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Development of a Web and Mobile Rule-Based Expert System for Vocational School Academic Supervision

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ABSTRACT

Purpose: This study develops a hybrid digital solution named BASRI (Best Academic Supervision with Recommendation using Intelligence) to resolve administrative inefficiencies and delayed feedback in the conventional academic supervision framework at SMK PGRI 1 Kota Bogor. **Methods:** Methodologically, an algorithmic Research and Development (R&D) pathway framed within the ADDIE framework was executed based on a preliminary needs assessment of 34 educators. **Findings:** Product validation confirmed the application is highly feasible, scoring 90.0% for material substance and 93.8% for media engineering. Subsequent field testing demonstrated exceptional operational practicality, achieving satisfaction ratings of 95.0% from the principal and 95.6% from 20 participating teachers. Furthermore, a Paired Sample T-Test revealed significant structural improvements in teaching outputs, with Learning Effectiveness increasing from 4.30 to 4.65, and Management Efficiency advancing from 4.32 to 4.73 (Sig. 2-tailed = 0.000 < 0.05). **Research Implications:** In conclusion, integrating an automated expert logic matrix within the supervisory workflow successfully shifts institutional administrative culture from passive, retrospective reporting to a responsive, real-time mentorship dynamic. **Originality:** Unlike conventional digital forms that merely digitize paperwork, BASRI introduces a novel Rule-Based AI expert system that automatically analyzes observation scores to diagnose pedagogical weaknesses and instantly delivers personalized professional development video recommendations to teachers. This system provides vocational institutions with an adaptable architectural blueprint to sustain micro-level continuous professional development and high-scientific advancement.

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INTRODUCTION

In the contemporary milestone of the Fourth Industrial Revolution, global educational landscapes demand an unprecedented level of technological literacy, computational agility, and digital adaptation from instructional staff. The matrix of the modern classroom environment requires secondary educators who not only possess rigorous, well-defined pedagogical, personal, and social competencies but who are also natively capable of fluidly incorporating smart processing systems into daily teaching-learning interactions (Bancoro, 2024; Firdaus et al., 2022). Empirical data across the spectrum of educational administration continuously affirms that the macroeconomic output of any state education apparatus is explicitly governed by individual teacher performance inside the classroom ecosystem, which in turn relies heavily on continuous organizational professional support, environmental comfort, technical rewards, and deep structural commitment (Alexandro Hutagalung, 2022; Colquitt et al., 2018; Pangestu et al., 2022). When teaching staff fall short of these multi-dimensional professional baselines, a direct downward trend is inevitably witnessed in student performance metrics and overall institutional rankings, signifying a critical operational failure that demands targeted, technology-driven management upgrades (Wibowo, 2018).

To effectively mitigate these persistent teaching gaps and prevent the stagnation of instructional skills, secondary schools traditionally leverage the mechanism of academic supervision orchestrated natively by the institutional leadership or senior master teachers. Formally conceptualized as a cooperative, clinical coaching continuum rather than a punitive, judgmental grading exercise, periodic academic supervision aims to continuously refine, adapt, and

elevate the instructional capabilities of the workforce (Nurpuspitasari et al., 2019). Contemporary literature within the domain of vocational education management strongly substantiates that when supervisory frameworks integrate systematic field observation, personalized clinical feedback, and collaborative technical dialogue, they act as an authoritative catalyst that boosts intrinsic professional motivation, vocational alignment, and teacher self-efficacy (Hasan et al., 2024; Puspo Nugroho. Yohanes Umbu Lede, 2022; Rokhman et al., 2024). Similarly, systematic educational supervision plays a crucial mediating role in transforming an individual's latent pedagogical potential into superior classroom teaching performance (Tasbi & Jufri, 2025). Vocational instructors require distinct, tailored advisory support due to the rapid shifts in labor market demands and technological standards. Therefore, an active supervisor must act as an ongoing industrial coach rather than an administrative auditor, striking a clear balance between pure pedagogical theory and practical, field-applied vocational mastery.

