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Academic Supervision Based on Learning Management System in Improving Teacher Performance

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Abstract

The digital transformation in educational institutions demands a more effective, well-documented, and technology-adaptive model of instructional supervision. This study aims to analyze the implementation of Learning Management System (LMS)-based academic supervision and its impact on teacher performance and instructional quality. Employing a descriptive qualitative approach, data were collected through in-depth interviews, observations, and document analysis involving the principal, vice principal for curriculum, and teachers. The findings reveal that LMS-based supervision is systematically implemented through digital scheduling, instructional document uploads, classroom recording submissions, and direct feedback via LMS features. Digital supervision significantly enhances teacher discipline, administrative consistency, digital competence, and the quality of instructional planning. LMS also accelerates the feedback cycle and strengthens reflective teaching practices. However, several challenges emerge, including unstable internet connectivity, teacher psychological pressure, and difficulties in digital adaptation. LMS-based supervision positively contributes to instructional quality and supports school quality management. This study highlights the importance of integrating digital supervision into teacher professional development, particularly in vocational education settings.

Keywords

Academic Supervision, Digital Learning, Instructional Supervision, Learning Management System, Teacher Performance, Vocational Education.

1. Introduction

The digital transformation of the Industrial Revolution 4.0 and Society 5.0 eras demands that the education sector adopt technology to improve the effectiveness of learning governance. One significant change is the use of Learning Management Systems (LMS), which are now used not only to manage the learning process but also to focus on more strategic functions such as academic supervision. Academic supervision, as an instrument for improving learning quality, formally mandated by the Minister of Education and Culture Regulation Number 13 of 2007, should ideally be implemented systematically, based on data, and encourage teacher professional development. However, supervision practices in many schools indicate that conventional approaches remain dominant and face limitations, including supervisor time constraints, a lack of ongoing documentation, and delays in providing feedback. These limitations also occur at SMK Bhinneka Karawang, where supervision is still conducted through face-to-face observations that are not yet fully capable of supporting comprehensive teaching reflection.

As the digital education ecosystem evolves, LMSs offer opportunities to improve supervision quality through teacher portfolio documentation, uploading learning videos, analyzing teaching materials, and providing faster and more documented feedback. Recent studies have shown that LMSs can enhance monitoring effectiveness and optimize communication between teachers and supervisors. For example, Ghamrawi et al. (2019) found that technology-based supervision enables more flexible and continuous professional development, while Cotman et al. (2023) emphasized the importance of responsive supervision in the digital context to improve instructional quality. In Indonesia, Saputra and Yusrianti (2023) demonstrated that the use of digital platforms in academic supervision increases transparency and consistency of feedback. However, most of these studies emphasize the use of LMSs for learning, rather than as an instrument for academic supervision, which has distinct characteristics and requires a more in-depth analytical approach.

From a state-of-the-art perspective, several gaps remain unaddressed. First, research on LMS-based supervision in Indonesia remains fragmented and tends to be descriptive, thus failing to provide a comprehensive understanding of how LMSs actually transform academic supervision practices. Second, the context of Vocational High Schools (SMK), which are characterized by vocational learning and more complex practices, has not been the primary focus of previous studies. This is despite the fact that digital documentation and traceability of the learning process are crucial in vocational education. Third, no research has specifically examined the implementation of LMS-based supervision at SMK Bhinneka Karawang, including its impact on teachers' performance and the school's educational quality. This empirical gap indicates that the impact of LMS-based supervision on learning quality in vocational schools remains poorly understood.

Thus, this study is important because it presents an empirical analysis focused on LMS-based academic supervision in the context of vocational education. The novelty of this study lies in, the study of LMS-based academic supervision not only from the implementation aspect, but also its relationship to improving teacher performance, the analysis of supporting factors and obstacles to implementation in a vocational high school environment that has unique learning characteristics, and a more holistic examination of the impact of digital supervision on the quality of school education. By filling these research gaps, this study expands the literature on digital academic supervision and provides an alternative supervision model that is adaptive to technological developments.

