

Supervisors' Digital Competence and Its Influence on the Quality of Islamic Education Teachers in Madrasah Ibtidaiyah

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ABSTRACT

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Keywords:

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Objectives: This research aims to analyze the influence of supervisors' digital competence on the quality of Islamic education teachers in Madrasah Ibtidaiyah.

Method: This study employed a quantitative approach with a causal-correlational design. The population consisted of Islamic Religious Education (IRE) supervisors at Madrasah Ibtidaiyah in Central Java, with a sample of 100 individuals. The sample was selected using proportional cluster random sampling. Data were collected using a questionnaire tested for validity and reliability. The data were analyzed using the Kolmogorov-Smirnov test, scatter plot technique, t-test, F-test, and regression analysis.

Results: The results showed that supervisors' digital competence had a significant influence on the quality of Islamic education teachers in Madrasah Ibtidaiyah, with a contribution of 36.2%.

Theoretical Contribution: This study enriches Islamic education theory by demonstrating that supervision aligns with the principles of *al-mas'ūliyyah* (professional responsibility), *al-amānah* (trust and integrity), *al-iḥsān* (continuous improvement), *ash-shūrā* (deliberation and collaboration), and *at-taqwīm* (evaluation and reflection), as well as mastery of technology as a manifestation of the command to *iqra'* (exploration and development of knowledge).

Implication: Future research should include additional variables such as school culture, technological support, and teacher motivation to develop a more comprehensive supervision model.

INTRODUCTION

A supervisor is someone who has high commitment, motivation, and authority to supervise every activity of an organization in order to minimize risks, mitigate errors, improve the quality of ongoing activities, and ensure that predetermined goals are achieved (Gordon, 2019). Supervisors monitor established academic standards and assess teachers to improve subsequent performance and ensure that teachers have the necessary support to support more effective teaching (Haryono, 2021).

Being a supervisor will certainly allow someone to recognize current problems and provide solutions and encouragement to teachers to facilitate effective learning (Amelia et al., 2022). However, supervisors also need to listen to complaints from teachers who encounter difficulties in the teaching process. Supervisors are not only focused on problems that arise when the task is executed. Instead, they can communicate with teachers and act as facilitators so that problems can be resolved (Arif et al., 2025).

Supervision is an inseparable part of the administrative process, aimed especially at enhancing the effectiveness of school personnel in carrying out their primary educational tasks. In other cases, a supervisor focuses more on administrative supervision than on classroom teaching conducted by teachers for students. Islamic Education Supervisors in Madrasah Ibtidaiyah have strategic and vital roles and functions (Qamariyah, 2024). The main role of education supervisors is to control, supervise, and evaluate the implementation of the learning process. They also provide direction, guidance, and suggestions to improve the quality of learning, aiming to optimize educational success and goals (Murray et al., 2023).

The digital competency indicators for supervisors at Madrasah Ibtidaiyah were adopted from the Digital Literacy across the Curriculum framework proposed by Hague. This framework reflects various important aspects of mastering comprehensive digital literacy. These indicators include advanced functional skills, creativity, collaboration, and communication. In addition, the ability to search, select, think critically, and evaluate information also plays a major part. Other aspects that are equally important include understanding the cultural and social context and

being aware of digital safety (e-safety) when using technology (Hague & Payton, 2010).

In the context of education, the concept of quality refers to input, process, output, and impact. First, the quality of human resources, including principals, teachers, administrative staff, and students. Second, the quality of material inputs, including teaching aids, curriculum books, and school infrastructure and facilities (Rasdiana et al., 2024). Third, the quality of inputs in the form of software, such as regulations, job descriptions, and organizational structures (Sulistiani & Dewi, 2024). Fourth, the quality of input in the form of aspirations and needs, such as vision, motivation, perseverance, and ideals (Yulinar et al., 2023).