Furthermore, within the structural transformation of the current Indonesian vocational curriculum specifically framed around the ongoing national implementation of the Merdeka Curriculum teachers are facing immense evolutionary pressures to shift their traditional, teacher-centered instructional habits into active, responsive, and industry-aligned learning paradigms. This curricular paradigm shift directly underscores that secondary school quality manuals and strategic institutional planning must explicitly be oriented toward achieving robust quality markers within the standardized 8 Dimensi Profil Lulusan (Graduate Profile Dimensions) framework. This strategic standard focuses deeply on multi-dimensional outcomes, including specialized professional competence, industry-oriented problem-solving skills, technological adaptability, and deep professional work commitment. Within this regulatory context, academic supervision by vocational school principals cannot be treated merely as an administrative afterthought or an annual compliance ritual; it must be executed as a highly optimized, continuous quality assurance mechanism designed to directly accelerate teacher learning innovation across vocational concentrations, such as Accounting, Office Management, and Digital Business (Agustin & Rubini, 2024; Ramadani & Laihad, 2024).

Nonetheless, a massive chasm exists between this theoretical ideal and the systemic realities observed within Indonesian vocational institutions, a trend distinctly highlighted during a preliminary comprehensive diagnosis at SMK PGRI 1 Kota Bogor. National internal indicators from the 2025 Education Report Card positioned the institution's overall learning quality index strictly within the intermediate cluster, revealing stagnant competencies in delivering high-impact technological instructions. A deeper contextual exploration via a baseline assessment of 34 active instructors exposed severe infrastructural bottlenecks and organizational delays within the conventional supervision workflow. Specifically, 74% of the surveyed teachers cited restrictive delays in getting administrative feedback, 76% expressed severe cognitive fatigue due to traditional paper-dependent workflows, and 79% identified a complete absence of structured post-supervision professional mentorship. These diagnostic values demonstrate that when supervision is treated merely as a passive regulatory checklist or a bureaucratic requirement, it fails to nurture an operational ecosystem of teaching innovation (Hendriawan et al., 2026; Imamah & Churrahman, 2022; Tidjani & Lailiyah, 2023).

Resolving these institutional bottlenecks necessitates an immediate pivot toward cross-platform mobile architecture and cloud infrastructure. Given the structural omnipresence of handheld smartphones running open-source systems among modern educators, implementing cellular management tools represents a logistical turning point for educational digitization (Purnamawati et al., 2020; Tewari & Singh, 2021). Integrating technology into educational management offers enormous potential benefits for organizing, data-logging, and monitoring teaching-learning processes across vocational departments (F.D.Setyawan et al., 2018). However, basic digital migration simply converting conventional paper evaluation sheets into flat, passive interfaces, scanned documents, or basic mobile databases fails to address the core clinical problem (Purnamawati et al., 2020). School administrators continue to encounter severe cognitive overload and temporal delays when attempting to manually synthesize raw evaluation scores into tailored, actionable professional advice for diverse teaching portfolios (Hasanah et al., 2019). The administrative burden of manual tabulation often leaves the supervisor with zero capacity to design personalized professional recovery pathways for struggling teachers.

To fundamentally disrupt this evaluation bottleneck and close the operational loops of school management, this investigation presents a proprietary digital ecosystem known as BASRI (Best Academic Supervision with Recommendation using Intelligence). The absolute novelty of the BASRI architecture is its backend deployment of a Rule-Based Artificial Intelligence (AI) expert logic system that acts as an automated advisory engine (Ahmad et al., 2022; Dogan et al., 2023). Artificial intelligence in education mimics human cognitive functions to deliver fast, adaptive decision-making support, alleviating human cognitive fatigue (Hamal et al., 2022). Unlike previous passive digital frameworks that merely serve as database repositories, BASRI's analytical core autonomously evaluates numeric pedagogical inputs against a customized diagnostic logic matrix. Whenever an explicit teaching criterion

drops to unsatisfactory parameters during a live observation, the expert system dynamically triggers an automated mitigation protocol, instantly provisioning the evaluated teacher with specialized micro-learning tutorial videos. Consequently, by effectively automating the post-observation feedback loop, this study seeks to thoroughly validate the feasibility, daily operational practicality, and statistical efficacy of the BASRI algorithm in shifting the baseline indicators of teacher performance and advancing vocational education administration.

METHOD

Methodologically, this inquiry operated within an algorithmic Research and Development (R&D) framework, intentionally modeled around the systematic, cyclical phases of the ADDIE design strategy (Analysis, Design, Development, Implementation, and Evaluation) to engineer a high-quality educational product (Branch, 2010). The developmental steps were executed systematically at SMK PGRI 1 Kota Bogor to translate raw field needs into a functional digital infrastructure.

