Available online at: http://journal.uny.ac.id/index.php/jpip

Jurnal Penelitian Ilmu Pendidikan

Volume 17, Nomor 2, 137 – 148, 2024

The influence of principals' digital leadership and teacher empowerment training on elementary school teachers' self-efficacy

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Abstract

This study examines the combined and individual influence of principals' digital leadership and teacher empowerment training on the self-efficacy of elementary school teachers in Central Lombok Regency, Indonesia. Employing a quantitative ex post facto design, the research involved a purposive sample of 100 teachers who had participated in empowerment training. Data were collected through validated questionnaires and analyzed using multiple linear regression. The results indicate that: (1) principals' digital leadership has a significant positive effect on teacher self-efficacy ($p = 0.020$, $t = 2.359$); (2) teacher empowerment training also exerts a significant positive effect ($p = 0.000$, $t = 4.554$); and (3) collectively, these two factors significantly contribute to teacher self-efficacy ($p = 0.000$, $F = 22.066$), explaining 31.3% ($R^2 = 0.313$) of its variance. These findings underscore the importance of developing school principals' digital leadership competencies and implementing structured teacher empowerment programs as effective strategies to bolster teachers' belief in their professional capabilities. The study provides empirical evidence for educational policymakers and school administrators aiming to enhance teacher quality and instructional effectiveness in the digital era.

Keywords: Digital leadership; teacher empowerment; self-efficacy; elementary school; teacher professional development

How to Cite (APA): Hikmah, H., & Sutapa, M. (2024). The influence of principals' digital leadership and teacher empowerment training on elementary school teachers' self-efficacy. *Jurnal Penelitian Ilmu Pendidikan, 17*(2), 137 – 148. doi: https://doi.org/10.21831/jpip.v17i2.92810

Received 13-10-2024; Received in revised from 23-10-2024; Accepted 25-11-2024

INTRODUCTION

A leader is characterized as an individual who fosters an inclusive environment, provides direction, and motivates followers towards significant accomplishments (Anderson & Hamman, 2024; Northouse, 2022; Siagian et al., 2021). In the field of education, the digital age encourages educators and policymakers to integrate technology into learning and to turn schools into connected learning communities that foster student creativity (Sheninger, 2020; Vaquero et al., 2023). A new direction of leadership that is more collaborative, adaptive, and utilizes advanced information technology to drive transformation, innovation, and changes in attitudes and behaviors is known as digital leadership (Avolio et al., 2000; Indarta, 2024). Digital leaders not only change mindsets but also influence social processes through modern information technologies that support change and improvement, creating school environments that integrate technology effectively (Karakose et al., 2022; Westerman et al., 2015). Digital leadership requires not only technical skills, but also adaptability, emotional intelligence, and a

strategic vision that begins with analyzing systemic deficiencies, planning improvements, and exploiting new opportunities (Röhl, 2022; Underwood, 2019). Schools can initiate this change by focusing on project-based learning, personalization, and technology integration; therefore, principals must facilitate collaboration to ensure everyone is aligned with the school's vision (Nor & Suriansyah, 2025; Richardson et al., 2021). A principal can use data from digital tools to make informed decisions about curriculum adjustments, resource allocation, and student support (Adanne, 2024). Principals who actively facilitate and support the adoption of technology will improve teachers' performance and confidence in the effective use of educational technology (Ismail et al., 2021; Sunu, 2022).

