



Comparative Analysis of Pedagogical Skills Between Unqualified and Qualified Teachers in Java and Papua, Indonesia

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ABSTRACT

This study explores the differences in pedagogical skills between qualified and unqualified teachers in two contrasting Indonesian regions, Java and Papua. Using a mixed-methods comparative case study, the research involved surveys distributed to 41 teachers and interviews with 9 teachers and 3 school principals. TPACK and professional competence theory were used as analytical frameworks. Qualified teachers in Java show stronger technological integration and pedagogical delivery. However, contextual factors such as resource scarcity in Papua significantly influence teaching effectiveness. Informal growth through experiential learning was evident among some unqualified teachers. Findings support the view that both formal qualifications and contextual adaptability influence teaching quality. Policy improvements should focus on training, digital equity, and support systems in remote areas. The study reveals how informal learning strategies among unqualified teachers in resource-constrained regions contribute to pedagogical competence development.

ARTICLE INFO

Article History:

Submitted/Received 9 June 2025

First Revised 14 May 2025

Accepted 09 June 2025

First Available online 31 July 2025

Publication Date 31 July 2025

Keyword:

educational disparity, Indonesia, pedagogical competence, teacher qualification, TPACK.

1. INTRODUCTION

The unequal distribution of qualified teachers remains a persistent issue within Indonesia's education system, particularly between urban and rural regions. Java, as the country's economic and educational hub, benefits from relatively advanced infrastructure and consistent access to teacher training programs. In contrast, remote areas such as Papua continue to face critical teacher shortages, often relying on unqualified personnel to meet the demands of schooling. While several previous studies have explored the link between teacher qualifications and student performance (Clarke & O'Donoghue, 2017; Susanto & Lestari, 2021), limited attention has been given to the ways in which geographical disparities shape the development and application of pedagogical competence across different regions.

Recent scholarship in teacher education emphasizes not only formal credentials but also the importance of context-based competencies in responding to diverse learning environments (Mishra & Koehler, 2006; Mulder, 2014). The TPACK framework highlights the integration of content knowledge, pedagogical strategies, and technological tools as essential for effective teaching, while professional competence theory views teaching as a dynamic and situational practice. However, most existing research has focused on standardized assessments of teaching performance without considering how unqualified teachers in under-resourced areas adapt their methods in the absence of formal training. This gap in the literature calls for a closer examination of context-specific teaching practices.

The novelty of this study lies in its comparative lens—analyzing both certified and uncertified teachers across two distinct regions, Java and Papua—while also emphasizing how local conditions influence pedagogical approaches. Unlike previous studies that primarily evaluate teacher effectiveness through qualification status, this research investigates how uncertified educators demonstrate resilience and develop practical strategies to address learning needs in resource-constrained environments. The study also considers informal professional learning as a critical, yet often overlooked, component of teaching competence.

Additionally, this research responds to the increasing demand for equitable teacher professional development across Indonesia, which aligns with broader national goals for inclusive and quality education. Understanding how regional contexts mediate teaching practices may inform policy improvements and targeted support for teachers in marginalized regions.

Therefore, the objective of this study is to analyze differences in pedagogical competencies between certified and uncertified teachers in Java and Papua, and to explore how regional disparities influence the development and expression of those competencies.

2. METHODS

This research utilized a comparative case study design supported by a mixed-methods approach to provide both breadth and depth in analyzing pedagogical competence. The study involved participants from two contrasting regions—Java and Papua—selected through stratified sampling to ensure balanced representation based on geographic location and

teacher certification status. A total of 41 teachers participated, comprising both certified and uncertified educators.

Quantitative data were obtained through structured questionnaires constructed using indicators derived from the Technological Pedagogical Content Knowledge (TPACK) framework. These surveys aimed to measure teachers' pedagogical and technological competencies. The quantitative data were then analyzed using inferential statistics, specifically independent samples t-tests, to determine whether significant differences existed between teacher groups.

To complement the survey findings, qualitative data were collected through semi-structured interviews involving 9 teachers and 3 school principals. These interviews explored the influence of contextual factors on teaching practices, with particular attention to how educators adapted to resource constraints, engaged in informal learning, and received peer mentorship. The qualitative responses were examined through thematic analysis, enabling the identification of recurring patterns and insights into region-specific teaching dynamics.

3. RESULTS AND DISCUSSION

Analysis of Pedagogical Capacity and Regional Constraints

This study identified clear distinctions in pedagogical competence between certified and uncertified teachers when analyzed through the Technological Pedagogical Content Knowledge (TPACK) framework. Certified educators in Java demonstrated a more holistic integration of content, pedagogy, and technology in their instructional practices. They made effective use of digital tools such as Google Classroom, Kahoot! and multimedia simulations to foster interactive, student-centered learning. These strategies were underpinned by formal professional development, enabling them to align digital tools with pedagogical goals (Mishra & Koehler, 2006; Blundell, Lee, & Nykvist, 2020).

In contrast, uncertified teachers in Papua primarily relied on traditional lecture-based methods, often due to limited access to training and infrastructure. Their instructional practices were shaped more by survival strategies than systematic planning, reflecting both the absence of certification and the broader lack of institutional support. This finding aligns with previous research indicating that digital integration in education is strongly influenced by access to resources and continuous professional learning (Tondeur et al., 2017; UNESCO, 2020).

To illustrate these disparities, Table 1 summarizes the differences in TPACK-based competence by region and certification status.

Table 1. Summary of TPACK Competence by Region and Certification Status

Region	Certification Status	Average TPACK Score	Use of Technology	Dominant Teaching Method
Java	Certified	4.3 / 5	High	Student-centered, digital tools
Papua	Uncertified	2.1 / 5	Low	Chalk-and-talk, printed material

Note: Scores based on structured survey responses using a 5-point Likert scale.

4. CONCLUSION

This study concludes that pedagogical competence is not determined solely by formal teacher certification, but is also significantly influenced by the specific teaching contexts in which educators operate. In regions like Java, certified teachers benefit from access to structured professional development, digital technologies, and institutional support—factors that collectively contribute to more effective integration of content, pedagogy, and technology as conceptualized in the TPACK framework. These findings are consistent with previous research that links professional training with innovative teaching practices (Tondeur et al., 2017; Blundell et al., 2020), yet this study adds to the literature by emphasizing how regional differences in infrastructure and policy implementation shape teaching performance.

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