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ORIGINAL RESEARCH ARTICLE

Determinants of Madrasah Effectiveness in the Digital Transformation Era

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ABSTRACT

The digital transformation of education requires madrasahs to develop institutional capacities that enable technology to improve organizational and educational effectiveness. This study aims to examine the determinants of Madrasah Effectiveness in the digital transformation era by analyzing the effects of Digital Leadership and Teacher Digital Competence. The study employed a quantitative approach with 78 respondents. Data were collected using questionnaires measuring Digital Leadership, Teacher Digital Competence, and Madrasah Effectiveness and analyzed using descriptive statistics, validity and reliability testing, Pearson correlation, and multiple linear regression. The findings revealed that Digital Leadership had a very strong positive relationship with Madrasah Effectiveness and significantly predicted institutional effectiveness ($\beta = 0.951$, $p < 0.001$). In contrast, Teacher Digital Competence demonstrated a positive bivariate correlation with Madrasah Effectiveness but did not have a significant independent effect in the regression model ($\beta = 0.012$, $p = 0.744$). Collectively, the two predictors explained 91.1% of the variance in Madrasah Effectiveness. The findings indicate that teachers' digital competence alone is insufficient to ensure institutional effectiveness without strategic leadership and organizational direction. This study contributes a leadership-enabled digital transformation perspective, positioning Digital Leadership as a key institutional mechanism for translating digital capacities into Madrasah Effectiveness. The study recommends strengthening digital leadership development alongside teacher digital digital competence to support sustainable digital transformation in madrasahs.

Keywords: Digital Leadership; Teacher Digital Competence; Madrasah Effectiveness; Digital Transformation; Islamic Education.



ABSTRAK

Transformasi digital dalam pendidikan menuntut madrasah untuk mengembangkan kapasitas kelembagaan yang memungkinkan teknologi meningkatkan efektivitas organisasi dan pendidikan. Penelitian ini bertujuan untuk mengkaji faktor-faktor penentu efektivitas madrasah di era transformasi digital dengan menganalisis pengaruh kepemimpinan digital dan kompetensi digital guru. Penelitian ini menggunakan pendekatan kuantitatif dengan melibatkan 78 responden. Data dikumpulkan melalui kuesioner yang mengukur kepemimpinan digital, kompetensi digital guru, dan efektivitas madrasah, kemudian dianalisis menggunakan statistik deskriptif, uji validitas dan reliabilitas, korelasi Pearson, serta regresi linear berganda. Hasil penelitian menunjukkan bahwa kepemimpinan digital memiliki hubungan positif yang sangat kuat dengan efektivitas madrasah dan secara signifikan memprediksi efektivitas kelembagaan ($\beta = 0,951$; $p < 0,001$). Sebaliknya, kompetensi digital guru menunjukkan korelasi bivariat yang positif dengan efektivitas madrasah namun tidak memiliki pengaruh independen yang signifikan dalam model regresi ($\beta = 0,012$; $p = 0,744$). Secara keseluruhan, kedua prediktor tersebut menjelaskan 91,1% varians dalam efektivitas madrasah. Temuan ini mengindikasikan bahwa kompetensi digital guru saja tidak cukup untuk menjamin efektivitas kelembagaan tanpa adanya kepemimpinan strategis dan arahan organisasi. Penelitian ini memberikan kontribusi berupa perspektif transformasi digital yang didukung oleh kepemimpinan, dengan menempatkan kepemimpinan digital sebagai mekanisme kelembagaan kunci untuk menerjemahkan kapasitas digital menjadi efektivitas madrasah. Penelitian ini merekomendasikan penguatan pengembangan kepemimpinan digital bersamaan dengan kompetensi digital guru guna mendukung transformasi digital yang berkelanjutan di madrasah.

Kata Kunci: Kepemimpinan Digital; Kompetensi Digital Guru; Efektivitas Madrasah; Transformasi Digital; Pendidikan Islam.

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1. INTRODUCTION

Digital transformation has become an important factor in shaping the development of educational institutions, including madrasahs. The use of digital learning platforms, information systems, artificial intelligence, and digital learning resources has created opportunities to improve the quality of learning, administrative efficiency, and institutional services (Ariyanto et al., 2026; Suparman et al., 2025). However, digital transformation does not automatically guarantee institutional effectiveness. Differences in leadership capacity, teacher competence, technological infrastructure, and organizational readiness may determine whether digital technology can be translated into meaningful improvements in madrasah performance (Bauwens & Cortellazzo, 2025; Dinata et al., 2026).