To increase teachers' self-belief in using technology, the Ministry of Education launched a teacher training program called teacher empowerment to develop teachers as learning leaders. Teacher empowerment, as learning leaders, are expected to act innovatively and possess personal competencies (skills and knowledge), beliefs (professional and personal), and values that enhance their teaching development (Mulyasa, 2021; Priestley et al., 2015). Teacher empowerment identify themselves with leadership roles and contribute to the community of educators; they influence colleagues and take responsibility in leadership activities, so their quality and recruitment are crucial (Dirsa et al., 2022; Katzenmeyer & Moller, 2009). Whether individually or collectively, teacher leadership influences and encourages colleagues, principals, and other school community members to learn new techniques and knowledge for solving classroom problems and improving teaching practices (Levin & Schrum, 2017; Zhang et al., 2021). Through such encouragement, collaboration, and innovation, teachers gain experience that enhances their confidence, particularly in adopting learning technologies. This increased confidence leads to more effective classroom management and a positive learning environment for students (Bandura, 1977; Burić & Kim, 2020; Kolay & Mirici, 2024). The use of technology in teaching is most effective when teachers can leverage it to support learning objectives and to foster students' critical thinking and problem-solving skills (DeCoito & Richardson, 2018; Yazar & Karabekir, 2019). Teachers with high self-efficacy find it easier to manage their classrooms, develop challenging and creative lessons, and build emotional closeness with their students. Such capabilities are bolstered by collaboration and support from the principal, colleagues, student feedback, teaching experience, and the teacher's own mental state (Gale et al., 2021; Hayati et al., 2023; Kwarteng & Sappor, 2021; Mudhar et al., 2024).

However, a diagnostic study by SMERU, involving focus group discussions and document analysis, revealed that the learning achievement of Elementary school students in Central Lombok remains low. This underachievement is associated with low teacher quality, incomplete learning by students, and a lack of parental involvement at home (Kurniawan et al., 2020). These findings align with the 2021–2026 Strategic Plan of Central Lombok Regency concerning the low quality of and access to education. Results from the regional literacy assessment (ASI ASLI) and the 2024 education report card show that student literacy is still at a special intervention level with only a few students reaching a proficient level, while student numeracy is at a moderate level (approximately 45%–50% proficiency). The existence of this gap raises questions about the extent to which principals' digital leadership and teacher empowerment training influence the self-efficacy of Elementary school teachers in Central Lombok Regency.

METHODS

This study employed a quantitative ex post facto design, which examines events that have already occurred and identifies the factors that might have caused them (Elfrianto & Lesmana, 2022). A quantitative approach was used to allow the use of structured instruments and statistical analysis to test the hypotheses (Sugiyono, 2020). The population included all teacher empowerment participants in public Elementary schools in Central Lombok Regency, totaling 132 individuals. The sampling technique was purposive sampling with a 5% margin of error, yielding a sample of 100 teacher empowerment teachers.

The measurement of the principal's digital leadership variable was based on the 2024 ISTE standards for education leaders, which include the following dimensions: support for equity and citizenship, visionary planning, empowering leadership, systemic planning, and being a connected learner (ISTE, 2024). The teacher empowerment training variable was measured using a combination of the teacher empowerment training Module 1.2 and the Teacher Leader Model Standards developed by the Leadership Exploratory Consortium, covering the aspects of independence, reflection, innovation, collaboration, and student-centered orientation. The measurement instrument for teacher self-efficacy was developed by adapting Bandura's Teacher Self-Efficacy Scale Bandura (2006) and an instrument by Kundu et al. (2020), encompassing three aspects of efficacy: technological efficacy, pedagogical efficacy, and integration efficacy.

Data was collected using a questionnaire administered via Google Forms. The questionnaire consisted of closed-ended items measured on a 4-point Likert scale (1 to 4). The stages of instrument development were as follows: 1) Developing the theoretical foundation for each research variable. 2) Developing or modifying existing instruments for each variable. 3) Conducting expert validation of the instrument. 4) Piloting the instrument on a subset of respondents. 5) Testing the instrument's validity and reliability.

After gathering the pilot data, the research proceeded with thorough validity and reliability analyses to assess the consistency and accuracy of the measurement instrument utilized. The relationships among individual variables were evaluated using Pearson's product-moment correlation to determine both the direction and the strength of these associations. Additionally, multiple correlation (represented as multiple R) was employed to measure the relationship strength among a set of independent variables in relation to the dependent variable. To ensure the reliability or internal consistency of the scales, Cronbach's alpha was computed.

For the subsequent data analysis phase, descriptive statistics were utilized to summarize the collected data without making broader generalizations beyond the sample. Key descriptive statistics included metrics such as mean, median, mode, and standard deviation, all of which were clearly represented through various tables and figures to enhance understanding (Sugiyono, 2020). In testing hypotheses, simple linear regression analysis was applied to each independent variable, while multiple regression analysis was conducted to explore the combined effects of the independent variables. This analysis specifically examined the interplay between principals' digital leadership (designated as X_1), teacher empowerment training (denoted as X_2), and teacher self-efficacy (identified as Y).