Teachers, acting as educational leaders, wield significant influence over students' learning journeys, guiding them toward achieving teaching goals. This leadership, whether exerted individually or collectively, can elevate the quality of teaching and consequently transform the overall learning environment for students. By fostering a supportive and engaging atmosphere, teachers can inspire greater student motivation and a deeper commitment to their studies (Day et al., 2016). Furthermore, through collaborative efforts and continuous refinement of their pedagogical approaches, teachers can contribute to a more enriching and effective educational experience, leading to improved student outcomes and a higher standard of education (Rosandi et al., 2023).

Education is considered high quality if it produces graduates who fulfill four competencies: academic competency, professional competency, values and attitudes competency, and competency to face change. To produce the desired graduates, schools must improve teachers' quality. Teachers are the driving force behind education implementation. The teachers' success in carrying out their duties is a reflection of teacher performance (Ahmadi & Saad, 2024).

The quality of teachers cannot be separated from education itself. The quality of qualified teachers has significant implications for the development of high-quality education (Sholeh et al., 2022). Teachers are the frontline in ensuring that education meets existing educational standards (Varshney, 2023). The term "quality" is closely tied to varying perspectives and user experiences, which leads to differences in

interpretation. This is because quality can be understood through both an absolute standard, where fixed criteria define excellence, and a relative standard, which depends on individual needs, expectations, and context (Riduan, 2021).

Ultimately, supervisors' digital competence impacts teacher quality, as supervisors are expected to be digitally literate in today's era. This proficiency enables them to effectively evaluate and monitor teacher performance in schools. By mastering digital tools and platforms, supervisors can identify areas where teachers may be falling short of the required professional standards. This allows for timely intervention and improvement. Digital competency is therefore an important aspect of the supervisor's role in fostering teacher development (Rasdiana et al., 2024). Public school supervisors also focus on understanding school management, including both educational and administrative aspects (Setiawan & Sulthoni, 2024).

Although the role of Islamic Religious Education (PAI) teachers in Madrasah Ibtidaiyah (MI) is vital in shaping students' character and spirituality from an early age, a number of studies indicate that the quality of PAI teachers in Central Java still faces fundamental problems. Research indicates that teachers often do not fully meet the expected pedagogical and professional competency standards. Pratiwi found that Islamic Religious Education teachers in Sumedang Regency lack competencies in areas such as innovative teaching methods and communication skills (Pratiwi et al., 2025). This is reflected in their ability to design effective learning, use innovative methods, and in their ability to master digital learning technology.

Furthermore, data from Suara Merdeka reveals that currently, around 15,996 PAI teachers in Central Java have not participated in the Teacher Professional Education (PPG) (Kelana, 2025). This condition shows a serious gap in meeting formal qualifications, which is one of the main indicators for improving teacher quality. The lack of involvement in PPG not only affects teachers' professional status but also weakens their competence in addressing the demands of modern education, which requires digital literacy-based learning and a scientific approach.

There are several previous studies that can be used as a literature review, including research focused on PAI supervisors as the main subject and that used a qualitative approach (Sumiyati, 2022). This study offers a new contribution by using

a quantitative approach and focusing on PAI teachers at the Madrasah level in Central Java. This creates a different scope of investigation because it involves a wider population and an approach that allows for stronger data generalization. In addition, the quantitative approach allows for statistical analysis of teacher perceptions and performance, which previous studies did not provide. Thus, although the supervisor variable remains a common factor, the perspective, methodological approach, geographical scope, and research objects are the main differentiators that strengthen the novelty of this study.

Other studies aim to determine the influence of the principal's digital leadership on teachers' reflective practices through the mediating effects of trust, self-efficacy, and work involvement. The results showed that teachers appreciate the leadership of the principal, which supports the learning process. In addition, teachers feel motivated and inspired to reflect on their learning because of leaders with digital competencies (Agustina et al., 2020). As explained above, supervisors' digital competence is very important for improving the quality of teachers, especially Islamic teachers. This study aims to examine the impact of supervisors' digital competence on Islamic education teachers at Madrasah Ibtidaiyah.

METHODS

Research Design

This study employed a quantitative approach using a causal-correlational design with an ex post facto approach. This design was used to investigate cause-and-effect relationships between variables that could not be directly manipulated because the events or conditions had already occurred, and the researcher only observed the resulting effects (Creswell & Cresswell, 2015).

