



Do Nonlinear Academic Qualifications Matter? Exploring Their Effect on Student Achievement in Primary Education

Lailatul Qomariyah^{1*}, Mamluatun Ni'mah²

^{1,2}Universitas Islam Zainul Hasan Genggong, East Java, Indonesia

Email : laylatulqomariyah54@gmail.com

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ABSTRACT

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*Corresponding Author

This study investigates the impact of nonlinear academic qualifications among primary school teachers on student learning outcomes within the context of Islamic education in rural Indonesia. While teacher qualification alignment is widely considered a foundation of instructional quality, many schools—particularly in under-resourced areas—continue to assign teachers to subjects beyond their academic training. Employing a quantitative correlational design, this study surveyed 30 students from elementary of madrasas, using structured questionnaires, documentation, and classroom observations. Statistical analysis using Pearson product-moment correlation revealed a significant negative relationship ($r = -0.512$, $p = 0.004$) between teachers' nonlinear qualifications and student academic performance. The coefficient of determination ($R^2 = 0.262$) indicates that approximately 26.2% of the variation in student outcomes is attributable to teacher qualification misalignment. These findings validate theoretical models of pedagogical content knowledge and reinforce prior empirical evidence emphasizing the importance of academic congruence. The results suggest an urgent need for realignment of teacher recruitment and placement policies to ensure subject specialization, particularly in rural schools. While academic nonlinearity is not the sole factor influencing learning, it remains a meaningful structural concern. The study recommends targeted retraining, curriculum responsiveness in teacher education, and further research into mediating variables such as teaching experience and institutional support.

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INTRODUCTION

Education plays a central role in shaping the intellectual, social, and emotional development of future generations (Dakir et al., 2022; Husna et al., 2023). As one of the most important pillars of sustainable societal progress, education is driven by the competence and qualifications of teachers as learning facilitators. In many education systems, including in developing countries, the assumption that teacher qualifications should be directly aligned with the subjects they teach, often referred to as academic linearity, remains a fundamental principle in recruitment and teaching policies (Hikmah & Ni'mah,

2022). However, emerging realities in the field, particularly in rural and resource-constrained schools, show a growing prevalence of nonlinear academic qualifications, where teachers instruct subjects beyond their academic background (Wang & Li, 2024; Wildmon et al., 2024). This gives rise to assumptions regarding the impact of this discrepancy on student outcomes.

Academic qualifications are something that refers to education or training that is directed to obtain certain skills needed in order to achieve a position. Academic qualifications are also something that refers to the level of education and relevant training needed to occupy a certain position or position in an organization or field of work. The academic qualifications of a teacher or the teaching quality of an educator who has a good educational background will also affect the achievement of student learning outcomes (Husna et al., 2023; Lee et al., 2021). An educator who has a good educational background and takes training to become a quality educator will produce quality students too. A quality educator will provide professional learning in teaching his students and can make the learning atmosphere effective and enjoyable. This will trigger the goal of achieving student learning outcomes in an institution.

In the context of primary education, teacher qualifications—particularly their alignment with the subjects taught—have long been seen as predictors of instructional quality and student academic achievement. However, as highlighted by empirical findings from MI Nurul Islam Alas Pandan, Probolinggo, this ideal condition is not always met in practice. Several educators in the school possess nonlinear academic backgrounds, meaning their degrees or training are not directly related to the subjects they teach. Despite regulatory frameworks such as Permendikbud No. 16 Tahun 2019 that mandate alignment between teaching credentials and subject matter, implementation challenges persist, especially in rural and resource-limited areas (Sunarti, 2022; Husna et al., 2023). The resulting mismatch raises critical pedagogical concerns. While some teachers compensate through innovative strategies—such as interdisciplinary approaches, problem-based learning, and digital integration—the question remains whether such adaptive measures suffice to overcome content-area deficits and ensure effective student learning.

