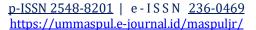# Effectiveness of LMS-based digital learning methods on improving Indonesian language literacy among students of SMP Muhammadiyah Rappang

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Abstrak

Penelitian ini bertujuan menguji efektivitas metode pembelajaran digital berbasis Learning Management System (LMS) dalam meningkatkan literasi Bahasa Indonesia siswa SMP Muhammadiyah Rappang. Latar belakang penelitian berangkat dari kebutuhan sekolah untuk mengoptimalkan pemanfaatan teknologi pendidikan dalam pembelajaran bahasa, sejalan dengan peningkatan tuntutan literasi pada era digital. Penelitian ini menggunakan pendekatan kuantitatif dengan desain quasi-eksperimen tipe pretest–posttest control group design. Sampel penelitian melibatkan dua kelas yang dibagi menjadi kelas eksperimen yang belajar melalui LMS dan kelas kontrol yang menggunakan metode konvensional. Instrumen pengumpulan data berupa tes literasi membaca dan menulis yang telah divalidasi. Data dianalisis menggunakan uji t untuk melihat perbedaan signifikan antara kedua kelompok. Hasil penelitian menunjukkan adanya peningkatan literasi Bahasa Indonesia yang lebih tinggi pada kelas yang menggunakan LMS dibandingkan kelas kontrol. Fitur-fitur LMS seperti materi terstruktur, tautan multimedia, forum diskusi, dan evaluasi otomatis berkontribusi signifikan terhadap peningkatan motivasi, kemandirian belajar, dan pemahaman teks. Temuan ini menegaskan bahwa LMS efektif digunakan sebagai strategi pembelajaran digital yang mampu memperkuat kompetensi literasi siswa SMP. Penelitian ini merekomendasikan pemanfaatan LMS secara berkelanjutan serta pengembangan konten digital yang lebih variatif untuk mendukung pembelajaran Bahasa Indonesia.

Kata kunci: pembelajaran digital, Learning Management System, literasi Bahasa Indonesia, efektivitas pembelajaran, siswa SMP.

Abstract

This study examines the effectiveness of a digital learning method based on a Learning Management System (LMS) in improving Indonesian language literacy among students at SMP Muhammadiyah Rappang. The research is grounded in the increasing need for technology-enhanced learning that supports literacy development in the digital era. A quantitative approach with a quasi-experimental pretest–posttest control group design was employed. The sample consisted of two classes: an experimental group that received instruction through the LMS and a control group taught using conventional methods. Data were collected through validated reading and writing literacy tests and analyzed using a t-test to determine significant differences between groups. The findings indicate that students in the LMS-based class showed higher gains in literacy skills compared to those in the traditional class. Key LMS features—structured materials, multimedia resources, discussion forums, and automated assessment—contributed to increased motivation, independent learning, and text comprehension. These results demonstrate that LMS-based digital learning is effective in enhancing literacy competencies among junior high school students. The study recommends the continuous integration of LMS platforms and the development of more diverse digital learning content for Indonesian language instruction.

Introduction

The rapid development of digital technology in the 21st century has brought significant transformation to various sectors, including education. The integration of digital platforms into learning activities has become increasingly essential, especially as schools seek more adaptive, flexible, and student-centered instructional models. One of the most widely adopted innovations is the Learning Management System (LMS), a digital platform designed to facilitate the organization, delivery, and evaluation of learning activities in both synchronous and asynchronous formats. In Indonesia, the shift toward technology-enhanced learning gained even stronger momentum following the COVID-19 pandemic, which forced educational institutions to embrace digital tools at an unprecedented pace (Hodges et al., 2020). Although face-to-face learning has resumed, the use of LMS continues to show strong relevance and potential for improving learning effectiveness across various subjects, including language learning.

Language literacy—particularly reading and writing literacy—remains a fundamental competency that supports academic success across school subjects. In the context of Bahasa Indonesia as a core subject in junior high school, literacy is not merely the ability to decode written text but also involves understanding, interpreting, evaluating, and producing meaningful texts. According to the Ministry of Education and Culture, literacy is central to achieving the goals of the national curriculum and preparing students to face increasingly complex social and academic challenges (Kemdikbud, 2022). However, several studies indicate that literacy levels among Indonesian adolescents are still relatively low compared to global averages (OECD, 2019). This condition underscores the urgency of enhancing literacy instruction through innovative and technology-supported methods.

