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THE EFFECTIVENESS OF THE MENTORING METHOD IN SUPPORTING SCHOOL INSPECTORS TO IMPROVE THE PEDAGOGICAL COMPETENCE OF EARLY CHILDHOOD EDUCATION TEACHERS IN JAMBU SUBDISTRICT, SEMARANG REGENCY

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ABSTRACT
This study examined the effectiveness of a mentoring-based professional development model in improving the pedagogical competence of early childhood education (PAUD) teachers compared with conventional supervision. A quantitative approach employing a quasi-experimental pre-test–post-test nonequivalent control group design was conducted involving 60 teachers equally assigned to experimental and control groups. The experimental group participated in a structured mentoring program emphasizing collaborative reflection, classroom observation, constructive feedback, and continuous professional support, whereas the control group received conventional workshop-based supervision. Data were collected using a validated and reliable pedagogical competence instrument and analyzed using descriptive statistics, paired-sample *t*-tests, and normalized gain (N-gain) analysis. The results showed statistically significant improvements in both groups ($p < 0.001$); however, the experimental group demonstrated substantially greater improvement, with the mean score increasing from 65.18 to 88.19, compared with 64.93 to 75.52 in the control group. The experimental group also achieved a moderate N-gain score of 0.66, indicating meaningful improvement in pedagogical competence. These findings suggest that structured mentoring provides a more effective approach than conventional supervision for strengthening teachers' pedagogical competence. The results support the integration of mentoring into continuous professional development programs for PAUD teachers and provide practical evidence for supervisors, school leaders, and educational policymakers in improving the quality of teacher supervision.

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INTRODUCTION

Teachers' pedagogical competence is widely recognized as a fundamental determinant of educational quality because it directly influences the planning, implementation, and evaluation of learning. In Indonesia, pedagogical competence constitutes one of the four core competencies required of professional teachers and serves as the foundation for effective instructional practice. The National Teacher Competency Model further emphasizes student-centered learning, authentic assessment, constructive feedback, and reflective practice as essential dimensions of teachers'

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professional competence (Government of Indonesia, 2005; Directorate General of Teachers and Education Personnel, 2023).

In early childhood education (PAUD), pedagogical competence plays an even more critical role because teachers are responsible for facilitating children's cognitive, social-emotional, language, moral, and physical development during the most formative years of life. Teachers with strong pedagogical competence are better able to understand children's developmental characteristics, design meaningful learning experiences, implement appropriate instructional strategies, and conduct authentic assessments that support children's holistic development (Bredekamp, 2019; NAEYC, 2020).

Despite continuous government initiatives to improve teacher professionalism through education and training programs, many PAUD teachers continue to experience challenges in implementing student-centered learning, conducting authentic assessments, and integrating reflective practices into daily instruction. Conventional professional development programs are often limited to short-term workshops that primarily focus on theoretical knowledge, providing insufficient opportunities for continuous guidance and practical application in classroom settings (Darling-Hammond et al., 2017; Kemendikbud, 2023).

Mentoring has increasingly been recognized as an effective strategy for continuous professional development because it emphasizes collaboration, individualized support, and reflective learning. Unlike conventional training, mentoring enables teachers to receive ongoing assistance while addressing authentic classroom challenges, thereby facilitating sustainable improvements in instructional practice and professional competence (Knight, 2018; Whitmore, 2017).

Within the Indonesian early childhood education system, PAUD supervisors (*penilik*) have strategic responsibilities not only for monitoring educational quality but also for guiding teachers' professional growth through supervision, coaching, consultation, and mentoring. As a collaborative supervisory approach, mentoring allows supervisors to provide continuous professional assistance that supports teachers in improving their pedagogical competence while fostering reflective teaching practices (Glickman et al., 2018; Directorate General of Teachers and Education Personnel, 2023).

Previous studies have consistently demonstrated that mentoring contributes positively to teachers' instructional competence, professional confidence, reflective practice, and overall teaching performance. Nevertheless, most existing studies have examined mentoring in general educational contexts, whereas empirical evidence concerning mentoring implemented by PAUD supervisors remains limited. Furthermore, few studies have evaluated mentoring effectiveness using experimental approaches within Indonesian early childhood education settings (Hobson et al., 2009; Ingersoll & Strong, 2011).