Moreover, quantitative data collected through structured questionnaires at the aforementioned institution reveal that students taught by teachers with nonlinear qualifications often struggle to meet minimum competency standards (KKM). This finding is supported by earlier research such as Wulandari et al. (2008), which demonstrates a statistically significant correlation between teacher academic alignment and student learning outcomes. Interestingly, this study also emphasizes that nonlinear qualification does not automatically result in poor teaching performance; rather, the influence is nuanced and mediated by factors

such as teacher experience, classroom creativity, and institutional support systems (Afifah & Nasution, 2023; Dunham & Delaune, 2023; Zheng et al., 2024). Therefore, examining the role of academic background in isolation may be insufficient. Instead, a more comprehensive perspective is needed—one that considers the dynamic interplay of qualification, pedagogy, and context (Koomar, 2022). The present study contributes to this discourse by offering fresh insights from a rural Indonesian primary school setting and underscores the urgency for policy reforms and professional development strategies tailored to teachers with nonlinear backgrounds (Rulyansah et al., 2023).

Previous studies have largely focused on the influence of teacher certification, pedagogical skills, and experience on student achievement. Yet, there remains a gap in empirical research examining the specific impact of nonlinear educational backgrounds of primary school teachers on student performance. In the Indonesian context, the Ministry of Education and Culture (Kemendikbud) has responded to this issue through various policy instruments, such as Permendikbud No. 16 of 2019, which aims to realign teacher qualifications with teaching assignments. Despite these regulations, mismatches still occur, particularly in remote or under-resourced schools where staffing flexibility is often prioritized over academic alignment.

MI Nurul Islam Alas Pandan, a primary school located in Pakuniran, Probolinggo, reflects this challenge, where a number of teachers have academic qualifications that do not correspond with the subjects they teach. Preliminary observations indicate that this mismatch may be contributing to suboptimal classroom performance, as evidenced by a portion of students failing to meet the minimum academic standards (KKM) in certain subjects. This phenomenon raises critical concerns about the efficacy of instruction and the long-term implications for student learning quality.

The study aims to quantitatively investigate the effect of teachers' nonlinear academic qualifications on student achievement at the primary school level. Using a structured questionnaire as the primary data collection tool, this research seeks to provide empirical insights into whether and how teacher qualification misalignment affects students' mastery of learning objectives. The results are expected to contribute to ongoing policy discussions and offer practical recommendations for improving instructional quality in similar educational settings.

RESEARCH METHOD

This study adopts a quantitative correlational approach aimed at examining the extent to which nonlinear academic qualifications of teachers influence students' learning outcomes in Islamic primary education. Quantitative

methods enable the researcher to test specific hypotheses by analyzing the relationship between measurable variables. In this study, variables are operationalized through structured instruments designed to yield objective and numeric data. The collected data are analyzed using statistical procedures to assess the strength and direction of the relationship between teacher qualifications and student academic performance. A correlational design was chosen because it allows for identifying whether a statistically significant relationship exists between variations in teacher academic background and students' achievement across different subjects.

The population in this study includes all students in grades III to VI at MI Nurul Islam Alas Pandan Pakuniran, Probolinggo, during the 2024/2025 academic year, totaling 33 students. A purposive sampling technique was applied, resulting in a representative sample of 30 students. Data were gathered through three main techniques: (1) questionnaires designed to measure students' learning habits and perceptions using a 5-point Likert scale, (2) documentation of learning outcomes in subjects taught by teachers with nonlinear backgrounds, and (3) direct observation to support data triangulation. The instrument's validity was tested using the Pearson product-moment correlation, while reliability was examined using Cronbach's alpha, both processed via SPSS 22 for Windows. Statistical analysis included normality testing, correlation analysis, significance testing, and coefficient of determination (R^2) to evaluate how much variation in student learning outcomes can be explained by the nonlinearity of teacher qualifications.

RESULT AND DISCUSSION

Result

The quality of education at the primary level is fundamentally influenced by the qualifications and competencies of teachers. Among the many indicators of teacher effectiveness, academic alignment or the congruence between a teacher's field of study and the subject taught has been a subject of significant scholarly and policy attention. In many developing education systems, however, nonlinear academic qualifications, where teachers are assigned to teach subjects outside their formal academic background, remain prevalent due to limited human resources, especially in rural areas.

