

Evaluating The Impact Of E-Learning On Students' Learning Achievement In Islamic Religious Education In The Era Of Digital Transformation

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Abstract

This study aims to evaluate the impact of using e-learning-based instructional media on students' learning achievement in Islamic Religious Education (PAI) at Pondok Pesantren IMMIM Putra Makassar. Within the context of digital transformation in education, e-learning is expected not only to deliver religious content cognitively but also to foster students' religious attitudes and spiritual values.

This research employs a quantitative approach using simple linear regression analysis. Data were collected through questionnaires, observation, and documentation of students' academic performance. The findings indicate that e-learning media has a positive and significant influence on students' learning outcomes in PAI, contributing 21.1% to their achievement. This study highlights the importance of integrating educational technology in Islamic education, supported by adequate teacher competencies and digital infrastructure.

Kata Kunci: Islamic Religious Education, E-Learning, Learning Achievement, Digital Transformation, Educational Technology

INTRODUCTION

The implementation of e-learning in Islamic Religious Education (PAI) is a strategic response to the challenges of the Industrial Revolution 4.0, which demands flexible, digital, and adaptive learning models. E-learning offers students the opportunity to access materials independently and develop personalized learning patterns (Nguyen et al., 2019; Aldowah et al., 2019; Khalaf & Al Athali, 2020; Banerjee et al., 2020; Almufairej et al., 2022; Imran et al., 2024), while also reinforcing religious character through more interactive and reflective media engagement (Hasibuan & Iqbal, 2021; Sugiarto & Dewantara, 2021; Oktavia et al., 2021; Suryati, Giatman, et al., 2023; Suryati, Simatupang, et al., 2023; Wardani & Budiono, 2023; (Ferdinan, Pewangi et al., 2023); Prayoga et al., 2024; Izzah et al., 2025).

E-learning-based instruction in PAI not only addresses the cognitive domain but also strengthens students' moral and spiritual values through relevant digital media (Zulkarnain et al., 2020). Various studies affirm the effectiveness of blended learning, digital pedagogy, and affective approaches in e-learning environments (Adri

et al., 2021; Amalia & Julia, 2022; Widaningsih et al., 2023; Aji, 2022; Noveliana & Ghani, 2022; Siregar et al., 2023; Muhammad et al., 2024; Rahman et al., 2024; Anggara & Enramika, 2024; Ibrahim & Megawati, 2025).

One of the major strengths of e-learning in PAI lies in its capacity to foster active student participation through project-based activities, online discussions, and interactive multimedia (Wahyugi & Fatmariza, 2021; Purba et al., 2021; Partono et al., 2021; Bagaskara & Putra, 2022; Agustina et al., 2022; Setiawan et al., 2023; Ratri et al., 2023; Javanis et al., 2024; Afriansyah et al., 2024; Niarulfalah et al., 2025).

This study was conducted to evaluate the impact of e-learning on students' learning achievement in Islamic Religious Education (PAI) within the digital transformation era, focusing specifically on Pondok Pesantren IMMIM Putra Makassar. As digital technologies continue to redefine educational practices, e-learning is no longer viewed merely as a medium for delivering cognitive religious content. Instead, it serves as a strategic platform that also supports the development of students' religious attitudes, moral reasoning, and spiritual discipline.

The findings demonstrate that the integration of e-learning significantly enhances students' accessibility to learning resources, promotes independent study habits, and encourages more active engagement with instructional content. E-learning environments allow students to manage their own pace of learning and facilitate deeper understanding through multimedia, interactive tools, and problem-based learning. These features contribute not only to academic improvement but also to the internalization of Islamic values in daily life.

In the context of learning achievement, the study found a statistically significant positive relationship between the use of e-learning and students' performance in PAI. The flexibility and interactivity offered by digital platforms helped increase student motivation, concentration, and participation—all of which are critical factors in achieving higher academic outcomes.