The limited evidence regarding mentoring-based supervision in PAUD indicates an important research gap. Existing studies predominantly emphasize mentoring as a general professional development strategy without specifically examining the supervisory role of PAUD inspectors as mentors or comparing mentoring with conventional supervisory practices using a quasi-experimental design. Consequently, there is still insufficient empirical evidence regarding whether mentoring conducted by PAUD supervisors produces measurable improvements in teachers' pedagogical competence under authentic educational conditions in Indonesia. Addressing this gap is important for strengthening evidence-based teacher professional development policies and improving supervisory practices in early childhood education (OECD, 2020; Kemendikbud, 2023).

This study contributes to the existing literature by addressing these unresolved issues through a quasi-experimental evaluation of a structured mentoring model implemented directly by PAUD supervisors in an Indonesian early childhood education setting. Unlike previous studies that primarily relied on descriptive or non-experimental approaches, this research compares mentoring with conventional supervision using pre-test and post-test measurements to provide stronger evidence of its effectiveness. The novelty of this study lies in its focus on the supervisory role of PAUD inspectors as mentors, the application of a structured mentoring intervention within authentic school contexts, and the empirical assessment of its impact on teachers' pedagogical competence. These contributions extend current knowledge on mentoring-based professional development while providing practical evidence to support the improvement of supervisory policies and practices in Indonesian early childhood education.

Therefore, this study aims to examine the effectiveness of mentoring implemented by PAUD supervisors in improving the pedagogical competence of early childhood education teachers in Jambu District, Semarang Regency. The findings are expected to enrich the literature on mentoring and teacher professional development while providing practical

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recommendations for strengthening supervisory practices and improving the quality of early childhood education in Indonesia (Glickman et al., 2018; Directorate General of Teachers and Education Personnel, 2023).

METHOD

This study employed a quantitative approach using a quasi-experimental design to examine the effectiveness of mentoring in improving the pedagogical competence of early childhood education (PAUD) teachers. Quantitative experimental research is appropriate for examining causal relationships by measuring the effects of a specific intervention on predetermined outcomes under controlled conditions (Sugiyono, 2017; Creswell, 2023). The independent variable was the mentoring method implemented by PAUD supervisors, whereas the dependent variable was teachers' pedagogical competence.

A Nonequivalent Control Group Design was adopted because participants were assigned to experimental and control groups based on existing school clusters without randomization. This design was considered appropriate because random assignment was not feasible within the organizational structure of PAUD institutions, while maintaining naturally occurring groups enhanced the ecological validity of the study. Both groups completed a pre-test to determine their initial pedagogical competence. The experimental group subsequently participated in a structured mentoring program conducted by PAUD supervisors, whereas the control group received conventional professional development through workshop-based training. Following completion of the intervention, both groups completed the same post-test instrument to measure changes in pedagogical competence attributable to the different professional development approaches (Sugiyono, 2017).

The study was conducted in Jambu District, Semarang Regency, Central Java, Indonesia. The participants consisted of 60 PAUD teachers, with 30 teachers assigned to the experimental group and 30 teachers assigned to the control group. Participants were selected using purposive sampling based on predetermined inclusion criteria, including: (1) being an active PAUD teacher in Jambu District, (2) having at least one year of teaching experience, (3) actively participating in school professional development activities, (4) not participating in another mentoring program during the study period, and (5) providing informed consent to participate. The grouping of participants followed the existing school cluster arrangement to preserve the natural educational environment and minimize disruption to routine instructional activities.

Data were collected using a pedagogical competence instrument developed based on the Indonesian National Teacher Competency Model and the pedagogical competency indicators established by the Directorate General of Teachers and Education Personnel. The instrument measured six dimensions of pedagogical competence, namely understanding learners' characteristics, instructional planning, implementation of learning activities, authentic assessment, utilization of assessment results, and reflective teaching practice. Prior to data collection, the instrument underwent expert judgment involving specialists in educational supervision and early childhood education to establish content validity. Construct validity was subsequently examined through item validity analysis using Pearson product-moment correlation, while internal consistency reliability was evaluated using Cronbach's Alpha coefficient. The instrument satisfied the recommended psychometric criteria, indicating that it was valid and reliable for measuring teachers' pedagogical competence (Sugiyono, 2017).

