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The SUPDIASI Strategy: Enhancing Teacher Pedagogical Competence Through Technical Guidance

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Abstract. The pedagogical competence of teachers is a critical determinant of educational quality, yet many educators, particularly at the elementary level, face challenges in designing and implementing effective instruction. This study was prompted by the need for an effective, job-embedded professional development model. This research analyzes the effectiveness of a Technical Guidance (Bimtek) strategy based on the Supervision, Discussion, and Action (SUPDIASI) model in enhancing teacher pedagogical competence. This study employed a qualitative action research methodology conducted at two elementary schools in Cianjur, Indonesia: SDN Sindangsari and SDN Tegalsari. The research was structured around the Plan-Do-Check-Act (PDCA) cycle. Data were collected through a triangulation of methods, including in-depth interviews with teachers and principals, participant observation of the complete SUPDIASI cycle, and analysis of institutional documents such as lesson plans and reflective journals. The findings demonstrate that the SUPDIASI model, managed through a PDCA framework, was highly effective. The initial Plan and diagnostic Supervision revealed specific teacher needs. The collaborative Discussion phase fostered reflective practice and problem-solving. The Action phase led to observable improvements in teachers' use of varied instructional strategies and classroom management. The final Check and Act stages institutionalized a culture of continuous improvement. The Bimtek strategy based on the SUPDIASI model is an effective and replicable framework for enhancing the pedagogical competence of elementary school teachers. By integrating supervision with collaborative reflection and concrete action, this model successfully bridges the gap between theory and practice, fostering a sustainable culture of professional learning.

Keywords: Pedagogical Competence, Professional Development, Academic Supervision.

1 Introduction

Elementary education serves as the bedrock of a nation's intellectual and character development, with the teacher positioned as the primary architect of the learning environment. The quality of this foundation is inextricably linked to the pedagogical competence of its educators [1]. Pedagogical competence is a complex, multifaceted construct that extends far beyond mere content delivery. It encompasses a teacher's ability to understand learners, design engaging and differentiated instruction, manage the

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classroom effectively, implement varied assessment strategies, and engage in reflective practice to continuously improve their craft [2]. A teacher endowed with strong pedagogical competence can create a learning environment that is not only orderly but also interactive, inspiring, and optimally suited to the diverse needs of students [3]. The Indonesian government has long recognized the centrality of this competence, formally enshrining it as a core standard for all educators [4].

Despite this clear mandate, a persistent gap exists between the expected standards of pedagogical competence and the reality observed in many elementary school classrooms. Initial observations at the research sites, SDN Sindangsari and SDN Tegalsari, revealed a common predicament reflective of broader national challenges. A significant portion of teachers struggled with the effective management of their classrooms. Instructional methods were often monotonous, heavily reliant on traditional lecture formats, which resulted in low levels of student engagement. Key aspects of modern pedagogy, such as differentiated instruction to cater to diverse learners and the use of formative assessment to guide teaching, were not yet fully understood or implemented [5]. This situation is often compounded by limited access to high-quality, sustained professional development opportunities, leaving teachers ill-equipped to adapt to evolving curricular demands, such as those introduced by the Kurikulum Merdeka (Emancipated Curriculum) in Indonesia [6].

This implementation gap highlights the inadequacy of traditional, one-off training models. Effective teacher professional development is not an event but a continuous, job-embedded process that is directly linked to the realities of the classroom [7] To address this, a more dynamic and collaborative approach is needed. This research proposes and investigates one such approach: a Technical Guidance (Bimtek) strategy based on the SUPDIASI model, which stands for Supervision, Discussion, and Action. This model is a cyclical, collaborative framework designed to bridge the gap between theory and practice. It integrates three powerful components: 1) Supervision: Developmental academic supervision, framed not as an evaluative inspection but as a collaborative process for observing practice and gathering data for reflection [8]. 2) Discussion: Structured, reflective dialogue within a professional learning community, where teachers collaboratively analyze the supervision data, share experiences, and co-construct solutions to pedagogical challenges [9]. 3) Action: The implementation of new, improved strategies in the classroom, followed by another cycle of observation and reflection.