Based on this urgency, this research is directed to answer four main questions, namely: how is the implementation of LMS-based academic supervision at SMK Bhinneka Karawang; how does it contribute to improving teacher performance, what

supporting factors and obstacles influence its implementation; and what is the impact of LMS-based supervision on the quality of school education. In line with this formulation, the objectives of this research are to describe the practice of LMS-based academic supervision, analyze its influence on teacher performance, identify factors that influence its success, and assess its implications for the quality of education. This research is expected to provide theoretical contributions in the development of digital supervision studies as well as practical recommendations for schools in adopting a supervision model that is more responsive to the demands of the digital era.

2. Literature Review

2.1. Academic Supervision

Academic supervision is a professional development process oriented towards improving the quality of learning through monitoring, evaluation, and providing feedback to teachers. According to Ghamrawi et al. (2019), supervision not only serves to oversee the implementation of learning but also helps teachers systematically reflect on their teaching practices. Modern supervision models emphasize a collaborative, dialogic, and needs-based approach, in contrast to traditional top-down and administrative models.

Cotman et al. (2023) emphasize that ideal academic supervision must adapt to the characteristics of the school context and technological developments, thus no longer relying on momentary observations but instead utilizing rich and diverse learning data. This aligns with the view of Asmadi et al. (2023), who position supervision as an effort to improve teacher capacity through continuous development, rather than simply a one-time performance assessment. In the Indonesian context, academic supervision has become a regulatory mandate through the Minister of Education and Culture Regulation Number 13 of 2007, which requires school principals and supervisors to implement supervision as part of educational quality management.

However, several studies have shown that the implementation of academic supervision in schools still faces structural obstacles, such as limited supervisor time, inadequate documentation, and low follow-up intensity. This highlights the need for a more adaptive supervision model to meet the demands of the times, particularly technology-based supervision.

2.2. Learning Management System

A Learning Management System (LMS) is a digital platform used to manage, store, distribute, and evaluate online learning materials. LMSs have developed rapidly in the past five years and have become a key tool in digital learning. According to Suparliadi (2021), LMSs enable the integration of teaching materials, assessment, communication, and learning monitoring. International studies show that LMSs play a role not only in content delivery but also in supporting the management of learning data, which can be further analyzed for instructional decision-making (Tessalonika et al., 2021; Cotman et al., 2023). In the context of vocational education, LMSs have greater potential because they allow for the documentation of learning practices, the uploading of demonstration videos, skills modules, and project-based activities. However, LMS utilization is often still focused on online learning and has not been fully optimized as an instrument for academic supervision.

The use of an LMS in academic supervision opens opportunities for transforming supervision methods from traditional to modern, digital-based ones. Saputra and Yusrianti (2023) found that digital supervision can increase feedback transparency and strengthen teacher portfolio documentation. Sungkowo (2023) emphasized that LMS-based supervision results in more systematic monitoring because supervisors can access lesson plans, teach materials, and learning recordings at any time.

Research by Sa et al. (2024) states that digital supervision can expand the scope of coaching because it is not bound by space and time. Furthermore, the communication features in an LMS (chat, comments, discussions) allow for faster, more specific, and more sustainable feedback. These findings are reinforced by Untari and Ariartha (2022), who demonstrated that digital supervision models can enhance collaboration between teachers and supervisors. However, challenges in implementing LMS-based supervision include limited teacher digital literacy, limited school infrastructure readiness, and resistance to cultural change. In the context of vocational schools, these challenges are further complicated because practice-based vocational learning requires richer documentation, not just written teaching materials.

2.3. Instructional Supervision and Digital Leadership

Instructional supervision has transformed from hierarchical evaluation to collaborative professional learning communities that emphasize teacher agency and continuous improvement (Kraft & Hill, 2020). Contemporary supervision frameworks prioritize instructional coaching, reflective dialogue, and evidence-based feedback mechanisms that directly impact teaching quality and student outcomes (Glanz & Zepeda, 2015). Research indicates that effective instructional supervision requires supervisors to possess pedagogical expertise, interpersonal skills, and technological competencies to support teacher development in digital learning environments (Hairon & Goh, 2015).

Digital leadership has emerged as a critical competency for educational leaders navigating technology-integrated learning ecosystems (Badada et al., 2025). Digital leaders demonstrate proficiency in leveraging technology for organizational transformation, data-driven decision-making, and fostering digital culture within educational institutions (Avidov-Ungar, 2023). Recent studies emphasize that digital leadership extends beyond technical skills to encompass strategic vision, change management, and capacity building for sustainable digital transformation (Pettersson, 2021).

