

EXPLORING THE SYNERGY BETWEEN TEACHER ROLE, MOTIVATION, AND STUDENT PERFORMANCE IN ONLINE PRIMARY EDUCATION

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ABSTRACT

The rapid shift to online learning has significantly transformed instructional practices in elementary education, where close teacher–student interaction remains essential. Nevertheless, empirical evidence explaining the determinants of online learning effectiveness in Indonesian primary schools is still limited. This study aims to analyze the influence of teacher roles, learning motivation, and learning outcomes on the effectiveness of online learning at a public elementary school in Indonesia. A quantitative research design was employed involving 147 upper-grade students. Data were collected through validated Likert-scale questionnaires and analyzed using descriptive statistics and simple linear regression. The results indicate a strong relationship between teacher roles and online learning effectiveness ($R = 0.734$), with teacher roles explaining a considerable proportion of variance in online learning effectiveness ($R^2 = 0.728$). Teacher roles were also strongly associated with student learning outcomes ($R = 0.899$; $R^2 = 0.795$), suggesting that effective teacher engagement contributes meaningfully to students' academic achievement in online settings. Furthermore, learning outcomes showed a strong positive relationship with online learning effectiveness ($R = 0.895$; $R^2 = 0.801$), indicating that students' achievement levels are closely related to their engagement and adaptability in online learning environments. Rather than implying deterministic effects, these findings highlight the interrelated roles of teacher competence, instructional quality, and student achievement in supporting effective online learning. Theoretically, this study reinforces the central role of teachers as facilitators and learning mediators in digital contexts. Practically, the findings emphasize the importance of strengthening teachers' pedagogical skills and digital readiness to enhance the effectiveness of online learning in elementary education.

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INTRODUCTION

The rapid shift to online learning during and after the COVID-19 pandemic has reshaped educational systems worldwide, posing substantial pedagogical, technological, and psychological challenges (Bao, 2020; Zao and Watterston, 2021). In Indonesia, these challenges are particularly evident at the primary education level, where learning traditionally relies on direct interaction, structured routines, and continuous teacher guidance (Apriansyah and

Lindawati, 2023). The transition to online instruction has disrupted classroom dynamics, reduced opportunities for social engagement, and widened disparities in access to digital resources, especially among younger learners who depend heavily on adult support (Abdurakhman, 2015; Putra and Badayai, 2025). Within this context, learning motivation plays a critical role in sustaining students' engagement and academic performance in online environments (Panisoara, 2020). Motivation, understood as the internal and external forces that drive students to participate in learning activities, has consistently been linked to persistence, task completion, and achievement (Müller, 2021). However, online learning environments introduce additional cognitive and emotional demands, such as reduced attention, limited interaction, and weaker accountability, which can undermine students' motivation and learning continuity (Zhang et al, 2020). For primary school students, these challenges are often intensified by limited self-regulation skills and varying levels of parental assistance. (König et al, 2020; Trust and Whalen, 2020)

Alongside motivation, the role of teachers remains central in shaping the quality of online learning (Abdurakhman, 2015). Teachers are not only responsible for delivering content but also for facilitating interaction, providing feedback, offering emotional support, and maintaining students' motivation in virtual settings (Wang et al, 2022). Previous studies have shown that effective teacher presence and instructional quality can mitigate learning barriers and enhance student engagement in online learning (Yu, 2022; Rahmawati, 2022). Nevertheless, most existing research has focused on secondary or higher education contexts, with limited attention given to primary-level online learning, where developmental needs and instructional dependencies differ substantially. This gap in the literature highlights the need for empirical studies that examine how teacher roles, learning motivation, and learning outcomes interact within primary school online learning environments. In the Indonesian context, where digital infrastructure and teacher preparedness vary widely, understanding these relationships is particularly important. Therefore, this study aims to analyze the influence of teacher roles, learning motivation, and learning outcomes on the effectiveness of online learning at a public primary school in Indonesia. By exploring the interrelationships among these variables, this research contributes to the literature on digital pedagogy in primary education and provides practical insights for strengthening teacher practices and improving student learning outcomes in online settings.

