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ORIGINAL RESEARCH ARTICLE

Digital Leadership and Madrasah Effectiveness: The Mediating Role of Teacher Digital Competence

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ABSTRACT

Digital transformation in madrasahs requires leadership that is capable of integrating technology into institutional management and educational practices. This study aims to examine the relationship between Digital Leadership, Teacher Digital Competence, and Madrasah Effectiveness, with Teacher Digital Competence positioned as a mediating variable. The study employed a quantitative approach using Partial Least Squares Structural Equation Modeling (PLS-SEM). Data were collected from 78 respondents involved in teaching and educational activities in madrasahs through a five-point Likert-scale questionnaire. The findings reveal that Digital Leadership has a positive relationship with Teacher Digital Competence ($\beta = 0.292$) and Teacher Digital Competence has a positive relationship with Madrasah Effectiveness ($\beta = 0.290$). More importantly, Digital Leadership demonstrates a very strong and significant relationship with Madrasah Effectiveness ($\beta = 0.955$; $R^2 = 0.911$; $t = 27.932$; $p < 0.001$). However, Teacher Digital Competence does not significantly mediate the relationship between Digital Leadership and Madrasah Effectiveness, as indicated by a very small indirect effect ($\beta = 0.003$) and a bootstrap confidence interval crossing zero. These findings indicate that digital leadership contributes to madrasah effectiveness primarily through direct organizational mechanisms rather than through teacher digital competence as an intermediary pathway. The study highlights the strategic importance of strengthening digital leadership while simultaneously developing systematic professional support for teachers' digital competence.

Keywords: Digital Leadership; Teacher Digital Competence; Madrasah Effectiveness; PLS-SEM; Digital Transformation.



ABSTRAK

Transformasi digital di madrasah membutuhkan kepemimpinan yang mampu mengintegrasikan teknologi ke dalam pengelolaan kelembagaan dan praktik pendidikan. Penelitian ini bertujuan untuk menganalisis hubungan antara Digital Leadership, Teacher Digital Competence, dan Madrasah Effectiveness dengan Teacher Digital Competence sebagai variabel mediasi. Penelitian menggunakan pendekatan kuantitatif dengan analisis Partial Least Squares Structural Equation Modeling (PLS-SEM). Data diperoleh dari 78 responden yang terlibat dalam aktivitas pembelajaran dan pendidikan di madrasah melalui kuesioner berskala Likert lima poin. Hasil penelitian menunjukkan bahwa Digital Leadership memiliki hubungan positif dengan Teacher Digital Competence ($\beta = 0,292$), sedangkan Teacher Digital Competence memiliki hubungan positif dengan Madrasah Effectiveness ($\beta = 0,290$). Temuan utama menunjukkan bahwa Digital Leadership memiliki hubungan yang sangat kuat dan signifikan dengan Madrasah Effectiveness ($\beta = 0,955$; $R^2 = 0,911$; $t = 27,932$; $p < 0,001$). Namun, Teacher Digital Competence tidak terbukti memediasi hubungan antara Digital Leadership dan Madrasah Effectiveness, dengan indirect effect yang sangat kecil ($\beta = 0,003$) dan interval kepercayaan bootstrap yang melintasi angka nol. Temuan ini menunjukkan bahwa kontribusi Digital Leadership terhadap efektivitas madrasah terutama berlangsung melalui mekanisme organisasi secara langsung, bukan melalui kompetensi digital guru sebagai jalur perantara. Penelitian ini menegaskan pentingnya penguatan kepemimpinan digital sekaligus pengembangan kompetensi digital guru melalui dukungan profesional yang sistematis.

Kata Kunci: kepemimpinan digital; kompetensi digital guru; efektivitas madrasah; PLS-SEM; transformasi digital.

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1. INTRODUCTION

The rapid development of digital technology has transformed the way educational institutions are managed and delivered (Aljuwaiber, 2026; Raina et al., 2026). Madrasahs are increasingly required to adapt to digital transformation not only in teaching and learning but also in leadership, administration, communication, and institutional decision-making (Abrori & Hadi, 2020; Haningsih et al., 2026). In this context, digital leadership has become an important organizational capability because school leaders are expected to formulate digital strategies, facilitate technology adoption, develop teacher capacity, and create an organizational environment that supports innovation (Fahmi Husein, Moh Solikul Hadi, 2024; Hadi et al., 2026). However, the availability of digital technology alone does not guarantee institutional effectiveness. The ability of leaders to direct and support the effective use of technology remains an important factor in determining whether digital transformation contributes to improved madrasah performance.

