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E-Learning Management Practices and Student Achievement in Islamic Education in the Digital Era

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ABSTRACT

Purpose of the study: This study aims to examine the relationship between students'perceived e-learning management practices and students' achievement in Islamic Religious Education (IRE) in an Islamic boarding school, and to estimate the extent to which e-learning management contributes to variations in IRE achievement.

Methodology: A predictive correlational (explanatory survey) design was applied to 45 Grade XI students using total sampling. Data were collected using a 15-item Likert questionnaire, supported by observation and official documentation of IRE academic records. Data were processed using descriptive statistics and simple linear regression in IBM SPSS Statistics version 26, with a t-test for coefficient significance at $\alpha = 0.05$.

Main Findings: Students reported high perceived e-learning management ($M = 64.20$; $SD = 26.89$) and high IRE achievement ($M = 91.80$; $SD = 5.039$; $Min = 83$; $Max = 98$). Regression results showed a significant positive association ($B = 0.086$; $SE = 0.025$; $Beta = 0.459$; $t = 3.395$; $p = 0.001$) with $R = 0.459$ and $R^2 = 0.211$, indicating that e-learning management accounted for 21.1% of the variance in IRE achievement.

Novelty/Originality of this study: This study advances existing evidence by examining e-learning as a measurable management-related construct associated with IRE achievement in an Islamic boarding school context. It provides practical insight for administrators to strengthen platform support, monitoring routines, and teacher facilitation to improve digital IRE learning outcomes.

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1. INTRODUCTION

The management of e-learning in Islamic Religious Education (IRE) represents a strategic adaptation to the demands of the digital era, which is characterized by rapid technological advancement, flexible learning models, and the proliferation of digital platforms in educational practices [1]. The expansion of digital learning also requires adequate digital literacy and teacher capacity to manage learning ecosystems so that online learning becomes meaningful rather than merely technical [2].

From the perspective of Islamic educational management, e-learning is not merely an instructional medium but an integrated system requiring systematic planning, structured implementation, and rigorous evaluation to improve learning quality and student outcomes [3]. Effective management enables students to access

learning resources more independently and to develop learning pathways that align with their cognitive styles and learning preferences [4].

In the context of Islamic education, e-learning management also supports value-based learning by enabling reflective, interactive, and contextualized digital materials that integrate Islamic principles into instructional activities [5]. Proper organization of digital content allows Islamic teachings to be embedded more consistently in the learning process, thereby strengthening religious character education in a relevant way for contemporary learners [6].

This emphasis is particularly important in Islamic boarding schools, where religious and academic curricula are delivered simultaneously, requiring more disciplined coordination of learning resources and learning supervision [7], [8]. Digital learning management can also strengthen the integration of Islamic values into daily learning routines when teachers use platforms to provide guidance, feedback, and continuous reinforcement. [9].

Additionally, e-learning in IRE extends beyond cognitive outcomes by cultivating spiritual awareness, ethical behavior, and religious commitment through carefully curated materials and learning activities [10], [11]. Empirical studies have shown that when digital pedagogy is combined with affective-oriented strategies and blended learning approaches, students demonstrate both academic mastery and value internalization [12], [13].

Well-managed e-learning systems can further foster active learning through project-based tasks, online discussions, and multimedia engagement that transform students from passive recipients into active constructors of knowledge [14], [15]. Such learning designs promote higher-order thinking and deeper understanding of religious concepts when digital interaction and learning monitoring are implemented consistently [16].

Despite these developments, several studies still discuss e-learning implementation at a general level, while fewer studies operationalize e-learning as a measurable managerial construct such as planning, accessibility/support, facilitation, monitoring, and evaluation/feedback especially within Islamic boarding school contexts [17]. Moreover, evidence that statistically links e-learning management dimensions to measurable IRE achievement in pesantren settings remains limited, leaving a clear gap for further investigation [18].

Well-managed e-learning systems in Islamic education can foster active learning by structuring project-based tasks that require students to plan, produce, and reflect on learning outputs in meaningful ways [14], [19]. Online discussions can also strengthen participation and interaction when teachers manage prompts, moderation, and feedback consistently in digital platforms [16], [20]. Multimedia engagement further supports understanding by presenting religious concepts through varied representations that can increase attention and comprehension [21]-[23].

Active learning is strengthened when collaborative digital activities are designed to promote problem solving and student contribution rather than one-way content delivery [24]. This approach becomes more effective when platform use is accompanied by systematic facilitation and monitoring routines that encourage students to stay engaged and complete learning tasks [25]. Active learning outcomes can also improve when e-learning management supports student autonomy and responsibility in completing assignments and participating in learning interactions [26]. In addition, sustained engagement is more likely when digital learning activities are implemented continuously and evaluated through clear standards and feedback cycles [27].