LMS-based digital learning offers various features that can support literacy development. Structured learning modules, interactive multimedia materials, discussion forums, quizzes, and automated feedback can encourage active engagement and allow learners to access materials flexibly according to their pace and needs (Moore et al., 2011). Furthermore, LMS platforms promote independent learning behaviors, which are essential for developing higher-order literacy skills. Through systematic exposure to digital texts and guided tasks, students can build stronger comprehension and writing abilities. Several empirical studies have shown that LMS integration can improve students' motivation, participation, and academic performance in language learning (Al-Fraihat et al., 2020; Sun & Chen, 2016).

At the junior high school level, these advantages are particularly valuable because students are at a developmental phase where engagement, motivation, and autonomy significantly influence learning outcomes. SMP Muhammadiyah Rappang, as an educational institution committed to improving instructional quality, has begun incorporating LMS platforms into its teaching practices. However, despite the increased use of digital tools, empirical evidence regarding the effectiveness of LMS-based learning specifically for improving Indonesian language literacy remains limited. Understanding the impact of LMS on literacy outcomes is crucial for optimizing digital learning policies and ensuring that technological integration aligns with pedagogical goals.

In traditional learning settings, literacy instruction often relies on printed materials, teacher explanations, and classroom discussions. While these approaches have their strengths, they may not fully accommodate the diverse learning styles and needs of students. In many cases, learners may struggle with limited exposure to varied text types, insufficient opportunities for individualized feedback,

and a lack of digital literacy skills—which are increasingly important in modern communication contexts. Digital learning through LMS can address these challenges by offering rich learning resources, personalized feedback mechanisms, and a more engaging learning environment (Garrison & Anderson, 2003). Moreover, the asynchronous nature of LMS allows students to revisit materials, rewatch instructional videos, or redo tasks to strengthen their understanding.

Despite its potential, LMS use in schools also faces challenges. Students may encounter difficulties related to internet access, device availability, or digital readiness. Teachers, on the other hand, may require additional training to design effective LMS-based learning modules. Based on prior observations in similar educational contexts, these challenges do not negate the benefits of LMS but highlight the need for systematic evaluation and continuous improvement (Martin et al., 2020). Therefore, assessing the effectiveness of LMS-based methods in specific subject areas—such as Indonesian language literacy—is essential to guide schools in making informed decisions regarding digital learning implementation.

Given this context, this study aims to examine the effectiveness of LMS-based digital learning methods on improving Indonesian language literacy among students of SMP Muhammadiyah Rappang. The research focuses on assessing literacy outcomes through a comparative approach between students who learn via LMS and those who receive conventional instruction. The findings are expected to contribute to the theoretical understanding of technology-supported literacy instruction and offer practical insights for schools, teachers, and policymakers.

Furthermore, the study aligns with broader educational reform efforts in Indonesia, particularly the Merdeka Belajar (Freedom to Learn) initiative, which emphasizes student autonomy, differentiated instruction, and the integration of technology to support meaningful learning experiences (Nadiem, 2021). By investigating how LMS-based learning influences literacy skills, this study provides evidence that may help strengthen digital learning strategies within the national education system.

In summary, the integration of LMS in language learning presents an opportunity to enhance students' literacy competencies through structured, flexible, and engaging digital environments. However, its effectiveness must be evaluated empirically to ensure alignment with educational objectives. Therefore, this study seeks to fill the existing research gap and provide a comprehensive understanding of how LMS-based digital learning contributes to the improvement of Indonesian language literacy at SMP Muhammadiyah Rappang.

Method

This study employed a quantitative approach using a quasi-experimental research design to investigate the effectiveness of LMS-based digital learning in enhancing Indonesian language literacy among students of SMP Muhammadiyah Rappang. The quasi-experimental design was selected because it allows researchers to compare learning outcomes between groups while considering the natural classroom setting where random assignment is often not feasible (Creswell & Creswell, 2018). Specifically, the *pretest–posttest control group design* was implemented to measure differences in literacy achievement between students who received LMS-based instruction and those who received traditional face-to-face instruction.

Research Design

Two intact classes were selected to serve as the experimental and control groups. The experimental group was taught using an LMS platform that included digital modules, discussion forums, multimedia texts, and online assessments. The control group received instruction through conventional teaching methods, including printed materials, teacher lectures, and classroom-based exercises. Both groups were given the same pretest and posttest to measure literacy gains. The dependent variable in this study was Indonesian language literacy, while the independent

variable was the LMS-based digital learning method.