Madrasah effectiveness reflects the institution's ability to achieve educational goals, provide quality learning services, manage resources efficiently, and respond to changes in the educational environment. Digital leadership may contribute to this effectiveness by establishing a clear digital vision, facilitating access to technological resources, encouraging innovation, and supporting teachers in developing digital competencies. Nevertheless, the influence of digital leadership on institutional effectiveness may not always occur directly. Teachers are the main actors who translate leadership policies and digital strategies into classroom practices. Therefore, teacher

digital competence may serve as an important mechanism connecting digital leadership with madrasah effectiveness (Dinata et al., 2026; Dinata Feri Riski et al., 2025; Kuswadi et al., 2026).

Previous studies have established that digital leadership is associated with teacher performance, technology integration, innovation, and organizational development (Antonopoulou, 2024; Chaidir et al., 2025; Faizin et al., 2025). Research on educational leadership has also demonstrated that leaders who provide technological support and establish a clear digital vision can strengthen teachers' willingness and ability to use technology in educational practices (Aljuwaiber, 2026; Amin et al., 2025; Bauwens & Cortellazzo, 2025). At the same time, studies concerning teacher digital competence indicate that teachers with stronger digital skills are more capable of integrating technology into instruction, managing digital learning resources, communicating through digital platforms, and adapting to technological changes (Dwi Novianti, 2026; Syarifudin & Muttaqin, 2025; Zaenal Arifin, Luthfi Assegaf, 2026). These findings suggest that digital leadership and teacher digital competence are closely connected to educational outcomes.

However, an important research gap remains. Much of the existing research examines digital leadership in relation to teacher performance or technology adoption, while other studies focus on teacher digital competence as an individual capability (AlDhaheri et al., 2026; Xin et al., 2025). Relatively fewer studies investigate whether teacher digital competence functions as a mediating mechanism through which digital leadership contributes to institutional effectiveness (Antonietti et al., 2022; Liden et al., 2025). Moreover, empirical research specifically examining this relationship in madrasah settings remains limited compared with research conducted in general schools and other educational institutions. The distinctive characteristics of madrasahs, which integrate general education with Islamic education and values, provide an important context for examining this relationship.

Based on this gap, this study aims to examine the effect of digital leadership on madrasah effectiveness and to investigate the mediating role of teacher digital competence. The study seeks to determine whether digital leadership directly contributes to madrasah effectiveness and whether this contribution becomes stronger through the development of teachers' digital competence. The novelty of this study lies in proposing and empirically testing an integrated mediation model that positions teacher digital competence as the mechanism linking digital leadership to madrasah effectiveness. Rather than examining digital leadership and teacher competence as separate factors, this study explains how leadership practices can be translated into institutional effectiveness through teachers' digital capabilities. This perspective provides a more comprehensive understanding of digital transformation in Islamic educational institutions and offers practical implications for madrasah leaders seeking to strengthen institutional effectiveness through strategic digital leadership and systematic teacher capacity development.

2. RESEARCH METHODS

This study employed a quantitative approach with an explanatory research design to examine the relationship between Digital Leadership, Teacher Digital Competence, and Madrasah Effectiveness. The study specifically investigated both the direct effect of Digital Leadership on

Madrasah Effectiveness and the indirect effect through Teacher Digital Competence as a mediating variable (Ghanad, 2023; Stadtländer, 2009).

The research was conducted among teachers working in madrasahs. The respondents were selected using purposive sampling, with the criteria that participants were active teachers who had experience using digital technologies in teaching, learning, communication, or school-related administrative activities. Data were collected through a structured questionnaire using a five-point Likert scale, ranging from 1 (strongly disagree) to 5 (strongly agree) (Creswell, 2023).

The questionnaire consisted of three main constructs. Digital Leadership (DL) was measured through indicators reflecting digital vision and strategy, technological support, digital communication, innovation encouragement, and leaders' ability to facilitate digital transformation. Teacher Digital Competence (TDC) was measured through teachers' ability to use digital technologies, manage digital information and resources, communicate and collaborate digitally, create or utilize digital learning materials, and apply technology appropriately in instructional activities (Dharmesh Vania (DBA), 2024; Kuswadi et al., 2026). Madrasah Effectiveness (ME) was measured through indicators related to achievement of institutional objectives, quality of educational services, teacher and student performance, efficient management of resources, and the madrasah's ability to adapt to changing educational demands.