The data collection framework leveraged a multi-dimensional array of specialized research instruments. For the preliminary phase, open-ended needs assessment questionnaires were developed to gather qualitative frustrations from the faculty. To measure product quality during the development phase, a Material Expert Validation Sheet and a Media Expert Validation Sheet were constructed, utilizing a 1-4 Likert scale to evaluate substance relevance, expert logic validity, and interface engineering metrics. User experience and operational viability were measured using a Practicality Questionnaire scored on a 1-5 Likert scale distributed to the school principal and instructors. The core measurement instrument consisted of a structured Classroom Observation Rubric focusing on two primary target variables: Learning Effectiveness (comprising indicators on student engagement, technology adoption, and formative assessment) and Learning Management Efficiency (comprising indicators on temporal allocation, administrative readiness, and material execution).

Data collection proceeded through an iterative, berjenjang sequence matching the ADDIE milestones. During the initial Analysis phase, qualitative and quantitative data were gathered from a purposive sample of 34 vocational teachers to map baseline systemic constraints. Qualitative responses were processed using NVivo text-mining algorithms to isolate structural themes. Following system construction, validation data were collected from a Material Expert (Academic Supervision Specialist) and a Media Expert (IT Infrastructure Specialist). Field implementation data collection utilized a tiered rollout strategy to systematically monitor usability and minimize system failures: a one-on-one trial with 3 teachers, an expanded small-group trial with 7 teachers, and a final broad field-test with 20 teachers. The quantitative performance data were collected through a rigorous pre-test (observations conducted under the legacy paper-based system) and a post-test (observations conducted after teachers implemented the personalized AI video recommendations).

The quantitative validation and practicality scores were analyzed using descriptive statistics. The actual total scores obtained from the rubrics were calculated against the ideal maximum scores to generate percentage matrixes, categorized into descriptive quartiles: 81%–100% (Highly Feasible/Practical), 61%–80% (Feasible/Practical), 41%–60% (Fairly Feasible/Practical), and 0%–40% (Not Feasible/Practical). To determine product effectiveness in shifting teacher competence, inferential statistics were applied to the pre-test and post-test datasets. The numeric data across the Learning Effectiveness and Learning Management Efficiency dimensions were verified for normality before conducting a Paired Sample T-Test in IBM SPSS Statistics. The null hypothesis (H_0) assumed no significant performance variance post-intervention, which was tested against an alternative hypothesis (H_a) under a standard significance threshold of $\alpha = 0.05$.

RESULTS

Figure 1. Needs Analysis Keyword Visualization (Word Cloud)

The initial phase diagnosed the shortcomings of the existing conventional supervision system. The pre-test questionnaire involving 34 teachers indicated that while psychological support from supervisors was generally good (mean score 4.53), managerial efficiency was severely lacking. The ease of scheduling scored the lowest (mean 3.32), and the speed of receiving feedback post-observation was suboptimal (mean 4.21). Qualitative analysis confirmed these frustrations, revealing that words like "recommendation," "time," and "document" were frequently collocated with complaints such as "difficult," "paper," and "manual."

Figure 2. Mapping of Priority Needs Themes (Hierarchy Chart)

Addressing the needs analysis, the BASRI application was designed with a multi-platform architecture (Android and Web). The system workflow was established to connect the Administrator, Curriculum Team, Supervisor, and Teachers in a seamless digital ecosystem. The main novelty introduced was the Rule-Based AI Logic Matrix embedded within the backend database. This expert system is programmed to read inputs on specific pedagogical indicators and trigger an automatic output if a score is Poor or Fair. For instance, if a teacher scores low in "Implementing differentiated instruction," the AI automatically generates tailored advice and pairs it with a direct video link for continuous professional development.

