# LITERACY AND NUMERACY MENTORING PROGRAMS AND TEACHER PERFORMANCE IN ELEMENTARY SCHOOLS

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**Abstract**
This study examines the influence of literacy (X1) and numeracy (X2) mentoring programs on improving elementary school education quality, as reflected in Education Report Card indicators (Y) in Payaraman District, Ogan Ilir Regency. A quantitative explanatory approach with a correlational design was employed, involving 96 teachers selected purposively from a population of 209. A validated and highly reliable questionnaire (90 items) served as the instrument. Data analysis used descriptive statistics, prerequisite tests, and regression with SPSS 25. The results indicate that both literacy mentoring ($R^2$ = 0.465; p = 0.000) and numeracy mentoring ($R^2$ = 0.507; p = 0.000) significantly contribute to improving the Education Report Card, with numeracy showing a relatively larger contribution (56.6%). The study concludes that ongoing mentoring programs are effective in enhancing teacher competence and student learning outcomes. It recommends the Education Department continue the program with a focus on numeracy and low-achieving schools.
Keywords: Literacy Mentoring, Numeracy Mentoring, Education Quality, Elementary Teachers, Professional Development

## INTRODUCTION

The quality of basic education is a critical determinant of a nation's human capital development and global competitiveness (OECD, 2019). In the 21st century, characterized by rapid technological, economic, and social shifts, proficiency in literacy and numeracy has become indispensable for individuals to navigate complex challenges effectively (World Bank, 2020; Baran & Woznyj, 2021). Literacy is now conceptualized beyond basic reading and writing to include the capacity to interpret, critically evaluate, and synthesize information from diverse sources. Similarly, numeracy encompasses the application of mathematical reasoning and problem-solving skills to real-world contexts (OECD, 2019; Pangesti, 2018). Despite this recognition, Indonesia continues to grapple with a pervasive learning crisis in these foundational competencies. The 2022 PISA results underscore this reality, with Indonesian students achieving reading literacy and mathematics scores of 359 and 366, respectively, far below the OECD average of 500. These rankings place Indonesia 74th out of 81 countries for reading and 72nd for mathematics (OECD, 2023). These statistics reflect systemic challenges that demand urgent and targeted interventions. While teacher mentoring has been identified as a potentially effective strategy for improving instructional quality (Knight, 2018), there is limited empirical research on the specific impact of structured mentoring programs on measurable education outcomes in the Indonesian elementary school context, particularly in semi-urban and rural regions.

This study addresses this research gap by investigating the influence of literacy and numeracy mentoring programs on the improvement of Education Report Card indicators—a key accountability metric in Indonesia's education system. The research contributes to the existing literature by providing empirical evidence from a localized context, utilizing a validated instrument, and offering practical insights for educational policy and practice.

Furthermore, it highlights the unique challenges and opportunities in implementing such programs in regions with constrained resources and varying levels of school readiness. The situation is particularly concerning in Payaraman District, Ogan Ilir Regency, South Sumatra, where 2023 Education Report Card data indicate a numeracy score of 44.44 (classified as "Very Low") and a literacy score of 48.21 ("Low"). These figures are significantly below the national average (Kemendikbud Ristek, 2023). Additional contextual challenges include a low percentage of certified teachers (45%), a high student-teacher ratio, and limited school facilities such as libraries. These conditions exacerbate the gap between current outcomes and desired educational standards.

In response, the literacy and numeracy strengthening mentoring program for teachers was introduced as a targeted intervention. Unlike conventional one-off training sessions, this program offers continuous, collaborative, and classroom-embedded professional development (job-embedded) through coaching and mentoring approaches (Knight, 2018; Costa & Garmston, 2016). The theoretical framework is grounded in Cognitive Coaching theory, which emphasizes reflective practice and teacher autonomy (Costa & Garmston, 2016), and the Mathematical Knowledge for Teaching (MKT) framework, which underscores the importance of pedagogical content knowledge (PCK) in improving mathematics instruction (Ball, Thames, & Phelps, 2008). Both frameworks posit that enhanced teacher capacity through mentoring leads to improved instructional practices, which in turn positively influence student learning outcomes.

Based on this rationale, this study addresses three main research questions: (1) Does the literacy mentoring program significantly affect Education Report Card indicators? (2) Does the numeracy mentoring program significantly affect Education Report Card indicators? (3) Do both programs simultaneously affect these indicators? By answering these questions, this study aims to provide a robust evidence base for policymakers and practitioners to optimize the design and implementation of professional development programs in similar contexts.