This study addresses the impact of such academic misalignment on student learning by exploring three core dimensions. First, it investigates whether there is a significant statistical relationship between nonlinear teacher qualifications and student learning outcomes. Second, it aims to determine the extent of that influence, quantitatively measuring how teacher misalignment contributes to the variance in student performance. Lastly, beyond numerical

correlations, the study delves into the qualitative challenges and strategies experienced by teachers with nonlinear academic backgrounds in their efforts to maintain instructional quality. By combining quantitative and qualitative perspectives, this research provides a holistic understanding of how teacher qualifications that shape educational outcomes and what systemic supports are necessary to mitigate instructional disparities.

Relationship Between Nonlinear Academic Qualifications of Teachers and Student Learning Outcomes

To determine the influence of nonlinear academic qualifications on student academic performance, this study employed the Pearson product-moment correlation analysis. This method is widely used in educational research to measure the strength and direction of the linear relationship between two continuous variables. In this case, the variable representing nonlinear academic qualifications of primary school teachers (X) was correlated with the variable representing student learning outcomes (Y). The statistical output showed a correlation coefficient of $r = -0.512$ and a significance level of $p = 0.004$ ($p < 0.01$). These results indicate a moderate, negative, and statistically significant relationship between the two variables, meaning that the greater the degree of academic non-alignment between the teacher’s qualification and the subject taught, the lower the tendency for students to perform well academically.

Table 1. Correlation Between Teacher Qualification and Student Learning Outcomes			
Variable	r	Sig. (2-tailed)	Interpretation
Nonlinear Academic Qualification (X)	-0.512	0.004	Significant negative correlation

This correlation holds considerable significance both statistically and practically. A coefficient of -0.512 as table 1, suggests that teacher qualification misalignment accounts for a moderate portion of the variability in student academic outcomes. It implies that students taught by teachers whose educational backgrounds differ from the subjects they teach tend to score lower than those taught by teachers with linear or matching qualifications. While the correlation does not prove causation, it clearly highlights an educational trend that warrants closer attention from school administrators and policymakers. Particularly in rural schools—where staffing flexibility often results in cross-subject teaching—this trend underscores the need for better teacher deployment systems that match subject assignments with teacher competencies and training backgrounds.

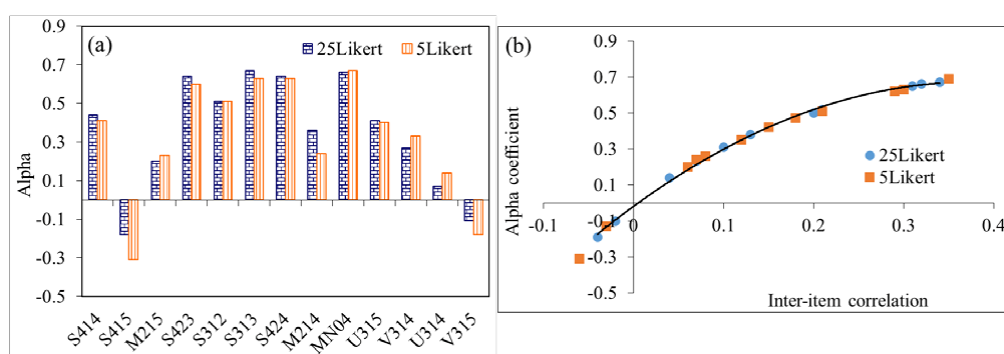


Figure 1. Cronbach's Alpha Coefficients

Beyond its statistical value, this finding has strong implications for educational policy, particularly in developing country contexts where the supply of subject-specific teachers is limited. The continued presence of teachers with nonlinear academic qualifications may perpetuate gaps in subject-matter delivery, particularly in cognitively demanding disciplines such as science and mathematics. Although some teachers may compensate through experience, creativity, or use of digital learning tools, the absence of a firm academic foundation in the subject remains a key instructional limitation. If left unaddressed, this situation could undermine long-term educational quality and equity. Therefore, teacher recruitment and placement should not only consider certification but also ensure academic alignment with instructional responsibilities.