The variables in this study were the digital competence of supervisors as the independent variable (X) and teacher quality as the dependent variable (Y). The hypotheses in this study were formulated as follows. The null hypothesis (H_0) stated that there was no significant influence of supervisors' digital competence on the quality of Islamic Education teachers in Madrasah Ibtidaiyah. In other words, the level of digital proficiency possessed by supervisors did not have a meaningful

relationship with teachers' professionalism and performance. Conversely, the alternative hypothesis (H_1) posited that there was a significant influence of supervisors' digital competence on the quality of Islamic Education teachers in Madrasah Ibtidaiyah. This meant that the higher the supervisors' digital competence, the greater their contribution to improving teacher quality in pedagogical, professional, social, and personal aspects.

Procedure

The research was conducted in several steps: 1) determining the number of supervisors in Central Java; 2) determining the sample size; 3) collecting data by distributing questionnaires to respondents; 4) conducting validity and reliability tests on the research instruments to ensure that each item in the questionnaire could accurately and consistently measure the intended variables; 5) distributing the questionnaire online or offline and ensuring an adequate response rate; 6) processing the data obtained using statistical analysis techniques, such as simple linear regression analysis, to determine the effect of supervisors' digital competence on teacher quality; and 7) drawing conclusions based on the results of data analysis and providing relevant recommendations for improving the quality of supervision and guidance of teachers in Madrasah Ibtidaiyah.

Population and Sample

The study population consisted of 100 Islamic Education supervisors working at Madrasah Ibtidaiyah in Central Java. Using the Slovin formula with a 10% margin of error, the sample size was set at 50 respondents. The sample was selected using proportional cluster random sampling, where supervisors were grouped according to their districts or cities. Within each cluster, respondents were randomly selected using a lottery method. This technique ensured proportional and fair representation of each region in Central Java.

Data collection

Data were collected using a questionnaire as the primary instrument, which was developed based on the indicators of each variable. Supervisors' Digital literacy indicators were drawn from Hague & Payton (2010) and comprised the following: 1) Functional skill; 2) Creativity; 3) Collaboration; 4) Communication; 5) Ability to

find and select information; 6) Critical thinking and evaluation; 7) Cultural and social understanding; and 8) E-Safety. Indicators of Islamic Education Teachers' Quality were adapted from Kastubi et al. (2021) and included: 1) intellectual ability, 2) assertiveness, 3) enthusiasm, 4) result orientation, and 5) maturity with appropriate behavior

To determine the validity and reliability of the questionnaire, an instrument trial was conducted involving 30 respondents. Questionnaire item validity was tested using the Product Moment correlation formula with a 5% significance level. Based on the validity test results, 30 items for the Supervisors' Digital Competence variable were valid, while 2 items were invalid. Meanwhile, all 28 items for the Islamic Education Teachers' Quality variable were valid. Accordingly, the final questionnaire included 30 items for Supervisors' Digital Competence and 28 items for Teachers' Quality.

Reliability was tested using Cronbach's Alpha, with a threshold coefficient of 0.600. For Supervisors' Digital Competence, the reliability coefficient was $r=0.948$, exceeding the critical value of $r=0.600$. Based on this result, the questionnaire items for the Supervisors' Digital Competence variable were reliable. Furthermore, the reliability coefficient for the Islamic Education Teachers' Quality variable was $r=0.942$, also exceeding the threshold value of 0.600. Therefore, the questionnaire items for the Islamic Education Teachers' Quality variable were reliable.

Data Analysis

The assumption tests were conducted using the Kolmogorov-Smirnov formula to test for normality, and the scatter plot technique to assess linearity. The t-test was used to examine the significance of the effect of a single independent variable in regression, while regression analysis was used to study the relationship between dependent and independent variables.

DISCUSSION

The frequency distribution of the supervisors' digital competence scores (X) is presented in the following table 1.