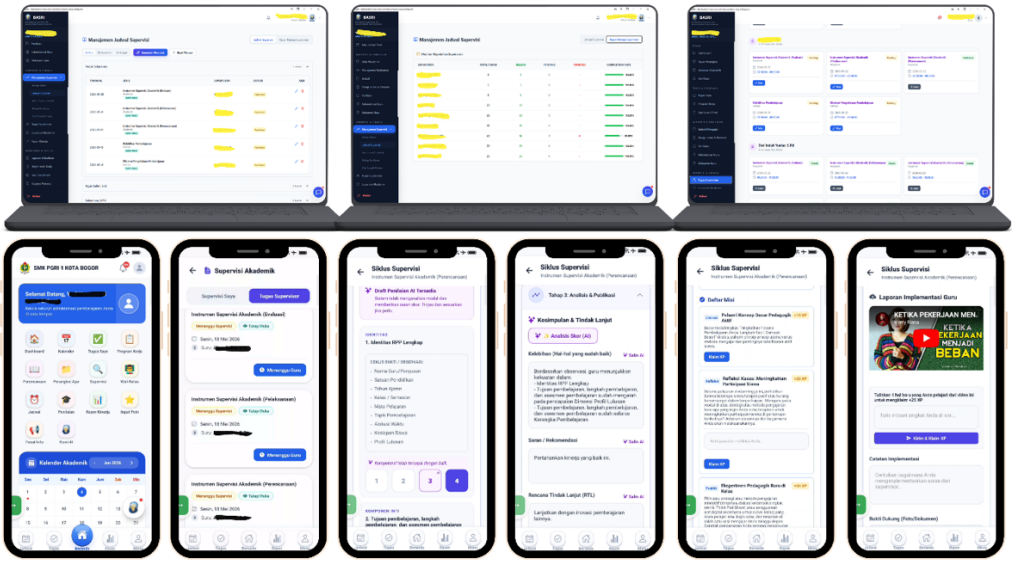

Figure 3. Screenshots of the BASRI Application

Before field implementation, the application was rigorously evaluated by experts. The Material Expert assessed the substance and pedagogical relevance, awarding a 90.0% feasibility rating (Highly Feasible). The Media Expert evaluated the software engineering and AI functionality, resulting in a 93.8% feasibility rating (Highly Feasible). During the broad field-test, the application operated stably without system crashes. Practicality was measured post-implementation. The principal awarded the application a practicality score of 95.0% (Highly Practical), citing the immense reduction in administrative burden. The 20 supervised teachers awarded a score of 95.6% (Highly Practical), praising the instant, real-time feedback.

Table 1. Descriptive Statistics of Teacher Performance (Pre-Test vs. Post-Test)

Teacher Performance Dimension	Pre-Test Mean	Post-Test Mean	Mean Difference
Learning Effectiveness	4.30	4.65	+ 0.35
Learning Management Efficiency	4.32	4.73	+ 0.41

The ultimate goal of this R&D was to ascertain if the application improved teacher performance. Descriptive statistics showed a clear surge. Learning Effectiveness increased from a pre-test mean of 4.30 to a post-test mean of 4.65 (+0.35). Learning Management Efficiency increased from 4.32 to 4.73 (+0.41).

Table 2. Paired Sample T-Test Results

Paired Differences	Mean	Std. Deviation	t	df	Sig. (2-tailed)
Pair 1: Pre_Effectiveness - Post_Effectiveness	-0.34500	0.34713	-4.445	19	0.000
Pair 2: Pre_Efficiency - Post_Efficiency	-0.41150	0.35531	-5.179	19	0.000

To verify statistical significance, a Paired Sample T-Test was conducted. The significance probability value (Sig. 2-tailed) is 0.000 for both Learning Effectiveness and Learning Management Efficiency. Because the p-value ($p < 0.001$) is strictly less than α (0.05), the null hypothesis is rejected. This provides robust empirical evidence of a highly significant improvement in teacher performance resulting from the intervention of the BASRI application.

DISCUSSION

The comprehensive Research and Development process has yielded a highly feasible, operational, and statistically effective management product. The exceptional validation indexes awarded by independent experts, combined with the high practicality scores from real school users, fully align with contemporary international standards for software quality and pedagogical tools. These milestones prove that the BASRI application successfully transforms the cumbersome, paper-based bureaucratic nightmare of traditional academic supervision into a streamlined digital ecosystem. The core theoretical and practical contribution of this study is underscored by the significant, rapid improvement in vocational teacher performance, which directly highlights the operational power of an automated, rule-based expert logic matrix operating within school workflows.

