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Development of An LMS-Based Self-Efficacy-Oriented E-Module for Junior High School Students' Remembering and Understanding in Social Studies

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Abstract

This study aimed to develop and examine the feasibility, practicality, and effectiveness of a Learning Management System (LMS)-based Social Studies e-module oriented toward students' self-efficacy. The e-module addressed eruption mitigation in mountainous areas and its relation to the Sustainable Development Goals (SDGs), while responding to the limited use of interactive LMS features in the learning context. The study employed a Research and Development (R&D) approach using the ADDIE model, comprising analysis, design, development, implementation, and evaluation. The product was developed as a Heyzine flipbook, visually designed in Figma, and integrated into the mooc.um.ac.id LMS to organize learning materials, activities, feedback, and assessment. Expert validation produced an average score of 99% (M = 3.96), indicating very high feasibility, while student responses reached M = 3.44 (86%), indicating very positive acceptance. Learning outcomes were assessed using pretest and posttest data. The mean N-Gain was 0.858, categorized as high, and the pretest–posttest difference was statistically significant ($p < 0.001$) with a large effect size ($d = 1.60$). Students' self-efficacy reached a mean of 3.09 on a four-point scale. These findings indicate substantial improvement in the targeted cognitive outcomes following implementation and support the feasibility and practical value of integrating a structured e-module with an LMS. Because the trial used a one-group pretest–posttest design, the findings should be interpreted as evidence from a development trial rather than definitive causal evidence. The study contributes a practical design that combines LMS-based delivery, interactive learning activities, and self-efficacy-oriented scaffolding for contextualized Social Studies learning.

Keywords: e-module; learning management system; self-efficacy; eruption mitigation; cognitive abilities.

1. Introduction

Digital technology has transformed educational practices and expanded the use of technology-supported learning environments. One important form of digital innovation is the Learning Management System (LMS), which supports access to instructional materials, communication, learning activities, and assessment. When these functions are intentionally connected to instructional design, an LMS can provide a more structured and interactive learning environment and can support the broader goal of inclusive and quality education reflected in Sustainable Development Goal 4.

However, the availability of an LMS does not automatically result in meaningful digital learning. Previous literature describes LMSs as environments for organizing learning resources, communication, activities, and assessment, while studies of practice have also

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highlighted the risk of using LMS platforms mainly as repositories for materials and assignment submission (Mahnegar, 2012; Watson & Watson, 2007). In the present learning context at SMP Laboratorium Universitas Negeri Malang, observations indicated that students primarily used the LMS to download materials and complete assignments, while interactive features had not been optimally utilized. This creates a practical design problem: the LMS is available, but its instructional affordances are not fully translated into a coherent learning experience.

An LMS-based e-module offers one way to address this gap because it can connect structured content with learning activities, exercises, feedback, and assessment rather than functioning only as a digital repository. Such integration is particularly relevant for Social Studies learning, where students need to construct and retrieve conceptual knowledge while connecting content to contextual issues. In this study, the targeted cognitive abilities are remembering and understanding. Remembering involves recognizing and retrieving information, whereas understanding includes explaining, interpreting, and connecting concepts (Nafiati, 2021). These abilities provide an important foundation for subsequent, more complex forms of thinking.

Self-efficacy provides an additional instructional consideration. Bandura (1977) defines self-efficacy as beliefs about one's capability to perform actions required to achieve particular goals. In digital learning, students must not only access content but also initiate activities, persist with tasks, interpret feedback, and use available learning features. An e-module can therefore be oriented toward self-efficacy by providing gradual learning sequences, manageable tasks, feedback, and opportunities for successful task completion. The present study does not test self-efficacy as a causal predictor of learning gains; rather, self-efficacy is positioned as an instructional orientation and is described alongside the learning outcomes obtained in the development trial.

The contribution of this study lies in integrating three elements that are often addressed separately in digital learning practice: (1) LMS-based instructional delivery, (2) self-efficacy-oriented learning design, and (3) contextualized disaster-mitigation content connected to the SDGs. The study therefore moves beyond simply converting printed material into an electronic format by structuring the e-module and LMS as a connected learning environment. This positioning addresses the local problem of underused LMS interactivity while providing a practical model for Social Studies learning on eruption mitigation.

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Based on these conditions, this study developed an LMS-based Social Studies e-module oriented toward self-efficacy on the topic of eruption mitigation in mountainous areas and its relation to the SDGs. The study aimed to determine the product's feasibility, practicality, and effectiveness, particularly in improving students' cognitive abilities in remembering and

understanding. The study also examined students' self-efficacy after using the developed learning resource.

2. Method

This study employed a Research and Development (R&D) approach using the ADDIE development model: analysis, design, development, implementation, and evaluation. The research was conducted in the context of learning at SMP Laboratorium Universitas Negeri Malang and involved 27 Grade VIII students as product-trial participants. The implementation used a one-group pretest–posttest design to examine changes in the targeted cognitive outcomes following use of the e-module.

During the analysis stage, the researchers identified learning needs, student characteristics, and problems related to LMS use. The design stage focused on the structure of the e-module, the learning flow, and the integration of self-efficacy-oriented elements into learning activities. In the development stage, the learning resource was produced as a flipbook using Heyzine, with visual design created using Figma, and subsequently integrated into the mooc.um.ac.id LMS.

In the implementation stage, the e-module was tested with Grade VIII students to examine its practicality and effectiveness. The evaluation stage considered the overall product quality based on expert validation, student responses, learning outcomes, and students' self-efficacy.

