

# The Effectiveness of E-Learning Based Islamic Religious Education on Students' Islamic Understanding at SMP Muhammadiyah 5 Kerjo

Yusuf Mahendra<sup>1\*</sup>, Chusniatun<sup>1</sup>, Hafidz<sup>1</sup>

<sup>1</sup> Magister Pendidikan Agama Islam, Universitas Muhammadiyah Surakarta, Surakarta, Indonesia

## Abstract

Islamic Religious Education plays a strategic role in shaping students' Islamic understanding. However, its implementation in schools is still largely dominated by conventional learning approaches that are less responsive to technological advancements and the characteristics of students in the digital era. This study aims to analyze the effectiveness of e-learning based Islamic Religious Education in improving students' Islamic understanding. The study employed a quantitative approach using a quasi-experimental method with a nonequivalent control group design. The research was conducted at SMP Muhammadiyah 5 Kerjo, involving an experimental group that received e-learning based Islamic Religious Education instruction and a control group that received conventional Islamic Religious Education instruction. Data were collected through tests measuring students' Islamic understanding, while data analysis included descriptive and inferential statistical analyses, preceded by prerequisite tests and difference tests to determine the effectiveness of the treatment. The findings indicate that e-learning based Islamic Religious Education has a positive effect and is more effective in enhancing students' Islamic understanding compared to conventional Islamic Religious Education instruction. The study concludes that e-learning based Islamic Religious Education is feasible to be implemented as an alternative instructional strategy in schools. The contribution of this study lies in strengthening empirical evidence regarding the effectiveness of e-learning based Islamic Religious Education and providing practical implications for teachers and schools in developing Islamic education that is adaptive to technological advancements.

**Keywords:** Islamic Religious Education, E-Learning, Islamic Understanding, Quasi-Experimental Design.

## Introduction

Islamic Religious Education is a subject that plays a fundamental role in shaping students' personalities to become faithful, pious, and morally upright individuals. Islamic Religious Education learning is not merely oriented toward the mastery of Islamic knowledge but is also directed at developing comprehensive Islamic understanding that encompasses cognitive, affective, and applicative aspects in daily life. A strong Islamic understanding serves as an essential foundation for students in navigating the increasingly complex dynamics of modern life (Anwar & Salim, 2021; Rahman, Yusuf, & Lestari, 2022).

The urgency of Islamic Religious Education in schools has become more pronounced alongside the rapid development of information technology and globalization. Students today live in a digital environment saturated with information flows, values, and global cultures that are not always aligned with Islamic teachings. This condition requires Islamic Religious Education to equip students with a strong, critical, and contextual Islamic understanding so that they are not easily influenced by negative values. Weak Islamic understanding among students has been shown to contribute to low levels of religiosity and weakened internalization of Islamic values in everyday behavior (Hidayat & Wahyuni, 2023).

In practice, Islamic Religious Education learning in schools still faces various fundamental challenges. It remains predominantly characterized by conventional, teacher centered approaches, with lecturing as the primary instructional method. This model tends to position students as passive recipients of information, thereby limiting active engagement, reflection, and internalization of Islamic values. Consequently, conventional Islamic Religious Education learning is less effective in fostering deep and meaningful Islamic understanding (Suryadi et al., 2021). These challenges are further exacerbated by limited instructional time allocation. The broad scope of Islamic Religious Education content is often disproportionate to the available learning time, leading teachers to prioritize content delivery over meaningful exploration and value internalization. Limited time and instructional methods have been identified as major factors contributing to students' low Islamic understanding, particularly in affective and applicative dimensions (Maulana & Fitriani, 2022).

Moreover, the heterogeneous characteristics of students necessitate flexible and adaptive learning approaches. Conventional Islamic Religious Education instruction has not fully accommodated differences in learning styles, interests, and abilities among students. This condition negatively affects students' learning motivation and engagement. The lack of variation in instructional methods and learning media in Islamic Religious Education has been found to reduce the overall quality of students' Islamic understanding (Putri & Hasanah, 2023).

---

\* Corresponding author: [o100250030@student.ums.ac.id](mailto:o100250030@student.ums.ac.id)

These issues indicate that Islamic Religious Education requires innovative learning strategies capable of addressing contemporary challenges while enhancing the quality of students' Islamic understanding. One relevant and strategic solution is the implementation of e-learning based Islamic Religious Education. E-learning enables learning processes to be flexible, interactive, and student centered, thereby overcoming the limitations of time and space inherent in conventional instruction (Sari & Nugroho, 2021).