In vocational school management, professional competence, pedagogical agility, and work commitment are highly governed by the technological and organizational support systems available to teachers (Purnamawati et al., 2020; Ramadani & Laihad, 2024). Traditional secondary school structures often isolate teachers within their respective classrooms, creating a structural barrier where instructional mistakes are rarely diagnosed in real time. The BASRI application disrupts this isolation by serving as an advanced, non-threatening professional support ecosystem. In conventional, legacy supervision models, school principals or vice-principals frequently lack the temporal capacity, objective tools, or specific vocational subject-matter expertise required to formulate deep, customized, and actionable clinical advice for every teacher under their purview. This structural limitation typically results in generic, superficial administrative comments that fail to trigger genuine pedagogical reflection or foster instructional innovation (Hendriawan et al., 2026; Puspo Nugroho. Yohanes Umbu Lede, 2022).

By directly integrating rule-based artificial intelligence, the BASRI framework successfully and seamlessly closes the traditionally fragmented supervision loop. It completely shifts the institutional paradigm of school supervision away from a judgmental, stressful administrative ritual or an annual regulatory requirement into a data-driven, continuous professional development (CPD) coaching platform (Giraud et al., 2023; Nordentoft et al., 2013). The automated expert system's ability to instantly read observation scores, diagnose a specific pedagogical deficiency, and immediately deliver a tailored micro-learning tutorial video directly to the teacher's smartphone fundamentally removes the friction between performance evaluation and performance improvement. Instructors can engage in deep self-reflection privately and immediately, absorbing targeted instructional models right when they need them most, which directly explains the substantial, statistically sound gains observed in the post-test scores. This responsive

mechanism directly solves the critical limitations of previous educational technology studies that only digitized observation rubrics onto mobile screens without providing an automated analytical or advisory layer (Purnamawati et al., 2020).

The contribution of this research to the field of educational administration and management is highly significant. By automating the analytical process, school principals can allocate more time to strategic leadership rather than administrative compliance (Hermawan et al., 2023; Yunus, 2025). Furthermore, this collaboration between educators and AI creates a responsive self-development ecosystem (Ajepri et al., 2022; Mujiono, 2023; Pisica et al., 2023). It is vital to recognize the contextual boundaries and operational limitations of this study. The empirical implementation of this R&D project was executed within a single vocational school environment utilizing a pre-programmed, static rule-based logic framework. While highly effective for targeted pedagogical diagnoses, a rule-based system relies on pre-defined conditional parameters and cannot adjust to unpredictable classroom dynamics outside its matrix. Therefore, as a strategic recommendation for future data-driven educational research, it is highly advised to scale this technological architecture by transitioning from a static rule-based system into an adaptive Machine Learning framework. Upgrading the backend database to machine learning algorithms will allow the system to autonomously parse broader metadata across multiple regional schools, predict macroeconomic pedagogical trends, detect systemic training deficiencies across districts, and dynamically generate custom, evolving instructional recommendations that adapt to future revisions in the national vocational curriculum.

CONCLUSION

Based on the multi-phase Research and Development process utilizing the ADDIE instructional model, this study successfully produced and validated the BASRI application as a smart management tool for vocational schools. The engineered product is empirically proven to be highly valid by material and media experts, while displaying exceptional operational practicality based on high satisfaction rates from both the school principal and the teaching staff. Crucially, the application effectively elevates teacher professional competence, generating significant statistical increases across both learning effectiveness and instructional management efficiency dimensions. The integration of an automated expert logic system successfully transforms academic supervision from a passive administrative assessment into an active, real-time coaching mechanism. Ultimately, this research provides a vital scientific contribution to educational management by offering an adaptable framework to continuously upgrade pedagogical innovation, and it is highly recommended for future studies to scale this system using advanced machine learning architecture.

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REFERENCE

Agustin, N., & Rubini, B. (2024). *Peningkatan kepuasan kerja melalui penguatan efikasi diri dan supervisi kepala sekolah*. *12*(01), 38–42. https://journal.unpak.ac.id/index.php/JMP/article/view/9939

Ahmad, S. F., Alam, M. M., Rahmat, M. K., Mubarik, M. S., & Hyder, S. I. (2022). Academic and Administrative Role of Artificial Intelligence in Education. *Sustainability (Switzerland)*, *14*(3), 1–11. https://doi.org/10.3390/su14031101

Ajepri, F., Vienti, O., & Rusmiyati, R. (2022). Strategi Kepala Sekolah Dalam Meningkatkan Kinerja Guru. *Mindset: Jurnal Manajemen Pendidikan Islam*, 130–149. https://doi.org/10.58561/mindset.v1i2.53