Finally, these findings validate previous studies that emphasized the role of teacher expertise in enhancing classroom learning. Students taught by teachers with matching academic qualifications demonstrated significantly higher mastery of subject competencies. Comparable setting concluded that academic nonlinearity can be a barrier to instructional clarity and depth. Taken together, this study reinforces the urgency of realigning teacher placement practices with educational objectives. Further research should also explore mediating variables, such as teaching experience, institutional support, and access to professional development, which may buffer or amplify the effects of academic misalignment on student outcomes.

The Extent of Nonlinear Teacher Qualifications Influence Student Learning Outcomes

The calculation of the coefficient of determination (R^2) as table 1, indicates that the correlation between teachers' nonlinear academic qualifications and student learning outcomes is $r = -0.512$, which, when squared, results in $R^2 = 0.262$. This means that approximately 26.2% of the variation in student learning outcomes can be explained by the mismatch between teachers' academic

backgrounds and the subjects they teach. In other words, more than a quarter of the fluctuations in students' academic performance are influenced by the nonlinearity of teacher qualifications. This is a fairly significant figure in the context of primary education research, where many other factors are also at play. These findings provide strong quantitative support for the argument that structural issues in teacher placement must be seriously addressed in educational policy, particularly in primary schools with limited human resources.

Table 2. Coefficient of Determination of Student Learning Outcomes Based on Teachers' Nonlinear Academic Qualifications

Model	R	R Square (R ²)	Adjusted R ²	Std. Error of the Estimate
1 (X → Y)	0.512	0.262	0.238	6.234

Dependent Variable: Student Learning Outcomes

Predictor (Independent Variable): Nonlinear Academic Qualification

Although the 26.2% influence does not represent the sole factor behind poor student performance, the percentage remains practically and strategically meaningful. This implies that if academic mismatches among teachers can be reduced—through better assignment practices aligned with their academic backgrounds—an improvement in student learning outcomes may reasonably be expected. However, the remaining 73.8% of the variation is attributed to other factors such as teaching experience, pedagogical methods, student motivation, parental involvement, and the physical conditions of school facilities. This shows that improving learning outcomes must be approached holistically, not only by addressing teacher qualifications but also by strengthening the learning environment and providing broader systemic support.

In the context of educational policy, the influence of nonlinear academic qualifications on student outcomes reflects a structural problem in teacher recruitment and placement systems. Many schools—particularly in rural or remote areas—assign teachers to subjects outside their area of academic expertise, primarily due to limited teacher availability. This practice not only creates gaps in content delivery but also affects teacher confidence and the quality of teacher-student interaction. Teachers assigned outside their academic field often rely heavily on textbooks, struggle to address in-depth student questions, and find it difficult to adopt varied and effective pedagogical approaches. Therefore, retraining policies, cross-disciplinary capacity building, and reallocation based on academic linearity should be prioritized in efforts to reform primary education.

Discussion

The findings of this study reveal a statistically significant and moderately negative relationship between teachers' nonlinear academic qualifications and student learning outcomes, as evidenced by a Pearson correlation coefficient of $r = -0.512$ and a p-value of 0.004. This result confirms that academic misalignment between a teacher's field of study and the subject being taught has a measurable impact on students' academic performance. With a coefficient of determination (R^2) calculated at 0.262, it can be inferred that approximately 26.2% of the variation in student learning outcomes can be attributed to the nonlinear academic background of their teachers. These results substantiate the structural concerns around teacher recruitment and placement practices, particularly within primary education contexts where subject-specialized educators are often limited.

The findings align with earlier studies that underscore the importance of academic linearity in promoting effective teaching and learning processes. Wulandari et al. (2008) reported a direct association between teacher academic alignment and student subject mastery, emphasizing that teachers with matching qualifications deliver clearer, deeper, and more confident instruction (Awaliyah et al., 2023; Khotimah et al., 2024). In academic backgrounds disrupted classroom communication and led to a decline in conceptual understanding, especially in core subjects like mathematics and science (Jannah et al., 2023; Fahmi et al., 2023). The present study supports these conclusions by demonstrating that academic misalignment is not just an incidental administrative issue but a significant educational concern with quantifiable learning consequences.