Madrasah effectiveness in the digital era is therefore influenced by more than the availability of technology (Fahmi Husein, Moh Solikul Hadi, 2024). Effective madrasahs require leaders who are able to formulate a clear digital vision and encourage innovation, teachers who possess adequate digital competence, sufficient technological infrastructure, and an organizational culture that supports adaptation and continuous improvement (Hadi et al., 2025). When these elements are not adequately developed, digital transformation may remain limited to the use of technological tools

without producing substantial changes in teaching quality, institutional management, or educational outcomes (Kuswadi et al., 2026).

Previous studies have examined several factors related to educational effectiveness in the digital era (Syarifudin & Muttaqin, 2025). Research on digital leadership has emphasized the role of leaders in facilitating technological innovation and institutional change, while studies on teacher digital competence have demonstrated its importance for effective technology integration in learning (Amin et al., 2025). Other research has highlighted technological infrastructure and organizational culture as important conditions for successful digital transformation. Nevertheless, these factors are often examined separately, and much of the existing research focuses on technology adoption or digital learning rather than on madrasah effectiveness as an institutional outcome.

This situation indicates a research gap concerning the integrated determinants of madrasah effectiveness in the context of digital transformation (Obied, 2025). In particular, limited attention has been given to how leadership, teacher competence, technological infrastructure, and organizational culture collectively contribute to the effectiveness of madrasahs (Ariyanto et al., 2026; Liden et al., 2025). This gap is significant because madrasahs have distinctive institutional characteristics that integrate religious and general education, making their digital transformation context different from that of general schools.

Therefore, this study offers an integrated perspective by examining digital leadership, teacher digital competence, technological infrastructure, and organizational culture as determinants of madrasah effectiveness (Afin Nida Al Hasanah et al., 2026; Dinata et al., 2026; Dinata Feri Riski et al., 2025). The novelty of this study lies in positioning these factors within a single analytical framework to explain how madrasahs can transform digital resources into institutional effectiveness. This approach shifts the discussion from merely examining technology adoption toward understanding the organizational and human conditions that make digital transformation effective.

Accordingly, this study aims to analyze the determinants of madrasah effectiveness in the digital transformation era by examining the influence of digital leadership, teacher digital competence, technological infrastructure, and organizational culture (Abrori & Hadi, 2020; Moh. Solikul Hadi, Alifia Azzahra Budi, Ali Kuswadi, 2025). The findings are expected to contribute to the development of a more comprehensive understanding of digital transformation in madrasahs and provide practical implications for strengthening institutional capacity and educational quality.

2. RESEARCH METHODS

This research employs a qualitative approach with a case study method. The case study design was chosen because it allows for an in-depth, holistic investigation of a contemporary phenomenon within its real-life context. This approach is particularly suitable for examining the complex, multifaceted nature of teacher competency development, which involves interactions between individual teachers, institutional structures, and broader educational policies. The qualitative case study enables the researcher to capture rich, detailed data about the processes, challenges, and

outcomes of performance-based competency development at MI Mathlaul Anwar Srirahayu. According to recent methodological literature in Islamic education research, case study approaches are particularly effective for exploring complex educational phenomena where context is critical (Creswell & Poth, 2018; Merriam & Tisdell, 2016).

This study employed a quantitative approach using an explanatory research design. The design was selected to empirically examine the determinants of madrasah effectiveness in the digital transformation era. The study specifically analyzed the influence of digital leadership, teacher digital competence, technological infrastructure, and organizational culture on madrasah effectiveness. Data were collected through a structured questionnaire and analyzed statistically to determine the relationships and relative contributions of the variables under investigation (Anastasia Riska Putri, Davina Aurora Azahra, 2024).

The population consisted of teachers and educational staff working in madrasahs that have implemented digital technologies in learning and institutional management. The sample was determined using a purposive sampling technique, with the following criteria: respondents were actively involved in madrasah activities, had experience using digital technology in their work, and had sufficient knowledge of the management and learning practices of their respective madrasahs. The number of respondents was determined based on the requirements of the statistical analysis and the characteristics of the research population (Creswell, 2023).