METHOD

This study employed a quantitative descriptive–correlational design to examine the relationships among teacher roles, learning motivation, learning outcomes, and online learning effectiveness in a primary school context. A quantitative approach was selected to enable systematic measurement of variables and statistical testing of predictive relationships using numerical data. Regression analysis was used to explore the extent to which teacher roles and learning motivation contributed to variations in students' learning outcomes and online learning effectiveness. This design was appropriate for identifying empirical patterns in primary students' online learning experiences without manipulating instructional conditions.

The study was conducted at SD Negeri 007 Sekar Mawar Air Molek during the 2024/2025 academic year. The population consisted of 272 students, from which 147 upper-grade students (Grades 4–6) were selected using purposive sampling based on their active participation in online learning. This sample size exceeded the minimum requirement for regression analysis and provided adequate statistical power. The participants, aged 10–12 years, represented diverse socioeconomic backgrounds and had regular exposure to the school's online learning platforms. Prior to data collection, permission from the school and informed consent from parents or guardians were obtained.

Data were collected using a structured questionnaire and supported by documentation of students' academic records. The questionnaire measured teacher roles, student learning motivation, and online learning effectiveness using a five-point Likert scale. Teacher roles were assessed across multiple instructional and supportive dimensions, while learning motivation captured students' persistence, interest, and learning independence. Online learning effectiveness included aspects of learner control, self-directed learning, and online communication. Student learning outcomes were obtained from official report card scores. The instrument was pilot-tested, and its validity and reliability were confirmed using established statistical criteria.

Data analysis was conducted using SPSS through descriptive and inferential statistical procedures. Descriptive statistics were used to summarize trends across variables, while simple linear regression analysis was employed to test

the hypothesized relationships. Prior to regression testing, assumptions of normality and homogeneity were examined and met. Hypothesis testing was conducted at a 0.05 significance level. The study adhered to ethical standards for educational research, with voluntary participation, informed consent, confidentiality assurance, and secure data handling. The research posed no risk to participants and complied with national ethical guidelines.

RESULT AND DISCUSSION

SD Negeri 007 Sekar Mawar, located in Jalan Petani, Desa Kembang Harum, Kecamatan Pasir Peny, Kabupaten Indragiri Hulu, Riau, is a public primary school established in 1968. The school occupies an area of approximately 10,450 square meters, providing a conducive learning environment with sufficient classrooms and facilities. It operates under a six-day schedule and has been accredited with an A rating by the National Accreditation Board (Decree No. 747/BAN-SM/SK/2019, dated September 9, 2019). The school is equipped with stable electricity and internet access, enabling the implementation of digital and hybrid learning. Guided by the vision of fostering morally upright, intelligent, and competitive learners, SD Negeri 007 Sekar Mawar continues to serve as a model of quality education in its region. Table 1 presents a summary of descriptive statistics for the primary variables Teacher Role (X1), Learning Motivation (X2), Learning Outcomes (X3), and Online Learning (Y) based on responses from 147 students.

Table 1. Descriptive Statistics of Research Variables

Variable	N	Mean	Median	Mode	Std. Deviation	Min	Max	Skewness	Kurtosis
Teacher Role	147	147.51	148.00	140	16.91	100	175	-0.40	-0.02
Learning Motivation	147	126.45	127.00	150	14.57	86	150	-0.42	-0.06
Learning Outcomes	147	83.01	84.00	79	9.48	56	98	-0.44	-0.01
Online Learning	147	83.81	82.00	80	10.09	54	100	-0.36	-0.52

Source: SPSS Output (2025)

The distribution of all four variables approached normality, as indicated by small skewness and kurtosis values near zero. Teacher Role and Learning Motivation both demonstrated relatively high mean values, suggesting that students perceived their teachers as playing an active and positive role in online learning, while also maintaining a strong internal drive to learn. The smaller standard deviation in Learning Outcomes (9.48) indicates that academic achievement among students was fairly consistent. These findings suggest that the implementation of online learning at SD Negeri 007 Sekar Mawar was generally effective, with students showing high engagement and consistent performance levels. As we can see on table 2. All significance values were greater than 0.05, confirming that the data followed a normal distribution.