The mentoring intervention was implemented systematically over several mentoring sessions conducted by PAUD supervisors. The first session focused on identifying teachers' professional learning needs through classroom performance review and needs assessment. The second session involved collaborative planning in which mentors and teachers jointly developed instructional improvement plans based on identified pedagogical challenges. The third session consisted of classroom observation, allowing mentors to observe authentic teaching practices and identify areas requiring improvement. The fourth session emphasized reflective discussion and constructive feedback, enabling teachers to critically evaluate their instructional practices and formulate improvement strategies. The final session focused on follow-up mentoring, during which teachers implemented recommended instructional improvements while receiving continuous guidance and monitoring from the supervisors. In contrast, participants in the control group received conventional professional development through workshop-based training without individualized mentoring, classroom observation, or continuous follow-up support.

Data analysis was conducted using descriptive and inferential statistical techniques. Descriptive statistics were employed to summarize participants' demographic characteristics and pedagogical competence scores before and after the intervention. Prior to hypothesis testing, the assumptions of normality and homogeneity of variance were examined to determine the suitability of parametric statistical procedures. Paired-sample *t*-tests were performed separately for each

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group to examine changes between pre-test and post-test scores because the same participants were measured at two different time points. Comparisons of improvement between the experimental and control groups were conducted using mean difference analysis. In addition, normalized gain (N-gain) analysis was employed to evaluate the magnitude of learning improvement achieved by participants in the experimental group. Statistical significance was established at the 0.05 level for all inferential analyses.

RESULT AND DISCUSSION

Descriptive Statistics of Teachers' Pedagogical Competence

To provide an overview of teachers' pedagogical competence before and after the intervention, descriptive statistics were calculated for both the experimental and control groups. The analysis compares the pre-test and post-test scores to identify changes in pedagogical competence following the mentoring intervention and the conventional supervisory approach.

Table 1. Descriptive Statistics of Pedagogical Competence Scores

Group	Test	Mean	SD	Minimum	Maximum
Experimental	Pre-test	65.18	2.17	58.93	70.00
Experimental	Post-test	88.19	1.80	84.30	91.80
Control	Pre-test	64.93	4.46	56.07	72.86
Control	Post-test	75.52	3.13	66.07	84.29

Table 1 shows that both groups demonstrated higher pedagogical competence scores after the intervention. The experimental group increased from a mean score of 65.18 on the pre-test to 88.19 on the post-test, representing an average improvement of 23.01 points. In comparison, the control group improved from 64.93 to 75.52, corresponding to an increase of 10.59 points. The experimental group also exhibited lower post-test score variability, indicating more consistent achievement among participants.

Comparison of Pre-test and Post-test Scores

To determine whether pedagogical competence significantly changed within each group, paired-sample *t*-tests were conducted separately for the experimental and control groups. The results are presented in Table 2.

Table 2. Paired Sample *t*-Test Results

Group	Mean Difference	t	df	p-value
Experimental	23.008	43.026	29	<0.001
Control	10.590	10.190	29	<0.001

Comparison Between Experimental and Control Groups

To compare the outcomes of the mentoring intervention with the conventional supervisory approach, post-intervention scores between the two groups were analyzed. This comparison was intended to determine whether the mentoring method produced better learning outcomes than conventional supervision.

Table 3. Comparison of Mean Pedagogical Competence Scores

Group	Pre-test Mean	Post-test Mean	Mean Improvement
Experimental	65.18	88.19	23.01
Control	64.93	75.52	10.59

As presented in Table 3, both groups experienced improvements after participating in professional development activities. Nevertheless, the experimental group consistently achieved higher post-test scores and demonstrated more than twice the average improvement observed in the control group. These findings indicate that teachers receiving mentoring attained higher levels of pedagogical competence than those participating in conventional supervision.

Effectiveness of the Mentoring Method

The effectiveness of the mentoring intervention was further examined using normalized gain (*N-gain*) analysis to determine the magnitude of improvement achieved by participants in the experimental group.