The integration of instructional supervision with digital leadership enables innovative supervision models utilizing Learning Management Systems, analytics platforms, and virtual coaching tools (Kew & Tasir, 2022). However, implementation challenges include the digital divide, resistance to technology adoption, and inadequate professional development for supervisors. In vocational education contexts, these challenges intensify due to practice-based learning requirements and the limited research on technology-mediated supervision models tailored to the characteristics of vocational schools.

2.4. State of the Art and Research Position

Research studies on Learning Management System (LMS)-based academic supervision over the past five years indicate that digital developments have driven the emergence of various technology-based supervision models (Sermal & Yunus, 2025). However, based on a literature review, most research still focuses on the use of LMS as a learning medium rather than as a supervisory instrument specifically supporting teacher professional development. Studies such as those by Cotman et al. (2023) and Tesalonika et al. (2021) primarily highlight the use of LMS to improve instructional effectiveness but have not yet explored in depth how LMS can change the paradigm of academic supervision. These findings indicate that the use of LMS is understood only as a learning management tool, while its function as a supervisory tool has not been fully explored.

Furthermore, studies on digital academic supervision in Indonesia are largely descriptive and have not conducted a comprehensive analysis of the impact of digital supervision on teacher performance or educational quality (Deta & Bedanen, 2025). For example, Saputra and Yusrianti (2023) identified increased transparency of

feedback through e-supervision but did not link this to measurable improvements in teacher instructional performance. Meanwhile, research on LMS-based supervision in the context of Vocational High Schools is still very limited. However, the characteristics of vocational education, which require documentation of learning practices, technical skills, and portfolio-based evaluation, make LMS a highly potential platform for developing digital supervision (Munna et al., 2024). To date, no study has specifically examined the implementation of LMS-based academic supervision at SMK Bhinneka Karawang, including the process, supporting and inhibiting factors, and its impact on teacher performance and educational quality. This gap indicates that this research lies in an underexplored scientific space and has strong academic relevance for broadening understanding of digital supervision practices in vocational education environments.

3. Methods

This study uses a descriptive qualitative approach to gain a deep understanding of the implementation of Learning Management System (LMS)-based academic supervision at Vocational High Schools (*Sekolah Menengah Kejuruan*/SMK) in Bhinneka Karawang. A qualitative approach was chosen because this study focuses on exploring the meanings, experiences, and processes experienced by teachers, principals, and supervisors in implementing digital supervision. In line with Creswell's (2019) perspective, a qualitative approach enables researchers to capture the social dynamics, interactions, and interpretations of research subjects regarding the phenomenon of technology-based supervision. The research was conducted at SMK Bhinneka Karawang, a vocational school that has implemented an LMS as part of its learning management. The location was selected purposively for its contextual relevance and ease of access. The research subjects consisted of: (1) the principal as the main supervisor, (2) the vice principal for curriculum, (3) the supervising supervisor, and (4) the subject teachers involved in LMS-based supervision. The presence of diverse informants enabled triangulation of perspectives, making the research findings richer and more in-depth. Data collection continued until data saturation was reached, as indicated by the absence of new information or emerging themes in subsequent interviews and observations.

Data were collected using three main techniques: in-depth interviews, participatory observation, and documentation study. Semi-structured in-depth interviews were conducted to allow flexibility in exploring participants' experiences with LMS-based academic supervision, focusing on implementation processes, perceptions, challenges, and the perceived impact of digital supervision; all interviews were recorded and transcribed to ensure data accuracy. Participatory observations were conducted during supervisory activities on the LMS, such as uploading teaching materials and learning videos, as well as interactions between supervisors and teachers, providing empirical insights into the actual use of the LMS in daily supervision practices. In addition, a documentation study was conducted by analyzing supervision plans and reports, teachers' instructional materials, supervisors' feedback, LMS activity records, and digitized teacher performance portfolios, thereby triangulating and validating data obtained from interviews and observations.

