Dirasah: International Journal of Islamic Studies
Vol. 4, Issue (1) (April, 2026), pp. 160-175
ISSN: 2986-9250 , DOI: https://doi.org/10.59373/drs.v4i1.94

Digital Learning Ecosystems and Learning Outcomes in Islamic Education: The Role of Mobile Learning, Digital Resources, and Instructional Models

Fathul Janah[1], Mohammad Salehudin[1], Siti Rosilawati Ramlan[2]

[1] Universitas Islam Negeri Sultan Aji Muhamamd Idris Samarinda Indonesia;
fathuljanah@uinsi.ac.id, moh.salehudin@uinsi.ac.id
[2] Universiti Sains Islam Negeri Sembilan, Malaysia; rosilawati@usim.edu.my

ARTICLE INFO

Keywords:

Mobile Learning;
Digital Learning Resources,
Learning Models,
Islamic Religious Education,
High School.

Article history:

Received 2026-04-29
Revised 2026-05-12
Accepted 2026-07-01

ABSTRACT

This research aims to investigate whether mobile learning, digital learning resources, and learning models have a significant influence on the learning outcomes of Islamic Religious Education. The study employs a quantitative approach using a survey research design, drawing a sample of 145 respondents through random sampling. Data collection is conducted using instruments that have been tested for validity and reliability. Data analysis is performed using Structural Equation Modelling (SEM) with Partial Least Squares (PLS) version 4.0. The study's findings reveal that mobile learning (ML) does not have a significant effect on Islamic Religious Education Learning Outcomes (IRELO) and is therefore rejected. Conversely, the variables of Digital Learning Resources (DLR) and Learning Model (LM) show a significant influence on IRELO and are accepted. Consequently, this research identifies a substantial impact among the variables, aligning with the ongoing digital transformation in education. It is imperative that both educators and students effectively utilise digital learning resources and mobile learning in their educational practices to ensure the attainment of educational objectives. The best learning model is not a single, rigid formula, but rather the one that best suits the instructional objectives, material characteristics, and students' specific needs, and whose development is fully supported by the completeness of digital learning resources. This research is crucial for the ultimate goal of enhancing the quality of education and cultivating a golden generation for Indonesia by the year 2045.

Corresponding Author:
Fathul Janah: Universitas Islam Negeri Sultan Aji Muhammad Idris Samarinda, Indonesia;
fathuljanah@uinsi.ac.id

INTRODUCTION

Digital transformation in the education sector is no longer merely an operational option but rather an absolute strategic response to technological disruption to maintain institutional relevance, improve governance efficiency, and build a modern, data-driven academic ecosystem (Batmetan, 2026; Mujahidin, 2026). This change demands a profound reconstruction that integrates cloud computing, artificial intelligence (AI), and adaptive learning platforms into curriculum structures and school governance models (Carmo, 2025). Through this adoption, educational institutions are expected to modernize bureaucratic workflows, automate academic services, and create personalized and flexible learning spaces to meet 21st-century stakeholder expectations.

However, the reality on the ground shows that the level of digitalization across educational institutions, particularly in developing countries like Indonesia, remains relatively low due to multidimensional unpreparedness, including financial limitations, infrastructure disparities, and organizational cultural resistance (Farhillah, 2026; Saputra, 2026). In disadvantaged, frontier, and outermost (3T) regions, this transformation process is hampered by fundamental problems, including limited electricity supply, a lack of devices, and the unequal distribution of high-speed internet (Farhillah, 2026). As a result, digital initiatives often fail to achieve long-term sustainability because they focus solely on hardware procurement, without the accompanying standardization of a mature information technology architecture and integration with adaptive governance (Batmetan, 2026). The utilisation of mobile learning (Zh et al., 2024) and Digital Learning Resources (Adeshina, 2024; Sugiyanto et al., 2024) in Islamic religious education has significant potential to enhance learning outcomes.

The tactical integration of mobile learning (ML) and digital learning resources (DLR), mediated by an appropriate learning model (LM), is grounded in the theoretical foundations of Constructivism and Connectivism, where technology serves as an active catalyst that transforms passive classrooms into student-centered instructional ecosystems. In the domain of Islamic Religious Education, the synergy of these three components provides flexible accessibility without the limitations of space and time, allowing the internalization of religious values to occur in a more contextual, interactive, and personalized manner, tailored to each individual's learning pace. By designing an adaptive learning model that leverages a wide range of digital media, from digital religious texts and interactive audiovisuals to mobile-based fiqh simulations, students' cognitive, affective, and spiritual processes can be stimulated simultaneously. The combination of teachers' ICT mastery, the availability of attractive digital learning resources, and the accuracy of this mobile-based instructional model has been proven empirically and theoretically to contribute significantly to optimizing the achievement of Islamic Religious Education Learning Outcomes (IRELO), both in terms of normative cognitive understanding and practical daily character practice.