The practical implications of these findings highlight the urgent need for Islamic education teachers to strengthen their digital pedagogical skills. This includes designing learning experiences that are student-centered, value-integrated, and technologically adaptive. Moreover, educational institutions must ensure robust digital infrastructure—such as stable internet access, device availability, and technical support—to create an inclusive and sustainable e-learning environment. Without such systemic support, efforts to improve students' learning achievement through digital Islamic education may face serious limitations.

RESEARCH METHODOLOGY

This study employed a quantitative approach with a correlational research design. This approach was selected to examine the relationship and influence between the use of e-learning-based instructional media as the independent variable

and students' learning achievement in Islamic Religious Education (PAI) as the dependent variable. The research focused on eleventh-grade students at Pondok Pesantren IMMIM Putra Makassar.

The study was conducted at Campus 2 of IMMIM Putra Islamic Boarding School, with all 45 eleventh-grade students serving as both the population and sample. A total sampling technique (saturated sampling) was applied, considering that the total population was less than 100 students.

Research instruments included a closed-ended questionnaire, an observation guide, and documentation analysis. Data collection was carried out through the distribution of questionnaires related to students' use of e-learning, direct observation of learning activities, and analysis of student academic records.

Data were analyzed using descriptive quantitative methods and simple linear regression with the aid of SPSS software. The analysis aimed to determine the statistical significance of the influence of e-learning media on student learning outcomes. The research instruments were tested for validity and reliability before use, and the results indicated that all items were valid and reliable.

The data description presented in this study aims to provide a general overview of the distribution of field data. The raw data were processed using descriptive statistical techniques. The variable of E-Learning-Based Instructional Media is described using a set of categorical intervals, as presented in Table 1.

Table 1. Research Variable Score Criteria

Mean Value	Criterion Variable
1,00-1,80	Very Bad
>1,80-2,60	Bad
>2,60-3,40	Pretty Good
>3,40-4,20	Good
>4,20-5,00	Excellent

Sumber: Sugiyono (2014:54)

RESEARCH FINDINGS AND DISCUSSION

Research Findings

A. Description of the E-Learning-Based Instructional Media Variable

Data for the variable on e-learning-based instructional media were collected using a questionnaire consisting of 15 statement items. Following tests for validity and reliability, all 15 items were confirmed as valid and met the criteria for inclusion in further analysis. The summarized results of the frequency distribution of

respondents' answers to each item related to the learning motivation variable are presented in Table 2:

Table 2. Distribution of the E-Learning-Based Instructional Media Variable (X)
(Table content not provided in your message; please upload or paste it if translation or formatting is needed.)

Item	Answer Score										Mean
	1		2		3		4		5		
	F	%	F	%	F	%	F	%	F	%	
X1	0	0	1	2.2	5	11.1	17	37.8	22	48.9	4.33
X2					7	15.6	27	60	11	24.4	4.09
X3			2	4.4	6	13.3	11	24.4	26	57.8	4.36
X4					8	17.8	13	28,9	24	53.3	4.36
X5			2	4.4	10	22.2	14	31.1	19	42.2	4.11
X6					2	4.4	12	26.7	31	68.9	4.64
X7			2	4.4	10	22.2	15	33.3	18	40	4.09
X8			1	2.2	10	22.2	18	40	16	35.6	4.09
X9			2	4.4	8	17.8	12	26.7	23	51.1	4.24
X10			2	4.4	6	13.3	17	37.8	20	44.4	4.22
X11			2	4.4	1	2.2	22	48.9	20	44.4	4.33
X12			1	2.2	2	4.4	12	26.7	30	66.7	4.58
X13			2	4.4	4	8.9	12	26.7	27	60	4.42
X14					5	11.1	18	40	22	48.9	4.38
X15			2	4.4	7	15.6	21	46.7	15	33.3	4.09
Total											64.33

Source: Primary Data Processed, 2025

Mean Variable: 4.28

Based on Table 2, it can be observed that out of 45 respondents surveyed, the overall perception of students regarding the use of e-learning-based instructional media (X1) was generally positive, with a total average score of **4.28**, which falls into the "Good" category. This indicates that Grade XI students at Pondok Pesantren IMMIM Putra Makassar were able to independently access learning materials through web-based platforms, submit assignments on time via Google Classroom, and complete quizzes accurately using Google Forms.