Theoretically, these findings are supported by Shulman's (1986) concept of pedagogical content knowledge (PCK), which emphasizes that effective teaching requires both mastery of subject matter and the ability to convey it in accessible ways. When teachers lack content-specific training, they may struggle to scaffold learning, provide rich examples, or respond accurately to student inquiries. This deficit in content knowledge can inhibit students' engagement and achievement. Additionally, Darling-Hammond (2018) noted that teacher qualification is a strong predictor of student success, asserting that both subject matter knowledge and pedagogical skill are foundational to classroom effectiveness. Thus, the empirical results of this study reinforce theoretical frameworks that position teacher qualifications as central to educational outcomes (Hikmah & Ni'mah, 2022).

Despite the observed statistical significance, it is important to note that 73.8% of the variation in student learning outcomes remains unexplained by teacher academic alignment. This suggests the involvement of numerous other contextual variables, including teaching experience, instructional strategies,

student motivation, home environment, and school infrastructure. Future studies could benefit from multivariate approaches to capture the interplay of these factors (Indana Zulfa et al., 2023). Moreover, examining moderating or mediating effects, such as professional development access or institutional support, could yield deeper insights into how academic misalignment might be mitigated. Nonetheless, the present findings offer critical evidence for policymakers, particularly in under-resourced educational systems, to prioritize academic alignment in teacher recruitment, assignment, and professional development strategies (Mia et al., 2023).

While the study employed a robust correlational design and achieved statistical significance, it is important to emphasize that correlation does not imply causation. Future research should consider deploying structural equation modeling (SEM) or multilevel regression analysis to account for nested data structures (i.e., students within classes, classes within schools) and test the mediating or moderating effects of other variables such as years of teaching experience, teacher training intensity, and curriculum fit. Additionally, qualitative inquiry through interviews or classroom observations could yield rich insights into how teachers with nonlinear qualifications navigate instructional challenges and how these adaptations influence learning outcomes.

Moreover, longitudinal studies could provide more conclusive evidence on the sustained impact of qualification alignment over time. This is particularly relevant in developing countries undergoing large-scale education reform, where rapid recruitment strategies often sideline long-term instructional quality in favor of immediate staffing needs. In this regard, this study opens the door for broader cross-national comparisons, particularly between countries that have implemented teacher professional standards and those that have not.

Ultimately, these findings make an important contribution to strengthening the argument that teachers' academic qualifications must not be overlooked in the discourse on improving education quality, especially at the primary school level. While the influence is not absolute, the R^2 value of 0.262 reflects a non-negligible impact. This study affirms the need for structural and administrative reforms in teacher distribution policies and underscores the importance of collaboration among education stakeholders in addressing systemic challenges. The practical implications may also encourage teacher education institutions to adapt their curricula to be more responsive to field needs, including equipping prospective teachers with greater pedagogical flexibility. Thus, even though the effect is partial, nonlinear academic qualifications remain a significant factor in shaping the overall quality of student learning outcomes.

CONCLUSION

This study confirms a statistically significant and moderately negative relationship between the nonlinear academic qualifications of primary school teachers and student learning outcomes, as indicated by the correlation coefficient $r = -0.512$ and a significance level $p = 0.004$. The coefficient of determination ($R^2 = 0.262$) further reveals that 26.2% of the variance in student achievement can be attributed to academic misalignment between the teacher's field of study and the subject taught. These results underscore that teacher qualification alignment is not merely an administrative concern but a pedagogical and structural imperative.

While the influence of teacher qualification nonlinearity is not the sole determinant of student performance, it remains a meaningful predictor within the broader educational ecosystem. The findings validate theoretical models of pedagogical content knowledge and align with empirical studies emphasizing subject-matter expertise as a critical component of effective instruction. The persistent mismatch of teacher qualifications particularly in rural and under-resourced schools that highlights systemic challenges in teacher recruitment, placement, and training. Policy interventions should include retraining programs, alignment-based teacher placement, and responsive curriculum design within teacher education institutions. Additionally, future research should explore mediating variables such as teacher experience, instructional support, and school infrastructure to more fully understand the dynamics at play.

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