



Effectiveness of the Rural Early Childhood Education Quality Assurance Clinic Model (KP-Jamupedes) in Strengthening Educator Competence in Resource-Constrained Rural Settings

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ABSTRACT

The study employed a Research and Development (R&D) approach, with the operational implementation of the model evaluated using a one-group pretest-posttest design. The KP-Jamupedes model integrates collaborative learning, peer learning, experience sharing, mentoring, and stakeholder involvement at the village level. The implementation was conducted in rural ECE settings in South Sulawesi, Indonesia. Data were collected using competency assessment instruments administered before and after the implementation and analyzed using descriptive statistics, a paired-samples t-test, and N-Gain analysis. The results showed an increase in the mean competency score from 53.33 in the pretest to 79.33 in the posttest. The paired-samples t-test indicated a statistically significant difference between the two measurements, $t(9) = -10.778$, $p < .001$. N-Gain analysis showed that all participants experienced improvement, with 20% categorized as high gain and 80% as medium gain. These findings provide preliminary empirical evidence of improved PTK competence following the implementation of KP-Jamupedes and indicate the potential of a village-based collaborative learning mechanism to support ECE quality assurance in resource-constrained rural settings. However, the findings should be interpreted within the limitations of the one-group pretest-posttest design without a comparison group.

Keywords: *Early Childhood Education; Quality Assurance; KP-Jamupedes; PTK Competence; Professional Learning.*

ARTICLE INFO

Article history:

Received

July 13, 2026

Revised

August 08, 2026

Accepted

September 30, 2026

Journal Homepage

<https://ojs.staialfurqan.ac.id/IJoASER/>

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INTRODUCTION

Early childhood education (ECE) is an important foundation for children's subsequent development and learning. The quality of ECE services is influenced not only by the availability of educational institutions but also by the quality of learning processes and the competence of educators who provide educational services. Evidence from rural Indonesia has shown that preschool quality is associated with children's developmental outcomes, indicating that improving the quality of ECE services is an important component of supporting children's development (Brinkman et al., 2017)

The challenge of maintaining ECE quality is particularly relevant in rural areas where educational institutions may experience limitations in facilities, human resources, professional development opportunities, and access to educational support. Recent evidence from rural Indonesia indicates that neighborhood characteristics are associated with ECE quality. Higher levels of neighborhood poverty were associated

with lower ECE quality, while stronger community participation was associated with better ECE quality (Klaas, 2025). These findings suggest that efforts to improve ECE quality need to consider not only the internal conditions of educational institutions but also the social and environmental context in which ECE services operate.

One of the important components of ECE quality is the competence of educators and educational personnel (PTK). PTK are directly involved in planning, implementing, and evaluating educational activities and therefore require continuous opportunities to improve their professional capacity. In non-formal ECE settings in Indonesia, particularly those serving communities with limited resources, professional competency development remains a challenge. (Palupi & Sugito, 2025) found that professional development among non-formal ECE educators can be supported through training, mentoring, professional communities, and peer learning. This finding indicates the importance of providing professional learning mechanisms that are accessible and relevant to the working context of ECE educators.

Professional development becomes more challenging when educators work in geographically isolated or resource-constrained areas. Opportunities to participate in conventional training programs may be limited by distance, costs, availability of trainers, and institutional conditions. Research on preschool teachers in rural areas has shown that limited professional development opportunities can become a constraint on teachers' professional growth, while school-based professional development and mentoring can provide relevant support for improving pedagogical practices (Yang & Rao, 2021). Therefore, professional development mechanisms that are located closer to ECE institutions and involve collaboration among educators may provide an alternative approach for addressing this challenge.

These conditions were also identified in the preliminary study underlying the development of the present model. The preliminary study conducted in several ECE units in Maros and Pangkep, South Sulawesi, identified limitations in educational facilities, variations in the qualifications and competence of PTK, and limited communication and professional learning forums among PTK at the village level. The study also identified ECE units that had not yet achieved accreditation and villages in which local stakeholders had limited understanding of ECE services. These findings indicated the need for a mechanism that could bring quality assurance, professional learning, and capacity development closer to ECE units at the village level.

To address these challenges, the Klinik PAUD Jaminan Mutu Pedesaan (KP-Jamupedes) model was developed as a village-based mechanism for strengthening ECE quality assurance and PTK competence. The model brings together ECE units, village government, partner organizations, community leaders, and other relevant stakeholders. Its activities include identifying the strengths and weaknesses of ECE units, planning capacity-building activities, facilitating knowledge and experience exchange among PTK, and providing opportunities for mentoring and collaborative problem solving. The model is designed to create a local professional learning environment in which ECE personnel can learn from one another while receiving support from relevant stakeholders.