2. Desription of Students' Learning Achievement in Islamic Religious Education (Y)

Data for the learning achievement variable were obtained from the students' test scores in the subject Islamic Religious Education and Character Development for Grade XI at IMMIM Putra Islamic Boarding School, Makassar. The students' test results are summarized in Table 3:

Table 3 Islamic Religious Education Test Results (Y)(Please upload or paste the contents of the table so I can help translate and format it if needed.)

No	Student Name	PAI Learning Outcomes
1	Faisal Abdillah Maulidy	90
2	Muh. Ilham Arif Sirajuddin Rausyanfikir	88
3	Abd. Rahman Syah Kasim	95
4	Muh. Farhan Hasan	93
5	Naufal Hanif Syarif	98
6	Muhammad Fayzul Khayri	90
7	Muh. Abrar Maulana. B	85
8	Muhammad Rifat Al Giffari Rahmat	95
9	Muh. Fathi Ibrahim	88
10	Aslam Wafir Malaganni Dwitama	98
11	Muh. Afigah Fathul Rahman	90

12	Muhammad Rezkyan Syah	83
13	Muhammad Muyassar Ikhwan	95
14	Satria Prawira Pamungkas	95
15	Alif Alfian	88
16	Sultan Haq	95
17	Mahatir Alghazali	90
18	Radhit Nurawal Ramadhan AR	88
19	Muhammad Fakhri Syam	93
20	Andi Sachio Fadhel Fritz Palinrungi	88
21	Abdul Hafizh Sunarto	93
22	Ahmad Zulkarnain	85
23	Muh. Hidayatullah	98
24	Ahmad Arsyan Sofyan	88
25	Atha Rezky Rasyid Zainuddin	98
26	Irsyad Auladi	83
27	Rasya Kharis Pratama	98
28	Ahmad Faqih Fasha	88
29	Athillah Zaky Diaulhaq	95
30	Muhammad Sukri	98
31	Mohamad Reiza Abdilla Toadji	90
32	Andi Raiyan Batara	98
33	Muhammad Azlah Ashar Hendra	95

34	Muhammad Taufiqurrahman	83
35	Nurzaky Sulthan Muslimin	98
36	Nadhir Fitrah Rajun	88
37	Muh. Farhan Bakri	95
38	M. Naufal. RPA	83
39	Arsya Zauky Ramadhan	98
40	Muhammad Muammar Qadafi	85
41	Arya Muliawan	90
42	Ahmad Raihan	98
43	Habibe Marwan	88
44	Muh. Rifal	95
45	Andi Gazali Majid	98

Source: Mapel PAI Teacher of IMMIM Putra Boarding School Makassar

Based on the variable data of student learning outcomes, the mean score was 91.80, the median was 93, the mode was 88, the minimum score was 83, and the maximum score was 98. For more clarity, you can see the table below:

Table 4 Descriptive Statistics of PAI Learning Outcome Variables

Statistics		
Learning Outcomes		
N	Valid	45
	Missing	0
Mean		91.80
Median		93.00
Mode		98.00
Std. Deviation		5.039
Minimum		83.00
Maximum		98.00

Based on this table, the predicate/category of PAI learning outcomes can be summarized in table 5:

Table 5 Frequency Distribution of PAI Learning Outcomes

Value Interval	Predicate	Frequency (F)	Percentage (%)
94-100	Excellent (A)	20	44,4
87-93	Good (B)	18	40,0
80-86	Enough (C)	7	15,6
< 80	Less (D)	0	0
Sum		45	100

Source: Data Processing Results, 2025

The table above shows that there are 20 students who received a very good predicate (A), 18 students with a good predicate (B), and 7 students with a sufficient predicate (C). It can be concluded that the majority of grade XI students at the IMMIM Putra Makassar Boarding School get very good learning results for Islamic Religious Education subjects with a very good predicate (A).