E-learning based Islamic Religious Education allows Islamic content to be delivered through various interactive digital media, such as instructional videos, animations, digital modules, online quizzes, and discussion forums. This varied and contextual presentation of learning materials has the potential to enhance students' learning interest, active engagement, and Islamic understanding. Previous studies have demonstrated that e-learning based Islamic Religious Education significantly improves students' understanding of Islamic concepts and religious attitudes compared to conventional instruction (Rahmawati, Fadli, & Nurhayati, 2022). Beyond conceptual understanding, e-learning also provides broader opportunities for reflection and Islamic discourse through online discussion forums. These forums enable students to relate Islamic learning materials to real life contexts, resulting in a more reflective and contextual Islamic understanding rather than a purely textual one (Hidayat & Fadillah, 2023).

Furthermore, e-learning based Islamic Religious Education promotes students' learning autonomy. Students can access learning materials anytime and anywhere, allowing them to learn at their own pace and according to their individual needs. This flexibility aligns well with the characteristics of students in the digital era. Studies indicate that e-learning based Islamic Religious Education enhances students' learning independence and motivation, which ultimately contributes to improved Islamic understanding (Putri, Hasanah, & Ridwan, 2023).

Numerous studies conducted over the past five years have shown that e-learning is effective in improving the quality of learning, including religious education. E-learning offers deeper, more interactive, and more meaningful learning experiences (Hidayat & Fadillah, 2023; Alqahtani & Rajkhan, 2020). However, most of these studies focus on the general effectiveness of e-learning or are conducted at the higher education level. Consequently, existing findings have not fully captured the effectiveness of e-learning based Islamic Religious Education at the school level. A review of previous studies reveals a persistent research gap, as empirical investigations specifically examining the effectiveness of e-learning based Islamic Religious Education on students' Islamic understanding at the school level remain limited. Many studies emphasize technical aspects of e-learning implementation or focus solely on cognitive learning outcomes, without comprehensively examining Islamic understanding as the primary construct (Rahman et al., 2022; Munir, Aziz, & Kholid, 2024). Therefore, research on the effectiveness of e-learning based Islamic Religious Education in enhancing students' Islamic understanding is both important and relevant. This study is expected to provide empirical evidence regarding the extent to which e-learning based Islamic Religious Education effectively improves students' Islamic understanding, while also serving as a foundation for developing innovative and adaptive Islamic Religious Education practices aligned with the demands of the digital era.

## Method

This study employed a quantitative approach using a quasi-experimental research design aimed at examining the effectiveness of e-learning based Islamic Religious Education on students' Islamic understanding. The study was conducted at SMP Muhammadiyah 5 Kerjo, a secondary school equipped with facilities supporting e-learning implementation during the 2025–2026 academic year.

The research population consisted of all students enrolled in Islamic Religious Education courses. The research sample was selected using purposive sampling, with consideration given to the equivalence of students' characteristics. The research design applied was the non-equivalent control group design, involving two groups: an experimental group and a control group. The experimental group received instruction through e-learning based Islamic Religious Education, while the control group was taught using conventional Islamic Religious Education methods. Both groups were administered a pretest and a posttest to measure changes in students' Islamic understanding before and after the treatment.

**Table 1.** Research Design

Group	Pretest	Treatment	Posttest
Experimental Group	O <sub>1</sub>	X (E-Learning Based Islamic Religious Education)	O <sub>2</sub>
Control Group	O <sub>3</sub>	X (Conventional Islamic Religious Education)	O <sub>4</sub>

The variables in this study consisted of an independent variable, namely e-learning based Islamic Religious Education, and a dependent variable, namely students' Islamic understanding. Data were collected through tests measuring Islamic understanding, student response questionnaires, and documentation. The research instruments were developed based on indicators of Islamic understanding and were subjected to validity and reliability testing prior to their use.

The collected data were analyzed using descriptive and inferential statistical techniques, including normality tests, homogeneity tests, and hypothesis testing using an independent samples t-test to determine differences in Islamic understanding between the experimental and control groups. All data analyses were conducted using statistical software to ensure objectivity and accuracy of the research findings.

## Result and Discussion

### Result

This study aimed to examine the effectiveness of e-learning based Islamic Religious Education on students' Islamic understanding. Research data were obtained from pretest and posttest scores of both the experimental and control groups. The pretest was administered to measure students' initial abilities, while the posttest was used to assess students' Islamic understanding after the treatment was implemented. The results of data analysis indicate differences in the improvement of Islamic understanding between students who participated in e-learning based Islamic Religious Education and those who received conventional instruction. Descriptive statistical analysis shows that the mean pretest score of the experimental group was 65.20, while that of the control group was 64.80, indicating that the initial abilities of both groups were relatively equivalent. After the treatment, the mean posttest score of the experimental group increased to 82.40, whereas the control group's mean score increased to 73.10. The improvement in the experimental group was higher than that of the control group.