The collaborative orientation of KP-Jamupedes is consistent with the broader role of community-based learning in strengthening social participation and educational processes. Previous research has shown that community-based educational initiatives can mobilize social capital, participation, and local relationships to support learning and community development (Rahmawati, 2020). Community environments can also function as educational spaces through social interaction, cultural values, and the

involvement of community members in supporting learning processes (Rahmawati & Eli, 2023). In rural Indonesia, professional learning communities have been associated with strengthening early childhood teachers' competence through collaborative planning, reflective dialogue, and peer feedback (Rusmiyati & Pudjaningsih, 2026). Building on these perspectives, KP-Jamupedes integrates community participation and collaborative professional learning into a village-based quality assurance mechanism for rural ECE.

The preliminary implementation of KP-Jamupedes produced measurable changes in the competence scores of the participants. The overall mean score increased from 53.33 in the pretest to 79.33 in the posttest. The paired-sample analysis showed a mean difference of 26.00 points, with $t(9) = -10.778$ and $p < .001$. N-Gain analysis also showed improvement among all participants, with 20% categorized as high gain and 80% as medium gain.

The research gap addressed in this study lies in the limited integration of ECE quality assurance, PTK competency development, peer learning, and village-level stakeholder collaboration within a single intervention model. Previous studies have examined rural ECE quality, professional development, mentoring, and professional learning communities, but these components have generally been examined separately. KP-Jamupedes integrates these components into a village-based mechanism specifically designed for ECE units experiencing limitations in access and resources.

The contribution of this research is the empirical examination of KP-Jamupedes as a village-based mechanism for strengthening PTK competence and supporting ECE quality assurance in resource-constrained rural contexts. Unlike conventional professional development that primarily positions educators as recipients of training, KP-Jamupedes emphasizes peer learning, identification of institutional needs, collaborative problem solving, and involvement of village-level stakeholders. The model consequently positions the village not merely as the geographical location of an ECE institution but as a potential learning and quality-assurance environment.

Based on the identified problems, research gap, and contribution of the proposed model, this study aims to examine the effectiveness of the Klinik PAUD Jaminan Mutu Pedesaan (KP-Jamupedes) model in improving the competence of educators and educational personnel (PTK) in resource-constrained rural ECE settings. The study specifically examines changes in participants' competence before and after implementation of the model and provides preliminary empirical evidence concerning the potential of a village-based approach to strengthening ECE quality assurance.

METHOD

This study employed a Research and Development (R&D) approach to develop and examine the Klinik PAUD Jaminan Mutu Pedesaan (KP-Jamupedes) model for strengthening the capacity of educators and educational personnel (PTK) in rural Early Childhood Education (ECE) settings. The development process consisted of a preliminary study, conceptual model development, conceptual input and validation, and operational model testing. The preliminary study was conducted through literature review and field studies using interviews and observations. The conceptual model was subsequently discussed and reviewed through a focus group discussion (FGD) involving experts and ECE practitioners. Following this process, the model was implemented and examined through a one-group pretest-posttest design to identify changes in participants' competence before and after implementation.

The research was conducted in rural ECE settings in South Sulawesi, Indonesia, including Bonto Mate'ne Village in Maros Regency and Bantimurung and Mattiro Langi Villages in Pangkajene and Islands Regency. The research sites were selected based on preliminary identification of limitations in ECE facilities, PTK qualifications and competence, accreditation conditions, and professional communication among ECE personnel. The operational analysis of the pretest and posttest data involved 10 participants.

The data were collected through interviews, observations, model review involving experts and practitioners, and pretest-posttest assessment. The model review focused on the conceptual content and operational components of KP-Jamupedes, including its framework, development foundation, rationale, objectives, benefits, working principles, learning activities, evaluation, and implementation guidelines. The competency assessment instrument was administered before and after the implementation of the model to identify changes in participants' competence.

Because quantitative validation records from the expert and practitioner review were not available in the final research documentation, this study does not report a numerical validation score or claim a quantified level of model validity. Instead, the article focuses its empirical analysis on the operational implementation and the measurable changes in participant competence. This approach was adopted to ensure that all reported findings are based on available research evidence.