The entire SUPDIASI strategy is managed through the lens of W. Edwards Deming's Plan-Do-Check-Act (PDCA) cycle, a renowned framework for continuous quality improvement [10]. The PDCA cycle provides a systematic, data-driven, and iterative structure for the process. In this context, the Plan involves identifying pedagogical needs and planning the SUPDIASI intervention. The Do phase is the implementation of the supervision, discussion, and action sequence. The Check phase involves evaluating the impact of the action on teacher practice and student learning. The Act phase uses this evaluation to standardize improvements or refine the strategy for the next cycle. This approach transforms professional development from a passive reception of information into an active, cyclical process of inquiry and refinement.

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This model is designed to directly address the core demands of 21st-century pedagogy. By engaging in the SUPDIASI cycle, teachers are expected to enhance not only their classroom management skills but also their capacity to foster critical thinking, creativity, communication, and collaboration among students. It provides a practical mechanism for translating the ambitious goals of modern curricula, such as the development of the Pancasila Student Profile, into concrete classroom practice. Previous research has indicated that training programs can positively impact teacher competence and motivation [11], but there is a need for more specific studies on integrated, cyclical models like SUPDIASI. This research, therefore, aims to analyze the effectiveness of the Bimtek strategy based on the SUPDIASI model in enhancing the pedagogical competence of teachers at SDN Sindangsari and SDN Tegalsari. The central research question is: How does the implementation of the SUPDIASI-based Bimtek strategy, managed through a PDCA cycle, contribute to the improvement of teachers' pedagogical competence? By providing a detailed, narrative account of this action research, the study seeks to offer a replicable and theoretically grounded model for effective, school-based professional development.

2 Method

This research employed a qualitative methodology using a Classroom Action Research (*Penelitian Tindakan Kelas*) design, which is a form of action research. This approach was selected because the primary goal was to improve the practical reality of teacher professional development within the specific context of the participating schools [1]. The study was structured as an iterative, reflective process undertaken collaboratively by the researcher and the participating teachers, aiming to produce direct and immediate improvements in pedagogical competence. The entire research process was framed by the four stages of the PDCA (Plan-Do-Check-Act) cycle, providing a systematic framework for the intervention and its evaluation [10].

The study was conducted at two public elementary schools in Cianjur, Indonesia: SDN Sindangsari and SDN Tegalsari. Data were collected through a triangulation of three primary techniques to ensure the depth and credibility of the findings. These techniques were: (1) participant observation, where the researcher actively observed all phases of the SUPDIASI intervention, including pre-observation conferences, classroom teaching, and post-observation reflective discussions; (2) in-depth, semi-structured interviews with the participating teachers, school principals, and the district supervisor to explore their perspectives, experiences, and perceived changes in competence; and (3) document analysis of relevant artifacts, including teacher-developed lesson plans (RPP), student work samples, observation instruments, and reflective journals. The combination of these methods allowed for a rich, multi-faceted understanding of the process and its impact [12].

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3 Result

3.1 Planning and Diagnostic Supervision: Establishing a Baseline for Growth

The initial phase of the action research was dedicated to meticulous planning and a diagnostic application of the first component of the SUPDIASI model: Supervision. This stage directly corresponds to the Plan phase of the Deming cycle. The process began with a collaborative needs analysis. At both SDN Sindangsari and SDN Tegalsari, initial meetings were held with teachers and school principals to identify the most pressing challenges related to pedagogical competence. The consensus was clear: teachers felt most challenged in managing student engagement, differentiating instruction for diverse learners, and implementing effective formative assessment. As one teacher stated, "We know the theory from the curriculum, but making it work in a class with 30 different children is the hard part." This initial diagnosis was crucial, as it ensured that the intervention was grounded in the authentic, self-identified needs of the practitioners, a key principle for effective professional development [13].

Based on this needs analysis, a detailed program plan was co-developed. The plan outlined a clear schedule for the SUPDIASI cycles, including initial supervisory observations, dedicated time for reflective discussions, and periods for teachers to plan and implement their "action" or revised lesson. This planning was not merely logistical; it was a strategic act of management. As Mulyasa emphasizes, planning is the critical first step where the direction for improving teacher performance is set [14]. By creating a clear and predictable structure, the plan reduced teacher anxiety and framed the entire process as a supportive, professional learning journey rather than an evaluative audit. The plan was socialized with all participants, including the school principals and the district supervisor, to secure their buy-in and active support, creating an ecosystem of encouragement around the teachers.