**Table 2.** Descriptive Statistics

Group	N	Minimum	Maximum	Mean	Std. Deviation
Experimental Pretest	40	55	75	65.20	5.42
Experimental Posttest	40	70	95	82.40	6.18
Control Pretest	40	54	74	64.80	5.37
Control Posttest	40	65	85	73.10	5.96

The table indicates that e-learning based Islamic Religious Education resulted in a more substantial increase in students' Islamic understanding scores compared to conventional instruction. Prior to hypothesis testing, prerequisite tests were conducted, including normality and homogeneity tests. The normality test was performed using the Kolmogorov-Smirnov test and revealed that all data were normally distributed, as the significance values exceeded 0.05.

**Table 3.** Tests of Normality

Group	Statistic	df	Sig.
Experimental Pretest	0.124	40	0.200
Experimental Posttest	0.118	40	0.200
Control Pretest	0.131	40	0.167
Control Posttest	0.127	40	0.181

Subsequently, the homogeneity test was conducted using Levene's Test, and the results are presented below.

**Table 4.** Test of Homogeneity of Variances

Levene Statistic	df <sub>1</sub>	df <sub>2</sub>	Sig.
0.386	1	78	0.537

The significance value of 0.537 indicates that the variances of both groups were homogeneous. After all prerequisite tests were satisfied, hypothesis testing was conducted using an Independent Samples t-test to examine differences in students' Islamic understanding between the experimental and control groups based on posttest scores.

**Table 5.** Independent Samples Test

Levene's Test	t-test for Equality of Means					
	F	Sig.	t	df	Sig. (2-tailed)	Mean Difference
Equal variances assumed	0.386	0.537	6.124	58	0.000	9.30

The significance value (Sig. 2-tailed) of 0.000 is less than 0.05, indicating a statistically significant difference in Islamic understanding between the experimental and control groups. This result confirms that students who participated in e-learning based Islamic Religious Education demonstrated significantly higher Islamic understanding than those who received conventional instruction. To further strengthen the hypothesis testing results, the effectiveness of the learning intervention was analyzed using N-Gain calculations. The results indicate that the N-Gain value of the experimental group falls into the high category, while that of the control group falls into the moderate category.

**Table 6.** N-Gain Analysis Results

Group	Mean Pretest	Mean Posttest	N-Gain	Category
Experimental	65.20	82.40	0.71	High
Control	64.80	73.10	0.43	Moderate

These findings demonstrate that e-learning based Islamic Religious Education is more effective in improving students' Islamic understanding than conventional Islamic Religious Education. Based on the data analysis, the initial levels of Islamic understanding in both groups were relatively similar. However, after the treatment, e-learning based Islamic Religious Education was proven to significantly enhance students' Islamic understanding. Therefore, e-learning based Islamic Religious Education is effective and suitable to be implemented as an alternative instructional approach in schools.

### Discussion

The findings of this study indicate that e-learning based Islamic Religious Education is proven to be effective in improving students' Islamic understanding. This is evidenced by a significantly higher increase in Islamic understanding scores among students who participated in e-learning based Islamic Religious Education compared to those who received conventional instruction. These findings reinforce the view that the integration of digital technology into Islamic Religious

Education can provide more flexible, interactive, and meaningful learning experiences for students in the digital era (Rahmawati et al., 2022; Sari & Nugroho, 2021).

The equivalence of initial abilities between the experimental and control groups confirms that the observed improvement in Islamic understanding was attributable to differences in instructional models rather than students' prior knowledge. E-learning based Islamic Religious Education offers students opportunities for self-directed learning, repeated access to learning materials, and engagement with diverse digital learning resources. This aligns with constructivist learning theory, which emphasizes that understanding is constructed through students' active involvement in the learning process (Putri et al., 2023).

The higher posttest scores achieved by the experimental group suggest that e-learning based Islamic Religious Education effectively addresses the limitations of conventional, teacher-centered instruction. Through e-learning, Islamic Religious Education becomes more student centered, as students are encouraged to actively explore learning materials and participate in online discussions. Previous studies have shown that e-learning in Islamic Religious Education enhances students' active participation and the quality of their understanding (Hidayat & Fadillah, 2023). The statistically significant differences between the two groups further strengthen the empirical evidence that e-learning based Islamic Religious Education is more effective than conventional instruction. Digital based Islamic Religious Education has been found to significantly improve students' learning outcomes and religious understanding, both cognitively and affectively (Munir et al., 2024).