The study involved four independent variables and one dependent variable. The independent variables were digital leadership (X1), teacher digital competence (X2), technological infrastructure (X3), and organizational culture (X4), while madrasah effectiveness (Y) was the dependent variable.

Data were collected using a Likert-scale questionnaire ranging from 1 (strongly disagree) to 5 (strongly agree). The digital leadership variable was measured through indicators related to digital vision, technology-oriented decision-making, innovation support, and leadership in digital transformation. Teacher digital competence included technological knowledge, digital pedagogical skills, digital communication, and responsible use of digital resources. Technological infrastructure was measured through the availability, accessibility, reliability, and adequacy of digital facilities (Creswell, 2018). Organizational culture included collaboration, openness to innovation, adaptability, and support for continuous improvement. Madrasah effectiveness was measured through the achievement of institutional objectives, quality of learning, administrative effectiveness, stakeholder satisfaction, and continuous institutional improvement.

Before the main analysis, the research instrument was tested to ensure its validity and reliability. Construct validity was assessed by examining the relationship between each indicator and its respective construct, while reliability was evaluated using Cronbach's Alpha. An instrument was considered reliable when the Cronbach's Alpha coefficient met the commonly accepted minimum criterion of 0.70. Items that did not adequately represent their constructs were reviewed before the questionnaire was used for the main data collection.

The collected data were analyzed using descriptive and inferential statistics. Descriptive analysis was used to present the characteristics of the respondents and the distribution of responses for each

research variable. Before hypothesis testing, the data were examined through the relevant classical assumption tests, including normality, multicollinearity, and heteroscedasticity tests. Multiple linear regression analysis was subsequently employed to examine the simultaneous and partial effects of digital leadership, teacher digital competence, technological infrastructure, and organizational culture on madrasah effectiveness. The coefficient of determination (R^2) was used to determine the proportion of variance in madrasah effectiveness explained by the independent variables. Hypotheses were tested at a significance level of 5% ($\alpha = 0.05$) (Waruwu et al., 2025).

3. RESULTS AND DISCUSSION

The study involved 78 valid respondents who provided complete responses to the three research instruments: Digital Leadership, Teacher Digital Competence, and Madrasah Effectiveness. Each construct was measured using 30 questionnaire items on a four-point Likert scale. The descriptive analysis indicates that all three variables were generally at a high level. Digital Leadership obtained a mean total score of 98.15 ($SD = 5.70$), Teacher Digital Competence obtained a mean of 97.68 ($SD = 6.17$), while Madrasah Effectiveness obtained a mean of 98.27 ($SD = 5.42$). When converted to the item-level scale, the mean scores were 3.27 for Digital Leadership, 3.26 for Teacher Digital Competence, and 3.28 for Madrasah Effectiveness. These results indicate that respondents generally perceived digital leadership, teachers' digital competence, and madrasah effectiveness positively. However, the relatively small standard deviations indicate that the respondents' perceptions were relatively concentrated around the mean.

The instrument analysis was conducted to determine the consistency and adequacy of the questionnaire items. Using the item-total correlation criterion, with a critical correlation of approximately 0.223 for 78 respondents at the 5% significance level, most items demonstrated acceptable relationships with their respective total scores. The Digital Leadership instrument had 26 items meeting the criterion, the Teacher Digital Competence instrument had 26 valid items, and the Madrasah Effectiveness instrument had 23 valid items. The remaining items showed relatively weak correlations with the total construct and should therefore be considered for revision or removal in subsequent instrument refinement.

The reliability analysis produced Cronbach's Alpha coefficients of 0.698 for Digital Leadership, 0.707 for Teacher Digital Competence, and 0.665 for Madrasah Effectiveness. The results indicate that Digital Leadership and Teacher Digital Competence demonstrated acceptable internal consistency, while the reliability coefficient for Madrasah Effectiveness was slightly below the commonly used 0.70 threshold but remained close to the acceptable range for an exploratory study. These findings suggest that the instruments were sufficiently consistent for the main regression analysis, although further refinement of several items is recommended.

The normality analysis indicated that the residuals of the regression model were normally distributed. The Shapiro-Wilk test for the regression residuals produced a statistic of 0.976 with a significance value of 0.155, which is greater than 0.05. Thus, the residuals did not significantly deviate from a normal distribution. The multicollinearity test also demonstrated that the two

independent variables did not suffer from problematic multicollinearity. Both Digital Leadership and Teacher Digital Competence had a VIF value of approximately 1.093 and a tolerance value of approximately 0.915. These values are well within the generally accepted limits, indicating that the two predictors were sufficiently independent for regression analysis.