Alexandro Hutagalung, B. (2022). Analisa Faktor – Faktor Yang Mempengaruhi Kinerja Pegawai: Kompetensi, Motivasi Dan Lingkungan Kerja (Penelitian Literature Review Manajemen Sumber Daya Manusia). *Jurnal Manajemen Pendidikan Dan Ilmu Sosial*, *3*(1), 201–210. https://doi.org/10.38035/jmpis.v3i1.866

Bancoro, J. C. (2024). Relationship Between Artificial Intelligence (AI) Usage and Academic Performance of Business Administration Students. *Pedagogy Review: An International Journal of Educational Theories, Approaches and Strategies*, *1*(1), 1–15. https://doi.org/10.62718/vmca.pr-ijetas.1.1.sc-1223-004

Branch, R. (2010). Instructional design: The ADDIE approach. In *Instructional Design: The ADDIE Approach*. https://doi.org/10.1007/978-0-387-09506-6

Colquitt, J. A., Wesson, M. J., & LePine, J. A. (2018). *Organizational Behavior: Improving Performance and Commitment in the Workplace*. McGraw-Hill Education. https://books.google.co.id/books?id=6SrJswEACAAJ

Dogan, M. E., Goru Dogan, T., & Bozkurt, A. (2023). The Use of Artificial Intelligence (AI) in Online Learning and Distance Education Processes: A Systematic Review of Empirical Studies. *Applied Sciences (Switzerland)*, *13*(5). https://doi.org/10.3390/app13053056

F.D.Setyawan, G. F., Wintolo, H., & Indrianingsih, Y. (2018). Pengembangan Layanan Penyebaran Informasi Akademik Berbasis Android. *JISKA (Jurnal Informatika Sunan Kalijaga)*, *2*(3), 151. https://doi.org/10.14421/jiska.2018.23-04

Firdaus, I. A., Arif, M., Dyah, M., & Nugraheni, A. (2022). *Technology In Elt Contexts : Does Google Classroom Provide Satisfactory Online Classrooms Climate For*. *07*(01), 1–14. https://doi.org/10.18860/abj.v7i1.14511

Giraud, L., Zaher, A., Hernandez, S., & Akram, A. A. (2023). The impacts of artificial intelligence on managerial skills. *Journal of Decision Systems*, *32*(3), 566–599. https://doi.org/10.1080/12460125.2022.2069537

Hamal, O., El Faddouli, N. E., Alaoui Harouni, M. H., & Lu, J. (2022). Artificial Intelligent in Education. *Sustainability (Switzerland)*, *14*(5), 1–11. https://doi.org/10.3390/su14052862

Hasan, A. N., Hariri, H., & Rini, R. (2024). *The Effects Of Academic Supervision By Principal And Work Motivation On Teachers ' Professionalism*. *09*(1), 86–95. https://doi.org/10.18860/abj.v9i1.24592

Hasanah, M. L., Batusangkar, I., & Kristiawan, M. (2019). *Supervisi Akademik dan Bagaimana Kinerja Guru*. *3*(2).

Hendriawan, R., Rahmawati, Y., & Suharyati, H. (2026). The Influence of the Quality of the School Quality Manual and Principal Supervision on Teacher Learning Innovation In Secondary. *11*(1), 1–12. https://doi.org/10.18860/abj.v11i1.35743

Hermawan, A., Susanti, E., Pendidikan, K., Teknologi, D., Indrati, B., & Alkarimiyah, S. (2023). Teacher Performance Improvement Optimization Through Teamwork Strengthening, Interpersonal Communication, Adversity Quotient And Work Motivation Article History. *IJEMS: Indonesian Journal of Education and Mathematical Science*, *4*(1), 2715–2985. https://jurnal.umsu.ac.id/index.php/ijems/article/view/13452

Imamah, N., & Churrahman, T. (2022). Academic Supervision by School Principals for Improving Teacher Performance. *KnE Social Sciences*, *2022*, 60–69. https://doi.org/10.18502/kss.v7i10.11209

Mujiono, M. (2023). Educational Collaboration : Teachers and Artificial Intelligence. *Jurnal Kependidikan: Jurnal Hasil Penelitian Dan Kajian Kepustakaan Di Bidang Pendidikan, Pengajaran Dan Pembelajaran*, *9*(2), 618. https://doi.org/10.33394/jk.v9i2.7801