As a result, these learning activities can transform students from passive recipients into active constructors of knowledge, encouraging higher-order thinking and deeper understanding of religious concepts. In light of these considerations, this study aims to examine the relationship between students' perceived e-learning management practices and achievement in Islamic Religious Education among Grade XI students at Pondok Pesantren IMMIM Putra Makassar and to estimate the extent of its contribution in a boarding school context

2. RESEARCH METHOD

2.1. Research Design

This study employed a predictive correlational design using an explanatory survey approach to examine the association and extent [28] of contribution of students' perceived e-learning management practices (X) to students' achievement in Islamic Religious Education (IRE) (Y), without making causal claims.

Research Setting and Participants, the study was conducted at Campus 2 of Pondok Pesantren IMMIM Putra Makassar, an Islamic boarding school that integrates formal education with religious instruction supported by a structured e-learning system. The population consisted of all eleventh-grade students enrolled in the 2023/2024 academic year, totaling 45 students.

2.2. Sampling Technique

A total sampling (saturated sampling) technique was applied because the population size was manageable and the study aimed to capture complete information from all eligible participants. Because the sample was drawn from a single institution with a relatively small population, the findings should be interpreted cautiously in terms of external generalizability beyond similar boarding school contexts.

Variables and Operational Definitions

Independent Variable (X): E-learning management (student perception). This variable refers to students' perceptions of how e-learning is managed in IRE learning activities, including planning, platform accessibility/support, teacher facilitation, monitoring/supervision, and evaluation/feedback. Dependent Variable (Y): IRE achievement. This variable refers to students' IRE learning outcomes obtained from official school academic records.

2.3. Research Instruments

Data were collected using a questionnaire, observation guidelines, and documentation analysis. To improve clarity, the instruments are summarized in Table 1.

Table 1. Research Instruments and Data Sources

Instrument/ Data Source	Variable/ Information	Indicators/Dimensions	Format/ Scale	Output Data
Questionnaire (student survey)	E-learning management (X)	Planning; platform accessibility/support; teacher facilitation; monitoring/supervision; evaluation/feedback	Likert scale (1 = strongly disagree to 5 = strongly agree); 15 items	Composite score of X (mean/total)
Observation guidelines	Implementation context	Platform use (e.g., Google Classroom/Forms); learning routines; teacher management practices	Structured observation notes	Contextual description/corroboration
Documentation analysis	IRE achievement (Y)	Official IRE scores/semester results	Academic record	Achievement score (Y)

The table presents the instruments and data sources used in this study to examine both the independent and dependent variables. The questionnaire, administered to students, is designed to measure e-learning management (X) through several key dimensions, including planning, platform accessibility and support, teacher facilitation, monitoring and supervision, as well as evaluation and feedback. It consists of 15 items using a Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree), and the results are calculated as a composite score (mean or total). In addition, observation guidelines are employed to capture the implementation context, focusing on aspects such as platform usage (e.g., Google Classroom or Forms), learning routines, and teacher management practices, with data recorded in structured observation notes to provide contextual description and corroboration. Furthermore, documentation analysis is used to obtain data on students' IRE achievement (Y), derived from official academic records such as semester results, which are then represented as achievement scores.

2.4. Validity and Reliability of the Instrument

Prior to statistical analysis, content validity was established through expert judgment involving experts in Islamic education, educational technology/e-learning, and educational measurement. Items were reviewed for relevance, clarity, and representativeness of the construct, and revisions were made based on feedback. After revisions, construct validity was tested using item total correlation, and internal consistency reliability was examined using Cronbach's Alpha ($\alpha = 0.761$).

2.5. Research Procedures

The study followed these steps, t he research was conducted through several clear stages. First, in the preparation stage, the researcher obtained permission from the institution and prepared the research instruments, such as questionnaires, observation sheets, and documentation checklists. Next, content validation was carried out by asking experts to review the questionnaire items, followed by revisions based on their suggestions. In the data collection stage, the questionnaire was distributed to all Grade XI students, observations were conducted to understand the implementation context, and students' Islamic Religious Education (IRE) achievement data were collected from school records. After that, the data were processed by coding and entering them into IBM SPSS Statistics (Version 26), as well as checking their completeness. The data were then analyzed using descriptive statistics and regression analysis, including assumption tests. Finally, the results were interpreted and reported as relationships or contributions in line with the predictive correlational research design.