The first active step of the intervention was the initial supervisory cycle. This was designed to be purely diagnostic, providing a rich, detailed baseline of each teacher's current practice. The process followed a clinical supervision model [15]. It began with a pre-observation conference, where the researcher (acting as the supervisor-coach) met with each participating teacher. In this meeting, the teacher shared their lesson plan (RPP) for the upcoming observation, their learning objectives, and the specific pedagogical areas they were concerned about. This collaborative goal-setting was vital for establishing trust and focusing the observation. The subsequent classroom observation was conducted using a detailed, descriptive protocol. The observer captured specific, non-judgmental evidence of teacher actions, student responses, and classroom dynamics, focusing on the areas identified in the pre-conference. For example, observations of Mr. Hendi at SDN Sindangsari and Ms. Sulilawati at SDN Tegalsari revealed similar patterns: while their content delivery was clear, they relied heavily on lecture and whole-class questioning, resulting in a segment of students being passive and disengaged. The management of classroom time was also identified as an area for improvement. This initial supervisory stage was critical. It did not just confirm the initial needs analysis; it provided concrete, classroom-based evidence that would become the

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primary "text" for the next, most crucial phase of the SUPDIASI model: the reflective discussion.

3.2 Discussion and Action: The Collaborative Engine of Pedagogical Change

This phase represents the heart of the SUPDIASI model and corresponds to the Do stage of the PDCA cycle. It was here that the data from the diagnostic supervision was transformed into a catalyst for professional learning and concrete changes in practice. The process was driven by two interconnected activities: structured reflective discussion and the planning and execution of a revised "action" lesson.

The reflective discussion was the central engine of change. Following the classroom observation, a post-observation conference was held. This was not a traditional feedback session where the supervisor delivered a verdict. Instead, it was a carefully facilitated dialogue designed to promote teacher self-reflection. The discussion was structured around the evidence gathered during the observation. The facilitator would begin with broad, reflective questions, such as, "How did you feel the lesson went compared to your plan?" and "What were the moments where you felt the students were most engaged?" Gradually, the conversation would move to the specific evidence. For example, the facilitator might say to Mr. Hendi, "I noticed in my notes that during the group work portion, three of the five groups were actively discussing, but two groups seemed off-task. What are your thoughts on that?" This evidence-based, non-judgmental approach allowed the teacher to analyze their own practice without becoming defensive.

This individual reflection was then amplified through a group discussion with the other participating teachers. In this collaborative setting, teachers shared the challenges identified in their individual conferences. A powerful dynamic emerged: teachers realized they were not alone in their struggles. Ms. Sulilawati's difficulty with time management was echoed by other teachers. Mr. Hendi's challenge with keeping all groups on task was a common problem. This shared vulnerability created a strong sense of collegiality and a collective desire to find solutions. The group would brainstorm alternative strategies, drawing on their collective experience and theoretical knowledge. For example, in response to the student engagement issue, the group discussed and researched cooperative learning structures, such as "Jigsaw" or "Think-Pair-Share," which are known to increase student participation [16]. This discussion phase was transformative; it moved teachers from a state of isolated problem-solving to collaborative professional inquiry.

This collaborative inquiry led directly to the Action phase. Each teacher, armed with new insights and specific strategies from the discussion, was tasked with revising their original lesson plan to address the identified challenges. Mr. Hendi, for example, redesigned his group work activity to incorporate a more structured cooperative learning protocol with clearly defined roles for each student. Ms. Sulilawati revised her lesson to include timed transitions and visual timers to improve her classroom management. This revised lesson was the concrete "action" plan. The teachers then implemented this revised lesson in their classrooms, often with a peer or the researcher observing again. This second observation was not just for evaluation; it was to gather new data on the

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effectiveness of the changed practice. The findings were striking. In the revised lessons, student engagement levels were visibly higher. The classrooms were more active and student-centered. Teachers reported feeling more confident and effective. This cycle of supervision-informed discussion leading to concrete action and re-evaluation is the core mechanism through which the SUPDIASI model directly improves pedagogical practice.