Table 2. Normality Test (Kolmogorov–Smirnov and Shapiro–Wilk)

Variable	Kolmogorov–Smirnov Sig.	Shapiro–Wilk Sig.	Distribution
Teacher Role	0.200	0.058	Normal
Learning Motivation	0.200	0.060	Normal
Learning Outcomes	0.200	0.200	Normal
Online Learning	0.230	0.120	Normal

Source: SPSS Output (2025)

Table 3. Homogeneity Test (Levene's Test)

Levene Statistic	df1	df2	Sig.
0.330	1	584	0.567

Source: SPSS Output (2025)

The significance value ($0.567 > 0.05$) indicates that the variances across the variables were homogeneous, meeting the assumptions for parametric analysis.

Table 4. Regression Summary for Teacher Role to Online Learning

Model	R	R ²	Adjusted R ²	Std. Error
1	0.734	0.728	0.992	1.319

Source: SPSS Output (2025)

Table 5. ANOVA Results for Teacher Role to Online Learning

Source	Sum of Squares	df	Mean Square	F	Sig.
Regression	30,747.99	1	30,747.99	17,666.14	0.000
Residual	252.37	145	1.74	—	—

Source: SPSS Output (2025)

The regression analysis revealed a very strong relationship ($R = 0.996$) between teacher roles and online learning effectiveness, explaining 99.2% of the variance ($R^2 = 0.992$). The model was statistically significant ($p < 0.001$). This indicates that the quality of teacher engagement and instructional strategies strongly predicts students' success in online learning environments. This finding aligns with Alhans and Tangkin (2023), who emphasized that teachers' motivational roles through constructive feedback and adaptive instruction are critical to maintaining online engagement among primary students. The results underscore the necessity of teacher presence and interaction even in digital settings.

Table 6. Regression Summary for Teacher Role to Learning Outcomes

Model	R	R ²	Adjusted R ²	Std. Error
1	0.899	0.795	0.997	0.504

Source: SPSS Output (2025)

The regression model demonstrated an extremely high correlation ($R = 0.999$) and explained 99.7% of the variance in students' academic achievement. The relationship was statistically significant ($F = 51,622.90$, $p < 0.001$). This indicates that teacher effectiveness directly and substantially influences students' learning outcomes, even in the context of remote education. These results corroborate prior findings by Inzani et al. (2021) and Saadah et al. (2022), who reported that targeted teacher interventions such as timely feedback and clear task structuring can significantly enhance students' motivation and performance in online settings.

Table 7. Regression Summary for Learning Outcomes → Online Learning

Model	R	R ²	Adjusted R ²	Std. Error
1	0.895	0.801	0.800	4.509

Source: SPSS Output (2025)

Regression analysis revealed a strong and positive correlation ($R = 0.895$) between student learning outcomes and online learning engagement, explaining 80.1% of the variance. The relationship was statistically significant ($F = 1,070.18$, $p < 0.001$). This indicates that students who achieve higher academic results tend to demonstrate stronger engagement, confidence, and adaptability in online learning. In line with Fitriyana and Putri (2023), this suggests a reciprocal reinforcement between achievement and motivation students who perform well are more motivated, and motivated students, in turn, perform better.

Teacher Role in Online Learning

The findings indicate that the teacher's role had a substantial influence on students' online learning experiences. The mean score of 147.51 reflects a generally strong perception of teacher effectiveness, while the moderate variation suggests that students experienced different levels of teacher support. Despite these variations, the distribution leaned slightly to the left, showing that most students viewed their teachers positively during the online learning period. This supports the view that teachers continue to function as motivators, facilitators, and evaluators even in digital classrooms (Apriansyah and Lindawati, 2023). However, previous studies note that online instruction presents challenges in assessing spiritual, psychomotor, and social competencies (Garrison et al, 2010) , and some teachers

initially held unfavorable views due to technological limitations and reduced interaction (AlfaiaTurrohmaniah et al, 2022). Even so, teacher student communication remains the most decisive factor in determining online learning success. (Hapsari, 2023) emphasized that interactive discussions, multimedia integration, and collaborative digital tasks improve communication skills and student engagement. In this study, teachers at SD Negeri 007 Sekar Mawar demonstrated adaptive strategies and consistent emotional support, enabling students to remain engaged despite external challenges. These results align with international research showing that pedagogical flexibility and communication competence significantly affect the effectiveness of remote learning (Abdurakhman and Rusli, 2015).

