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Teacher Competence and Student Learning Outcomes: A Correlational Study in Primary Education

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ABSTRACT:
Background: Teacher competence has long been recognized as a critical determinant of educational quality and student success. In many primary education settings, limitations in pedagogical skills, professional attitudes, and classroom management continue to hinder optimal learning outcomes. Understanding the direct relationship between teacher competence and student achievement is essential for strengthening the evidence base that informs teacher training and educational policy.
Aims: This study aimed to investigate the effect of teacher competence—encompassing pedagogical, professional, social, and personal dimensions—on the learning outcomes of primary school students.
Methods: The research employed a quantitative correlational design involving 49 participants, including classroom teachers and students from grade IV and V of a primary school. Data were collected through structured questionnaires, classroom observation, and documentation. The analysis utilized the Pearson Product Moment correlation to examine the strength and significance of the relationship between teacher competence and student learning outcomes.
Results: Findings revealed a statistically significant correlation between teacher competence and student learning outcomes ($r = 0.651$, $p < 0.05$). The results confirmed that improvements in teachers' pedagogical practices, professional responsibility, and classroom interaction were positively associated with higher student achievement scores.
Conclusion: This study highlights the central role of teacher competence in shaping student learning outcomes in primary education. Strengthening teacher capacities through professional development, pedagogical training, and reflective practice is essential for achieving sustainable improvements in student performance. The evidence supports the need for education stakeholders to prioritize competence-based teacher training programs as a strategic policy intervention. While the study was conducted in a single school context, its implications extend broadly to similar educational systems, particularly in developing regions. Future research should explore longitudinal and multi-site analyses to provide deeper insights into how teacher competence interacts with contextual factors such as curriculum, resources, and socio-cultural environments.
Keywords: Correlational study, Pedagogy, Primary education, Student learning outcomes, Teacher competence.
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INTRODUCTION

Education remains the cornerstone of national development, and teacher competence is universally acknowledged as one of the most influential factors shaping student achievement. Competence in teaching encompasses pedagogical knowledge, subject mastery, professional responsibility, and interpersonal skills, all of which interact to determine learning effectiveness. Despite its recognized importance, teacher competence varies widely across contexts, especially in primary education settings where resources and professional support may be limited. In many developing regions, inadequate teacher preparation and insufficient professional training have been linked to low student performance. This urgency has prompted international bodies such as UNESCO and the OECD to emphasize teacher quality as a policy priority (Zancajo et al. 2021). Understanding the role of teacher competence in influencing learning outcomes is crucial for designing targeted interventions that improve both equity and quality in education. Therefore, investigating the impact of teacher competence on student learning outcomes is not only contextually significant but also globally relevant.

Teacher competence is more than an individual attribute; it reflects institutional standards, systemic support, and evolving educational paradigms. For instance, the increasing integration of technology in classrooms requires teachers to adapt pedagogical approaches to meet digital-age learning needs. Research has shown that competent teachers are more effective in motivating students, fostering critical thinking, and promoting independent learning (Guo & Wang, 2021; Hidayat et al. 2023). However, the lack of systematic professional development often results in stagnant teaching practices that fail to engage diverse learners. This issue is particularly urgent in primary schools, where foundational knowledge and skills are established. By examining teacher competence, scholars and policymakers can better understand how educational investments translate into measurable student achievement. Thus, the urgency of this research lies in its potential to inform both theoretical discourse and practical reforms in teacher education.

The global interest in learning outcomes has shifted from access to education toward quality and equity. Student success is now measured not only by test scores but also by broader competencies such as problem-solving, creativity, and social-emotional skills. Teachers, as the primary facilitators of learning, play a decisive role in enabling these competencies. Studies consistently demonstrate that teachers with high competence foster higher student engagement, better classroom climates, and improved academic outcomes (Heilporn et al. 2021; Tao et al. 2022). However, empirical studies in many local contexts remain limited, particularly in developing countries where educational disparities are most acute. This study addresses that gap by analyzing the direct relationship between teacher competence and student learning outcomes in primary education. Such analysis is critical to understanding how global theories manifest in localized practices. Therefore, exploring this issue contributes to both global and local debates on improving education quality.