The data were analyzed using descriptive statistics, a paired-samples t-test, and Normalized Gain (N-Gain) analysis. Descriptive analysis was used to determine the mean and standard deviation of the pretest and posttest scores. The scores were categorized into three levels: high (80–100), medium (60–79), and low (<60). A paired-samples t-test was used to determine whether there was a statistically significant difference between participants' pretest and posttest scores, with a significance level of 0.05. N-Gain analysis was additionally used to determine the level of improvement in participants' scores following implementation of the KP-Jamupedes model.

The original statistical analysis showed a pretest mean of 53.332 and a posttest mean of 79.332, with a mean difference of 26.000 points, $t(9) = -10.778$, $p < .001$.

RESULT AND DISCUSSION

The results of the study are presented to describe the development and operational implementation of the Klinik PAUD Jaminan Mutu Pedesaan (KP-Jamupedes) model and to examine changes in the competence of educators and educational personnel (PTK) following its implementation. The analysis focuses on the operational characteristics of the model, changes in participants' pretest and posttest scores, the statistical significance of the observed difference, and the level of improvement based on N-Gain analysis. The discussion further interprets these findings in relation to collaborative professional learning, community participation, and the contextual conditions of rural Early Childhood Education (ECE). Because the study employed a one-group pretest-posttest design, the findings are interpreted as preliminary empirical evidence of change following the implementation rather than as definitive evidence of a causal effect of the KP-Jamupedes model.

1. Operationalization of the KP-Jamupedes Model

KP-Jamupedes was developed as a village-based mechanism that connects ECE quality assurance with professional learning and local stakeholder participation. The model was developed in response to preliminary findings concerning limitations in ECE facilities, variations in PTK competence, limited professional communication, and

limited access to professional learning opportunities. The operational orientation of the model can be summarized through several interconnected activities.

Figure 1. Operational Framework of the KP-Jamupedes Model

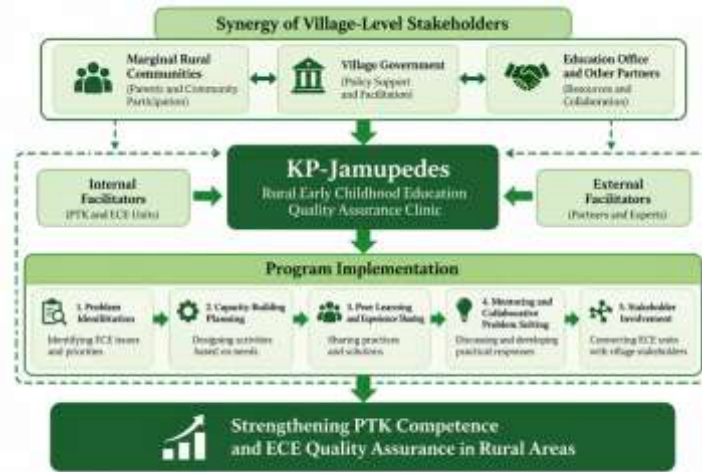


Figure 1 illustrates the operational framework of KP-Jamupedes, showing how village-level stakeholder synergy supports the implementation of the quality assurance clinic through internal and external facilitation. The model is operationalized through five interconnected components: problem identification, capacity-building planning, peer learning and experience sharing, mentoring and collaborative problem solving, and stakeholder involvement. The main activities, participants, and expected functions of each component are presented in Table 1.

Table 1. Core Operational Elements of the KP-Jamupedes Model

Component	Main Activity	Main Participants	Expected Function
Problem identification	Identifying strengths, weaknesses, and priority ECE problems	PTK and relevant stakeholders	Establish priority areas for improvement
Capacity-building planning	Planning activities according to identified needs	PTK, facilitators, village stakeholders	Develop context-based improvement activities
Peer learning and experience sharing	Sharing experiences, practices, and solutions	ECE educators and educational personnel	Facilitate collaborative professional learning
Mentoring and collaborative problem solving	Discussing professional problems and developing practical responses	PTK, facilitators, partners	Strengthen professional capacity
Stakeholder involvement	Connecting ECE units with village government, community, and partners	Village stakeholders and ECE personnel	Support sustainability of quality improvement

The central characteristic of KP-Jamupedes is therefore not the delivery of training alone. Rather, it is the creation of a local mechanism through which ECE personnel can identify problems, learn collaboratively, exchange experiences, and obtain support from relevant stakeholders. This orientation is particularly relevant in

resource-constrained rural settings where conventional professional development opportunities may be difficult to access.