Validity Test

An instrument is declared valid if the calculation $> r_{table}$. R calculation can be seen from the item total correlation while r table can be seen from r product moment with the degree of freedom / $df = n - 2$. If the number of respondents is 45, then the r value of the table can be obtained through the r product of the pearson moment with $df = n - 2$, so $df = 45 - 2 = 43$, then $r_{table} = 0.248$. The results of the validity test can be seen in table 4.9:

Table 5 Instrument Validity Test Results

Variabel	Item Question	R count	R table	Wedt
E-Based Learning Learning	X1	0,472	0,248	Valid
	X2	0,439	0,248	Valid
	X3	0,459	0,248	Valid
	X4	0,576	0,248	Valid
	X5	0,470	0,248	Valid
	X6	0,499	0,248	Valid
	X7	0,521	0,248	Valid
	X8	0,518	0,248	Valid
	X9	0,449	0,248	Valid
	X10	0,468	0,248	Valid
	X11	0,453	0,248	Valid
	X12	0,522	0,248	Valid
	X13	0,450	0,248	Valid
	X14	0,550	0,248	Valid
	X15	0,426	0,248	Valid

Sumber: Hasil Olah SPSS, 2025

Based on table 4.9, the results of the validity test show that all statement items in the questionnaire have a *correlation item_total* > 0.248 . Based on these results, it can be concluded that all statement items in the questionnaire are valid

Reliability Test

A research instrument is declared reliable if the $\alpha > 0.60$. Reliability testing in the study was carried out using *the croanbach's alpha* technique with a sample of 45 respondents. The calculation of the reliability coefficient value for the research instrument used can be seen in the following table:

Table 6 Instrument Reliability Test Results

Variabel	Croanbach's Alpha	Information
Learning E-learning based	0,761	Reliabel

Sumber: Hasil Olah SPSS, 2025

Based on Table 4.10, showing the results of the reliability test of the research instrument, showing *Croanbach's alpha* value > 0.60 , it can be concluded that the instrument is declared reliable.

Simple linear regression test.

Linear regression analysis is used to determine the changes that occur in dependent variables (variable Y), the value of dependent variables based on the independent value (variable X) that is known. It can be seen in the following table 4.11:

Table 7 Simple Linear Regression Test Coefficients ^a						
Model		Unstandardized Coefficients		Standardize d Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	86.135	1.671		51.507	.000
	X	.086	.025	.460	3.395	.001

a. Dependent Variable: Y1

Source: SPSS Processing Results, 2025

So it can be stated that every change in the value of X is 0.086 and the value of Y will increase by 86.135. This means that the higher the X value, the higher the Y value or the higher the influence of E-learning-Based Learning Media , the higher the PAI Learning

Outcome.

T test

The t-test is used to determine the significance of the regression coefficient as well as test the proposed hypothesis. In order for the results obtained by the regression to be explained in a relationship, the results obtained by the regression are tested using the t-test by having the criteria, namely if the t_{cal} value of the table $> t$ or the significant value of < 0.05 then the hypothesis is accepted and if the t_{count} is $< t_{table}$ or the significant value > 0.05 , then the hypothesis is rejected. The results of the t-test can be seen in the following table 8.

Table 8 T test

Coefficients ^a						
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	86.135	1.671		51.507	.000
	X	.086	.025	.460	3.395	.001

a. Dependent Variable: Y1

Source: SPSS Processing Results, 2025

From the results of the t-test in the table above, it shows that the t_{cal} value of the table $> t$ or $3.395 > 1,681$ because the $t_{cal} > t_{of}$ this table shows that the use of E-learning-Based *Learning Media* has an effect on PAI Learning Outcomes.