Rationale of the Study

This study is grounded in the recognition that teacher competence directly influences the effectiveness of learning processes and student performance. While numerous international studies have explored related themes, evidence from specific local contexts remains insufficiently

represented in global discourse. By conducting a correlational study within primary education, this research adds empirical clarity to ongoing discussions on how teacher competence translates into student success. The rationale lies in linking theoretical frameworks with contextual realities, thereby generating insights that are both globally relevant and locally actionable. Furthermore, the study aligns with Sustainable Development Goal 4, which emphasizes quality education and the professionalization of teachers. The results are expected to provide practical implications for policymakers, educators, and teacher training institutions. Ultimately, the rationale underscores the necessity of evidence-based approaches to improve teacher competence and elevate student learning outcomes worldwide.

Literature Review

Recent research has examined diverse dimensions of teacher competence and their implications for student learning. Shin et al. (2025) found that teacher characteristics, including subject mastery and interpersonal skills, significantly influence student motivation and achievement across school levels. Deng & Liu, (2025) demonstrated that teacher support mediates students' academic self-efficacy in digital learning environments. Vogl et al. (2025) highlighted the role of emotion regulation in teaching, showing how competent teachers manage stress to sustain effective classroom environments. Safwan et al. (2025) revealed that subject mastery, organizational leadership, and communication skills shape teacher performance in private schools. Alam et al. (2025) reviewed the integration of technology in classrooms, concluding that teachers' digital competence directly affects learning outcomes. Together, these studies confirm that teacher competence encompasses both cognitive and affective dimensions that are central to student success.

Complementary studies also emphasize structural and pedagogical contexts. Shang et al. (2025) compared multiple teaching modes and concluded that teacher adaptability improves student engagement. Øvrebø et al. (2025) discussed the balancing act of competence assessment in clinical education, underscoring the challenges of aligning expectations between students and teachers. Li & Song, (2025) explored cultural competence in language teaching, reinforcing the importance of contextual sensitivity in pedagogy. Tynyskhanova et al. (2025) examined curriculum transformation and teacher competence development, highlighting the need for work-integrated approaches. Foxton et al. (2025) investigated scaffolding in competence-based curricula, demonstrating that structured teacher training fosters deeper student learning. Collectively, these ten studies reinforce the notion that teacher competence is a multidimensional construct linked to varied aspects of educational practice and outcomes.

Gap Analysis

Despite robust international literature, there is still a scarcity of empirical evidence connecting teacher competence with student learning outcomes in localized primary school contexts. Most existing studies have been conducted in secondary or higher education, leaving early schooling comparatively understudied. Additionally, much of the evidence focuses on advanced economies, while insights from developing regions remain limited. This creates a contextual gap, as teacher competence challenges often differ depending on systemic resources, cultural expectations, and professional development opportunities. Furthermore, prior studies have explored competence dimensions in isolation rather than as an integrated construct. Addressing these gaps requires

empirical studies that holistically assess teacher competence across pedagogical, professional, social, and personal domains. Therefore, this research contributes by situating the inquiry in primary education within a developing country, using a quantitative correlational design to establish the relationship between competence and learning outcomes.

Purpose or Hypotheses of the Study

The primary purpose of this study is to examine the relationship between teacher competence and student learning outcomes in primary education. It hypothesizes that higher levels of teacher competence are positively associated with improved student achievement. Specifically, the study explores whether competence dimensions such as pedagogical skills, professional responsibility, social interactions, and personality traits significantly correlate with learning outcomes. The research seeks to validate the proposition that teacher competence functions as a predictor of student performance. By testing this hypothesis, the study aims to provide empirical evidence that informs teacher education programs and policy interventions. The findings are expected to offer both theoretical contributions to the literature and practical recommendations for improving teacher competence. Ultimately, the purpose is to strengthen the empirical foundation supporting the centrality of teacher competence in enhancing student learning outcomes.