RESULTS AND DISCUSSION

Results

The results of the descriptive analysis of the variables of school principals' digital leadership, teacher education, and self-efficacy are as follows:

Table 1. Descriptive results

Variable	Mean	Median	SD	Variance	Min	Max
Principals' Digital Leadership	57.70	61.85	15.594	243.186	20	80
Teacher Empowerment Training	52.72	55.00	6.894	47.521	23	60
Self – Efficacy	50.78	51.62	6.603	43.597	24	59

Based on Table 1, the average score for principals' digital leadership was 57.70 with a median of 61.85. This indicates a left-skewed distribution, where most respondents rated their principal's digital leadership relatively high, but a small number gave low ratings. The standard deviation of 15.594 (variance 243.186) suggests a widespread in the data, meaning there were considerable differences in how principals practiced digital leadership as perceived by teachers.

The teacher empowerment training variable had a mean of 52.72 and a median of 55.00, indicating a left-skewed distribution as well. Most respondents rated the outcomes of the teacher empowerment training highly. The standard deviation of 6.894 (variance 47.521)

indicates a relatively narrow spread, suggesting that the impact of the teacher empowerment training was consistent among respondents.

The teacher self-efficacy variable had a mean score of 50.78 and a median of 51.62, which also indicates a left-skewed data distribution. This means that most teachers reported fairly high self-efficacy. The standard deviation of 6.603 (variance 43.597) is relatively small, indicating that self-efficacy levels were quite homogeneous across the sampled teachers.

To investigate the direct impact of independent variables on teacher self-efficacy, simple linear regressions were performed, and the results are presented in Table 2.

Table 2. Linear Regression Results

Model	Constant	Koefisien Regresi	Sig.
Principals' Digital Leadership	40.834	0.172	0.000
Teacher Empowerment Training	24.384	0.501	0.000

From Table 2, the regression equation for principals' digital leadership (X_1) and teacher self-efficacy (Y) can be derived as $Y = 40.834 + 0.172\ X_1$. This indicates that if the principal's digital leadership score is 0, the predicted self-efficacy score would be 40.834. For each one-unit increase in the principal's digital leadership score, the teacher's self-efficacy is expected to increase by 0.172 units on average (assuming other factors remain constant).

Similarly, for teacher empowerment training (X_2), the regression equation is $Y = 24.384 + 0.501\ X_2$. This means if the teacher empowerment training score is 0, the predicted self-efficacy score would be 24.384. Each one-unit increase in the teacher empowerment training score is associated with an increase of 0.501 units in the teacher's self-efficacy score.

Both regression models show highly significant results for the predictors. The significance value (Sig.) for both X_1 and X_2 is 0.000 ($p < 0.05$), indicating that each predictor individually has a statistically significant effect on teacher self-efficacy.

Subsequently, a multiple regression analysis was performed to examine the simultaneous influence of both predictors while controlling for their interrelationship. The results are presented in Table 3.

Table 3. Multiple Regression Results

Model	Constant	Regression Coefficient	Sig.
Principals' Digital Leadership	23.863	0.093	0.020
Teacher Empowerment Training		0.408	0.000

As shown Table 3, the p-values demonstrate that both variables remain statistically significant predictors in the multivariate context. However, a notable observation emerges: when both variables are analyzed together, the regression coefficient for digital leadership decreases from 0.172 (in the simple model) to 0.093, while the coefficient for training decreases slightly from 0.501 to 0.408. This indicates that part of their individual influence is shared or mediated when both are considered simultaneously. Nevertheless, teacher empowerment training retains a considerably stronger unique effect on self-efficacy compared to digital leadership.

To formally test the hypotheses for each independent variable, t-tests were conducted on the regression coefficients. Table 4 provides the detailed t-test results for the multiple regression model.