The heteroscedasticity test further indicated that there was no significant heteroscedasticity in the regression model. The Breusch-Pagan test produced a significance value greater than 0.05, indicating that the residual variance was relatively stable across the predicted values. Therefore, the assumptions required for multiple linear regression were adequately satisfied.

The Pearson correlation analysis revealed a very strong positive relationship between Digital Leadership and Madrasah Effectiveness ($r = 0.955$, $p < 0.001$). This finding indicates that higher levels of digital leadership were strongly associated with higher levels of madrasah effectiveness. In contrast, Teacher Digital Competence demonstrated a relatively weak positive relationship with Madrasah Effectiveness ($r = 0.290$, $p = 0.010$). The relationship between Digital Leadership and Teacher Digital Competence was also positive but weak ($r = 0.292$, $p = 0.009$).

The particularly strong correlation between Digital Leadership and Madrasah Effectiveness constitutes the most prominent relationship in the dataset. This result suggests that leadership may represent a central institutional mechanism through which madrasahs respond to digital transformation.

Multiple linear regression was conducted to determine the simultaneous contribution of Digital Leadership and Teacher Digital Competence to Madrasah Effectiveness. The regression model was statistically significant, $F(2,75) = 385.60$, $p < 0.001$. The model produced an R^2 value of 0.911 and an Adjusted R^2 of 0.909. This means that Digital Leadership and Teacher Digital Competence collectively explained approximately 91.1% of the variance in Madrasah Effectiveness, while approximately 8.9% of the variance was associated with other factors outside the model.

The results show that Digital Leadership had a positive and statistically significant effect on Madrasah Effectiveness ($B = 0.905$, $\beta = 0.951$, $t = 26.460$, $p < 0.001$). This indicates that an increase in Digital Leadership was associated with a substantial increase in Madrasah Effectiveness, after controlling for Teacher Digital Competence. The standardized coefficient ($\beta = 0.951$) also demonstrates that Digital Leadership was the dominant predictor in the model.

In contrast, Teacher Digital Competence did not have a statistically significant partial effect on Madrasah Effectiveness when Digital Leadership was simultaneously included in the regression model ($B = 0.010$, $\beta = 0.012$, $t = 0.328$, $p = 0.744$). Although Teacher Digital Competence showed a significant bivariate correlation with Madrasah Effectiveness, its independent contribution disappeared after Digital Leadership was controlled. This finding indicates that the relationship between teacher digital competence and institutional effectiveness may be more complex than a direct effect alone.

The F-test confirms that Digital Leadership and Teacher Digital Competence jointly provide a statistically significant contribution to Madrasah Effectiveness. The very high R^2 value of 0.911 indicates that the regression model has substantial explanatory power within this sample. However, examination of the standardized coefficients demonstrates that this explanatory power is

overwhelmingly associated with Digital Leadership rather than Teacher Digital Competence. Digital Leadership recorded a standardized beta coefficient of 0.951, whereas Teacher Digital Competence recorded only 0.012.

Therefore, Digital Leadership emerged as the dominant determinant of Madrasah Effectiveness in the present model. The finding suggests that the effectiveness of madrasahs during digital transformation is strongly connected to the capacity of institutional leaders to direct, manage, and integrate digital transformation into organizational practices. Teacher Digital Competence, although positively related to Madrasah Effectiveness at the bivariate level, did not demonstrate a significant independent contribution when Digital Leadership was entered into the regression model.

Overall, the quantitative findings demonstrate that Digital Leadership is the principal determinant of Madrasah Effectiveness in the present dataset. The exceptionally strong correlation between Digital Leadership and Madrasah Effectiveness and its significant regression coefficient indicate that leadership is closely associated with the institutional capacity of madrasahs to achieve effectiveness in the digital transformation era. Teacher Digital Competence, on the other hand, showed a positive bivariate relationship with Madrasah Effectiveness but did not produce a significant partial effect in the multiple regression model. Thus, the findings suggest that teacher competence alone may not be sufficient to determine institutional effectiveness unless it is supported by strong digital leadership and institutional direction. The regression model as a whole explained 91.1% of the variance in Madrasah Effectiveness, indicating that the two predictors collectively provide substantial explanatory power, although further research is needed to examine other organizational, pedagogical, technological, and contextual factors that may account for the remaining variance.

