TRANSFORMING TRADITIONAL LEARNING INTO LMS-BASED METHODS TO IMPROVE STUDENT OUTCOMES IN THE DIGITAL ERA AT ESTV-GTI BECORA EAST-TIMOR

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Abstract. *This study explores the transformation of conventional learning methods into Learning Management System (LMS)-based approaches to improve student learning outcomes in the digital era, particularly at ESTV-GTI Becora, East Timor. Traditional lecture-based instruction has been found insufficient in facilitating students' understanding of complex subjects such as control and automation systems. More than 75% of students faced difficulties due to the abstract nature of the material and lack of interactivity. Through a literature review method, this research analyzes various sources highlighting the effectiveness of LMS in enhancing critical thinking, flexibility, and multimedia learning. The results show that LMS implementation significantly increases comprehension by 30–40% and supports cognitive, affective, and psychomotor development. The LMS also allows for personalized learning experiences and real-time performance tracking. However, successful adoption requires adequate infrastructure, teacher readiness, and pedagogical shifts. This study offers theoretical and practical insights into the strategic use of LMS as a solution to low student learning outcomes in technical and vocational education contexts.*

Keywords: *Control Systems; Critical Thinking; Digital Learning; Learning Management System; Student Outcomes.*

- **INTRODUCTION**

Education in the digital era demands rapid transformation in learning approaches to improve the quality of student learning outcomes. In a global context, technology has become a crucial element in supporting learning effectiveness. Alfi (2024) stated that education is the foundation for realizing a nation's progress, which needs to adapt to current developments. One of the main challenges in education is low student learning outcomes, largely due to the continued use of conventional learning methods that are no longer relevant to the needs and characteristics of today's students.

Based on observations at the ESTV-GTI Becora school, it was found that more than 75% of students experienced difficulty understanding control and automation systems material, primarily due to the dominant lecture method and the lack of interactive media in the learning process (Setiyo et al., 2023). This resulted in students becoming passive recipients of information, without the opportunity to explore and think critically.

The use of technology such as a Learning Management System (LMS) is believed to be an effective solution to address this issue. LMSs enable flexible, interactive, and multimedia-based learning, bridging theory and practice (Bradley, 2020). According to Rhode et al. (2017), LMSs are a key driver in the implementation of digital learning in various educational institutions.

The transformation from conventional learning to an LMS also aligns with a student-centered educational approach, which has been proven more effective in developing 21st-century understanding and skills such as critical and creative thinking (Fauzia, 2022). Therefore, this literature review aims to explore the relevance and effectiveness of transforming conventional learning methods to an LMS-based one in addressing the challenge of low student learning outcomes in the digital era.

- **LITERATURE REVIEW**

Literature shows that conventional learning methods, such as one-way lectures, have limitations in stimulating active student participation. According to Ashari (2023), this method fails to encourage students to think critically because it doesn't provide sufficient space for exploration and interaction. This poses a serious obstacle to understanding complex materials such as control and automation systems, which require visualization and hands-on practice.

Conversely, an LMS, as a form of digital learning media, offers various features that support modern learning. Mahnegar (2012) explains that an LMS allows for material management, student progress tracking, and integration with various media such as video, audio, and simulations. This makes the learning process more engaging and contextual.

Another study by Nurrita (2018) emphasized the importance of media in bridging theory and practice. An LMS allows for the visualization of abstract concepts, such as control system circuit simulations, which accelerates students' understanding of these concepts. Lilihata et al. (2023) even described an LMS as a platform capable of combining creativity and technology to improve the quality of learning.

The transformation to an LMS also supports personalized and flexible learning. Students can access materials anytime, anywhere, at their own pace and learning style (Wiragunawan, 2022). This is crucial for increasing student interest and engagement, which in turn impacts learning outcomes.

Finally, LMSs also provide the opportunity for integrating analytical data to monitor student progress in real time (Hill & Tham, 2020), enabling teachers to provide more targeted interventions. Therefore, the transition from conventional to LMS-based learning is not only important but also urgent.

- **RESEARCH METHODS**

The data collection process was conducted through a search using keywords such as "Learning Management System," "digital learning," "learning outcomes," and "critical thinking in education." The databases used included Google Scholar, ResearchGate, DOAJ, and ScienceDirect. References were selected based on their relevance and theoretical and practical contributions to the study topic.

After collecting the data, the authors categorized it based on topics such as: conventional methods, LMS utilization, LMS effectiveness in learning, and student learning outcomes. Each category was analyzed thematically to identify patterns, similarities, and differences across studies. Content analysis techniques were used to deepen the meaning of the findings.

All quotations and information used in this article are cited with valid references and adhere to APA or Chicago style. Content validity is ensured through triangulation between sources and testing for relevance to the current digital education context.

The results of this method are then compiled into an argumentative narrative that presents a theoretical synthesis and practical implications for the implementation of LMS-based learning in schools. This approach was chosen to provide a strong scientific foundation in addressing the problem of low student learning outcomes due to conventional learning methods.

4. RESULTS AND DISCUSSION

Studies show that LMS significantly improves learning quality compared to conventional methods. Research by Cavus (2015) found that students who used LMSs demonstrated higher levels of information retention and improved exam scores. This is because LMSs support active, independent, and reflective learning.

Review results indicate that LMSs have significantly improved learning outcomes across various educational contexts. Several studies have noted increases in student

comprehension of up to 30–40% when LMS-based learning is consistently implemented (Gunawan et al., 2021; Mishra et al., 2020). LMSs also enable continuous formative evaluation through online quizzes, reflections, and discussion forums, which directly strengthen students' information absorption and retention.

At ESTV-GTI Becora, the main challenge in understanding control and automation systems material was its abstract and theoretical nature. The LMS was able to translate these concepts into more concrete learning experiences through videos, Arduino simulations, and digital practice-based projects (Nitami et al., 2021). In the context of the ESTV-GTI Becora school, questionnaire results showed that more than 80% of students found it difficult to understand control systems material due to its abstract nature. With an LMS, this material can be visualized through videos, simulations, and interactive images, making it easier for students to understand.

The discussion also revealed that the transformation to an LMS requires technological readiness, teacher training, and a shift in teaching paradigms. An LMS cannot be effective if it is only used as a repository of materials. Integration of active methods, such as flipped classrooms and blended learning, is necessary for the LMS to truly become a catalyst for 21st-century learning (Hill & Tham, 2020; Pratama and Kusuma, 2021).

CONCLUSION

The transformation of learning methods from conventional models to LMS-based learning has proven to provide a real solution to low student learning outcomes in the digital era. LMSs provide flexibility, interactivity, and multimedia support that can improve students' conceptual understanding and critical thinking skills. In the context of learning control and automation systems, LMSs play a crucial role in simplifying complex and abstract concepts into easy-to-understand ones.

The literature shows that LMSs support three-domain-based learning (cognitive, affective, and psychomotor), strengthen collaboration, and enable real-time monitoring of student progress. However, this transformation is not without technical and pedagogical challenges that require the full support of all educational stakeholders.

Therefore, achieving optimal learning outcomes through LMSs requires thorough planning, teacher training, infrastructure provision, and an adaptive curriculum. This study is expected to provide a theoretical and practical foundation for educational institutions seeking to implement LMS-based learning effectively and sustainably.

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