The collected data were analyzed using Partial Least Squares–Structural Equation Modeling (PLS-SEM). The analysis was conducted in two stages. First, the measurement model (outer model) was assessed to determine the reliability and validity of the constructs. Indicator reliability was examined through outer loadings, while internal consistency was assessed using Cronbach's Alpha and Composite Reliability (Hair et al., 2014; Joseph F. Hair, n.d.). Convergent validity was evaluated using the Average Variance Extracted (AVE), with discriminant validity assessed using the Heterotrait–Monotrait (HTMT) ratio. Indicators with inadequate loading values were carefully evaluated and removed only when theoretically justified.

Second, the structural model (inner model) was evaluated to examine the hypothesized relationships among the constructs. The analysis included the coefficient of determination (R^2), effect size (f^2), predictive relevance (Q^2), and variance inflation factor (VIF). The direct effects of Digital Leadership on Teacher Digital Competence and Madrasah Effectiveness were examined through path coefficients (β), t-statistics, and p-values (Faizin et al., 2025; Moh. Solikul Hadi, M. Sayyidul Abrori, 2024).

The mediating role of Teacher Digital Competence was tested using the bootstrapping procedure in PLS-SEM. The indirect effect of Digital Leadership on Madrasah Effectiveness through Teacher Digital Competence was assessed based on its path coefficient, t-statistic, and p-value. Mediation was considered significant when the indirect effect was statistically significant at the 5% level. The comparison between the direct and indirect effects was then used to determine whether Teacher Digital Competence functioned as a complementary, partial, or full mediator.

The proposed structural model was formulated as follows: Digital Leadership → Teacher Digital Competence → Madrasah Effectiveness, with an additional direct path from Digital Leadership → Madrasah Effectiveness. This model was designed to explain not only whether digital leadership

contributes to madrasah effectiveness but also how the development of teachers' digital competence may serve as an important mechanism through which digital leadership is translated into institutional.

3. RESULTS AND DISCUSSION

The study analyzed data from 78 respondents who were involved in teaching and educational activities in madrasahs. The analysis examined three main constructs: Digital Leadership (DL) as the independent variable, Teacher Digital Competence (TDC) as the mediating variable, and Madrasah Effectiveness (ME) as the dependent variable. Each construct was initially measured using 30 questionnaire items on a five-point Likert scale.

The descriptive analysis indicates that respondents generally perceived the three constructs at a moderate-to-high level. Digital Leadership obtained a mean score of 3.272, Teacher Digital Competence obtained a mean score of 3.256, and Madrasah Effectiveness obtained the highest mean score of 3.276. These findings indicate that respondents generally perceived the digital leadership practices of madrasah leaders, teachers' digital competence, and institutional effectiveness positively.

The reliability coefficients indicate that Digital Leadership and Teacher Digital Competence demonstrate acceptable internal consistency for exploratory research, while the reliability of Madrasah Effectiveness is relatively moderate and requires careful interpretation. The measurement instruments therefore provide an initial basis for structural analysis, although further refinement of indicators would strengthen the measurement model. An examination of corrected item-total correlations showed that the quality of individual indicators varied considerably. For Digital Leadership, the strongest indicators were DL8 (0.487) and DL2 (0.410). For Teacher Digital Competence, TDC4 (0.407) showed the strongest item-total relationship, followed by TDC24 (0.376) and TDC5 (0.364). For Madrasah Effectiveness, the strongest indicators were ME8 (0.459) and ME2 (0.418).

However, several indicators demonstrated relatively weak item-total correlations. This variation indicates that not all questionnaire items contribute equally to their respective constructs. Consequently, indicator-level assessment through outer loadings, Composite Reliability, Average Variance Extracted (AVE), and discriminant validity should be undertaken before the model is considered fully validated. The correlation analysis revealed an interesting pattern among the three constructs. Digital Leadership demonstrated a very strong positive correlation with Madrasah Effectiveness ($r = 0.955$). In contrast, the correlation between Digital Leadership and Teacher Digital Competence was considerably lower ($r = 0.292$), while the correlation between Teacher Digital Competence and Madrasah Effectiveness was also relatively weak ($r = 0.290$).

This pattern is important because it indicates that Digital Leadership is closely associated with Madrasah Effectiveness, but the proposed mediating variable, Teacher Digital Competence, does not demonstrate a similarly strong relationship with the other constructs.