2. Pretest and Posttest Results

The pretest was administered before the implementation of KP-Jamupedes to identify participants' initial competence. The overall mean pretest score was 53.332, which falls within the low category based on the study's scoring classification. Following implementation, the mean posttest score increased to 79.332, which falls within the medium category.

Table 2. Overall Pretest and Posttest Results

Measurement	N	Mean	SD	Category
Pretest	10	53.33	7.84	Low
Posttest	10	79.33	7.56	Medium

The difference between the two measurements was 26.000 points. Thus, the descriptive results show a substantial increase in the competence scores following implementation of the KP-Jamupedes model.

The change from the low category to the upper range of the medium category indicates that participants demonstrated higher competency scores after the intervention. However, the result should be interpreted as a pre-post change rather than as definitive evidence of a causal effect because the study did not employ a control or comparison group.

3. Difference between Pretest and Posttest Scores

To determine whether the observed difference was statistically significant, a paired-samples *t*-test was conducted. The analysis involved 10 participants who completed both measurements.

Table 3. Paired-Samples Test Results

Comparison	Mean Difference	<i>t</i>	df	<i>p</i>
Pretest - Posttest	-26.000	-10.778	9	< .001

The paired-samples test produced a mean difference of -26.00 points, $t(9) = -10.778$, $p < .001$. The result indicates a statistically significant difference between participants' competence scores before and after implementation of KP-Jamupedes.

The finding provides preliminary empirical evidence of a significant pretest-posttest change associated with the implementation of the model. Participants demonstrated higher competency scores following the intervention.

This finding is consistent with research emphasizing collaborative professional learning as a mechanism for strengthening the competence of early childhood educators. Rusmiyati and Pudjaningsih (2026), for example, reported that professional learning communities in rural Indonesia can support teacher competence through collaborative planning, reflective dialogue, and peer feedback. KP-Jamupedes applies a similar collaborative learning principle within a broader village-based quality assurance framework.

Nevertheless, the statistical result needs to be interpreted according to the research design. The study employed a one-group pretest-posttest design and did not include a control or comparison group. Therefore, the significant difference demonstrates a change between the two measurements following implementation, but

it does not establish that the change was caused exclusively by KP-Jamupedes. Other factors occurring during the intervention period cannot be completely excluded.

4. N-Gain Analysis

N-Gain analysis was conducted to examine the level of improvement experienced by individual participants between the pretest and posttest.

The results showed that all 10 participants experienced an increase in their scores. Two participants, representing 20%, were classified in the high-gain category, while eight participants, representing 80%, were classified in the medium-gain category. No participant was classified in the low-gain category.

Table 4. Distribution of Participants Based on N-Gain Category

N-Gain Category	Participants	Percentage
High	2	20%
Medium	8	80%
Low	0	0%
Total	10	100%

The N-Gain results complement the paired-samples t-test by showing that improvement was not limited to a small number of participants. All participants demonstrated an increase in their scores, although the magnitude of improvement varied.

The pattern is relevant to the design of KP-Jamupedes because the model facilitates interaction and knowledge exchange among participants with different levels of initial competence. Through peer learning, participants have opportunities to compare experiences, discuss problems, and identify practical responses within their own educational settings.

Palupi & Sugito (2025) reported that professional development among non-formal ECE educators can be supported through mentoring, professional communities, and peer learning. In the context of KP-Jamupedes, these principles are incorporated into a broader village-based mechanism through which PTK can discuss quality-related problems and exchange practical experiences.

5. The Role of KP-Jamupedes in Strengthening Rural ECE Capacity

The findings indicate that implementation of KP-Jamupedes was accompanied by an improvement in participants' competence. The model was developed in response to problems identified during the preliminary study, particularly limitations in facilities, PTK competence, and professional communication at the village level.

The main characteristic of KP-Jamupedes is its emphasis on village-based collaborative learning. The model involves ECE units, village government, partner organizations, community leaders, and other relevant stakeholders in identifying problems, planning capacity-strengthening activities, and facilitating knowledge exchange among PTK.

This orientation extends the role of the community from being merely a social setting for education to becoming an active learning environment. Previous research on the Rumah Luwu Reading Community demonstrated that community-based educational initiatives can strengthen participation and mobilize social capital to support learning and community development (Rahmawati, 2020). In the context of KP-Jamupedes, this community-based principle is extended to professional learning and quality assurance among ECE personnel.