Determination Test (R²)

The determination coefficient aims to measure how far the computational ability in explaining the variation of the dependent variable Value (R) has an interval between 0 and 1. The following are the results of the Determination (R²) test data in the following table:

Table 9 Determination Test Results (R ²)			
Model Summary ^b			
R	R Square	Adjusted R Square	Std. Error of the Estimate
.460	.21	.193	.7319
a	1		7

a. Predictors: (Constant), elearning-based Learning Media

b. Dependent Variable: Learning Outcomes
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Sumber: Olah Data *SPSS*, 2025

From the results of table 4.13 calculation of *SPSS v.26.00 for windows* data processing, a determination coefficient (R^2) was obtained which was 0.211. This means that the influence of E-learning-Based Learning Media on Student Learning Outcomes is 21.1% while 78.9% is influenced by other factors that affect the rise or fall of student Learning Outcomes because apart from the use of E-learning-Based Learning Media, there are many other factors that have not been researched.

Discussion

The results of this study confirm that the use of e-learning-based learning media has a positive and significant influence on the learning outcomes of Islamic Religious Education (PAI) students. This finding was strengthened by the average score of students' perception of e-learning of 4.28 (the "good" category), as well as the average PAI learning outcomes of 91.80, where more than 44% of students obtained a score in the "excellent" category. This shows that digital-based learning supports academic achievement in the religious realm quite effectively.

The implementation of e-learning allows students to access the material independently, actively participate through online quizzes (Whiter, 2019); (Khalaf & Al Athali, 2020); (Mousa et al., 2020); (Morze et al., 2021); (Digout & Samra, 2023); (Vithana et al., 2023); (van der Merwe et al., 2023); (Cholisoh et al., 2024) as well as submitting assignments on time through digital platforms such as Google Classroom and Google Forms. These findings are in line with a study (Hasibuan & Iqbal, 2021) which emphasizes that e-learning supports flexibility and independence of learning, and can strengthen students' religious character when combined with a reflective and contextual approach.

Furthermore, PAI learning through e-learning does not only touch the cognitive aspect (Alsubhi et al., 2019); (Ansyah, 2022); (Cataudella et al., 2021); (Kaiss et al., 2022); (Kamalludeen, 2022); (Kasim et al., 2022); (Rajiani, 2024) (Nurlela et al., 2025); (Yadati et al., 2025) but also able to form students' moral and spiritual values. (Adri et al., 2021); (Amalia & Julia, 2022) states that blended learning approaches and digital pedagogy can increase the effectiveness of value learning in the context of religious education. The results of the regression test in this study also strengthen this argument, with a significance value of 0.001 (< 0.05) and a determination coefficient value of R^2 of 0.211, which means that e-learning contributes 21.1% to student learning outcomes, while the rest is influenced by other factors.

However, challenges were also identified, especially related to digital literacy gaps, the availability of devices, and teachers' skills in designing learning with Islamic values. This

is reinforced by the opinion (Prayoga et al., 2024); (Ibrahim & Megawati, 2025) which emphasized that teacher training and infrastructure support are the keys to the success of technology integration in PAI learning.

In addition, (Wahyuni & Fatmariza, 2021); emphasizing that project-based learning and interactive multimedia are able to build students' active involvement in understanding Islamic values, which is very much in line with the findings of this study which shows that students are able to take online evaluations optimally.

Thus, it can be concluded that the effectiveness of e-learning in PAI learning is highly determined by contextual learning design, teachers' digital competence, and sustainable digital system support. For this reason, the development of the PAI learning model in Islamic boarding schools must integrate technological aspects and values, so that the process of forming students' religious character can continue to be maintained comprehensively.

Conclusion

Based on the results of the research, it can be concluded that e-learning-based learning media has a significant and positive influence on the learning outcomes of Islamic Religious Education of grade XI students at the IMMIM Putra Makassar Islamic Boarding School. Students showed a high level of e-learning utilization, and the majority managed to achieve learning outcomes with good to excellent predicates.

Statistical analysis shows that the use of e-learning contributes 21.1% to the achievement of learning outcomes, while the rest is influenced by other external factors. Therefore, the application of e-learning in PAI learning needs to continue to be developed with the support of facilities, improving teacher competence, and sustainable character development.

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