Nordentoft, H. M., Thomsen, R., & Wichmann-Hansen, G. (2013). Collective academic supervision: A model for participation and learning in higher education. *Higher Education*, *65*(5), 581–593. https://doi.org/10.1007/s10734-012-9564-x

Nurpuspitasari, D., Sumardi, S., Hidayat, R., & Harijanto, S. (2019). Efektivitas Pembelajaran Ditinjau Dari Supervisi Akademik Kepala Sekolah Dan Budaya Sekolah. *Jurnal Manajemen Pendidikan*, *7*, 762–769. https://doi.org/10.33751/jmp.v7i1.962

Pangestu, R. N., Rani, D. S., Tyas, T. S. N., & Farhah, Z. (2022). Faktor-faktor yang Mempengaruhi Kinerja Karyawan: Perencanaan , Kualitas dan Kepemimpinan (Literature Review Manajemen Kinerja). *Jurnal Ilmu Manajemen Terapan*, *4*(2), 215–228. https://dinastirev.org/JIMT/article/view/1285

Pisica, A. I., Edu, T., Zaharia, R. M., & Zaharia, R. (2023). Implementing Artificial Intelligence in Higher Education: Pros and Cons from the Perspectives of Academics. *Societies*, *13*(5), 1–13. https://doi.org/10.3390/soc13050118

Purnamawati, R. F., Hidayat, R., & Suharyati, H. (2020). Development of Supervision Instrument Application Model through the Utilization of Android-Based Technology for School Heads. *International Journal of Global Operations Research*, *1*(4), 143–150. https://doi.org/10.47194/ijgor.v1i4.60

Puspo Nugroho. Yohanes Umbu Lede. (2022). *Supervisi Pendidikan*. CV. Azka Pustaka. https://books.google.co.id/books?id=pxSfEAAAQBAJ

Ramadani, A. H., & Laihad, G. H. (2024). *Peningkatan Kepuasan Kerja Guru Melalui Penguatan*. *12*(02), 123–128. https://journal.unpak.ac.id/index.php/jmp/article/view/10234

Rokhman, R., Diana, N., Etek, Y., Koderi, K., & Sufian, M. (2024). The Development of a Scientific-based Academic Supervision Management Model. *AL-ISHLAH: Jurnal Pendidikan*, *16*(2), 1383–1398. https://doi.org/10.35445/alishlah.v16i2.4626

Tasbi, A., & Jufri, M. (2025). *Implementation Of Teachers ' Strategies In Strengthening Religious Character In Smpn 2 Aralle Mamasa District*. *10*(4), 1056–1063. https://doi.org/10.18860/abj.v10i4.34589

Tewari, A., & Singh, P. (2021). Android App Development: A Review. *Journal of Management and Service Science (JMSS)*, *1*(2), 1–6. https://doi.org/10.54060/jmss/001.02.006

Tidjani, A., & Lailiyah, Z. (2023). The role of academic supervision in improving teacher professionalism. *Educenter : Jurnal Ilmiah Pendidikan*, *2*(2), 96–101. https://doi.org/10.55904/educenter.v2i2.730

Wibowo. (2018). *Manajemen Kinerja Edisi Kelima*. ptrajagrafindo persada 1. https://books.google.co.id/books?id=cmXwzwEACAAJ

Yunus, M. (2025). *Bridging Technology and Pedagogy : A Study on Virtual Academic Supervision for Teacher Professional Growth*. *17*, 1844–1853. https://doi.org/10.35445/alishlah.v17i2.7207

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AUTHOR CONTRIBUTION STATEMENT

YYAB conceptualized the research, engineered the algorithm layout, coded the cross-platform hybrid backend, conducted the field implementations, and drafted the manuscript text. BR provided rigorous academic supervision, structured the pedagogical observation indicators, and revised the study design. RH evaluated the statistical data analysis, monitored the R&D methodology requirements, and critically edited the final manuscript. All authors have read and approved the final manuscript.

AI DISCLOSURE STATEMENT

The authors declare that this research was prepared, researched, written, and edited without the aid of artificial intelligence (AI) techniques for generating the core data or scientific claims. Standard grammar and formatting tools were utilized solely to enhance the readability of the English text. The authors take full responsibility for the content and originality of the publication.

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