Table 4. N-Gain Analysis of the Experimental Group

Indicator	Value
Mean Pre-test	65.18
Mean Post-test	88.19
Mean N-Gain	0.66
Gain Category	Moderate

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The N-gain analysis yielded an average score of 0.66, which falls within the moderate effectiveness category. This result indicates that the mentoring intervention generated substantial improvements in teachers' pedagogical competence. The increase in post-test scores, together with the moderate N-gain value, demonstrates measurable learning progress among teachers who participated in the mentoring program.

Mentoring as an Effective Strategy for Improving Teachers' Pedagogical Competence

The findings of this study demonstrate that mentoring is an effective professional development strategy for enhancing the pedagogical competence of early childhood education (PAUD) teachers. The experimental group exhibited a substantial increase in pedagogical competence, with the mean score improving from 65.18 on the pre-test to 88.19 on the post-test, representing an average improvement of 23.01 points. In contrast, the control group improved from 64.93 to 75.52, corresponding to a mean improvement of only 10.59 points. Although the paired-sample *t*-test indicated statistically significant improvements in both groups ($p < 0.001$), the considerably larger improvement observed in the experimental group demonstrates that mentoring generated stronger learning outcomes than conventional supervision. These findings indicate that while professional development activities generally contribute to teacher improvement, structured mentoring provides more intensive and sustained learning opportunities that enhance pedagogical competence more effectively (Ahmad, 2018; Bozeman, 2016; Dougherty, 2016).

The effectiveness of mentoring can be explained by the characteristics of the mentoring process itself. The greater improvement of 23.01 points achieved by teachers who received mentoring reflects the benefits of continuous guidance, collaborative reflection, classroom observation, and individualized feedback throughout the intervention. Unlike conventional supervision, which often emphasizes administrative evaluation, mentoring encourages reciprocal learning between supervisors and teachers through ongoing professional dialogue and contextual problem-solving. These continuous interactions enable teachers to critically evaluate their instructional practices and immediately apply suggested improvements in authentic classroom situations, thereby producing greater competence gains than those achieved through workshop-based supervision alone (Sulasmono et al., 2017; Handriyanto, 2022; Sulhan, 2022; Smith, 2021).

The normalized gain analysis further supports these findings. The experimental group achieved an average N-gain score of 0.66, which falls within the moderate effectiveness category, indicating that the mentoring intervention produced meaningful improvements in teachers' pedagogical competence rather than merely statistically significant differences. This result is consistent with previous studies reporting that mentoring strengthens instructional competence, reflective practice, teacher confidence, and professional commitment (Ellen, 2017; Morrison, 2020; Iriani, 2022). In the context of early childhood education, where teachers are required to understand child development, design developmentally appropriate learning experiences, and conduct authentic assessments, the substantial improvement demonstrated by the experimental group provides empirical evidence that mentoring represents a sustainable model of professional development capable of strengthening pedagogical competence (Bredekamp, 2021; Pianta, 2020; Akbar, 2021).

Why Mentoring Produced Greater Improvement than Conventional Supervision

One of the most important findings of this study is that teachers who participated in mentoring demonstrated more than twice the average improvement achieved by teachers receiving conventional supervision. Specifically, the experimental group improved by 23.01 points, whereas the control group improved by only 10.59 points, despite both groups showing statistically significant pre-test to post-test differences ($p < 0.001$). This numerical difference indicates that mentoring generated substantially greater professional learning than conventional workshop-based supervision.

The superior outcomes achieved by the mentoring group can be explained through the characteristics of mentoring as a collaborative and practice-oriented professional development approach. The large improvement observed in the experimental group suggests that continuous classroom observation, reflective dialogue, individualized feedback, and follow-up assistance enabled teachers to address authentic instructional challenges more effectively than participants who attended conventional workshops. Rather than focusing primarily on evaluation and administrative compliance, mentoring encourages active participation, collaborative problem-solving, and immediate application of new pedagogical strategies, thereby producing greater improvements in instructional competence (Ruswandi, 2007; Sudarta, 2017; Ahmad, 2018).