3.3 Monitoring and Evaluation: Checking for Impact and Institutionalizing Growth

This final phase of the process corresponds to the Check and Act stages of the Deming cycle. It was focused on evaluating the impact of the intervention, reflecting on the process, and planning for the sustainability of the improvements. The management of this phase was crucial for ensuring that the changes in teacher practice were not temporary but became embedded in their professional repertoire.

The monitoring and evaluation (Check) process was multi-faceted and ongoing. The most immediate form of evaluation was the post-action reflection. After implementing their revised lesson, each teacher engaged in another reflective discussion, this time comparing the outcomes of the second lesson with the first. They analyzed the new observation data and their own experiences to assess the impact of the changes they had made. Teachers consistently reported positive changes. They noted higher levels of student participation, a better flow to their lessons, and a greater sense of confidence in their ability to manage a student-centered classroom. This positive feedback loop was a powerful motivator and reinforced the value of the collaborative process.

Evaluation was also conducted more formally at the end of the entire Bimtek program. This summative evaluation aimed to assess the overall impact on teachers' pedagogical competence. It involved a final round of interviews and a review of a portfolio of documents from each teacher, including their initial and revised lesson plans, their reflective journals, and samples of student work. The analysis of these portfolios revealed clear evidence of growth. Teachers' lesson plans became more detailed, more student-centered, and included a greater variety of instructional strategies and assessment techniques. Their reflective journals showed a marked increase in the depth and sophistication of their pedagogical thinking. This aligns with research showing that sustained, practice-based professional development is far more effective at changing teacher practice than traditional workshops [13], [17]. The school principals and the district supervisor, who were involved in observing the final lessons, also provided positive feedback, noting a visible improvement in the quality of instruction.

The final stage was the follow-up and institutionalization (Act). Based on the overwhelmingly positive evaluation, a final meeting was held with all participants to plan for the future. The key action was to sustain the momentum and embed the SUPDIASI model into the school's regular professional development structure. The group decided to form a permanent Professional Learning Community (PLC) that would continue the cycle of peer observation, discussion, and action on a regular basis. This was a critical step in moving from a researcher-led project to a teacher-led, self-sustaining system of professional growth. The principals at both schools committed to providing dedicated

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time and resources for these PLC meetings. A plan was also made to replicate and disseminate the model, with the initial cohort of teachers acting as facilitators to guide their colleagues through the SUPDIASI cycle in the following academic year. By formalizing the process and building internal capacity, the schools were acting to institutionalize the culture of collaborative improvement that the Bimtek had initiated. This final stage ensured that the project's impact would be both deep and lasting.

4 Discussion

The findings of this action research provide a rich, practice-based illustration of how a well-managed professional development strategy can significantly enhance teacher pedagogical competence. The effectiveness of the SUPDIASI-based Bimtek, framed within the PDCA cycle, offers several important implications for the theory and practice of teacher education and school management.

First, this study provides compelling empirical support for job-embedded, cyclical models of professional development over traditional, episodic training. The success of the SUPDIASI model reinforces the core principles articulated by leading scholars like Darling-Hammond and Guskey: that for professional development to be effective, it must be intensive, ongoing, connected to practice, focused on student learning, and collaborative [7], [18]. The SUPDIASI model embodies all these principles. It was not a one-day workshop but a sustained cycle of inquiry. It was not decontextualized theory but was directly linked to the teachers' own classrooms through supervision. It was not individualistic but was deeply collaborative, leveraging the collective wisdom of the professional community. The observable improvements in teacher practice at both schools serve as a powerful testament to the superiority of this approach. This finding challenges the still-prevalent reliance on short-term, "drive-by" workshops and advocates for a systemic shift toward school-based models that treat teacher learning as a continuous, integral part of the professional workday.

Second, the research highlights the critical role of developmental supervision as a catalyst for reflective practice. The "Supervision" component of the model was deliberately framed in the tradition of Glickman's developmental supervision, which emphasizes coaching and collaboration over inspection and evaluation [19]. By using a clinical supervision model (pre-conference, observation, post-conference) and focusing on teacher-identified goals, the process created a climate of psychological safety. This was crucial. It allowed teachers to be vulnerable, to honestly assess their own practice, and to be receptive to feedback. The observation data was used not to judge the teacher but as a shared text for a reflective conversation. This is the key that unlocks professional growth. Without this safe, reflective space, supervision can easily devolve into a defensive exercise that reinforces existing practices rather than challenging them. This study demonstrates that when managed effectively, supervision is the most powerful tool a school has for connecting professional learning directly to classroom practice.