Table 4. T-test Results

	Model	Unstandardized Coefficients		Standardized Coefficients	*t*	Sig.
		B	Std. Error	Beta		
1	(Constant)	23.863	4.292		5.560	0.000
	Teacher Empowerment Training	0.408	0.090	0.426	4.554	0.000
	Principals' Digital Leadership	0.093	0.040	0.221	2.359	0.020

As shown in Table 4, for principals' digital leadership (X_1) the t-test yielded $t = 2.359$ with $p = 0.020$. The *t*-value (2.359) exceeds the critical *t*-table value (approximately 1.984 for $df = 98$ at $\alpha = 0.05$), and $p < 0.05$. Therefore, the null hypothesis (H_0) is rejected, and the alternative

hypothesis (H_a) is accepted for X_1. This means that principals' digital leadership has a positive and significant effect on teacher self-efficacy. In practical terms, the better the principal's digital leadership, the higher the teachers' self-efficacy tends to be.

For teacher empowerment training (X_2), the t-test results show $t = 4.554$ with $p = 0.000$. Since $4.554 > 1.984$ and $p < 0.05$, H_0 is rejected for X_2 as well. Thus, Teacher empowerment training has a positive and significant effect on teacher self-efficacy. This indicates that teachers who have undergone the teacher empowerment training program tend to have higher self-efficacy than those who have not, or that improvements in the quality/intensity of teacher empowerment training are associated with higher teacher self-efficacy.

An F-test was performed to determine whether principals' digital leadership and teacher empowerment training together have a significant simultaneous effect on teacher self-efficacy. The results of the ANOVA (F-test) are shown in Table 5.

Table 5. F-test Results

	Model	Sum of Squares	*df*	Mean Square	*F*	*Sig.*
1	Regression	1349.641	2	674.821		
	Residual	2966.509	97	30.583	22.066	.000[b]
	Total	4316.150	99			

a. Dependent Variable: *Self – Efficacy*
b. Predictors: (Constant), Principals' Digital Leadership, Teacher Empowerment Training

Table 5 reveals that the regression analysis, with teacher self-efficacy serving as the dependent variable and the predictors being principals' digital leadership and teacher empowerment training, yields significant results. The F statistic calculated is 22.066, which is accompanied by a p-value of 0.000, indicating statistical significance at the alpha level of 0.05 ($p < 0.05$). When comparing this F value to the critical value from the F-table, which is approximately 3.09 for degrees of freedom 1 ($df_1 = 2$) and degrees of freedom 2 ($df_2 = 97$), the obtained F value is significantly higher. As a result, the null hypothesis can be rejected, affirming that there is a meaningful simultaneous effect of both principals' digital leadership and teacher empowerment training on enhancing teacher self-efficacy when both predictors are analyzed together.

To assess how much of the variation in teacher self-efficacy is explained by the two independent variables, the coefficient of determination was calculated. Table 6 provides the R and R^2 values for the multiple regression model.

Table 6. R Square Results (R^2)

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	0.559[a]	0.313	0.299	5.530

a. Predictors: (Constant), Principals' Digital Leadership, Teacher Empowerment Training

From the provided data in Table 6, the analysis reveals that the multiple correlation coefficient (R) is 0.559, indicating a moderate relationship between the independent variables and the dependent variable, which is teacher self-efficacy. The R Square value stands at 0.313, suggesting that approximately 31.3% of the variance observed in teacher self-efficacy can be accounted for by the influences of principals' digital leadership and the teacher empowerment training program. Furthermore, the adjusted R^2 is reported at 0.299, meaning that after accounting for the number of predictors in the model, the effective variance explained is 29.9%. This indicates that the substantial majority, around 68.7%, of the variance in teacher self-efficacy remains unexplained by the current model, implying that there are additional factors influencing teacher self-efficacy that were not addressed in this study.

Further analysis was conducted to determine the contribution of each independent variable to predict teacher self-efficacy. Effective contribution refers to the portion of the R^2 contributed by a specific variable, while relative contribution refers to the percentage of the explained variance that is attributable to a specific variable relative to the total explained variance. Table 7 presents the effective and relative contributions of each independent variable.