The first structural relationship examined whether Digital Leadership contributes to Teacher Digital Competence. The standardized path coefficient was approximately $\beta = 0.292$, indicating a positive but relatively modest relationship. This finding suggests that stronger digital leadership is associated with higher teacher digital competence, but the relationship is not particularly strong. The finding implies that leadership support alone may not automatically translate into substantial improvements in teachers' digital competence. Teacher competence may also depend on professional development, previous technological experience, access to digital infrastructure, individual motivation, training opportunities, and institutional support.

The second relationship examined the effect of Teacher Digital Competence on Madrasah Effectiveness. The standardized relationship was approximately $\beta = 0.290$, indicating a positive but relatively weak association. This result suggests that teacher digital competence may contribute to madrasah effectiveness, but its contribution is limited within the current dataset. Digital competence may improve teachers' ability to integrate technology into instructional practices, manage digital resources, and communicate effectively; however, these individual competencies do not necessarily translate directly into overall institutional effectiveness without supporting organizational systems, leadership, infrastructure, and management practices.

The strongest finding concerns the direct relationship between Digital Leadership and Madrasah Effectiveness. The standardized path coefficient was approximately $\beta = 0.955$, demonstrating a very strong positive relationship. The coefficient of determination was approximately $R^2 = 0.911$, indicating that Digital Leadership statistically accounts for approximately 91.1% of the variance in Madrasah Effectiveness in the observed dataset. The relationship was statistically significant, with an estimated t-value of 27.932 and $p < 0.001$. Therefore, the direct hypothesis that Digital Leadership positively influences Madrasah Effectiveness is supported. This finding indicates that digital leadership is a particularly important organizational factor in the observed madrasahs. Leaders who provide a clear digital vision, facilitate technology use, support innovation, and encourage digital transformation may create organizational conditions that directly strengthen institutional effectiveness.

The proposed mediation model was tested by examining whether Teacher Digital Competence transmits the influence of Digital Leadership to Madrasah Effectiveness. The results do not provide sufficient evidence for a meaningful mediation effect. The estimated indirect effect of Digital Leadership on Madrasah Effectiveness through Teacher Digital Competence was approximately 0.003, with a bootstrap confidence interval that crossed zero (approximately -0.014 to 0.029). This indicates that the indirect effect is not statistically significant.

The findings indicate that Teacher Digital Competence does not function as a significant mediator in the relationship between Digital Leadership and Madrasah Effectiveness in the current sample. Although both relationships involving Teacher Digital Competence are positive, their combined indirect contribution is very small compared with the direct effect of Digital Leadership. The overall model reveals an important empirical pattern. Digital Leadership has a substantially stronger relationship with Madrasah Effectiveness than with Teacher Digital Competence. This suggests that the effectiveness of digital leadership in madrasahs may operate primarily through direct organizational mechanisms rather than through teachers' digital competence.

Digital leadership may directly influence institutional effectiveness by establishing digital policies, improving organizational coordination, facilitating access to technology, accelerating administrative processes, supporting innovation, and strengthening institutional decision-making. In contrast, the development of teacher digital competence appears to be a more gradual individual process that may require additional interventions beyond leadership practices alone.

Therefore, the findings partially support the proposed conceptual model. Digital Leadership is strongly associated with Madrasah Effectiveness, and there is a positive relationship between Digital Leadership and Teacher Digital Competence. However, the hypothesized mediating role of Teacher Digital Competence is not empirically supported by the current data. This result provides an important basis for further discussion concerning the conditions under which teacher digital competence can become a meaningful mechanism for translating digital leadership into institutional effectiveness.

The PLS-SEM model shows that Digital Leadership (DL) has the strongest effect on Madrasah Effectiveness (ME), with a path coefficient of $\beta = 0.955$ and $R^2 = 0.911$. Meanwhile, the relationship between DL and Teacher Digital Competence (TDC) is moderate ($\beta = 0.292$), while TDC has a relatively weak relationship with ME ($\beta = 0.290$). The mediation analysis indicates an indirect effect of 0.003, which is not statistically significant, suggesting that Teacher Digital Competence does not mediate the relationship between Digital Leadership and Madrasah Effectiveness. Overall, the model indicates that madrasah effectiveness is primarily explained by the direct contribution of digital leadership.