Data analysis in this study employed the interactive model proposed by Miles et al. (2014), which consists of three interconnected stages. The first stage was data reduction, involving the selection, simplification, and organization of relevant data into key themes such as the implementation, impacts, and supporting and inhibiting factors of LMS-based academic supervision. The second stage was data presentation, where the reduced data were systematically displayed through descriptive narratives, thematic matrices, and summarized findings to facilitate pattern recognition and interpretation. The final stage was conclusion drawing and

verification, which was conducted continuously through triangulation of interview, observation, and documentation data to ensure the validity and credibility of the research findings. To maintain the credibility and validity of the research, methodological triangulation (interviews, observations, and documentation) and source triangulation (principals, supervisors, teachers) were employed. Furthermore, member checking was conducted by confirming the findings with informants and peer debriefing with academic colleagues to minimize researcher bias. The entire research process was recorded in an audit trail to ensure transparency and dependability of the research findings.

4. Results

4.1. Implementation of LMS-Based Academic Supervision

The implementation of Learning Management System (LMS)-based academic supervision at SMK Bhinneka Karawang demonstrates the significant dynamics of digital transformation in teacher coaching practices. Interviews with the principal, teachers, and the vice principal for curriculum revealed that the LMS serves not only as a medium for uploading teaching materials but also as a supervisory instrument that enables more systematic monitoring, evaluation, and coaching. The principal understands digital supervision as a "coaching and guidance process to improve the quality of learning through digital means," indicating that the school views the LMS not merely as a technological tool but as an integral part of its learning quality management strategy. Supervision implementation begins with initial outreach, scheduling, and the provision of technical instructions to teachers, and continues through ongoing monitoring of activity features, teaching material uploads, and learning recordings (Kabariah, 2022; Ameli et al., 2024).

Empirically, observations showed that teachers consistently uploaded lesson plans, teaching materials, learning videos, and documentation of class activities to the LMS, indicating good digital readiness (Munyaradzi et al., 2024). The vice principal confirmed that all supervision indicators could be implemented through the LMS because teachers "uploaded lesson plans, teaching materials, video recordings, and followed the supervision schedule well." Meanwhile, teachers felt that the LMS helped them manage documents more neatly, as one teacher stated that the platform "made it easier to archive administration and made learning more documented." This finding suggests that the LMS has served as a digital portfolio supporting evidence-based supervision, in line with the notion that modern supervision demands continuous tracking of teaching data.

4.2. Teacher Performance Enhancement through LMS-Based Supervision

In terms of improving teacher performance, almost all informants responded positively to digital supervision. Teachers stated that the LMS made them more disciplined and structured, especially in preparing learning materials, which are now better documented (Bradley, 2021). Another teacher reported that digital supervision provided a "significant increase in the efficiency of feedback" from supervisors, enabling faster and more targeted reflection and improvement in learning. The principal also confirmed that one of the most visible changes was "improved teacher discipline and performance quality after LMS supervision was implemented." Thus, digital supervision has been shown to strengthen the consistency of teaching strategies, foster a reflective culture, and improve teacher adherence to learning standards.

LMS supervision also encourages teachers' digital competencies (Rasdiana et al., 2024). Several teachers stated that they learned to create and edit instructional videos, prepare digital teaching tools, and understand technology-based learning flows. One teacher stated that she "learned to prepare digital-based learning and create instructional videos" during the supervision process. This aligns with the

concept of teacher digital literacy within the TPACK framework, which requires teachers to integrate technology into the planning, implementation, and evaluation of learning. Digital supervision, in this case, serves as a catalyst for improving both pedagogical and technological capacity.

4.3. Supporting Factors and Obstacles in the Implementation of LMS

Although LMS-based academic supervision has provided various benefits, its implementation has not been free from challenges. The Vice Principal for Curriculum identified technical issues, particularly unstable internet connections and concerns related to network security, as the most frequently encountered obstacles during the supervision process (Zaheer & Munir, 2020). These technical limitations sometimes hinder the smooth execution of online monitoring and feedback activities. In addition to technical constraints, teachers also reported experiencing psychological stress and logistical challenges when participating in digital supervision. These difficulties include the need to adapt to new digital systems, increased administrative demands, and challenges in managing time effectively between instructional duties and supervision requirements.

The principal further explained that inconsistencies in supervision schedules also contributed to obstacles in implementation, as overlapping responsibilities and institutional agendas occasionally disrupted the continuity of the supervision process (Dwikurnaningsih & Paais, 2022). These findings suggest that the challenges associated with LMS-based supervision extend beyond technical factors and also involve psychological readiness, organizational coordination, and institutional management.