Table 1. Frequency Distribution of the Supervisors' Digital Competence Questionnaire Scores (X)

Interval Class	Category	Frequency	Percentage
62-74	Low	4	4.00 %
75-86	Poor	21	21.00 %
87-98	Moderate	58	58.00 %
99-110	Fair	15	15.00 %
111-122	High	2	2.00 %
Total			100

The table 1 of supervisors' digital competence (X) shows that the majority of respondents scored between 87-98, totaling 58 respondents. This is followed by 21 respondents who scored between 75-86, 15 respondents with scores between 99-110, 4 respondents with scores between 62-74, and the fewest—only 2 respondents—scored between 111-122. To collect data on supervisors' digital competence, the researcher distributed a total of 30 questionnaire items to Islamic Education teachers at Madrasah Ibtidaiyah in Central Java. The sample consisted of 100 respondents. The data on supervisors' digital competence (X), as shown in the table, indicate that the highest score is 118, the lowest score is 82, the mean is 90.85, and the standard deviation is 9.252.

The frequency distribution of the scores for Islamic Education teacher quality (Y) is presented in the following table 2.

Table 2. Frequency Distribution of Islamic Education Teacher Quality (Y) Scores

Class Interval	Category	Frequency	Percentage
60-69	Low	5	5.00 %
70-79	Poor	8	8.00 %
80-89	Fair	25	25.00 %
90-99	Good	49	49.00 %
100-109	High	13	13.00 %
Total			100

The table 2 of Islamic Education teacher quality (Y) scores above shows that the majority of respondents obtained scores between 90-99, totaling 49 respondents. This is followed by 25 respondents who scored between 80-89, 13 respondents who

scored between 100–109, and 8 respondents who scored between 70–79. The fewest respondents, totaling 5, scored between 60–69. Data on the variable of Islamic Education teacher quality (Y) were obtained through the distribution of questionnaires to 100 respondents as the research sample. The results from the teacher quality questionnaire showed a highest score of 109, a lowest score of 60, a mean of 90.48, and a standard deviation of 9.334.

Before proceeding to the data analysis stage, we conducted assumption tests to minimize standard deviation errors, including the normality test and the linearity test. The result of the normality test base on the Kolmogorov-Smirnov test result shows a value of 1.322, while the Asymp. Sig (2-tailed) is 0.061, indicating a non-significant result. This means that the residual data are normally distributed. Based on the output of the Scatter Plot technique, it shows a linear relationship between the independent variables and the quality of Islamic education teachers.

To examine the influence of supervisors' digital competence (X) on the quality of Islamic Education teachers (Y), a simple linear regression analysis was conducted using SPSS. The SPSS output is presented below.

Table 3. ANOVA Table of the Regression Model

Model	Sum of Squares	Df	Mean Square	F	Sig.
Regression	232.16	1	232.16	13.02	0.000
Residual	1419.84	78	18.20		
Total	1652.00	79			

Sig. = 0,000 < 0,05 → Significant influence

The researcher applied simple linear regression to test whether supervisors' digital competence significantly influenced the quality of Islamic Education teachers. The ANOVA table, which shows an F-value of 13.02, indicating that the regression model has a good ability to explain the variability in the data. Furthermore, the significance value (Sig.) obtained was 0.000, which is far below the 0.05 threshold. This indicates that the regression model is statistically significant, meaning that supervisors' digital competence has a significant influence on the quality of Islamic Education teachers at Madrasah Ibtidaiyah. Therefore, the higher the level of digital

competence possessed by a supervisor, the greater the potential improvement in the quality of the teachers under their supervision.

Table 4. Coefficients of the Regression Model

Model	Unstandardized Coefficients (B)	Std. Error	T	Sig.
(Constant)	37.221	3.500	10.635	0.000
Digital_Competence	0.485	0.134	3.608	0.000

The calculated t-value was 3.608 with a significance value of 0.000. Since the significance value was less than 0.05 ($0.000 < 0.05$), the null hypothesis (H_0) was rejected and the alternative hypothesis (H_a) was accepted. This means that there was a positive and significant influence of supervisors' digital competence on the quality of Islamic Education teachers. The regression equation derived from the analysis is as follows: $Y = 37.221 + 0.485X$.