However, to fully realise its benefits, attention must be directed to the factors influencing the effective implementation of technology use, while minimising barriers to access and utilisation among teachers and students in the classroom. Consequently, it is imperative to conduct research that examines various theories and prior studies addressing these issues, in order to ascertain the extent of the impact of mobile learning (ML), Digital Learning Resources (DLR), and Learning Models (LM) on Islamic Religious Education Learning Outcomes (IRELO) within the context of Islamic Education lessons (Rafiq et al., 2024).

In deep and meaningful learning, various approaches are essential, particularly in technology-based Islamic Religious Education. However, it has been acknowledged that accessibility can pose a challenge to implementation; not all students have adequate devices or stable internet connections. Furthermore, the latest technological approaches to learning have not been effectively implemented by

all teachers and students (Ahmad et al., 2025; Danish & Hmelo-Silver, 2020), digital learning resources and learning models (Halawa et al., 2022; Rahmawati & Salehudin, 2021; Syah et al., 2024). Students who utilise mobile learning and digital learning resources tend to be more active and engaged in the learning process, as they can access materials at any time and from any location. This aligns with constructivist learning theory, which posits that active interaction with learning materials can enhance understanding and information retention.

The utilisation of mobile learning has become increasingly prevalent in education, particularly in the instruction of Islamic Religious Education (PAI) at the Senior High School (SMA) level. This mobile learning approach offers greater flexibility in comparison to traditional methods, which are often constrained by specific times and locations. One of the primary advantages of mobile learning is its ability to deliver interactive and engaging educational materials (Zh et al., 2024).

As an application, Ruangguru offers Islamic Education (PAI) content that is not only in text form but also includes videos, quizzes, and discussion forums. Previous research has indicated that students who utilise mobile learning applications demonstrate improved learning outcomes compared to those who rely solely on textbooks (Danish & Hmelo-Silver, 2020). This indicates that mobile learning can enhance students' understanding of Islamic Education (PAI) material. Furthermore, mobile learning supports a more personalised approach to education; through various applications, students can learn at their own pace and according to their individual learning styles (Solihah et al., 2022).

Several previous studies have identified new and interesting research findings that can be developed into findings in the field of education and learning. Research conducted by M. Sudeka and Arif Setiawan (2024) indicates that students who engage in learning through mobile applications tend to exhibit greater independence and proactivity in seeking additional information regarding Islamic Religious Education (PAI) (Sudeka & Setiawan, 2024), creating a more positive learning atmosphere and enhancing student motivation, as well as the utilisation of mobile learning, has a positive impact on the learning outcomes of Islamic Religious Education in senior high schools. Mobile learning can serve as an effective tool for improving the quality of Islamic Education in Indonesia (Antoni, 2023; Kulbi, 2019).

Similarly, digital learning resources have become an integral part of the learning process in this digital era. In the context of Islamic Education, digital learning resources such as e-books, educational videos, and online articles provide students with broader access to understand various concepts and values of Islam. The utilisation of digital learning resources in Islamic Education can enhance students' interest and comprehension of the subject matter. Digital learning resources offer a variety of information delivery methods, which can assist students with diverse learning styles. For instance, students who prefer visual learning can benefit from educational videos that engagingly explain Islamic Education concepts. This demonstrates that the diversity of digital learning resources can cater to students' varying educational needs.

Digital learning resources also enable students to access the latest and most relevant information regarding contemporary issues. With the availability of the internet, students can easily find articles, journals, and news on themes in Islamic Education (PAI). Consequently, students feel more confident in discussing Islamic issues after utilising digital learning resources. This indicates that digital learning resources not only enhance knowledge but also improve students' critical thinking skills (Asante & Novak, 2024).

Not all information available on the internet is reliable; therefore, students must be trained to discern and select valid sources. In this context, the role of teachers in guiding students to utilise digital learning resources wisely is of utmost importance. Consequently, educators need to provide training on how to search for, evaluate, and effectively use information from digital sources (Adeshina, 2024).

Teachers must strive for excellence and be proficient in employing instructional models such as project-based, cooperative, and problem-based learning, which have been shown to effectively enhance student engagement and learning outcomes. The appropriate instructional model can have a significant positive impact on educational outcomes in Islamic religious studies (Ritiauw et al., 2021; Salehudin, 2023). By adopting a learning model aligned with students' needs, the teaching of Islamic Religious Education (PAI) in the digital era is expected to enhance learning outcomes and enable students to better comprehend the teachings of Islam (Oktavia & Khotimah, 2023).

The cooperative learning model has emerged as an effective approach to enhancing student collaboration, particularly in Islamic Religious Education (PAI). This research discusses the implementation of the cooperative learning model (Slavin, 2022). The learning process in Islamic Religious Education (PAI) aims to develop social skills, enhance comprehension of the material, and promote a spirit of mutual cooperation among students (Indrawati & Desky, 2024). By employing strategies such as group discussions, jigsaw activities, and think-pair-share, cooperative learning fosters an inclusive and collaborative learning environment, thereby enhancing educational outcomes (Halawa et al., 2022). This model not only enhances student engagement in the learning process but also reinforces Islamic values, such as ukhuwah Islamiyah (Islamic brotherhood) and tolerance. The implementation of cooperative learning models is an effective approach to fostering collaboration among students while strengthening character development in alignment with Islamic principles (Syah et al., 2024).