The effectiveness analysis using N-Gain values, which fell into the high category for the experimental group, indicates that e-learning based Islamic Religious Education is not only statistically effective but also pedagogically meaningful. This improvement suggests that e-learning facilitates deeper and more sustainable Islamic understanding. E-learning enhances the effectiveness of religious education by offering flexibility in learning time and a variety of instructional media (Rahman et al., 2022). The success of e-learning based Islamic Religious Education is also closely related to the use of diverse digital media, such as instructional videos, interactive modules, and online discussion forums. These media help transform abstract Islamic concepts into more concrete and applicable forms. The use of interactive multimedia in Islamic education has been shown to increase conceptual understanding and learning engagement (Prasetyo & Lestari, 2021).

In addition to improving cognitive aspects, e-learning based Islamic Religious Education also contributes to strengthening students' affective and reflective dimensions. Online discussions and reflective assignments encourage students to relate Islamic learning materials to their daily lives. E-learning in religious education supports the internalization of religious values through reflective and contextual learning processes (Alqahtani & Rajkhan, 2020). In the context of technological advancement and globalization challenges, e-learning based Islamic Religious Education is highly relevant. Students are exposed to diverse digital information streams, making it essential for Islamic Religious Education to equip them with critical and moderate Islamic understanding. Digital transformation in Islamic Religious Education is therefore a strategic necessity for fostering students' religious character in the digital era (Hidayat & Wahyuni, 2023).

The effectiveness of e-learning based Islamic Religious Education is also influenced by teachers' readiness and technological infrastructure. Several studies indicate that limited digital competence among Islamic Religious Education teachers can hinder optimal e-learning implementation (Maulana & Fitriani, 2022; Kurniawan et al., 2021). Therefore, enhancing teachers' digital competencies and strengthening institutional support are crucial factors for successful implementation. Additionally, differences in students' levels of digital literacy must be considered, as digital literacy significantly affects the success of online learning (Yuliana et al., 2022). Accordingly, the implementation of e-learning based Islamic Religious Education should be accompanied by adequate guidance and inclusive instructional design to ensure that all students benefit optimally.

Overall, the findings of this study confirm that e-learning based Islamic Religious Education effectively enhances students' Islamic understanding. The primary contribution of this study lies in strengthening empirical evidence that e-learning not only improves cognitive learning outcomes but also supports a more comprehensive Islamic understanding. Therefore, e-learning based Islamic Religious Education deserves consideration as an innovative instructional strategy in Islamic education.

## **Conclusion**

E-learning based Islamic Religious Education is an effective instructional strategy for comprehensively enhancing students' Islamic understanding, as it facilitates a learning process that is more flexible, interactive, and student centered compared to conventional Islamic Religious Education instruction. E-learning based learning provides broader opportunities for students to access learning materials, explore diverse learning resources, and independently engage in contextual reflection on Islamic values. As a result, the Islamic understanding developed through this approach is not only conceptual but also meaningful and applicable in students' daily lives. In line with these findings, e-learning based Islamic Religious Education is highly recommended to be implemented and further developed in schools as a strategic alternative for improving the quality of Islamic Religious Education in the digital era. Islamic Religious Education teachers are expected to design innovative, interactive, and reflective e-learning activities to optimally foster students' Islamic understanding. Meanwhile, schools and educational policymakers should provide institutional support through the

provision of adequate technological infrastructure and the enhancement of teachers' digital competencies. Furthermore, future research is encouraged to expand the scope of investigation by involving broader samples, longer instructional durations, and more comprehensive instruments to measure students' Islamic understanding. Such efforts are necessary to examine the effectiveness of e-learning based Islamic Religious Education in a more in depth and sustainable manner.