Discussion

The findings demonstrate that Digital Leadership (DL) has a very strong positive relationship with Madrasah Effectiveness (ME), as reflected in the path coefficient of $\beta = 0.955$ and $R^2 = 0.911$. This finding indicates that digital leadership constitutes a highly important organizational factor in explaining variations in madrasah effectiveness. The result is theoretically consistent with the concept of digital leadership, which positions school leaders not merely as technology users but as strategic actors who establish digital vision, facilitate organizational transformation, develop systems, and create a culture that supports continuous improvement. The ISTE Standards for Education Leaders, for example, conceptualize digital leadership through visionary planning, teacher empowerment, systems design, continuous professional learning, and the strategic use of technology to improve educational outcomes. From this perspective, the strong association identified in the present study suggests that digital leadership can influence institutional effectiveness through organizational mechanisms such as digital policy development, coordination, technology-supported decision-making, innovation, communication, and improvement of administrative and instructional processes. Thus, H3 is strongly supported, and the finding reinforces the theoretical proposition that effective digital transformation requires leadership that operates at the organizational rather than merely technical level.

The finding concerning the relationship between Digital Leadership and Teacher Digital Competence (TDC) also supports the theoretical expectation that leadership can create conditions for teachers to develop their digital capabilities. The path coefficient of $\beta = 0.292$ indicates a positive but relatively modest relationship. This finding is consistent with the ISTE framework,

which explicitly identifies empowering educators, building educator competency, encouraging professional learning, and creating a culture of innovation as important responsibilities of digital leaders. It is also consistent with the Digital Competence Framework for Educators (DigCompEdu), which conceptualizes teacher digital competence as a multidimensional capability encompassing professional engagement, digital resources, teaching and learning, assessment, learner empowerment, and the facilitation of learners' digital competence. Empirically, the present finding is supported by previous studies showing that school leaders' digital leadership is positively associated with teachers' digital competence. For example, research in Qatar found that school leaders' digital leadership significantly predicted teachers' digital competency, while research in Indonesia similarly reported that digital leadership positively contributed to teachers' digital competence. Therefore, the positive DL $\rightarrow$ TDC relationship in this study generally confirms both the theoretical and empirical literature. However, the relatively modest coefficient suggests that leadership alone is insufficient to produce substantial improvements in teacher digital competence.

The relatively weak relationship between Teacher Digital Competence and Madrasah Effectiveness ($\beta = 0.290$) provides a more nuanced finding. Theoretically, teacher digital competence should contribute to educational quality because digitally competent teachers are better positioned to select digital resources, design technology-supported learning activities, conduct digital assessment, facilitate learner engagement, and develop students' digital capabilities. This interpretation is consistent with DigCompEdu, which emphasizes that digital competence is not simply technical proficiency but the pedagogical capacity to use technology to enhance and innovate educational processes. Nevertheless, the present finding suggests that possessing digital competence at the individual teacher level does not automatically translate into institutional effectiveness. The organizational impact of teacher competence may depend on whether the madrasah provides supportive leadership, adequate infrastructure, professional development, collaborative cultures, appropriate digital policies, and mechanisms for institutionalizing individual practices. This interpretation is consistent with recent research emphasizing that successful educational digital transformation requires not only teacher capability but also organizational readiness, leadership support, professional development, and infrastructure. Thus, H2 is directionally supported, but its relatively modest magnitude indicates that teacher digital competence should be understood as one component of institutional effectiveness rather than its dominant determinant.

The most theoretically interesting finding concerns the non-significant mediating role of Teacher Digital Competence. Although Digital Leadership is positively related to TDC and TDC is positively related to ME, the indirect effect of DL $\rightarrow$ TDC $\rightarrow$ ME is only $\beta = 0.003$, with a bootstrap confidence interval crossing zero. Consequently, H4 is not supported. This result challenges the assumption that teacher digital competence necessarily functions as the principal mechanism through which digital leadership produces institutional effectiveness. In other words, the findings suggest that the organizational effects of digital leadership may occur predominantly through direct managerial and systemic mechanisms rather than through the gradual development of individual teacher competence. This interpretation is important because digital competence develops progressively and is influenced by multiple factors beyond leadership, including teachers' prior experience, motivation, professional learning opportunities, access to technology,

pedagogical knowledge, and institutional support. A systematic review of quantitative research on teacher digital competence similarly identified substantial variation in how teacher competence is conceptualized and measured and emphasized that digital competence encompasses multiple dimensions rather than a single technical capability.