Discussion

The findings of this study demonstrate that digital leadership is the most substantial determinant of madrasah effectiveness in the digital transformation era. The very strong relationship between Digital Leadership and Madrasah Effectiveness ($r = 0.955$, $p < 0.001$), together with its significant partial effect in the regression model ($\beta = 0.951$, $p < 0.001$), indicates that the effectiveness of madrasahs in responding to digital transformation is closely associated with the capacity of institutional leaders to provide direction, establish a digital vision, facilitate technological adaptation, and integrate technology into institutional management and educational practices. This finding can be interpreted through the perspective of transformational leadership theory, which views leadership not merely as administrative control but as a process of creating vision, mobilizing organizational members, facilitating change, and developing collective commitment toward institutional goals. In the context of digital transformation, this leadership function becomes increasingly important because technology adoption requires organizational coordination and strategic direction rather than simply the availability of digital devices. The finding is consistent with the meta-analysis of Okunlola, which synthesized 11 empirical studies across six countries and found a robust positive relationship between digital leadership and school effectiveness (pooled $r = 0.672$, $p < 0.001$). Similarly, studies conducted in Thailand have reported

significant relationships between administrators' digital leadership and school effectiveness, demonstrating that digital leadership functions as an important institutional factor in educational effectiveness. Recent research in rural schools has also examined digital leadership as a determinant of school effectiveness, reinforcing the argument that leadership becomes particularly important when educational institutions must negotiate technological change within contextual constraints. Thus, the present finding strengthens the existing literature by demonstrating that the leadership dimension remains central when effectiveness is examined specifically within the context of madrasah digital transformation.

The exceptionally high contribution of Digital Leadership in this study, however, provides a more specific interpretation than simply confirming that digital leadership is positively related to school effectiveness. The regression coefficient ($\beta = 0.951$) suggests that leadership is not merely one factor among several technological determinants; rather, it appears to function as the institutional mechanism through which digital transformation is translated into organizational effectiveness. From the perspective of transformational leadership theory, technological transformation requires leaders to articulate a shared direction, encourage innovation, provide support for organizational members, and align technological initiatives with institutional goals. This interpretation is also consistent with recent evidence from Qatar showing that school leaders' digital leadership significantly predicted teachers' digital competence, with digital leadership accounting for a substantial proportion of the variation in teacher digital competence. Likewise, research in Indonesian educational settings has emphasized that digital leadership is connected to technology-driven learning and the effective integration of digital practices. The implication is that leadership should not be conceptualized merely as the ability of principals or madrasah heads to operate digital systems. More fundamentally, digital leadership represents the institutional capacity to transform technology into coordinated organizational action. This distinction is important because it explains why leadership can have a stronger relationship with overall institutional effectiveness than individual technological competence.

A contrasting finding emerges in relation to Teacher Digital Competence. The bivariate analysis showed that Teacher Digital Competence had a positive and statistically significant relationship with Madrasah Effectiveness ($r = 0.290$, $p = 0.010$), suggesting that teachers with stronger digital competencies tend to be associated with more effective madrasah conditions. However, when Digital Leadership was simultaneously entered into the regression model, Teacher Digital Competence no longer demonstrated a significant partial effect ($\beta = 0.012$, $p = 0.744$). This result is theoretically important because it indicates that teacher digital competence should not automatically be interpreted as an independent determinant of institutional effectiveness. Within the framework of digital transformation, individual competence may require organizational leadership, direction, and support before it can be translated into institution-wide effectiveness. This finding partially differs from recent research showing that teachers' digital competence can have a significant effect on classroom teaching practices, while digital leadership may have a weaker direct effect on classroom teaching. It also differs from studies emphasizing teacher digital competence as an important component of successful digital educational practices. However, the difference can be explained by the dependent variable used in the present study. Whereas previous studies have frequently examined teacher digital competence in relation to classroom teaching,

instructional effectiveness, or digital culture, the present study examines madrasah effectiveness as an institutional-level outcome. Teacher competence may therefore contribute to the quality of individual teaching practices without necessarily producing a direct and independent effect on overall institutional effectiveness. Institutional effectiveness requires coordination among leadership, organizational systems, policy, resources, and collective practices. Consequently, the insignificant partial effect of Teacher Digital Competence should not be interpreted as evidence that teacher competence is unimportant; rather, it suggests that its contribution may depend upon the institutional conditions created by digital leadership.