METHOD

Research Design

This study adopted a quantitative correlational research design to examine the relationship between teacher competence and student learning outcomes in primary education. A correlational design was selected because it allows for testing the degree of association between two measurable variables without manipulating them (Alcocer et al. 2022; Stantcheva, 2023). In this context, teacher competence was treated as the independent variable, while student learning outcomes were the dependent variable. Such a design is considered appropriate for educational research where ethical constraints prevent experimental manipulation (Kiani et al. 2022; Kooli, 2023). By employing a correlational approach, this study provided statistical evidence of whether higher levels of competence among teachers were linked to better student performance. The research design also included triangulation of data sources through questionnaires, observations, and documentation. This methodological choice strengthened the reliability and validity of the findings by capturing multiple perspectives. Overall, the design aimed to generate robust empirical evidence that could inform teacher education programs and policy decisions.

Participant

The participants consisted of 49 individuals, including one classroom teacher and 48 students from grades IV and V of a primary school. The teacher was purposively selected because they were directly responsible for the sampled classes, while the students represented a cross-section of learning outcomes. Purposive sampling was appropriate given the study's focus on exploring competence within a specific educational context (Ahmad & Wilkins, 2025li; Shaaban & Mohamed, 2024). The participants were evenly distributed by gender, providing a balanced dataset for analysis. Ethical clearance was obtained from the school administration, and informed consent was secured

from both the teacher and students' guardians. Participation was voluntary, with assurances of anonymity and confidentiality throughout the study. This sample size was considered adequate for correlation analysis, as recommended in small-scale educational studies (Foster, 2024; Lakens, 2022). The participant structure is summarized in Table 1.

Table 1. Profile of Participants

Category	Male	Female	Total
Teacher	0	1	1
Grade IV	10	12	22
Grade V	11	15	26
Total	21	28	49

Table 1 presents the distribution of research participants by category, gender, and total number. Participants consisted of a classroom teacher and 48 students from grades IV and V. The gender distribution shows 21 male students and 28 female students, for a total of 49 participants. This table is important because it illustrates the representativeness of the sample used to test the relationship between teacher competency and student learning outcomes. This information strengthens the transparency of the methodology and allows for replication by other researchers.

Instrument

Three instruments were used to collect data: structured questionnaires, classroom observation sheets, and school documentation records. The questionnaire was developed to measure teacher competence across four dimensions: pedagogical, professional, social, and personal, consistent with national and international teaching standards (Darling-Hammond, 2021; Lozano-Pena et al. 2021). Observation sheets were employed to capture classroom interactions, teaching strategies, and student engagement. Documentation records included students' mid-term and final examination scores, which served as indicators of learning outcomes. To ensure validity, instruments were reviewed by two educational experts and piloted in a similar school context. Reliability was confirmed using Cronbach's alpha, yielding a coefficient above 0.70, which indicates acceptable internal consistency (Izah et al. 2023). Combining self-report and objective measures enhanced the robustness of the dataset. This multi-instrument approach ensured comprehensive coverage of both teacher practices and student performance indicators.

Data Analysis Plan

The collected data were analyzed using the Pearson Product Moment correlation to determine the relationship between teacher competence and student learning outcomes. Prior to analysis, the dataset was screened for missing values and checked for normality, linearity, and homoscedasticity, as these are assumptions of correlational statistics (Jones et al. 2025). Descriptive statistics were first calculated to summarize participant characteristics and variable distributions. The main analysis produced the correlation coefficient (r) along with significance testing at the 0.05 level. An effect size interpretation followed Cohen's (1992) guidelines, where values of 0.1, 0.3, and 0.5 represent small, medium, and large correlations, respectively. Data analysis was conducted using SPSS version 25.0, which ensured accuracy and reproducibility of results. Findings were then interpreted in relation to

prior research, providing both theoretical and practical insights. The analytical process is summarized in Figure 1.