This approach is important because ECE quality in rural areas is influenced by the wider environment in which educational institutions operate. (Klaas, 2025) found that community participation was associated with better ECE quality in rural Indonesia. This finding is relevant to KP-Jamupedes because the model deliberately involves village-level stakeholders in identifying problems and supporting quality improvement.

The role of the community as an educational environment is also supported by Rahmawati & Eli (2023), who demonstrated that community-based educational processes can involve social interaction, cultural values, and community participation in supporting children's learning. Therefore, involving local stakeholders in quality improvement provides a contextual dimension that cannot be achieved through teacher training alone.

KP-Jamupedes also provides an alternative to professional development that positions educators primarily as recipients of externally delivered training. Through peer learning, participants have opportunities to share experiences and discuss problems arising directly from their educational settings. This approach connects professional learning with the social resources available within the local community.

The orientation is also compatible with the concept of professional learning communities, in which educators learn collaboratively through planning, reflection, feedback, and problem solving (Rusmiyati & Pudjaningsih, 2026)

6. Contextual Characteristics of Rural ECE Settings

Although the statistical analysis in this study focuses on the overall group of 10 participants, the research was implemented across several rural ECE settings in Maros and Pangkep. The preliminary study identified differences in institutional resources, PTK competence, accreditation conditions, and access to professional communication.

These contextual characteristics are important for understanding why a village-based model is relevant. Rural ECE institutions should not necessarily be treated as homogeneous units. Differences in resources, professional experience, local support, and access to professional development may influence how educators participate in capacity-building activities.

Klaas (2025) similarly demonstrated that ECE quality in rural Indonesia is connected to broader neighborhood characteristics and community participation. This supports the rationale for an approach that does not isolate professional development from the community environment in which ECE institutions operate.

KP-Jamupedes therefore provides a framework in which professional learning can be connected with local conditions. Rather than applying professional development as a uniform intervention, the model allows problems and learning activities to be connected to the needs and resources available in each setting.

7. Research Contribution and Implications

The findings provide preliminary empirical support for the potential of KP-Jamupedes as a village-based mechanism for strengthening PTK competence and supporting ECE quality assurance.

The contribution of the study is not limited to demonstrating an increase in participants' test scores. The study proposes an alternative way of organizing professional learning for ECE personnel in rural settings where access to conventional professional development may be constrained.

- a. The model connects several elements that are often addressed separately;
- b. ECE quality assurance;
- c. PTK competency development;

- d. peer learning;
- e. mentoring;
- f. collaborative problem solving;
- g. community participation; and
- h. village-level stakeholder involvement.

By positioning the village as a collaborative learning environment, KP-Jamupedes connects institutional quality assurance with social resources available within the local community.

However, the findings should not be interpreted as evidence that KP-Jamupedes alone caused the observed improvement. The effectiveness test involved a small number of participants and used a one-group pretest-posttest design without a comparison group.

Future research should therefore involve larger samples, comparison or control groups, longer-term follow-up, and measures of actual changes in professional practice. Such research would provide stronger evidence concerning the sustainability and broader applicability of the KP-Jamupedes model.

CONCLUSION

The implementation of the Klinik PAUD Jaminan Mutu Pedesaan (KP-Jamupedes) model was associated with an improvement in the competence of educators and educational personnel (PTK) in the rural ECE settings examined in this study. The overall mean competency score increased from 53.332 in the pretest to 79.332 in the posttest, representing a mean increase of 26.000 points.

The paired-samples analysis showed a statistically significant difference between the pretest and posttest scores, $t(9) = -10.778$, $p < .001$. N-Gain analysis further showed that all participants experienced improvement, with 20% categorized as high gain and 80% as medium gain.

These findings provide preliminary empirical evidence that a village-based collaborative professional learning mechanism such as KP-Jamupedes has potential to strengthen PTK competence. The model connects ECE quality assurance with peer learning, knowledge exchange, mentoring, collaborative problem solving, and involvement of local stakeholders.

The contribution of the study lies in providing an alternative village-based framework for organizing professional learning and supporting ECE quality assurance in resource-constrained rural settings. However, the findings should be interpreted within the limitations of the small sample and the one-group pretest-posttest design without a comparison group. Further research involving larger samples, comparison groups, longer-term follow-up, and measures of changes in professional practice is needed to examine the sustainability and broader applicability of the model.

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