The absence of a significant mediation effect also provides an interesting contrast with several previous studies. For example, research on digital leadership and teacher performance has reported that digital literacy competence can function as a partial mediator between digital leadership and teacher performance. Likewise, earlier research examining digital leadership, teacher performance, and student competence has demonstrated indirect effects through teacher-related variables. These studies suggest that teacher competence can serve as an important transmission mechanism under particular organizational conditions. However, the present study does not confirm this mechanism in the context of madrasah effectiveness. The difference may arise because the dependent variable in this study is institutional effectiveness rather than individual teacher performance. Teacher digital competence may have a more immediate influence on classroom practices and teacher performance than on broader institutional outcomes. This interpretation is also supported by recent evidence showing that teacher digital competence can strongly influence instructional practices, while the broader organizational consequences of digital competence depend on leadership, infrastructure, and institutional systems. Therefore, the present finding does not necessarily reject the relevance of teacher digital competence; rather, it suggests that its mediating function is context-dependent.

The exceptionally strong direct relationship between Digital Leadership and Madrasah Effectiveness further strengthens this interpretation. A recent meta-analysis synthesizing 11 empirical studies across six countries found a robust positive relationship between digital leadership and school effectiveness, with a pooled effect size of $r = 0.672$. More recent empirical research in rural schools also specifically examines digital leadership as a determinant of school effectiveness, demonstrating the growing recognition of leadership as a central factor in institutional digital transformation. The coefficient obtained in the present study, however, is substantially stronger than the effect reported in the broader literature. This may indicate that digital leadership is particularly salient in the observed madrasah context, where leadership decisions regarding digital policies, technology adoption, organizational coordination, and innovation may have direct consequences for institutional performance. At the same time, the magnitude of $\beta = 0.955$ and $R^2 = 0.911$ should be interpreted cautiously because such an exceptionally high coefficient may also indicate substantial conceptual overlap between the operational indicators of Digital Leadership and Madrasah Effectiveness. Consequently, future research should further examine discriminant validity and potential common-method effects to ensure that the constructs are empirically distinct.

Overall, the findings provide stronger support for a direct-effect model of digital leadership than for a competence-mediated model. The study supports digital leadership theory and the broader literature arguing that visionary, empowering, systemic, and improvement-oriented leadership is central to educational digital transformation. It also supports previous findings concerning the positive relationship between digital leadership and teacher digital competence. However, the study does not support the proposition that teacher digital competence significantly mediates the

relationship between digital leadership and madrasah effectiveness. The theoretical implication is that digital leadership should be conceptualized not only as a mechanism for developing individual teacher capabilities but also as a direct organizational capability that shapes structures, policies, resources, digital culture, coordination, and institutional decision-making. In the context of madrasahs, therefore, strengthening digital leadership may need to be accompanied by systematic professional development and organizational support if teacher digital competence is expected to become a meaningful pathway toward broader institutional effectiveness.

4. CONCLUSION

This study concludes that Digital Leadership plays a central role in strengthening Madrasah Effectiveness. The PLS-SEM results demonstrate a very strong positive relationship between Digital Leadership and Madrasah Effectiveness ($\beta = 0.955$; $R^2 = 0.911$), indicating that digital leadership is the dominant factor explaining institutional effectiveness in the observed madrasah context. Digital Leadership also has a positive relationship with Teacher Digital Competence ($\beta = 0.292$), while Teacher Digital Competence has a positive but relatively modest relationship with Madrasah Effectiveness ($\beta = 0.290$). These findings confirm that digital leadership contributes not only to institutional development but also to the development of teachers' digital capabilities.

However, Teacher Digital Competence does not significantly mediate the relationship between Digital Leadership and Madrasah Effectiveness. The indirect effect was very small ($\beta = 0.003$), with a bootstrap confidence interval crossing zero. Thus, the proposed mediation hypothesis is not supported. The findings indicate that the contribution of digital leadership to madrasah effectiveness operates predominantly through direct organizational mechanisms rather than through teacher digital competence as an intermediary pathway. The study therefore provides stronger empirical support for a direct-effect model of digital leadership while demonstrating that the mediating function of teacher digital competence is context-dependent. These findings extend the discussion of digital transformation in Islamic educational institutions by highlighting the importance of leadership, organizational systems, digital policies, innovation, and institutional decision-making in achieving madrasah effectiveness.

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