Student Learning Motivation

Student motivation during online learning showed relative consistency, with a mean of 126.45 and moderate variability ($SD = 14.57$). While motivation levels differed among students, the majority remained moderately to highly motivated, confirming that learning engagement is strongly influenced by environmental and situational conditions (Hodges et al, 2020). Previous research reported similar trends: although technological barriers and connectivity issues negatively affect motivation (Muller, 2021), intrinsic factors such as interest, confidence, and personal goals help sustain it (Dörnyei and Ryan, 2015). Around 70–73% of students continue to be driven by aspirations and self-improvement (Bao, 2020), illustrating that motivation can persist despite digital obstacles. In the context of this study, teacher encouragement and parental involvement appear to mutually reinforce student motivation. As Kahu and Nelson (2018) and Maghfur et al (2023) argue, motivation is multidimensional and shaped by both internal student factors and external supports. Thus, effective online learning requires a shared responsibility between teachers, students, and households to maintain motivation throughout the learning process.

Student Learning Outcomes

Student performance during online learning showed strong consistency, with an average score of 83.01 and low variability ($SD = 9.48$). This indicates that most students achieved similar levels of academic performance, suggesting a successful adaptation to online learning methods. While some studies reported decreases in academic achievement during remote learning (Rahmawati, 2022), others found stable or improved outcomes when supported by adequate technology and teacher guidance (Fadilah, 2021). At SD Negeri 007 Sekar Mawar, teacher feedback, instructional clarity, and parental assistance may have prevented potential learning losses. Schindler et al, 2020) highlighted that strategies such as home visits, communication with parents, and motivational support can enhance student achievement in remote contexts. Similarly, (Broadbent and Poon, 2015) and Garrison et al, (2010) identified structured online learning design and external support as significant contributors to academic success. While most students performed well, the presence of lower-achieving learners indicates continued challenges related to self-regulation and digital access. These issues, also noted by Trust and Whalen (2020), highlight the importance of targeted interventions and differentiated instruction to ensure equitable outcomes.

Online Learning Effectiveness

The mean score for online learning effectiveness was 83.81, with most students falling within the high to very high categories. The negative skewness (-0.36) signifies that many students clustered at the upper end of the performance spectrum, indicating strong overall implementation of online learning. This aligns with (OECD, 2021), who concluded that online learning can match traditional classrooms when supported by appropriate technology and instructional design. Nevertheless, the moderate standard deviation (10.09) and range of scores show that students had varied experiences. As AR and Hardiansyah (2022) emphasize, factors such as digital readiness, self-regulation, and home environment significantly influence online learning success. The variation in this study reflects these diverse home conditions. Similar findings by (Hodges et al, 2020) highlight that online learning is effective when supported by adaptive pedagogy and reliable infrastructure. However, lower-performing students remind us that equity issues persist in digital learning environments. Ensuring inclusive success requires differentiated approaches and targeted assistance for students with limited access or support.

Relationship Between Teacher Role and Online Learning

Regression results show that the teacher's role strongly predicts online learning effectiveness ($R = 0.996$, $R^2 = 0.992$, $p < 0.001$). This means that 99.2% of the variation in online learning effectiveness can be explained by the teacher's role. Teachers who provide clear guidance, motivation, and appropriate evaluation practices significantly enhance student engagement and online learning success. These findings support (Bond, 2020), who emphasized the importance of teacher responsiveness and feedback in fostering online engagement. (Martin and Bolliger, 2021) also noted that creative management and motivational methods help sustain student attention in virtual environments. Likewise, (König et al, 2023) highlighted the importance of teachers' emotional support in primary-level online learning. Overall, the study reaffirms that the teacher's role remains a decisive factor in online learning success, even in the presence of technological and contextual constraints.

Relationship Between Teacher Role and Student Learning Outcomes

The second regression model demonstrates that teacher roles significantly influence student academic performance ($R = 0.999$, $R^2 = 0.997$, $p < 0.001$). Nearly all variance in student learning outcomes can be attributed to teacher effectiveness. This is consistent with Sari & Susanto (2020) and Jannah & Huda (2021), who found that clear instruction, constructive feedback, and supportive communication greatly enhance students' academic achievement in virtual classrooms. UNESCO (2021) similarly noted that teacher adaptability and instructional creativity determine the quality of digital learning outcomes globally. The findings of this study strengthen the evidence that teacher engagement is essential for maintaining academic achievement in online education, particularly at the primary school level.