Table 7. Relative and Effective Contribution Results of X_1 and X_2

Variable	*b*	*R*	*R Square*	*SE*	*Total SE*	*SE*	*Total SR*
Principals' Digital Leadership	0.221	0.407	31.3%	9.0%	31.3%	28.74%	99.9%
Teacher Empowerment Training	0.426	0.503		22.3%		71.18%	

As shown in Table 7, the effective contribution of principals' digital leadership to the variance in teacher self-efficacy is about 9.0%, whereas teacher empowerment training contributes about 22.3% effectively. These effective contributions sum to approximately 31.3%, matching the R^2 value of the model.

The relative contribution provides insight into the importance of each predictor relative to the total explained variance. Principals' digital leadership accounts for about 28.74% of the explained variance in self-efficacy, while teacher empowerment training accounts for about 71.18%. In relative terms, teacher empowerment training provides roughly two-thirds to three-quarters of the explained variance, indicating that, within this model, improvements in or differences due to teacher empowerment training have a larger impact on teacher self-efficacy than differences in principals' digital leadership. In summary, the teacher empowerment training program contributes much more to enhancing teachers' self-efficacy (among the factors studied) than the principals' digital leadership does.

Discussion

Influence of Principals' Digital Leadership on Teacher Self-Efficacy

The results of the hypothesis tests indicate that principals' digital leadership has a positive influence on the self-efficacy of Elementary school teachers in Central Lombok Regency. The partial regression test for this variable was significant ($p = 0.020 < 0.05$, $t = 2.359 >$ t-table 1.984), with a coefficient of determination (R^2) of about 0.09 (9%). This suggests that while principals' digital leadership does contribute to teachers' self-efficacy, the majority (around 91%) of the variance in self-efficacy is explained by other factors. Nevertheless, the finding supports the notion that the principal's digital leadership, the higher and more robust the teachers' self-efficacy will be.

Delving into the components of digital leadership, the highest average score in the principals' digital leadership questionnaire was in the aspect of "Empowering Leader," with an average rating of 3.2 (on a 1–4 scale). This indicates that, in general, principals are facilitating the development of teachers' technological skills and encouraging good practices in technology innovation among staff. These results support Ismail's research findings that professional and digital citizenship training are the biggest contributors to digital leadership (Ismail et al., 2021). In this context, effective principals invest in teacher professional development tailored to individual needs, addressing each teacher's strengths and weaknesses to make learning more effective and adaptive (Sheninger, 2020; Sterrett & Richardson, 2022). When principals exhibit high levels of digital leadership, they tend to inspire digital teaching practices and facilitate collaboration among teachers (Hamzah et al., 2021; Nor & Suriansyah, 2025). One of the most crucial leadership skills in the digital era is providing a clear vision and goals for technology integration; digital leaders must have a transformative vision for their schools, encompassing both short-term and long-term objectives (Kane et al., 2019).

Conversely, the lowest rated dimension of digital leadership was the "Connected Learner" aspect, with an average score of about 2.6. This suggests that school principals could improve in developing a culture of reflection and continuous improvement using technology. Specifically, there is a need for greater appreciation of digital innovation and fostering a learning culture through ICT exploration. By doing so, principals can develop their skills in leading and navigating technological change, advancing school systems, and promoting a sustainable mindset about how technology can enhance learning outcomes. These considerations reinforce the idea that digital technology can transform existing educational processes and tools when effectively leveraged (Shivakumar, 2023). Principals who use technology as a driver for digital

transformation tend to create more effective learning environments. They facilitate technology-based professional development, ensure rapid access to information, and motivate teachers to reflect on and improve their teaching practices often by building a trusting environment that encourages experimentation (Agustina et al., 2020; Yirci et al., 2021). The quality of school leadership has a significant impact on teachers' performance and beliefs in their capabilities, which in turn determines the success of schools in achieving learning objectives (Sunu, 2022). Moreover, inspirational leaders with strong emotional intelligence can effectively motivate and guide their followers, thereby improving overall performance and team cohesion (Ghosh, 2024). These findings underscore that a principal's digital leadership, especially when it includes empowering teachers and being an active learner alongside staff, contributes positively to teachers' confidence in integrating new technologies and pedagogical innovations in the classroom.