The difference between the significant bivariate relationship and the nonsignificant partial regression coefficient of Teacher Digital Competence is particularly noteworthy. The correlation result indicates that teacher competence and madrasah effectiveness move in the same positive direction, but the regression result indicates that this relationship contributes little additional explanatory power once Digital Leadership is taken into account. This pattern suggests that leadership may provide the organizational context within which teacher digital competence becomes educationally meaningful. In other words, digitally competent teachers may possess the ability to use technology, but their competence does not necessarily translate into institutional effectiveness unless the madrasah provides strategic direction, organizational coordination, technological support, and a culture that encourages the systematic use of digital practices. This interpretation extends the discussion beyond a simple human-capital perspective in which individual competence is assumed to directly generate institutional outcomes. Instead, the findings support a leadership-enabled digital transformation perspective, in which institutional leadership acts as a coordinating mechanism that connects individual digital capacity with organizational effectiveness. Recent research on digital leadership and teacher digital competence similarly indicates that leadership can shape teachers' digital capabilities, supporting the argument that digital competence does not operate in complete isolation from organizational leadership.

The finding that the regression model explains 91.1% of the variance in Madrasah Effectiveness further emphasizes the importance of examining digital transformation as an organizational process rather than merely a technological adoption process. Although the high explanatory power of the model should be interpreted cautiously because the data are cross-sectional and based on self-reported measures, the result indicates that the two variables collectively provide substantial information about variations in perceived madrasah effectiveness. More importantly, the dominance of Digital Leadership within the model suggests that the strategic capacity of institutional leaders may determine whether technological resources and teacher competencies are successfully transformed into effective educational practices. This interpretation is consistent with emerging studies that place digital leadership at the center of technology integration, institutional change, and educational effectiveness. Therefore, digital transformation in madrasahs should not be reduced to infrastructure provision or teacher training programs. It requires leadership that can establish a coherent digital vision, coordinate organizational change, support teachers, develop appropriate digital policies, and ensure that technology contributes directly to the achievement of educational objectives.

The findings consequently contribute a theoretical refinement to the existing literature on digital transformation in education. Previous studies have generally established that digital leadership,

teacher digital competence, and technology integration are important for educational improvement, but the present study reveals that these factors do not necessarily operate with equal explanatory power when the outcome is institutional effectiveness. The most important contribution of this study is therefore the identification of digital leadership as an enabling determinant of institutional effectiveness, while teacher digital competence appears to function more as an individual-level capacity whose institutional impact may depend on leadership and organizational conditions. This leads to the novelty of the study: madrasah effectiveness in the digital transformation era is better understood through a leadership-centered model in which digital leadership provides the strategic and organizational conditions for translating digital capabilities into institutional effectiveness. This proposition moves the discussion from a technology-centered approach toward a leadership-enabled digital transformation perspective, particularly within the context of Islamic educational institutions. The novelty is also contextually important because much of the existing literature focuses on general schools, higher education, or technology integration, whereas the present study applies the determinant perspective specifically to madrasah effectiveness. Thus, the study suggests that the central question of digital transformation in madrasahs is not simply whether teachers are digitally competent, but whether institutional leaders are capable of creating the organizational conditions that enable such competence to generate collective educational effectiveness.

4. CONCLUSION

This study concludes that Digital Leadership is the primary determinant of Madrasah Effectiveness in the digital transformation era. The findings showed that Digital Leadership had a very strong and significant effect on Madrasah Effectiveness ($\beta = 0.951, p < 0.001$), whereas Teacher Digital Competence did not demonstrate a significant independent effect when Digital Leadership was controlled ($\beta = 0.012, p = 0.744$). Although Teacher Digital Competence was positively correlated with Madrasah Effectiveness, its contribution appears to depend on the organizational direction and strategic support provided by institutional leaders. The model collectively explained 91.1% of the variance in Madrasah Effectiveness. These findings suggest that digital transformation in madrasahs is not determined merely by teachers' ability to use technology, but more importantly by the capacity of leaders to establish a digital vision, manage organizational change, and integrate technology into institutional practices. The novelty of this study lies in proposing a leadership-enabled digital transformation perspective, which positions Digital Leadership as the institutional mechanism that enables digital capacities to contribute to Madrasah Effectiveness.

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