2.6. Data Analysis Techniques

The data were analyzed using IBM SPSS Statistics version 26 through several steps. First, descriptive statistics were used to present the mean (M), standard deviation (SD), minimum, and maximum values of the main variables. Next, regression assumption tests were conducted, including checking the normality of residuals, linearity, homoscedasticity, and independence of errors using the Durbin–Watson test, while multicollinearity was not tested because the study used only one predictor variable. Then, a simple linear regression analysis was performed to estimate the model ($Y = a + bX$), reporting the values of R and R^2, with results interpreted as contributions rather than causal relationships. Finally, hypothesis testing was conducted using a t-test at a significance level of $\alpha = 0.05$ to determine whether the regression coefficient was statistically significant.

2.7. Ethical Considerations

Institutional permission was obtained prior to data collection. Participants (and guardians where applicable) provided informed consent, participation was voluntary, and students could withdraw at any time without penalty. Data were anonymized, stored securely, and used solely for academic purposes.

3. RESULTS AND DISCUSSION

3.1. E-Learning Management (Independent Variable)

The e-learning management variable was measured using a 15-item Likert-scale questionnaire (1 = strongly disagree to 5 = strongly agree) completed by students. Therefore, the score represents students' perceptions of e-learning management practices, including planning, platform accessibility/support, teacher facilitation, monitoring, and evaluation/feedback. Descriptive analysis indicated a high overall score for e-learning management (see Table 3).

Qualitatively, students reported timely access to learning materials, consistent digital instruction delivery, and adequate teacher support through platforms such as Google Classroom and Google Forms, indicating an organized digital learning environment.

Table 3. Descriptive Statistics of Study Variables (N = 45)

Variable	Scale/Source	Mean (M)	SD	Min	Max
E-learning management (X)	15-item Likert questionnaire (TOTAL score; student perception)	64.20	26.89	15	75
IRE achievement (Y)	Official academic record	91.80	5.039	83	98

3.2. Student Achievement in Islamic Religious Education (Dependent Variable)

Student achievement data were obtained from official school records for Islamic Religious Education (IRE). Overall achievement was high (M = 91.80, SD = 5.039, Min = 83, Max = 98; Table 4). For ethical reasons and confidentiality, individual student scores are not displayed; instead, the distribution is summarized by categories (Table 4).

Table 4. Descriptive Statistics of Student Achievement (IRE)

Statistic	Value
N (Valid)	45
Mean	91.80
Median	93.00
Mode	98.00
Std. Deviation	5.039
Minimum	83.00
Maximum	98.00

Table 5. Achievement Categories

Value Interval	Predicate	Frequency	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	0.0
Total		45	100

These results indicate generally strong IRE performance, with most students in the **Good** to **Excellent** categories.

3.3. Regression Assumptions and Predictive Correlational Analysis

Before conducting simple linear regression, assumptions were evaluated, including normality of residuals**,** linearity**,** homoscedasticity**,** and independence of errors**.** Because the model included a single predictor, multicollinearity was not applicable. The assumption checks were conducted using residual diagnostics (e.g., histogram/P–P plot and scatterplots) and indicated that the model was suitable for regression analysis (Table 6).

Table 6. Regression Assumption Checks (Diagnostic Summary)

Assumption	Indicator/Procedure	Result
Normality of residuals	Histogram & Normal P–P Plot	Residuals visually approximated normal distribution
Linearity	Scatterplot (Observed vs Predicted)	Linear trend indicated
Homoscedasticity	Residual scatterplot	No clear funnel pattern observed
Independence of errors	Study design (cross-sectional); DW not computed	Independence assumed; DW can be reported if SPSS option enabled

Simple linear regression was performed to examine the extent to which students' perceived e-learning management practices were associated with IRE achievement. The regression equation was:

$$Y = 86.135 + 0.086X$$

This indicates that higher perceived e-learning management scores are associated with higher IRE achievement scores. The regression results are presented in Table 7.

Table 7. Simple Linear Regression Results (Dependent Variable: IRE Achievement)

Predictor	B	SE(B)	Beta	t	p
(Constant)	86.135	1.671	—	51.507	0.000
E-learning management (X)	0.086	0.025	0.459	3.395	0.001

Model summary: $R = 0.459$**;** $R^2 = 0.211$; $N = 45$

The model explained 21.1% of the variance in IRE achievement ($R^2 = 0.211$), suggesting a meaningful but moderate contribution**.** Given the predictive correlational design, these findings should be interpreted as evidence of a statistically significant association/contribution, rather than a direct causal impact.