These findings are also consistent with theories of adult learning and workplace learning, which emphasize that professional competence develops most effectively when learning activities are directly connected to authentic work experiences. The 23.01-point improvement and the moderate N-gain value (0.66) indicate that teachers benefited from contextual learning experiences in which they discussed real classroom problems, received individualized feedback, and implemented instructional improvements under continuous supervision. Such conditions reduce the gap between

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theoretical knowledge and classroom practice while fostering reflective and self-directed professional learning (Bozeman, 2016; Dougherty, 2016; Bruce Joyce & Calhoun, 2024).

Another important factor contributing to the effectiveness of mentoring is the establishment of supportive professional relationships between mentors and teachers. Besides achieving the highest post-test mean score (88.19), the experimental group also demonstrated a lower post-test standard deviation than the control group, indicating that improvements occurred consistently across participants rather than being concentrated among only a few individuals. This finding suggests that mentoring provided equitable learning opportunities through continuous support, open communication, and collaborative problem-solving. Previous studies similarly report that supportive mentoring relationships strengthen teacher motivation, professional confidence, and long-term instructional improvement because participants receive sustained psychological and professional support throughout the learning process (Iqbal, 2021; Ramdhany, 2021; Wijdan, 2020).

Practical Implications for Early Childhood Teacher Professional Development

The results of this study have important implications for the design of teacher professional development programs within early childhood education. The 23.01-point improvement achieved by the mentoring group, compared with only 10.59 points in the conventional supervision group, demonstrates that continuous mentoring produces substantially greater improvements in pedagogical competence than short-term workshop-based training. These findings indicate that professional development programs should increasingly emphasize sustained, practice-based mentoring rather than relying exclusively on one-time training activities. Through continuous guidance, reflective dialogue, and classroom-based feedback, mentoring enables teachers to apply new instructional strategies directly within their teaching practice, making professional learning more relevant and sustainable (Prof. Dr. Chandra Wijaya, 2023; Indonesia, D. J., 2023).

For school leaders and educational supervisors, the significantly higher post-test mean (88.19) and the moderate N-gain score (0.66) achieved by the mentoring group provide empirical support for adopting coaching- and mentoring-oriented supervision. Supervisors should increasingly function as professional learning facilitators who provide continuous feedback, encourage reflective practice, and assist teachers in solving instructional challenges collaboratively rather than focusing primarily on administrative evaluation. Such an approach aligns with contemporary perspectives on educational leadership that prioritize continuous capacity building and collaborative professional learning communities (Sulasmono et al., 2017; Sudarmadi, 2017; Mardiyatun, 2021).

Finally, the present findings contribute to the growing body of evidence supporting mentoring as a sustainable strategy for improving educational quality. The substantial improvement in pedagogical competence demonstrated by the experimental group suggests that strengthening teachers through structured mentoring can positively influence classroom instruction and children's learning experiences. Because pedagogical competence underpins teachers' ability to design developmentally appropriate learning activities, conduct authentic assessment, and provide responsive instruction, expanding mentoring programs across early childhood education institutions represents a promising policy direction for improving teacher quality and achieving national educational objectives (Bredekamp, 2021; Pianta, 2020; Lestari, 2023; Pebrianti, 2021; Akbar, 2021).

CONCLUSION

The findings of this study confirm that mentoring is more effective than conventional supervision in improving the pedagogical competence of early childhood education (PAUD) teachers. Although both the experimental and control groups demonstrated statistically significant improvements, teachers who participated in the mentoring program achieved substantially higher post-test scores, greater mean improvement, and a moderate normalized gain, indicating that structured mentoring provides superior professional learning outcomes. These findings demonstrate that continuous guidance, collaborative reflection, constructive feedback, and classroom-based support constitute more effective professional development strategies than conventional workshop-based supervision.

Beyond confirming the effectiveness of mentoring, this study provides practical implications for strengthening professional supervision in early childhood education. PAUD supervisors (*penilik*), school principals, and educational policymakers are encouraged to integrate structured mentoring into regular teacher professional development programs to promote continuous pedagogical improvement and establish sustainable collaborative learning cultures within schools. Future research should involve larger and more diverse samples, extend the duration of mentoring interventions, and examine their long-term effects on instructional quality, children's learning outcomes, and teachers' professional commitment to provide more comprehensive evidence for educational policy and practice.

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