Data collection instruments consisted of an expert validation sheet, a student response questionnaire, pretest and posttest instruments, and a self-efficacy questionnaire. Descriptive analysis was used to evaluate product feasibility and student responses. Learning improvement was assessed using N-Gain. A paired comparison of pretest and posttest scores was also used to examine whether the observed difference was statistically significant; the source analysis reported $p < 0.001$ and a large effect size ($d = 1.60$). Because no control group was included, these analyses describe change within the development trial and do not by themselves establish a causal effect of the e-module.

3. Results and Discussion

3.1 Result

The developed e-module was structured around learning objectives, organized learning materials, exercises, and evaluation activities integrated into the LMS. The design incorporated self-efficacy-oriented elements through gradual learning activities and feedback. The product was intended to support students in accessing materials, completing learning activities, and evaluating their understanding within a structured digital environment.

Expert validation resulted in an average score of 99% (mean = 3.96), indicating a very high level of feasibility in terms of content, presentation, and learning media. Student responses produced a mean score of 3.44, equivalent to 86%, indicating very positive acceptance and suggesting that the e-module was perceived as attractive, usable, and supportive of learning.

Table 1. Summary of product evaluation and learning outcomes

Evaluation aspect	Result	Interpretation
Expert validation	99% (M = 3.96)	Very feasible
Student response	86% (M = 3.44)	Very positive
N-Gain	0.858	High
Pretest–posttest	$p < 0.001$; $d = 1.60$	Significant; large effect
Self-efficacy	M = 3.09 / 4	High

The learning outcome analysis showed a mean N-Gain of 0.858, categorized as high. The source analysis reported that posttest scores were significantly higher than pretest scores ($p < 0.001$), with a large effect size ($d = 1.60$). These results indicate substantial within-group improvement in the targeted cognitive outcomes after implementation. However, because the study used a one-group pretest–posttest design, the magnitude of the gain should not be interpreted as definitive evidence that the e-module alone caused the improvement.

Students' self-efficacy was measured using a four-point Likert scale. The mean score was 3.09 out of 4, or approximately 77%, which was categorized as high. This result indicates that students demonstrated a relatively strong level of confidence in accessing the learning materials, participating in learning activities, and completing learning tasks through the LMS

3.2 Discussion

The findings suggest that integrating an e-module with an LMS can provide a more structured learning experience than using the LMS mainly for material distribution and assignment submission. This interpretation is consistent with descriptions of LMSs as environments for organizing learning resources, communication, activities, and assessment (Mahnegar, 2012; Watson & Watson, 2007). In the present product, the e-module was not treated as a standalone digital book: its materials were connected to activities and assessment within the LMS. The practical implication is that the value of the LMS depends not only on platform availability but also on how its functions are organized into an instructional sequence.

The 99% expert validation score indicates that the developed product met the expected quality criteria across its content, presentation, and media aspects. The 86% student response further indicates positive learner acceptance. These findings are compatible with literature emphasizing the importance of well-designed digital learning environments for learner experience and satisfaction (Sun et al., 2008). Rather than treating feasibility and acceptance as evidence of effectiveness, these two indicators provide complementary evidence that the product was considered suitable for use and acceptable to its intended learners.

The high N-Gain score and statistically significant improvement in pretest–posttest performance indicate that the e-module was associated with substantial improvement in the targeted cognitive outcomes. The learning focus on remembering and understanding is consistent with the role of basic cognitive abilities as a foundation for more complex thinking

processes. The result should nevertheless be interpreted within the scope of the development trial, as the study used a one-group pretest–posttest design with 27 students.

The mean self-efficacy score of 3.09 out of 4 provides descriptive support for the self-efficacy orientation of the product. The learning sequence incorporated gradual activities and feedback, which were intended to provide manageable opportunities for students to engage with the material and complete tasks. The result is also compatible with literature reporting an association between self-efficacy and academic achievement (Suartini et al., 2023). Nevertheless, the present study did not statistically test self-efficacy as a mediator, predictor, or cause of the observed learning gains. Therefore, the self-efficacy finding should be interpreted as an accompanying outcome of the instructional design rather than proof of a causal relationship between self-efficacy and achievement.

Taken together, the findings indicate that the main contribution of the developed product is its integration of instructional content, LMS activities, and self-efficacy-oriented scaffolding in a contextualized Social Studies topic. This combination addresses the identified problem of limited LMS interactivity and provides a practical digital learning environment for eruption-mitigation content. The contribution is therefore primarily a design and development contribution supported by feasibility, acceptance, and within-group learning-outcome evidence, rather than a claim of definitive causal effectiveness.

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4. Conclusion

The developed LMS-based Social Studies e-module oriented toward self-efficacy was found to be highly feasible and positively accepted by students. Expert validation reached 99% (M = 3.96), while student responses reached 86% (M = 3.44). The learning outcome analysis produced a mean N-Gain of 0.858, categorized as high, with a statistically significant pretest–posttest difference ($p < 0.001$) and a large effect size ($d = 1.60$). Students' self-efficacy also reached a high mean score of 3.09 on a four-point scale. Overall, the findings support the practical value of combining an LMS with a structured e-module, interactive learning activities, and self-efficacy-oriented scaffolding for Social Studies learning, particularly on eruption mitigation. Because the study used a one-group development trial, the results should be interpreted as evidence of substantial within-group improvement rather than definitive causal proof of effectiveness. Future research should test the product with broader samples and comparative designs and examine self-efficacy using analyses that can clarify its relationship with learning outcomes.

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