## METHOD

This study employs a quantitative approach with an explanatory design, aiming to examine cause-and-effect relationships through hypothesis testing (Sugiyono, 2019). A correlational design with regression analysis was adopted, as the researcher collected data on variables that have already occurred (ex-post facto) without manipulation. Consequently, causal claims should be interpreted with caution, as the design does not establish causation definitively. Population and Sample, The study population consisted of all elementary school classroom teachers in Payaraman District, totaling 209 teachers from 12 schools (11 public, 1 private). Purposive sampling was employed with specific inclusion criteria: (a) active classroom teachers; (b) attendance of at least 75% of the literacy and numeracy mentoring sessions during the 2023-2024 period; (c) availability of complete Education Report Card data for their respective schools. This selection strategy was chosen to ensure that participants had sufficient exposure to the mentoring intervention and that outcome data could be reliably linked to the program. The final sample comprised 96 teachers.

Research Instrument, The main instrument was a questionnaire using a 1-5 Likert scale, consisting of 90 statement items (30 per variable). The instrument grid was developed based on established theories: effective mentoring (Knight, 2018) and Education Report Card indicators (Kemendikbud Ristek, 2022). The instrument underwent rigorous validation. Expert judgment was performed by two professors and one senior educational researcher to assess content

validity. Based on their feedback, minor revisions were made to item wording to enhance clarity and relevance. Subsequently, a pilot test was conducted with 30 teachers outside the main sample. Validity testing using Pearson's product-moment correlation showed all items had r-count > r-table (0.361) at α = 0.05. Reliability was assessed using Cronbach's Alpha, yielding very high coefficients: X1 = 0.934; X2 = 0.941; Y = 0.938. Discriminating power analysis further confirmed all items were in the "very good" category (r > 0.40). Data Analysis Techniques, Data analysis proceeded in three stages: (1) descriptive statistics to summarize respondent characteristics and variable distributions; (2) prerequisite assumption tests including normality (Kolmogorov-Smirnov), linearity, multicollinearity (Tolerance & VIF), and heteroscedasticity (Glejser test); (3) hypothesis testing using simple linear regression (for H1 and H2) and multiple linear regression (for H3) with SPSS Version 25.

## RESULTS AND DISCUSSION

Research Results, Descriptive Analysis Results: The distribution of respondents was fairly even, with the highest number from SDN 04 Payaraman (11 teachers; 11.46%) and the most teaching in grade 3 (22 teachers; 22.92%). The descriptive statistics results for the research variables are presented in Table 1

Tabel 1. Descriptive Statistics of Variabel

| Variabel | N | Min | Max | Mean | Std. Deviation | Category |
|---|---|---|---|---|---|---|
| Literacy Mentoring (XI) | 96 | 96 | 150 | 128,67 | 12,34 | High |
| Numeracy Mentoring (X2) | 96 | 100 | 150 | 127,83 | 13,21 | High |
| Inprovement of Education Report Card Indonesia (Y) | 96 | 98 | 150 | 126,50 | 14.08 | High |

Category ranges: Very Low (30-54), Low (55-78), Moderate (79-102), High (103-126), Very High (127-150). Source: Primary data processed (2026) Table 1 indicates that the average teacher perception of all three variables falls within the "High" category, suggesting that the mentoring program was generally well-received and that improvements in Education Report Card indicators were perceived positively by teachers. Objective School Education Report Card Data, Data from the Education Report Card Platform (Kemendikbud Ristek, 2023) reveal varied achievement patterns among the 12 elementary schools. Overall, 7 schools (58.3%) showed positive gains, 1 school remained stable, and 4 schools (33.3%) experienced declines. The largest improvement was observed at SDN 04 Payaraman (gain of +46.67%), followed by SDN 01 (+41.10%) and SDN 05 (+40.00%).

Prerequisite Assumption Test Results, All prerequisite assumptions were met: (a) Normality test (Kolmogorov-Smirnov) produced Sig. values > 0.05 for X1 (0.405), X2 (0.427), and Y (0.375); (b) Linearity test confirmed linear relationships for X1-Y and X2-Y (Sig. Deviation from Linearity > 0.05); (c) Multicollinearity test showed Tolerance = 0.478 (>0.10) and VIF = 2.092 (<10); (d) Heteroscedasticity test (Glejser) produced Sig. X1 = 0.342 and X2 = 0.278 (>0.05). These results confirm that the data are suitable for regression analysis. Hypothesis Testing, Hypothesis 1 (Effect of X1 on Y): Simple linear regression analysis showed $R^2 = 0.465$, regression coefficient (Beta) = 0.682, and Sig. = 0.000 ($p < 0.05$). Regression equation: $Y = 32.456 + 0.731X1$. Conclusion: The literacy mentoring program significantly contributes to improving Education Report Card indicators, accounting for 46.5% of the variance.