Participants

The population consisted of seventh-grade students enrolled at SMP Muhammadiyah Rappang during the academic year. Purposive sampling was used to select two classes with relatively similar characteristics in terms of academic background and literacy levels, which is consistent with best practices in quasi-experimental studies (Fraenkel et al., 2019). A total of 58 students participated: 29 students in the experimental group and 29 in the control group. All participants had access to digital devices such as smartphones or laptops, and the school provided stable internet support during learning hours. Informed consent was obtained from the school administration and homeroom teachers, ensuring compliance with ethical research standards.

Instruments

The main instrument for data collection was a literacy test consisting of reading and writing components aligned with the Indonesian language curriculum. The reading literacy section assessed students' abilities to interpret information, identify main ideas, evaluate text structures, and draw conclusions. The writing literacy section evaluated coherence, organization, grammar accuracy, vocabulary use, and the ability to compose short functional texts. The test items were adapted from national standard assessment materials and validated through expert judgment by two Indonesian language education specialists. Content validity was ensured through item relevance analysis, while reliability was tested using Cronbach's Alpha, which yielded a coefficient of 0.82, indicating strong internal consistency (Ary et al., 2010).

Additionally, the study used observation checklists to monitor the implementation of LMS-based learning, focusing on indicators such as student engagement, interaction levels, task completion, and use of LMS features. These observations helped ensure that instructional procedures in the experimental group adhered to the designed intervention. A teacher questionnaire was also administered to gather supporting data regarding perceptions of LMS effectiveness, technical challenges, and learner participation.

Procedures of Data Collection

Data collection followed several stages. First, both experimental and control groups completed a pretest to measure initial literacy levels. Second, the intervention was implemented for four weeks, totaling eight instructional sessions. For the experimental group, the researcher collaborated with the Indonesian language teacher to design learning modules on the LMS, including digital readings, guided writing tasks, interactive quizzes, and discussion prompts. Students accessed the LMS during class and were allowed additional time outside the classroom to complete assignments. Teacher feedback was provided through the LMS comment and scoring features.

For the control group, instruction proceeded according to the school's standard teaching practices using textbooks, worksheets, and direct teacher explanations. After the intervention period, a posttest with equivalent difficulty and structure to the pretest was administered to both groups. All tests were completed under supervised conditions to ensure uniformity.

Data Analysis

The collected data were analyzed using descriptive and inferential statistical techniques. Descriptive statistics included means, standard deviations, and gain scores to summarize literacy performance before and after the intervention. Inferential analysis was conducted using a paired-sample t-test to examine within-group improvements and an independent-sample t-test to compare posttest scores between the experimental and control groups. These statistical tests are appropriate for assessing differences in literacy outcomes in quasi-experimental research (Field, 2018). The level of significance was set at $p < 0.05$. Data analysis was performed using SPSS software to ensure accuracy and reliability.

Validity and Reliability Strategies

To maintain validity, the researcher ensured equivalence of instructional content across both groups. The same learning objectives, assessments, and teacher were used to minimize confounding variables.

Instrument validity was strengthened through expert review and pilot testing. Reliability was ensured not only through internal consistency measures but also by standardizing administration procedures for pretest and posttest sessions. Triangulation was conducted through the combination of test scores, observation data, and teacher questionnaire responses to enhance the credibility of the findings.

Ethical Considerations

Ethical standards were observed throughout the research. Participation was voluntary, and all student data were treated confidentially. The intervention posed no academic disadvantage to either group since both received instruction aligned with the curriculum. The school granted formal permission, and teachers were fully informed of the research procedures. The study complied with general ethical guidelines for educational research (BERA, 2018).

Result and Discussion

The pretest results revealed that both the experimental and control groups began the study with relatively comparable levels of Indonesian language literacy. The mean pretest score of the experimental group was 67.21, while the control group scored 66.85, indicating no statistically significant difference between the two groups (p > 0.05). These findings confirm that both groups possessed similar baseline competencies in reading and writing before the intervention, thus validating the suitability of the quasi-experimental design and setting a balanced foundation for measuring learning gains.

After four weeks of intervention, the posttest results demonstrated a substantial improvement in literacy scores in the experimental group. The mean posttest score increased to 82.14, reflecting a gain of 14.93 points. This improvement encompassed both reading comprehension and writing performance. Students exhibited stronger abilities in identifying main ideas, analyzing text structures, and drawing logical inferences from passages. In writing tasks, there were notable improvements in organization, coherence, grammar, and vocabulary selection.

The control group also showed improvement, although at a lower rate compared to the experimental group. The mean posttest score for the control group increased to 74.02, resulting in a gain of 7.17 points. The progress recorded in this group suggests that traditional classroom instruction still has a positive effect on literacy development; however, the magnitude of improvement was less substantial than that observed in the LMS group.