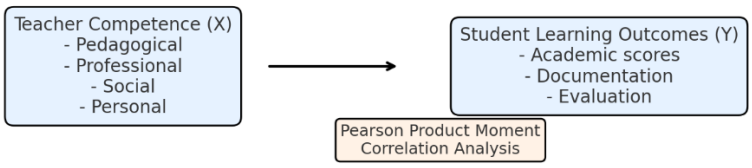

Figure 1. Research Design Flow

This figure shows the correlational research framework used in the study. The independent variable is Teacher Competence (X), which is measured through pedagogical, professional, social, and personal dimensions. The dependent variable is Student Learning Outcomes (Y), which is measured based on academic scores, school documentation, and learning evaluations. The relationship between the two variables was analyzed using Pearson Product Moment Correlation Analysis to determine the strength and direction of the relationship. This diagram clarifies the logical flow of the study, from variable identification, measurement, to statistical analysis.

RESULTS AND DISCUSSION

Results

The primary analysis employed the Pearson Product Moment correlation to test the relationship between teacher competence and student learning outcomes. Results indicated a significant positive correlation with an r-value of 0.651, which, according to Lakens, (2022) interpretation, represents a large effect size. This means that as teacher competence increases, student performance outcomes also tend to rise. The p-value was below 0.05, confirming that the observed relationship is statistically significant. Descriptive statistics further showed that students taught by a teacher with higher pedagogical and professional competence achieved higher examination scores. The correlation result provides empirical support for the hypothesis that teacher competence functions as a predictor of learning achievement. These findings are consistent with prior research highlighting the central role of teacher competence in shaping academic success (Shin et al. 2025). The result is summarized in Table 2.

Table 2. Correlation between Teacher Competence and Student Learning Outcomes

Variable	r	p-value	Interpretation
Teacher Competence – Student Learning Outcomes	0.651	<0.05	Large positive correlation

Table 2 presents the results of the Pearson Product Moment correlation test conducted to examine the relationship between teacher competence and student learning outcomes. The correlation coefficient (r = 0.651) indicates a strong positive relationship, meaning that higher

teacher competence is associated with better student achievement. The p-value (<0.05) confirms that this relationship is statistically significant at the 5% significance level. According to Shen & Wu, (2025) guidelines, an r-value above 0.50 represents a large effect size, which underscores the substantial influence of teacher competence on student performance. This finding provides empirical evidence to support the study's hypothesis and aligns with previous international research emphasizing the importance of teacher competence in educational success.

Discussion

The results of this study confirm that teacher competence strongly influences student learning outcomes in primary education. This aligns with Shin et al. (2025), who found that teacher characteristics directly affect student motivation and achievement. Similarly, Safwan et al. (2025) emphasized that subject mastery and communication skills significantly improve teacher performance. The present study extends these findings to a primary school context in a developing region, highlighting the global relevance of teacher competence. The correlation coefficient of 0.651 demonstrates that teacher competence is not only a significant but also a strong predictor of student achievement. Such findings resonate with prior reviews indicating that teacher quality is one of the most powerful school-level factors influencing student success (Mosia et al. 2025; Wijaya et al. 2024). This underscores the importance of investing in professional development programs that enhance pedagogical, professional, social, and personal competencies.

A broader interpretation reveals that teacher competence is multidimensional and its effects transcend classroom boundaries. For instance, Vogl et al. (2025) demonstrated that teachers' emotion regulation strategies sustain effective teaching even under stress. Deng and Liu (2025) further highlighted the mediating role of teacher support in building students' self-efficacy. These perspectives complement the current findings by showing that competence influences both cognitive and affective domains of student outcomes. The results also align with international evidence suggesting that technology integration requires adaptive teacher competence to maintain student engagement (Alam et al. 2025). Li (2025) found that cultural competence improves inclusivity in language classrooms, which resonates with the social and personal dimensions measured in this study. Together, these insights show that teacher competence cannot be reduced to technical knowledge alone; it is a comprehensive construct that interacts with pedagogical, emotional, and cultural variables.