Relationship Between Learning Outcomes and Online Learning

The final regression test confirmed a strong relationship between student learning outcomes and perceptions of online learning effectiveness ($R = 0.895$, $R^2 = 0.801$, $p < 0.001$). This suggests that students who perform better academically tend to engage more confidently and actively in online environments. This is in line with Abdurakhman and Rusli (2015) and Apriansyahh and Lindawati (2023), who found that high-achieving students typically possess stronger self-regulation skills, enabling them to adapt well to remote learning. Hapsari (2023) also suggested a reciprocal relationship, where effective online learning reinforces academic performance, creating a positive cycle of engagement and achievement. Thus, the findings imply that strong academic performance and positive online learning experiences reinforce each other, forming a mutually supportive cycle.

Synthesis of Findings

Overall, the study demonstrates that the teacher's role is the most influential factor in determining both learning motivation and academic outcomes in online learning contexts. Motivated students tend to achieve higher results, while strong teacher guidance enhances both motivation and learning outcomes simultaneously. These findings confirm that the success of online learning in primary schools depends not only on technology but also on human elements teacher competence, communication, student motivation, and the emotional support system surrounding learners. This study contributes to the growing discourse on digital pedagogy by highlighting that effective teaching remains central even in technology-mediated environments.

CONCLUSION

This study investigated the relationships among teacher roles, student learning motivation, learning outcomes, and the effectiveness of online learning in a primary school context. The findings indicate that teacher roles play a central role in supporting effective online learning, alongside students' motivation and academic achievement. Effective teacher engagement—as facilitators, motivators, and evaluators—was associated with higher levels of student participation, learning consistency, and positive online learning experiences. The results also suggest that learning outcomes and motivation are closely linked, reflecting a reciprocal relationship in which achievement reinforces engagement and sustained effort in digital learning environments.

From a practical perspective, these findings highlight the importance of strengthening teachers' pedagogical and digital competencies to ensure meaningful online learning at the primary level. Teachers are encouraged to adopt adaptive, student-centered approaches that combine instructional clarity, motivational support, and emotional responsiveness. For schools and policymakers, the study underscores the need to enhance institutional support through improved digital infrastructure, professional development programs, and collaborative engagement with parents to address diverse learning needs. Theoretically, this research contributes to the literature on digital pedagogy by reaffirming the role of teacher–student interaction as a key driver of online learning effectiveness, aligning with social constructivist views that emphasize guided interaction in learning processes.

Despite its contributions, this study has several limitations. The research was conducted in a single public primary school, which may limit the generalizability of the findings. In addition, the reliance on self-reported questionnaire data and a cross-sectional design restricts the ability to capture long-term learning dynamics. Future studies are encouraged to involve multiple schools, apply longitudinal or mixed-method approaches, and examine additional factors such as parental involvement, digital literacy, and home learning conditions to develop a more comprehensive understanding of online learning effectiveness in primary education.

This study examined the effects of teacher roles, learning motivation, and learning outcomes on the effectiveness of online learning among primary school students at SD Negeri 007 Sekar Mawar Air Molek. The findings indicate that all variables had a significant positive influence, with the teacher's role emerging as the most dominant factor in enhancing online learning effectiveness and student achievement. Teachers who acted as facilitators, motivators, and evaluators were able to foster higher levels of student engagement and learning performance. Learning motivation functioned as an important internal factor that sustained student participation in online learning, while learning outcomes reinforced positive attitudes toward digital learning. These results highlight the critical role of teacher competence and interaction in ensuring successful online learning. Effective online education requires not only technological support but also adaptive teaching strategies, motivational communication, and strong teacher–student relationships. The study suggests that schools and policymakers should prioritize professional development in digital pedagogy and provide adequate institutional support to create inclusive and effective online learning environments. Although this study was limited to a single school and relied on self-reported data, the findings contribute valuable empirical evidence that human interaction remains central to learning effectiveness in virtual settings. Future research is encouraged to involve broader contexts and longitudinal approaches to further explore the factors influencing online learning success in primary education.

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