Therefore, it can be concluded that students' perceived e-learning management practices show a significant positive association with IRE achievement and provide a measurable contribution to explaining differences in students' learning outcomes within the studied Islamic boarding school context.

3.4. Discussion

The findings show that students' perceived e-learning management practices are positively and significantly associated with IRE achievement, indicating that learning outcomes in digital environments depend not only on the availability of platforms but also on how learning is planned, supported, monitored, and evaluated in daily practice. This interpretation aligns with the argument that successful e-learning requires systematic coordination of instructional design, contextual readiness, and ongoing evaluation rather than relying solely on technology adoption .

The coefficient of determination ($R^2 = 0.211$) indicates a meaningful but moderate contribution**,** meaning that e-learning management accounts for 21.1% of the variance in IRE achievement. The remaining variance is likely related to factors beyond managerial practices, such as students' learning motivation, prior achievement, digital literacy, and teacher pedagogical competence, which are frequently identified as determinants of achievement in digital learning settings [29]. In Islamic education settings, the management of learning is also closely connected to students' engagement with value-based content, which may shape both participation and internalization of religious learning goals [30].

In the pesantren context, the association found in this study can be understood within a learning environment that combines academic obligations with structured religious routines, where institutional governance may shape discipline, learning schedules, and access to support. In this study, observation and documentation were used to contextualize the quantitative results by describing the implementation setting and confirming that achievement scores were derived from official academic records. This provides additional credibility that the dependent variable reflects formal learning outcomes rather than self-reported achievement.

The originality of this study lies in framing e-learning as a managerial construct consisting of planning, accessibility/support, facilitation, monitoring, and evaluation/feedback, then linking these dimensions statistically to measurable IRE achievement in an Islamic boarding school setting. This perspective extends discussions that often focus on platform use by emphasizing that governance and daily learning management practices can be quantified and examined as an academic predictor [31].

Despite the positive association, the findings also highlight practical challenges that may limit the consistency of effective implementation. Digital transformation in Islamic education can be constrained by infrastructure limitations and unequal access to stable connectivity, which affects participation and continuity of learning [32]. Teacher competence in digital pedagogy can also vary, which may influence the quality of facilitation, feedback, and monitoring across learning sessions and therefore reduce the consistency of management practices experienced by students. [31].

This study also suggests that active learning strategies should be integrated more systematically into e-learning management, because structured project-based tasks and guided online discussions can strengthen student engagement and higher-order thinking [14]. Multimedia-supported learning can further support comprehension when digital resources are curated and aligned with learning outcomes, particularly for abstract or value-oriented religious concepts [21]. Such approaches may strengthen the quality of e-learning management by making learning interactions more meaningful and by increasing student participation in ways that support achievement.

This study has several limitations. First, the sample was limited to one Islamic boarding school campus with a relatively small population (N = 45), so generalization to broader contexts should be made cautiously. Second, the independent variable was measured using students' perceptions, which may be influenced by response tendencies and individual differences. Third, the model used a single predictor, meaning that other potentially important determinants of IRE achievement were not included in the regression model and may explain the majority of variance.

Future studies should involve larger samples and multiple Islamic boarding schools to strengthen external validity and allow comparison across contexts. Additional predictors should be included, such as learning motivation, digital literacy, teacher pedagogical competence, instructional design quality, assessment practices, and pesantren learning culture, to build a more comprehensive explanatory model of IRE achievement. Mixed-method approaches may also be used to explore how specific management dimensions (e.g., monitoring routines or feedback systems) operate in practice and how they can be improved through institutional policy.

In summary, this study emphasizes that managing digital learning environments with intentionality and pedagogical insight is essential in Islamic boarding schools, where education aims to balance academic achievement with spiritual growth. The results suggest that improving e-learning management governance can support better learning outcomes, although additional factors beyond management practices should be addressed for broader and more sustainable improvement.

4. CONCLUSION

This study found a statistically significant positive association between students' perceived e-learning management practices and Islamic Religious Education (IRE) achievement. The regression results ($t = 3.395$; $p = 0.001$) indicated that perceived e-learning management contributed moderately to achievement variation ($R^2 = 0.211$), meaning that approximately 21.1% of the variance in IRE achievement was explained by the model. Practically, these findings suggest that administrators of Islamic boarding schools may strengthen digital IRE learning outcomes by improving managerial components such as instructional planning, platform support, monitoring routines, and timely feedback. The results should be generalized cautiously due to the single-site context and limited sample size; future studies should include multiple boarding schools and additional predictors to provide a more comprehensive explanation of achievement.

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