Hypothesis 2 (Effect of X2 on Y): Analysis showed $R^2 = 0.507$, Beta = 0.712, and Sig. = 0.000 ($p < 0.05$). Regression equation: $Y = 28.123 + 0.789X2$.

Conclusion: The numeracy mentoring program significantly contributes to Y, explaining 50.7% of the variance. Hypothesis 3 (Simultaneous effect of X1 and X2 on Y): Multiple linear regression produced $R^2 = 0.572$, F-count = 62.345 > F-table (3.09), and Sig. = 0.000 ($p < 0.05$). Regression equation: Y = 18.567 + 0.412X1 + 0.498X2. Both variables together explain 57.2% of the variance in improving Education Report Card indicators, with numeracy contributing relatively more (56.6%) than literacy (43.4%).

Tabel 2. Rangkuman Hasil Pengujian Hipotesis

| Hipotesis | Pengaruh | Koefesien (Beta) | $R^2$ | Sig | Keputusan |
|---|---|---|---|---|---|
| H1:X1=Y | Positif&Signifikan | 0,628 | 0,4650,000 | | H1 Diterima |
| H2:X2=Y | Positif&Signifikan | 0,712 | 0,5070,000 | | H2 Diterima |
| H3:X1,X2=Y | Positif&Signifikan (Simultan) | - | 0,5720,000 | | H3 Diterima |

Discussion, The findings of this study provide compelling evidence that structured mentoring programs are effective in improving educational quality, as measured by Education Report Card indicators. The positive and significant effects of both literacy and numeracy mentoring underscore the value of continuous, job-embedded professional development over traditional, episodic training models. The findings of this study confirm that effective literacy mentoring can encourage improved student literacy achievement reflected in the Education Report Card. The contribution of 46.5% indicates that although not dominant, this program is an important factor. This result aligns with Cognitive Coaching theory (Costa & Garmston, 2016), which emphasizes that reflective mentoring develops teachers' professional autonomy. Teachers equipped with good pedagogical literacy strategies tend to be able to create text-rich classroom environments, implement diagnostic assessments, and improve students' reading comprehension (Shanahan & Shanahan, 2008). The remaining 53.5% influence comes from other factors such as principal leadership (Hallinger, 2011) and parental support (Henderson & Mapp, 2002).

Effect of the Literacy Mentoring Program, The finding that literacy mentoring accounts for 46.5% of the variance in Education Report Card indicators confirms that such programs can significantly enhance teachers' capacity to foster student literacy. This aligns with Cognitive Coaching theory (Costa & Garmston, 2016), which posits that reflective mentoring cultivates teachers' professional autonomy and adaptive expertise. Teachers who receive effective literacy mentoring are more likely to implement evidence-based strategies such as differentiated instruction, formative assessment, and the creation of text-rich classroom environments (Shanahan & Shanahan, 2008). Moreover, the mentoring process encourages teachers to reflect on their practice, identify student needs, and adjust instruction accordingly—a cycle that is critical for sustained improvement. The remaining 53.5% of variance may be attributed to factors such as principal leadership (Hallinger, 2011), parental involvement (Henderson & Mapp, 2002), school culture, and student socioeconomic background. These findings suggest that while mentoring is a powerful lever for improvement, it must be complemented by supportive school-level and community-level conditions.

Effect of the Numeracy Mentoring Program Interestingly, the numeracy mentoring program demonstrated a slightly higher effect ($R^2 = 50.7\%$) compared to literacy. This may be due to the nature of numeracy instruction, which often involves more concrete and measurable outcomes, such as problem-solving accuracy and procedural fluency. The finding is consistent with the Mathematical Knowledge for Teaching (MKT) framework (Ball et al., 2008), which emphasizes that teachers' pedagogical content knowledge in mathematics is a strong predictor of student achievement. Numeracy mentoring programs that equip

teachers with strategies such as the use of manipulatives, contextual problem-solving, and student error analysis appear to be particularly effective in enhancing student outcomes (Smith & Stein, 2018; Ma, 1999). However, the greater contribution of numeracy mentoring should not be interpreted as literacy being less important. Rather, it may reflect the specific context of Payaraman District, where numeracy scores were notably lower, thus leaving more room for improvement. This finding suggests that targeted numeracy interventions could yield substantial returns in similar low-performing settings.