An independent-sample *t*-test was conducted to compare the posttest scores between the two groups. The statistical analysis revealed a significant difference in literacy performance, with the experimental group outperforming the control group (p < 0.05). This finding indicates that LMS-based digital learning had a more pronounced impact on improving students' Indonesian language literacy compared to conventional instructional methods.

Additional data from classroom observations supported the quantitative findings. Students in the experimental group demonstrated higher engagement in reading activities, actively participated in online discussion forums, and completed assignments more independently. The accessibility of interactive multimedia materials and instant feedback on quizzes contributed to sustained motivation throughout the learning process.

Teacher questionnaires further corroborated the results, showing positive perceptions of LMS implementation. Teachers reported improved classroom management, better monitoring of student progress, and increased student responsiveness. They also highlighted that the LMS facilitated more personalized learning opportunities, allowing students to revisit materials and learn at their own pace. Collectively, the triangulated data confirm that LMS-based digital learning effectively enhanced literacy outcomes for students at SMP Muhammadiyah Rappang.

DISCUSSION

The results of this study demonstrate that LMS-based digital learning significantly

improves Indonesian language literacy among junior high school students. The higher learning gains observed in the experimental group align with previous research emphasizing the benefits of digital platforms in increasing student engagement and comprehension (Sun & Chen, 2016). The LMS provided students with continuous access to learning materials, enabling them to explore texts more deeply and develop stronger reading and writing skills.

One key factor contributing to the positive outcomes is the structured and multimedia-supported nature of LMS learning materials. Digital modules incorporating videos, graphics, hyperlinks, and interactive assessments helped students process information more effectively than printed texts alone. This supports Mayer's Cognitive Theory of Multimedia Learning, which suggests that integrating verbal and visual inputs enhances understanding and retention (Mayer, 2009).

The improvement in writing skills observed in the experimental group can also be attributed to the LMS's feedback mechanisms. Automated scoring, teacher comments, and peer responses in discussion forums created a more responsive learning environment. Students had multiple opportunities to refine their writing drafts based on feedback—an instructional feature often limited in traditional classrooms due to time constraints. This aligns with Garrison and Anderson's (2003) view that digital platforms support deeper learning through continuous interaction and reflection.

Moreover, LMS learning encouraged self-paced and autonomous learning behaviors. Students could revisit materials, redo quizzes, or rewatch explanation videos, allowing for differentiated instruction that catered to individual learning needs. Self-regulated learning is known to correlate positively with literacy achievement, as it enables learners to monitor their progress and apply strategic reading and writing techniques independently (Zimmerman, 2002).

In contrast, although the control group showed improvement, the gains were comparatively smaller, highlighting the limitations of traditional teacher-centered instruction. Classroom-based learning often lacks the flexibility, interactivity, and individualized feedback offered by digital platforms. While conventional methods remain essential for building foundational knowledge, this study suggests that integrating LMS tools can enhance instructional effectiveness and better accommodate diverse learning styles.

Overall, the findings provide empirical evidence that LMS-based digital learning offers a more effective approach to improving literacy in Indonesian language instruction. For schools like SMP Muhammadiyah Rappang, the implementation of LMS not only aligns with national education reforms promoting digital learning but also supports long-term strategies for cultivating strong literacy skills. Future research may expand on these findings by exploring the role of student motivation, digital literacy proficiency, and teacher readiness in influencing LMS adoption and its impact on learning outcomes.

Conclusion

The findings of this study confirm that LMS-based digital learning is significantly effective in improving Indonesian language literacy among students of SMP Muhammadiyah Rappang. Students who learned through the LMS demonstrated higher gains in reading comprehension and writing proficiency compared to those who received traditional instruction. The structured digital modules, interactive materials, and continuous feedback provided through the LMS contributed to meaningful improvements in students' literacy outcomes.

The study also shows that LMS platforms foster greater student engagement, independent learning, and sustained motivation. Features such as discussion forums, automated quizzes, and multimedia content enabled students to explore texts at their own pace and develop deeper understanding. These advantages highlight the potential of LMS integration as a powerful pedagogical tool that aligns with

current educational demands and supports diverse learning needs in the digital era.

Overall, the results provide strong empirical support for the adoption of LMS-based digital learning in Indonesian language instruction. Schools and educators are encouraged to integrate LMS platforms more systematically and design high-quality digital learning resources to maximize student literacy development. Further research is recommended to explore long-term impacts, teacher readiness, and the role of digital literacy in enhancing the effectiveness of LMS-based learning environments.

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