, educational-based LMS by adding various features such as visualization, images, video, audio, simulations, and feedback. The results showed that the interactive, education-based LMS had a positive impact and was proven to improve student learning outcomes. Although not yet fully reflecting the personalization approach, the features available in the LMS reflect an effort to accommodate the variety of student learning styles, which is one element of personalized learning. The emphasis on the diversity of these features indicates that the LMS has adaptive potential that can be further developed to respond to more specific learning needs, including kinesthetic learning styles that were still neglected in the initial design. Therefore, learning, especially based on a Learning Management System (LMS), needs to be designed in such a way and in line with the principles of personalization to meet the personal needs of each student, especially students with kinesthetic learning styles.

The appropriate approach for kinesthetic learners is active learning, as it provides students with space to move, participate, and directly experience the material being studied. With advances in technology and the increasing use of digital devices, the needs of kinesthetic students can be met through a virtual approach using an interactive Learning Management System (LMS) platform. An interactive Learning Management System (LMS) allows students with a kinesthetic learning style to be facilitated and assisted. This was demonstrated in five studies conducted by Mega Astuti and Esgi Afrista, which showed that the Moodle

Learning Management System (LMS) facilitated and assisted students with a kinesthetic learning style in attending lectures. However, this facilitation for these students was not commensurate with their learning outcomes. This indicates that the features available in the Moodle Learning Management System (LMS) are quite comprehensive but do not fully integrate elements that encourage interactive, active, digital-based learning (Suryanto et al., 2021). One solution to address this is the implementation of personalized learning within an LMS tailored to the characteristics of kinesthetic learning styles. In other words, accessible learning isn't enough to guarantee quality learning outcomes if it isn't balanced with an instructional design approach that aligns with the learner's dominant learning style.

One approach to supporting the principle of personalization is the integration of gamification into a Learning Management System (LMS) platform. Gamification is a learning approach that integrates elements of games and video games into the learning process to enhance and motivate students. Self-Determination Theory (SDT) classifies motivation into two types: internal motivation, which originates from within the student, and external motivation, which originates from outside the student. In learning, internal motivation needs to be cultivated in students to foster enthusiasm during an activity. In the context of learning, if material is packaged inappropriately, students will tend to ignore it and their learning outcomes will decline. Therefore, platforms such as gamification are seen as a solution for fostering student interest, as they feature various interactive elements.

This is proven in the fourth study by Hadnistia Darmawan et al. which explains that the development of gamification with ten stages of needs analysis, data collection, product design, design validation, design revision, product creation, product testing, product revision, product usage and distribution trials plus the integration of animation, video, and interactive quizzes in gamification, and the addition of elements such as levels, challenges, and direct feedback is proven to increase student motivation and active engagement. This is in line with research by Suparmini et al. (2024), which explains that gamified learning is proven to significantly increase student motivation, especially through dynamic engagement resulting from the use of game elements such as challenges, point systems, and rewards. This relationship shows how SDT theory can be operationalized through appropriate gamification design, resulting in a meaningful learning experience for kinesthetic students.

Elements of gamification can address the needs of kinesthetic learners. The learning needs of kinesthetic learners who emphasize activities such as experimenting, doing practical projects, moving, touching, and directly

experiencing the learning process can be accommodated through digital simulations in the form of simulation games designed to resemble real-life situations. These simulation games have been shown to increase motivation, active engagement, and facilitate kinesthetic learning styles (Joyo et al., 2020). As explained in the sixth study by Alisia Zahro'atul on the integration of Minecraft: Education Edition gamification in fifth-grade mathematics learning at MIN 02 Batang, it was proven to be effective in increasing students' understanding of abstract concepts such as geometric shapes, measurement, and scale, making them more concrete, easier to understand, and meaningful. Thus, the integration of gamification through simulation-based media not only functions as educational entertainment, but also as a concrete bridge between abstract content and real-life learning experiences that are much needed by kinesthetic learners.

Based on the results of a review of nine previous research literatures, it was found that the Learning Management System (LMS) has not been able to fully integrate features to facilitate kinesthetic learning styles that have a tendency to learn accompanied by physical activity, several studies on gamification show that gamification is proven to be effective in increasing students' intrinsic motivation, active student involvement, and improving learning outcomes. From several previous studies on gamification, results show that simulation games supported by integrated visual elements can be a solution for meeting the needs of kinesthetic learners when integrated into the Learning Management System (LMS). Therefore, further research is needed that examines the development and testing of gamification-based Learning Management System (LMS) models of simulation games specifically designed to personalize kinesthetic learners is very necessary to understand more specific mechanisms. By considering the characteristics of each learning style, integrating gamification into the Learning Management System (LMS) can be an effective way to increase student engagement and learning outcomes. These findings are expected to make a significant contribution to the design and implementation of gamification in Learning Management Systems (LMS) to maximize its impact on student motivation and future learning outcomes.

Reinforcing previous findings, the Learning Management Systems (LMSs) commonly developed in educational institutions typically contain only text and video, thereby not fully facilitating the kinesthetic learning style. This indicates that there are still gaps in supporting the needs of students with kinesthetic learning styles, who require physical engagement in learning. Integrating various gamification elements and implementing them through simulation games can make learning more contextual and tailored to kinesthetic learning styles. In addition to developing the personalization approach described previously, this study also

provides latitude for LMS developers to design more adaptive features such as activity navigation options, direct feedback systems in the form of kinesthetic visuals, and learning missions that simulate real-world experiments. The implementation relevance of these findings is the importance of collaboration between educational components, such as teachers, educational technology developers, and researchers, in designing Learning Management System (LMS) models that can increase kinesthetic student engagement and foster intrinsic motivation.

CONCLUSION

This research aims to examine the potential of integrating gamification into a Learning Management System (LMS) to increase engagement among kinesthetic learners. A literature review of several previous studies found that a Learning Management System (LMS) is a digital learning platform with high flexibility and effectiveness, but it is not yet fully able to accommodate the needs of students with kinesthetic learning styles. Furthermore, gamification has been shown to increase intrinsic motivation, enhance active student engagement, and improve student learning outcomes, especially when designed as a contextual digital simulation.

Integrating gamification features into a Learning Management System (LMS) is a strategic approach to personalized learning that aligns with the characteristics of kinesthetic learners. Gamification elements such as points, challenges, badges, and virtual simulations provide opportunities for active participation and direct interaction, which are much-needed for students who tend to learn through physical activity. This research contributes to the academic landscape by reinforcing the urgency of developing a gamification-based LMS that is not only informative but also transformative in fostering engagement with specific learning styles.

As a recommendation for further research, it is necessary to develop and test a gamification-based LMS model specifically designed to support kinesthetic learners in primary and secondary education contexts. Empirical testing of the model's effectiveness in increasing student motivation, engagement, and learning outcomes would be a significant next step. Furthermore, collaboration between educational technology developers, teachers, and researchers is essential to creating a digital ecosystem that is adaptive, inclusive, and responsive to the needs of all learning styles.

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