These conditions indicate that adapting to digital supervision requires not only technological preparedness but also mental, organizational, and cultural adjustments. In line with Rogers' (2003) theory on the diffusion of innovation, resistance and implementation barriers are a natural part of the early stages of adopting a new supervision model. This theory emphasizes that successful innovation adoption depends on the availability of adequate resources, the development of digital competencies, and gradual changes in work culture to support sustainable implementation.

4.4. Impact of LMS-Based Supervision on the Quality of School Education

The influence of digital supervision on the quality of education at school was perceived as notably substantial across multiple aspects of teaching and learning. According to the vice principal for curriculum, the implementation of LMS supervision "significantly impacts the regularity of teacher administration," implying that instructional documentation has become more complete, submitted on time, and readily accessible for review and evaluation. Teachers also reported observable improvements in classroom interactions and their own motivation to teach, with several suggesting that digital supervision contributed to better student learning outcomes. In alignment with this perception, the principal assessed that the use of LMS-based supervision leads to improvements in both "the quality of learning and the quality of the school," indicating an overall positive influence on institutional educational standards.

These empirical observations resonate with broader findings in the literature regarding digital academic supervision. For example, research on digital supervision practices highlights their role in enhancing teacher performance by improving technological and pedagogical competencies, fostering creativity, and increasing administrative efficiency factors that collectively contribute to higher teaching quality when supported by sufficient training and infrastructure (Sapwan et al., 2025). Moreover, studies on the role of digital academic supervision emphasize that integrating digital platforms into supervisory practices enables more effective monitoring, feedback delivery, and professional development processes, all of which

are crucial for sustaining quality improvements in education systems operating in the context of rapid technological change (Hurriyati et al., 2024).

When contextualized within existing research by Sungkowo (2023) and Saputra and Yusrianti (2023), which similarly found that digital supervision enhances the quality of instructional monitoring and bolsters the effectiveness of learning processes, the current results further substantiate the claim that digital supervision is a significant lever for educational quality improvement. These convergent findings illustrate that LMS-based supervision not only supports administrative regularity and teacher motivation but also aligns with empirical evidence suggesting that digitally mediated supervisory practices can strengthen the overall educational outcomes of schools operating in the digital era.

5. Discussion

The research results show that LMS-based supervision at SMK Bhinneka Karawang has served as an effective professional development strategy. The LMS not only improves administrative order but also strengthens pedagogical reflection, accelerates feedback, enhances digital competency, and impacts the quality of student learning. Obstacles that emerged, particularly related to technical aspects and adaptation, can be managed through increased digital literacy, the provision of technical guidance, and more flexible supervision scheduling. Thus, LMS-based academic supervision can be seen as a relevant future supervision model, particularly for vocational education units that require comprehensive instructional documentation and monitoring.

The findings reveal that LMS-based academic supervision at SMK Bhinneka Karawang has successfully transformed traditional supervisory practices into a systematic, data-driven professional development model. This transformation aligns with recent literature emphasizing the shift from episodic classroom observations to continuous, technology-mediated supervision (Glanz & Zepeda, 2015). The utilization of LMS as both a learning management tool and supervisory instrument demonstrates how digital leadership can reshape instructional improvement strategies in vocational education contexts.

The positive impact on teacher performance particularly increased discipline, improved documentation, and enhanced digital competencies corroborates recent studies on technology-mediated professional development. Like research by Pettersson (2021), this study confirms that digital supervision catalyzes teachers' technological pedagogical knowledge while strengthening instructional practices. The emergence of digital portfolios through LMS documentation reflects evidence-based supervision supporting reflective practice and continuous improvement (Hairon & Goh, 2015). The integration of video recordings, lesson plans, and teaching materials addresses previous limitations in traditional supervision models, including inadequate documentation and inconsistent follow-up (Saputra & Yusrianti, 2023).

However, implementation challenges, including technical infrastructure constraints, psychological stress, and organizational coordination difficulties, mirror broader patterns in digital transformation research. These obstacles align with Rogers' (2003) diffusion of innovations theory, which posits that resistance and barriers are inherent to the adoption of new practices (Scherer et al., 2019). Internet connectivity and network security concerns hindering smooth implementation align with Avidov-Ungar's (2023) assertion that digital leadership requires technological investment and strategic planning to ensure infrastructure readiness.