Effect of Teacher Empowerment Training on Teacher Self-Efficacy

The analysis also demonstrates that the teacher empowerment training program has a significant positive effect on teacher self-efficacy. The partial test for this variable was highly significant ($p = 0.000 < 0.05$, $t = 4.554 > t$-table 1.984), with an R^2 of approximately 0.223 (22.3%). This indicates that about 22% of the variability in teachers' self-efficacy can be linked to their involvement in the teacher empowerment training, while roughly 77.7% is attributable to other factors. The hypothesis that participating in teacher empowerment training improves teachers' self-efficacy is supported by these results.

Examining the dimensions of the teacher empowerment program, the highest average score was in the student-oriented aspect, with an average of 3.6. This finding implies that teachers who underwent the teacher empowerment training place strong emphasis on prioritizing students' needs, potential, and voices in their teaching practice. These teacher empowerments utilize formative assessments to understand and respond to individual student needs, and they provide opportunities for students to express their ideas and participate actively in the learning process. They employ a variety of pedagogical strategies, designing learning activities tailored to individual differences in learning readiness based on data-driven insights (Dewey, 2001; Gibbs, 2023). This approach is precisely in line with the Teacher Empowerment training modules, which promote learner-centered teaching practices, differentiated instruction, and social-emotional learning coaching (Samsinar et al., 2020). The emphasis on being student-oriented confirms that the training program successfully instills a focus on student-centered learning and responsive teaching strategies, which can enhance a teacher's confidence in managing and facilitating learning for diverse students.

Another aspect of teacher empowerment training that scored highly was independence, with an average score of 3.5. Teachers who excel in this aspect tend to independently seek out learning resources and professional development opportunities to improve their competencies. They make instructional decisions based on moral principles and valid data rather than solely on directives from superiors. This trait of professional autonomy and continuous learning is significant because teacher leadership and ongoing professional learning have been shown to positively impact teachers' sense of competence. Teachers who engage in various specialized training or education programs generally feel more skilled and confident, which in turn increases their motivation to support student learning and often earns them recognition from peers (Cañoso, 2025). By developing leadership qualities, teachers can realize their professional values (such as a commitment to student growth and collaborative practice) while still fulfilling their Elementary role as classroom instructors (Katzenmeyer & Moller, 2009). In essence, the teacher empowerment program's focus on cultivating independent, proactive teacher leaders contributes to higher self-efficacy by empowering teachers to take charge of their own professional growth and instructional decision-making.

On the other hand, the collaboration aspect received the lowest average rating among the teacher empowerment dimensions (the exact average was the lowest of the five aspects).

This suggests that there is room for improvement in building a more collaborative culture through the teacher empowerment initiative. A strong collaborative culture is essential for an inclusive and productive learning community. Teachers who serve as learning leaders should be able to facilitate collaboration across different roles – for example, encouraging teamwork among fellow teachers, engaging students as partners in learning, and involving parents in educational activities. Effective teacher leaders promote cross-role collaboration in decision-making and innovation, which can lead to more successful learning outcomes. They leverage communication technology and collaborative tools to connect teachers, students, and parents, thereby creating a support network that benefits student learning. Prior research supports the idea that teacher leadership not only boosts individual teachers' efficacy and performance but also enhances classroom practices, fosters a cooperative work environment, and creates an effective school climate. These improvements collectively impact both teaching quality and student achievement (Akman, 2021; Arain, 2020). Therefore, strengthening the collaborative aspect of the teacher empowerment program by providing teachers with more strategies and opportunities for teamwork and shared leadership could further amplify the program's positive effect on teacher self-efficacy.

Combined Influence of Digital Leadership and Teacher Empowerment Training on Self-Efficacy

The findings from the simultaneous (combined) analysis indicate that principals' digital leadership and teacher empowerment training together have a significant effect on teacher self-efficacy. The F-test result was $F = 22.066$ ($p = 0.000 < 0.05$) for the regression model including both independent variables, confirming that the combined model is statistically significant. The coefficient of determination for the joint effect was $R^2 = 0.313$, meaning that about 31.3% of the variance in Elementary school teachers' self-efficacy in Central Lombok Regency is jointly explained by principals' digital leadership and the teacher empowerment training program. The remaining 68.7% of variance is due to other variables not included in this study. This significant combined influence suggests that these two factors are both important and, to some extent, complementary in shaping teacher self-efficacy.