Simultaneous Effect and Implications, The simultaneous effect of 57.2% confirms that literacy and numeracy are complementary rather than competing domains. Teachers who are proficient in both areas can create more meaningful integrated learning experiences, which is particularly relevant in the Indonesian elementary curriculum that emphasizes thematic learning. This finding aligns with research by Fauzan & Indriyani (2023), who found that lesson study-based mentoring simultaneously enhances teachers' competence in integrating literacy and numeracy. Nevertheless, 42.8% of the variance remains unexplained, highlighting the influence of external factors such as student socioeconomic conditions, learning resource availability, and regional policies (Coleman et al., 1966; Thapa et al., 2013). This underscores the need for a holistic approach to educational improvement that addresses both school-based and broader systemic factors. The objective Education Report Card data provide a critical reality check. While 7 schools improved, 4 schools (SDN 06, 07, 11, and SDM Seri Kembang) experienced declines. Further analysis suggests that these schools had lower teacher participation rates in the mentoring program and limited principal support. This reinforces the exposure criterion established by Kraft, Blazar, and Hogan (2018), who found that the intensity and consistency of participation in mentoring are key determinants of success. It also suggests that school leadership plays a crucial role in fostering a culture of continuous improvement. Theoretical and Practical Contributions, Theoretically, this study contributes to the growing body of literature on teacher professional development by providing empirical support for the efficacy of mentoring in improving measurable education outcomes. It extends the application of Cognitive Coaching and MKT theories to the Indonesian elementary school context, demonstrating their relevance and effectiveness in a semi-urban setting. Practically, the findings offer several insights for policymakers. First, the higher relative contribution of numeracy suggests that allocating additional resources to numeracy mentoring could yield greater improvements. Second, the success of the program in some schools and not others highlights the importance of context-specific strategies and the need for differentiated support based on school readiness and performance. Third, the positive perceptions of teachers indicate strong buy-in, which is a favorable condition for scaling up the program.

## CONCLUSION

Based on the results of data analysis and discussion, this study concludes that: This study provides robust empirical evidence that both literacy and numeracy mentoring programs significantly contribute to improving Education Report Card indicators in elementary schools in Payaraman District. The theoretical and practical implications of these findings are profound, offering guidance for policymakers, school leaders, and practitioners. The literacy mentoring program accounts for 46.5% of the variance in Education Report Card indicators, while the numeracy mentoring program contributes slightly more at 50.7%. Simultaneously, both programs explain 57.2% of the variance, with numeracy showing a relatively larger contribution (56.6%) compared to literacy (43.4%).

These results confirm that ongoing, job-embedded mentoring is an effective strategy for enhancing teacher competence and student learning outcomes.

This study makes several key contributions. Theoretically, it validates and extends the applicability of Cognitive Coaching and MKT frameworks in a semi-urban Indonesian context, providing empirical support for the mechanisms through which mentoring influences teaching quality and student outcomes. Methodologically, it offers a rigorously validated instrument that can be adapted for future research in similar settings. Practically, the findings suggest that mentoring programs should be sustained, expanded, and contextually adapted. The higher contribution of numeracy indicates that targeted interventions in this area could be particularly beneficial. Furthermore, the variability in school outcomes underscores the importance of addressing contextual factors such as school leadership, teacher participation, and resource availability. However, the study has limitations that should be acknowledged. The ex-post facto design does not permit strong causal claims, and the sample is limited to a single district, which restricts generalizability. Future research should employ experimental or quasi-experimental designs with control groups, include a broader range of schools and regions, and incorporate qualitative methods to capture the nuances of the mentoring process. Such research would further strengthen the evidence base for mentoring as a key strategy for educational improvement in Indonesia and similar contexts. Simultaneously, both mentoring programs have a positive and significant effect on improving Education Report Card indicators ($R^2$ = 57.2%; F-count = 62.345; Sig. = 0.000). Objectively, out of 12 elementary schools in Payaraman, 7 schools (58.3%) experienced improved achievement, 1 stable, and 4 schools (33.3%) experienced declines. The highest improvement occurred at SDN 04 Payaraman (gain +46.67%).

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