This indicated that for every 1-point increase in the supervisors' digital competence score, the quality of Islamic Education teachers increased by 0.485 points. The results of the regression analysis showed that supervisors' digital competence had a significant effect on the quality of Islamic Education teachers in Madrasah Ibtidaiyah across Central Java. Thus, the higher the digital competence possessed by supervisors, the better the quality of Islamic Education teachers tended to be.

Table 5. Model Summary of the Regression Analysis

Model Summary	R	R Square	Adjusted R Square	Std. Error
	0.602	0.362	0.356	4.518

$R^2 = 0.362 \rightarrow$ the contribution of X to Y is 36.2%

Table 5 presents the Model Summary from the simple linear regression analysis between supervisors' digital competence (X) and the quality of Islamic Education teachers (Y). The R value of 0.602 indicates a moderately strong correlation between the two variables. The R Square (R^2) value of 0.362 meant that 36.2% of the variance in teacher quality could be explained by supervisors' digital competence. In other words, supervisors' digital competence contributed 36.2% to changes in teacher quality, while the remaining 63.8% was influenced by other

factors not included in this model. The Adjusted R Square value of 0.356 reflected a slightly corrected estimate that accounted for the number of predictors and sample size, indicating that the model was relatively stable and appropriate for analysis.

Based on the results of the data analysis, it is known that the supervisor's digital competence variable influences the quality of Islamic religious education teachers in Madrasah Ibtidaiyah in Central Java. This is indicated by the large contribution given by the supervisor's digital competence variable, which is 36.2%. This implies that the supervisor's digital competence is very important to get serious attention because it can influence the quality of Islamic religious education teachers.

From the above findings, researchers attempted to compare these findings with previous studies, first, research stating that the community's assessment of a school depends on the quality of teachers in implementing the learning process. Therefore, it can be said that the progress or decline in teacher quality depends on how a supervisor carries out supervision (Haryono, 2021). Second, there is research on Islamic education supervisors in the digital era. This study aims to provide motivation and insight, especially for Islamic education supervisors and, more generally, for Islamic education teachers, on how to respond to changes in the times, especially in this digital era, in order to remain relevant and continue to strive to improve their competence and performance (Sumiyati, 2022). Third, research on the influence of digital leadership of school principals on the reflective practices of vocational teachers, mediated by the variables of trust, self-efficacy, and work engagement. The results of the study show that teachers appreciate the leadership of the principal, who supports the learning process. In addition, teachers feel motivated and enthusiastic to reflect on their learning because of leaders who have digital characteristics (Agustina et al., 2020).

Based on the above explanation, this study supports the findings of previous research. In this era, supervisors must master digital technology because it helps in supervising and improving the quality of teachers, especially those in Madrasah Ibtidaiyah. Technology in education functions as a system to support learning so that the desired goals can be achieved. In Indonesia, the implementation of

technology in education can serve as a learning medium, an administrative tool, and a learning resource.

Based on the graphical data and statistical tests (t-test), it is proven that there is a positive and significant relationship between supervisors' digital competence (X) and the quality of Islamic religious education (PAI) teachers in Madrasah Ibtidaiyah in Central Java. This can be seen from the t-value of 3.608 and a significance level of 0.000 (<0.05), which statistically indicates that the alternative hypothesis is accepted. The contribution of the supervisors' digital competence variable to the quality of PAI teachers is 36.2%. This finding reflects that supervisors' digital competence not only supports administrative tasks but also acts as a catalyst for improving teacher professionalism (Sary et al., 2023).

From the perspective of Islamic education theory, supervisors function as murabbi (mentors) who not only supervise but also guide and direct teachers to carry out the learning process based on Islamic values (Maulana & Nisa, 2021). In this context, the mastery of digital technology by supervisors becomes a means of taqwiyyatul mu'allim (strengthening educators) so that Islamic Education teachers can deliver teaching materials more effectively, contextually, and in line with the development of the times (Mufidah & Lutfi, 2025). Islamic education emphasizes the importance of *islah* (improvement) and *tarbiyah* (continuous guidance), which can be achieved optimally if supported by supervisors who are adaptive to information technology.