Principals and school leaders can amplify teachers' confidence by simultaneously working on their leadership approaches and supporting teacher development programs. For instance, principals who actively provide and endorse professional development and training programs help improve teachers' knowledge, skills, and teaching practices (Cahyanto et al., 2023).

Broadly speaking, the professional development of educators when well-planned has been shown to increase teachers' confidence and belief in their abilities to perform their duties and to adapt to changes in their environment. This empowerment can transform the school organization by equipping teachers with essential skills and, ultimately, lead to higher job satisfaction (Mukminin et al., 2019). It is crucial, however, that such development and training programs are tailored to individual teacher needs; a one-size-fits-all approach is less effective. Tailoring training allows for more effective learning and adaptation, as it acknowledges each teacher's specific strengths and areas for improvement (Richardson et al., 2020). When teachers feel that professional development opportunities are relevant to their personal context and needs, they are more likely to feel supported and "cared for" by the institution. Consequently, they develop greater pride in their work and confidence in utilizing new technologies and strategies in their teaching.

In summary, the interplay between a principal's digital leadership and the teacher empowerment teacher training program has meaningful implications for teacher self-efficacy. The analysis of relative contributions revealed that teacher empowerment training contributes about 22.3% (effective contribution) to teacher self-efficacy, compared to 9.0% from principals' digital leadership. In relative terms, within the explained variance, approximately 71% is attributable to teacher empowerment training and 29% to digital leadership. This disparity

suggests that, at present, the direct training of teachers through the teacher empowerment program has a larger measurable impact on their self-efficacy than the indirect influence of principals' leadership does. Consequently, while both factors are important, strengthening the teacher empowerment training yields a higher immediate payoff in terms of boosting teacher confidence. At the same time, the relatively lower contribution of principals' digital leadership indicates an opportunity for growth: school principals may need to further develop their digital competencies and leadership strategies. By improving their own digital leadership skills, principals can better support and sustain the gains made by teacher training programs. In practice, this means principals should strive to develop a transformative digital vision for their schools, build a positive digital culture, and actively support teachers' professional development. When principals effectively model and lead technology integration by providing infrastructure, encouragement, and recognition for innovative teaching, teachers are likely to feel more confident and efficacious in using those technologies and methods in their classrooms.

CONCLUSION

This study analyzes the impact of principals' digital leadership and the teacher empowerment training program on the self-efficacy of Elementary school teachers in Central Lombok Regency. There is a positive and significant correlation between effective digital leadership by principals and the self-efficacy of teachers. Principals who actively promote professional development and encourage technology use enhance teachers' confidence in integrating technology into their instruction. By acting as coaches and leveraging technology (such as data-driven decision-making), principals create a supportive environment conducive to continual learning, which is crucial for boosting teacher self-efficacy, especially in adopting innovative teaching methods and tools. The teacher empowerment program positively affects teacher self-efficacy, with participants showing greater confidence in their teaching abilities. The program emphasizes reflective practices, student-centered learning, and innovative pedagogical methods, contributing to a better classroom culture that positively influences student learning. Teachers involved in this training develop skills for differentiating instruction, meeting student needs, and collaborating with stakeholders, leading to increased motivation and capability in addressing classroom challenges.

The interaction between principals' digital leadership and the teacher empowerment training program collectively enhances teacher self-efficacy. The training program accounts for a more significant portion of the variance in self-efficacy (22.3%) compared to principals' digital leadership (9%). This finding underlines the necessity for principals to engage in continuous improvement of their digital leadership skills to support teachers effectively. A dual strategy is recommended, promoting high-quality training programs like teacher empowerment while fostering forward-thinking digital leadership within school administrations to cultivate an environment that nurtures teachers' skills and confidence for improved educational outcomes.

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