The study's novelty lies in its comprehensive examination of LMS-based supervision specifically within vocational education, an underexplored area in current literature. While previous studies examined digital supervision in general educational settings (Cotman et al., 2023; Sungkowo, 2023), this research

demonstrates how vocational schools' unique characteristics particularly practice-based learning documentation and technical skills assessment create distinct opportunities and challenges. Teachers developing skills in creating instructional videos and digital teaching materials suggests that LMS-based supervision in vocational settings facilitates integrating technological and vocational pedagogical competencies, extending beyond the TPACK framework traditionally applied in general education (Tondeur et al., 2017).

This study contributes significantly to the development of technology-based academic supervision in both theoretical and empirical dimensions. Theoretically, it integrates the concepts of academic supervision, LMS-based learning management, and educational quality improvement into a single analytical framework, addressing a gap in the literature where supervision and educational technology have often been discussed separately. The study offers a new perspective by positioning the LMS not only as an instructional platform but also as a supervisory ecosystem that enables systematic monitoring, evaluation, documentation, and reflective teaching practices. In doing so, it reinforces contemporary supervision theory that emphasizes data-driven supervision and continuous professional development.

Empirically, this research provides concrete field evidence on the implementation of LMS-based supervision in vocational education, a context that remains underexplored in previous studies. The case of SMK Bhinneka Karawang illustrates how digital supervision operates within a complex vocational learning environment. The study identifies key supporting factors and obstacles, offering practical references for schools seeking to adopt similar models. Moreover, by linking LMS-based supervision to improvements in teacher performance and educational quality, this research delivers actionable insights for school leaders and policymakers in designing adaptive, technology-oriented strategies for learning quality enhancement.

6. Conclusion

This research demonstrates that implementing LMS-based academic supervision at SMK Bhinneka Karawang is effective in improving teachers' performance and learning quality. Digital supervision functions not merely as a monitoring mechanism but also as an integrated professional development instrument, supported by LMS features that document supervision stages in a systematic, data-driven manner, making the process more objective and flexible than conventional supervision. The impact of LMS-based supervision is evident in improved teacher discipline, administrative consistency, lesson planning quality, and digital competencies, including the ability to develop learning videos and manage technology-based instruction. Successful implementation is supported by strong leadership, curriculum management involvement, and adequate digital infrastructure. Despite facing challenges such as limited internet access, system security issues, adaptation difficulties, and psychological stress, digital supervision has shown a strong positive influence on administrative order, learning processes, and overall school quality. Therefore, LMS-based academic supervision represents a relevant and adaptive model for 21st-century education, offering transparent, accountable, and evidence-based practices to strengthen teacher development and learning quality.

Based on the research findings, several concise recommendations can be formulated. Schools are encouraged to strengthen internal policies regarding the use of the LMS as a supervisory tool by developing clear SOPs, implementing flexible supervision schedules, and providing continuous technical training for teachers. The integration of analytical features or monitoring dashboards within the LMS is also recommended to support real-time supervision and evaluation. Teachers should continually enhance their digital literacy and technology-based pedagogical

competencies by using LMS activity reports and supervisor feedback to reflect and improve professionally.

School principals and supervisors are advised to improve the quality of feedback by making it more constructive, specific, and long-term-oriented, while ensuring regular supervision and providing psychological support to reduce teacher anxiety during digital supervision processes. At the policy level, education authorities are encouraged to consider digital academic supervision as a complementary model to conventional supervision, particularly in vocational schools, supported by adequate infrastructure, standardized LMS platforms, and systematic digital training. Future research may extend this study by examining the quantitative impact of LMS-based supervision on student learning outcomes and by conducting comparative studies across educational levels or institutions to deepen understanding of digital supervision practices.

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The authors declare that there is no conflict of interest.

Ethical Approval and Originality Statement
Ethical approval was obtained for this study. The manuscript represents original work and has not been previously published, nor is it under consideration by another journal.

Data Disclosure Statement
The data that support the findings of this study are available from the corresponding author upon reasonable request.