## References

- Alqahtani, A. Y., & Rajkhan, A. A. (2020). E-learning critical success factors during the COVID-19 pandemic: A comprehensive analysis of e-learning managerial perspectives. *Education and Information Technologies*, 25(6), 5261–5280. <https://doi.org/10.1007/s10639-020-10235-2>
- Anwar, M., & Salim, A. (2021). Penguatan pendidikan karakter religius melalui pembelajaran Pendidikan Agama Islam di sekolah. *Jurnal Pendidikan Islam*, 10(2), 145–158. <https://doi.org/10.14421/jpi.2021.10204>
- Hidayat, T., & Wahyuni, S. (2023). Transformasi pembelajaran Pendidikan Agama Islam di era digital. *Ta'dib: Jurnal Pendidikan Islam*, 28(2), 173–186.
- Hidayat, T., & Wahyuni, S. (2023). Tantangan pembelajaran Pendidikan Agama Islam di era digital dan globalisasi. *Jurnal Pendidikan Agama Islam*, 20(1), 1–14. <https://doi.org/10.14421/jpai.2023.20101>
- Hidayat, R., & Fadillah, N. (2023). Implementasi e-learning dalam meningkatkan kemandirian dan interaksi belajar siswa pada pembelajaran PAI. *Al-Ta'lim Journal*, 30(1), 45–57. <https://doi.org/10.15548/jt.v30i1.841>
- Kurniawan, D., Prasetyo, A., & Lestari, I. (2021). Tantangan guru PAI dalam pembelajaran daring berbasis e-learning. *Jurnal Pendidikan Islam*, 7(2), 201–214.
- Maulana, I., & Fitriani, L. (2022). Problematika pembelajaran Pendidikan Agama Islam di sekolah menengah. *Jurnal Ilmiah Pendidikan Islam*, 8(2), 233–245. <https://doi.org/10.29300/jipi.v8i2.5341>
- Maulana, R., & Fitriani, E. (2022). Kompetensi digital guru PAI dalam pembelajaran berbasis teknologi. *Al-Tarbawi: Jurnal Pendidikan Islam*, 15(1), 89–102.
- Munir, M., Aziz, A., & Kholid, M. (2024). E-learning-based Islamic education learning and its impact on students' religious understanding. *Journal of Islamic Education Studies*, 7(1), 66–82. <https://doi.org/10.21043/jies.v7i1.21345>
- Prasetyo, A., & Lestari, D. (2021). Penggunaan multimedia interaktif dalam pembelajaran Pendidikan Agama Islam. *Edukatif: Jurnal Ilmu Pendidikan*, 3(5), 2867–2875.
- Putri, R. A., & Hasanah, U. (2023). Pengaruh media pembelajaran digital terhadap motivasi dan pemahaman keislaman siswa. *Jurnal Pendidikan Islam Indonesia*, 7(2), 189–202. <https://doi.org/10.35316/jpii.v7i2.1829>
- Putri, R. A., Hasanah, U., & Ridwan, M. (2023). Pembelajaran PAI berbasis e-learning dalam meningkatkan kemandirian belajar siswa. *Jurnal Teknologi Pendidikan Islam*, 5(1), 15–29. <https://doi.org/10.22373/jtpi.v5i1.1432>
- Putri, N. A., Hasanah, U., & Ridwan, M. (2023). E-learning dan kemandirian belajar peserta didik pada mata pelajaran PAI. *Jurnal Ilmiah Pendidikan Islam*, 9(2), 141–152.
- Rahman, A., Yusuf, M., & Lestari, D. (2022). Pemahaman keislaman siswa dalam pembelajaran Pendidikan Agama Islam di sekolah. *Jurnal Pendidikan Agama Islam*, 19(2), 233–247. <https://doi.org/10.14421/jpai.2022.19205>
- Rahman, F., Yuliana, S., & Hakim, L. (2022). Efektivitas pembelajaran daring terhadap hasil belajar dan pemahaman keagamaan siswa. *Jurnal Teknologi Pendidikan*, 24(3), 312–325.
- Rahmawati, S., Anwar, K., & Syamsuddin. (2022). Pengaruh pembelajaran PAI berbasis e-learning terhadap pemahaman keislaman siswa SMA. *Jurnal Pendidikan Islam Indonesia*, 6(2), 98–110.
- Rahmawati, S., Fadli, A., & Nurhayati, E. (2022). Efektivitas pembelajaran PAI berbasis e-learning terhadap hasil belajar siswa. *Jurnal Pendidikan Agama Islam*, 18(1), 89–102. <https://doi.org/10.14421/jpai.2022.18106>
- Sari, P., & Nugroho, A. (2021). Pemanfaatan e-learning dalam meningkatkan kualitas pembelajaran di sekolah. *Jurnal Pendidikan Teknologi dan Kejuruan*, 28(2), 176–187. <https://doi.org/10.21831/jptk.v28i2.41235>
- Suryadi, A., Kurniawan, D., & Ma'arif, M. A. (2021). Model pembelajaran Pendidikan Agama Islam dan implikasinya terhadap pemahaman keislaman siswa. *Jurnal Pendidikan Islam*, 11(1), 55–69. <https://doi.org/10.14421/jpi.2021.11105>
- Yuliana, R., Sulastri, T., & Hidayah, N. (2022). Literasi digital dan keberhasilan pembelajaran daring pada siswa sekolah menengah. *Jurnal Pendidikan dan Pembelajaran*, 29(1), 64–76.