Third, the study underscores the power of structured professional dialogue as an engine for change. The "Discussion" phase of the SUPDIASI model was more than just an informal chat; it was a facilitated, evidence-based conversation. By grounding the

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discussion in the concrete data from the classroom observation, the facilitator guided teachers to move beyond general complaints or anecdotal sharing toward a more rigorous, analytical inquiry into their practice. This process of collaborative reflection allowed teachers to co-construct new pedagogical knowledge that was directly relevant to their context. It transformed the teachers from passive recipients of expertise to active agents in their own professional learning. This aligns with the principles of Professional Learning Communities (PLCs), which contend that sustained improvement occurs when teachers engage in collective inquiry into their practice [9], [20]. The SUPDIASI model provides a clear, replicable structure for making these professional conversations productive and transformative.

Finally, this research implicitly argues that effective professional development is a management challenge. The success of the SUPDIASI intervention was not accidental; it was the result of a deliberate and systematic management process guided by the PDCA cycle. The meticulous Planning, the consistent Doing of the cycle, the rigorous Checking of its impact, and the strategic Acting to sustain the gains were all essential components [10]. This highlights the indispensable role of instructional leadership. The school principals and the district supervisor were not passive observers; they were active supporters and facilitators of the process. They helped create the conditions—such as providing time, resources, and encouragement—that allowed the professional learning to flourish. This reinforces the extensive body of research indicating that school leadership is a critical catalyst for effective teacher professional development and school improvement [20]. In conclusion, the synthesis of these themes suggests that enhancing teacher competence requires more than just a good program; it requires a well-managed system that integrates supervision, collaboration, and a relentless focus on continuous improvement.

5 Conclusion

This action research concludes that the Technical Guidance (Bimtek) strategy, structured around the Supervision, Discussion, and Action (SUPDIASI) model and managed through the Plan-Do-Check-Act (PDCA) cycle, is a highly effective framework for enhancing the pedagogical competence of elementary school teachers. The findings from SDN Sindangsari and SDN Tegalsari demonstrate that this job-embedded, collaborative, and cyclical approach successfully bridges the gap between pedagogical theory and classroom practice. By integrating developmental supervision, structured reflective dialogue, and concrete action, the SUPDIASI model empowers teachers to critically analyze their own teaching, collaboratively solve problems, and implement innovative, student-centered strategies.

The study confirms that the model leads to tangible improvements in teachers' ability to plan instruction, vary their teaching methods, manage their classrooms effectively, and assess student learning. More importantly, it fosters a sustainable culture of professional collaboration and continuous improvement. The key implication for educational practice is the need to shift professional development from isolated workshops to integrated, school-based systems like SUPDIASI. It is recommended that school leaders be

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trained in facilitating such models, and that districts provide the necessary time and resources to support this deep, practice-based professional learning.

References

[1] Ani Widayati, *Penelitian Tindakan Kelas*, vol. VI, no. 1. Jakarta: Bumi Aksara, 2008.

[2] W. Junita and D. Adela, 'Peran Kompetensi Pedagogik Dalam Mengelola Kelas Terhadap Kondusifitas Belajar Siswa', *Didakt. J. Ilm. PGSD STKIP Subang*, vol. 8, no. 2, 2021.

[3] Syarifuddin, 'Peningkatan Kompetensi Pedagogik Guru Kelas di SD IT Ihsanul Amal', *Aksara J. Ilmu Pendidik. Nonform.*, vol. 6, no. 2, 2020.

[4] S. Anwar, F. Maulani, W. Lutfiah, S. I. H. Syadiah, and A. S. N. Azizah, 'Integrasi Nilai Ketauhidan dan Ekopedagogi dalam Kurikulum Madrasah Ibtidaiyah untuk Penguatan Karakter Peduli Lingkungan', *TSAQAFATUNA J. Ilmu Pendidik. Islam*, vol. 7, no. 1, 2025.