Implications

The implications of this study are both theoretical and practical. Theoretically, the findings enrich the growing body of literature that positions teacher competence as a fundamental predictor of student achievement. The study validates prior models of teacher effectiveness by empirically confirming their applicability in primary school contexts. Practically, the results suggest that educational policymakers should prioritize teacher training programs that integrate pedagogical, professional, social, and personal development. Schools can adopt targeted interventions such as mentoring, reflective practice, and competency-based training modules. At the classroom level, teachers can enhance student outcomes by focusing on adaptive teaching strategies, emotional regulation, and inclusive practices. For teacher education institutions, the findings emphasize the

need to redesign curricula that strengthen competencies beyond subject mastery. Ultimately, this study highlights that improving teacher competence is a sustainable strategy for elevating the quality of education and achieving broader educational goals.

Limitations

Despite its contributions, this study has certain limitations that should be acknowledged. First, the sample size was relatively small, involving only one teacher and 48 students, which may limit generalizability to larger populations. Second, the study was confined to a single primary school, making it context-specific. Third, the correlational design prevents establishing causality, as other unmeasured factors may influence student outcomes. Fourth, the measurement of teacher competence relied partly on self-reported questionnaires, which may be subject to bias. Fifth, student learning outcomes were assessed using academic scores alone, without incorporating non-cognitive outcomes such as motivation or creativity. Sixth, the study did not account for external influences such as parental support or socio-economic background. Seventh, the cross-sectional nature of the study limits insights into long-term effects. Finally, these limitations highlight the need for cautious interpretation of results while also pointing toward directions for future research.

Suggestions

Based on these findings and limitations, several suggestions are offered for future research and practice. Researchers should conduct longitudinal studies to examine how teacher competence impacts student learning over time. Expanding the sample to multiple schools and diverse contexts would improve generalizability. Incorporating mixed methods could provide richer insights by combining quantitative data with qualitative narratives from teachers and students. Future studies should also explore additional variables such as student motivation, classroom climate, and parental involvement. For practice, schools should establish continuous professional development programs emphasizing competence across all domains. Teacher education institutions could integrate competence-based training modules into pre-service curricula. Policymakers should design systemic reforms that link teacher evaluation with ongoing professional development. Finally, fostering international collaboration would provide comparative insights and enhance the global understanding of how teacher competence shapes student learning outcomes.

CONCLUSION

This study set out to examine the relationship between teacher competence and student learning outcomes in primary education. Using a quantitative correlational design, the findings revealed a strong and statistically significant positive correlation between the two variables. The result demonstrates that teacher competence, measured through pedagogical, professional, social, and personal dimensions, is a substantial predictor of student achievement. These findings provide empirical evidence supporting the argument that the quality of teaching is one of the most influential school-level factors affecting student success. The conclusion reinforces international discourses that emphasize the centrality of teacher competence in achieving Sustainable Development Goal 4, which advocates for inclusive and equitable quality education.

Beyond statistical confirmation, the study highlights the multidimensional nature of teacher competence and its impact on both cognitive and affective learning domains. The evidence suggests that competence is not confined to subject mastery alone, but also encompasses interpersonal skills, professional responsibility, and the ability to adapt to diverse learning environments. This has practical implications for teacher education institutions, policymakers, and schools in designing professional development initiatives that are holistic and competency-driven. By focusing on teacher competence, educational systems can foster more effective classroom practices and ultimately enhance student performance.

Although the study was limited to a single school context with a relatively small sample, its implications extend more broadly to similar educational systems, particularly in developing regions. The results call for sustained investments in teacher training and continuous professional development as strategic measures to improve educational outcomes. Future research should expand on this study by incorporating larger and more diverse samples, exploring longitudinal effects, and integrating additional variables such as motivation and socio-emotional learning. In conclusion, strengthening teacher competence represents a powerful, evidence-based pathway toward improving student learning outcomes and ensuring educational quality at both local and global levels.

AUTHOR CONTRIBUTION STATEMENT

All authors contributed substantially to the work reported in this article. Author 1 was responsible for the conceptualization of the study, research design, and overall supervision of the project. Author 2 contributed to data collection, statistical analysis, and interpretation of findings. Author 3 provided expertise in methodology, validated the instruments, and reviewed the theoretical framework. All authors were actively involved in drafting, reviewing, and revising the manuscript to ensure its intellectual content and academic rigor. The final version of the article was read and approved by all authors, and each author agrees to be accountable for all aspects of the work.

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