Furthermore, Imam Al-Ghazali in *Ihya Ulumuddin* emphasized that the success of education is largely determined by the quality of teachers and their supervisors. Therefore, increasing supervisors' digital competence is in line with the spirit of Islamic education, which continues to encourage *tathwir* (development) in various aspects, including the use of technology as a tool to optimize the learning process. Increasing the digital competence of Islamic education teachers is also important to optimize the learning process in the digital era (Eraku et al., 2021). Thus, this finding confirms that supervisors' digital competence must be a serious concern in Islamic education teacher development policy because it contributes significantly to improving the quality of Islamic education in Madrasah Ibtidaiyah.

This study also contributes theoretically to the field of Islamic education, particularly in developing a conceptual framework that shows educational supervision and technological mastery are not only professional requirements but also have normative and spiritual foundations in Islamic teachings.

The Qur'an provides fundamental principles that are both relevant to and applicable in the practice of educational supervision. These principles include *al-mas'ūliyyah* (professional responsibility), *al-amānah* (trust and integrity), *al-iḥsān* (continuous improvement), *ash-shūrā* (deliberation and collaboration), and *at-taqrīm* (evaluation and reflection). For example, the principle of *al-mas'ūliyyah* is reflected in Surah *Al-Tahrim* verse 6, which emphasizes individual responsibility to family and community: "O you who have believed, protect yourselves and your families from a Fire." (Saputra et al., 2024) In the Qur'an, four important principles are clearly emphasized: *al-amānah* (trust and integrity) in Surah *An-Nisā'* verse 58, which highlights the obligation to uphold trust and justice; *al-iḥsān* (continuous improvement) in Surah *An-Naḥl* verse 90, which commands believers to practice excellence in all aspects of life; *ash-shūrā* (deliberation and collaboration) in Surah *Ash-Shūrā* verse 38, which serves as the foundation for collective decision-making; and *at-taqrīm* (evaluation and reflection) in Surah *Al-Ḥasyr* verse 18, which urges every believer to engage in self-reflection.

Mastery of technology can also be seen as a manifestation of the command to *iqra'*. The concept of *iqra'* in Islam goes beyond mere reading and includes the exploration and development of knowledge, including technology. This interpretation is supported by various studies that highlight the transformative power of reading in encouraging intellectual and spiritual growth. (Avicena & Azizah, 2024). QS. *Al-'Alaq*: 1-5 emphasizes the importance of developing knowledge as part of faith. The Qur'an contains verses that can be interpreted to support technological innovation and scientific investigation, emphasizing the integration of religious values with modern scientific progress.

Within this framework, the mastery of technology by teachers and supervisors reflects the Islamic work ethic and sincerity in delivering contextual, adaptive, and high-quality religious education. Thus, the quality of PAI education that is effectively

supervised and supported by technological mastery will ensure that the main objective of Islamic education, namely the formation of *insān kāmil* (perfect human beings), can be achieved in a relevant manner in the digital age.

CONCLUSION

The study concludes that supervisors' digital competence has a positive and significant effect on the quality of Islamic education teachers. This conclusion is supported by the results of the t-test calculation, where the t-value is 3.608 with a significance level of 0.000, which is smaller than 0.05. These results indicate that supervisors' digital competence significantly affects the quality of Islamic education teachers in Madrasah Ibtidaiyah in Central Java. In other words, the better the performance and competence of supervisors, especially in utilizing digital tools and approaches, the better the quality and professionalism of Islamic education teachers.

This study also enriches Islamic education theory by demonstrating that supervision is consistent with the principles of *al-mas'ūliyyah* (professional responsibility), *al-amānah* (trust and integrity), *al-iḥsān* (continuous improvement), *ash-shūrā* (deliberation and collaboration), and *at-taqwīm* (evaluation and reflection), as well as mastery of technology as a manifestation of the command to *iqra'* (exploration and development of knowledge). Thus, this study offers an integrative approach between theological and pedagogical dimensions in improving the quality of Islamic education.

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