[5] I. Tohidian and S. G. Nodooshan, 'Teachers' Engagement Within Educational Policies and Decisions Improves Classroom Practice: The Case of Iranian ELT School Teachers', *Improv. Sch.*, vol. 24, no. 1, pp. 33–46, 2020, doi: 10.1177/1365480220906625.

[6] W. E. Deming, *Out of the Crisis*. Cambridge, MA: MIT Press, 2000. [Online]. Available: https://books.google.co.id/books?id=LA15eDlOPgoC

[7] C. D. Glickman *et al.*, *Effective Teacher Professional Development*, 2nd ed., vol. 58, no. 1. New York: Routledge, 2020.

[8] C. D. Glickman, S. P. Gordon, J. M. Ross-Gordon, G. R. Terry, N. K. Denzin, and Y. S. Lincoln, *Supervision and Instructional Leadership: A Developmental Approach*, 10th ed. London: Pearson, 1977.

[9] OECD, 'Teacher and school leader policy', in *TALIS 2018 Results (Vol. 2): Teachers and School Leaders as Valued Professionals*, Paris: OECD Publishing, 2019.

[10] S. K. Nikmah, 'Pengaruh Kompetensi Pedagogik dan Kompetensi Sosial Guru Terhadap Pengelolaan Kelas di MIN 2 Ponorogo', IAIN Ponorogo, 2022.

[11] Vivtor, 'Pengaruh Pelatihan Peningkatan Kompetensi Pedagogik Guru dan Motivasi Kerja Terhadap Kinerja Mengajar Guru Sekolah Dasar Negeri di Tangerang Selatan', Universitas Pendidikan Indonesia, 2015.

[12] M. Sahlan and D. Setiawan, 'Peningkatan kompetensi pedagogik guru melalui kegiatan pelatihan berbasis lesson study', *J. Pendidik. Guru Sekol. Dasar*, vol. 6, no. 2, pp. 112–120, 2021.

[13] L. Darling-Hammond, M. E. Hyler, and M. Gardner, *Effective Teacher Professional Development*. Palo Alto, CA: Learning Policy Institute, 2017.

[14] E. Mulyasa, *Menjadi Kepala Sekolah Profesional*. Bandung: Remaja Rosdakarya, 2009.

[15] C. D. Glickman, S. P. Gordon, and J. M. Ross-Gordon, *Supervision and Instructional Leadership: A Developmental Approach*, 10th ed. London: Pearson, 2017.

[16] C. Motycka, 'Using interprofessional medication management simulations to

Journal of Science and Education (JSE)
Vol 6, Special Collection 2.2, March 2026, Pages 1-10
ISSN: 2745-5351 (Media Online)
DOI: https://doi.org/10.58905/jse.v6i2.2.672

impact student attitudes toward teamwork to prevent medication errors', *Curr. Pharm. Teach. Learn.*, vol. 10, no. 7, pp. 982–989, 2018, doi: 10.1016/j.cptl.2018.04.010.

[17] N. Sulastri, S. Anwar, U. Suherman, and E. S. Cipta, 'Deep Learning-Based Planning Model for Islamic Education in Indonesian Integrated Schools', *EDUKASIA J. Pendidik. dan Pembelajaran*, vol. 5, no. 2, pp. 645–658, 2024, doi: https://doi.org/10.62775/edukasia.v5i2.1734.

[18] T. R. Guskey, 'Professional development and teacher change', *Teach. Teach. Theory Pract.*, vol. 8, no. 3, pp. 381–391, 2002, doi: 10.1080/135406002100000561.

[19] S. Anwar and H. Umam, 'Transformative Education: Emphasizing 21st Century Skills and Competencies in The Independent Learning Curriculum', *AIM J. Islam. Educ. Manag.*, vol. 1, no. 1, pp. 1–16, 2020, doi: 10.15575/aim.v1i1.28886.

[20] U. Suherman *et al.*, 'Implementing a Kindness-Based Leadership Strategy in Islamic Elementary Education', *EDUKASIA J. Pendidik. dan Pembelajaran*, vol. 6, no. 1, pp. 281–292, 2025, doi: https://doi.org/10.62775/edukasia.v6i1.1384.