The purpose of this study is to analyze and empirically demonstrate the impact of mobile learning on learning outcomes in Islamic Religious Education. Furthermore, it aims to examine and describe the tangible contribution of digital learning resources to improving students' Islamic Religious Education learning outcomes in schools. Furthermore, this study aims to investigate the effectiveness of implementing specific learning models in moderating the instructional process, thereby significantly impacting holistic learning outcomes in Islamic Religious Education.

METHODS

This research employs a quantitative approach (Creswell, 2013; Mukrimaa et al., 2016) with a survey research type (Fred, 2019). The population of this study comprises high school students in Samarinda, East Kalimantan. This study is conducted during the academic year 2024-2025, with the selection of respondents employing a random sampling technique (Ghony & Almanshur, 2009; Sugiono, 2016), It is employed to ensure that students have an equal opportunity as respondents, who are designated as such by returning the questionnaire response sheets, utilising Google Forms to facilitate the collection of data for the research outcomes, The following explanation is an elaboration of the hypothesis that we narrate as an illustration.

The first hypothesis, which states that mobile learning influences learning outcomes in Islamic Religious Education, is based on the premise that the accessibility and flexibility of mobile technology can overcome the limitations of space and time in the process of internalizing religious values. When students can access religious materials independently on their devices, their motivation and active engagement in learning will increase, thereby linearly optimizing the achievement of their cognitive and affective learning outcomes in Islamic Religious Education. Furthermore, the second hypothesis regarding the influence of digital learning resources on learning outcomes in Islamic Religious Education is based on the idea that the diversity of digital media, such as worship video tutorials, e-books of holy books, and interactive applications, can present abstract material in a more concrete and engaging way. The availability of these rich, contextual digital learning resources enhances students' ability to absorb information more deeply, thereby directly improving student learning outcomes.

Meanwhile, the third hypothesis, which confirms the influence of learning models on learning outcomes in Islamic Religious Education, assumes that the effectiveness of instructional interactions is highly dependent on the accuracy of the syntax or learning steps applied by the teacher. An adaptive, student-centered learning model that integrates technology harmoniously will create a classroom ecosystem conducive to critical thinking, enabling the optimal transmission of the procedures and substance of Islamic teachings, and achieving maximum learning outcomes.

The population comprises senior high school students, and the research sample was selected through random sampling, with 145 students designated as respondents for this study. This study involved a sample of 145 students, all of whom were enrolled in formal government-owned senior high schools, across two public schools: a State Senior High School (SMAN) and a State Vocational High School (SMKN). All of the research subjects, who served as the unit of analysis in this study, were in grade XI. An analysis of the sample data reveals that the majority of respondents are female gender, as illustrated in the following table:

Table 1. The characteristics of the Respondent

No	Characteristics	Prosentase
1	Male	41%
	Female	59%
2	Learning Technology Equipment	
	Smartphone	87%
	Laptop	13%
3	Domisili	
	City	92%
	Village	8%
4	Total respondents	145 siswa

The research instrument comprises 21 questionnaire items, developed from key theories pertinent to the research variables, including those proposed by Adeshina, A. E. (2024). The transformative role of digital resources in teaching and learning. *Open Journal of Educational Development*. Asante, K., & Novak, P. (2024). When the push and pull factors in digital educational resources backfire: The role of the digital leader in digital educational resources usage. *Education and Information Technologies*. Additionally, several other variable theories are employed.

The research process began with the instrument preparation stage, during which researchers developed a structured questionnaire to measure mobile learning variables, digital learning resources, learning models, and Islamic Religious Education learning outcomes among the target population. After the questionnaire instrument was validated and deemed feasible, researchers moved to the data collection stage, leveraging the efficiency of digital communication technology via the WhatsApp application.

The digital questionnaire link was widely distributed in WhatsApp chat groups of eleventh-grade students at the public high schools (SMA) and vocational high schools (SMK) serving as the research locations, providing students with easy access to respond flexibly during their Islamic Religious Education classes. Given that data collection was conducted online and voluntarily, researchers implemented a strict data selection procedure at the final stage, including only responses from students who completed and returned the questionnaire.

Thus, from the entire eleventh-grade population at the two public schools exposed to the research link, a definitive sample of 145 students who returned valid questionnaires was obtained. Data from this group of students was then subjected to further statistical analysis to test all formulated research hypotheses.

The validity and reliability results are presented in Tables 1 and 2. The research design, featuring the respective variables of Mobile Learning (ML), Digital Learning Resources (DLR), and Learning Model (LM) in relation to Islamic Religious Education Learning Outcomes (IRELO), is illustrated in the following research design diagram:

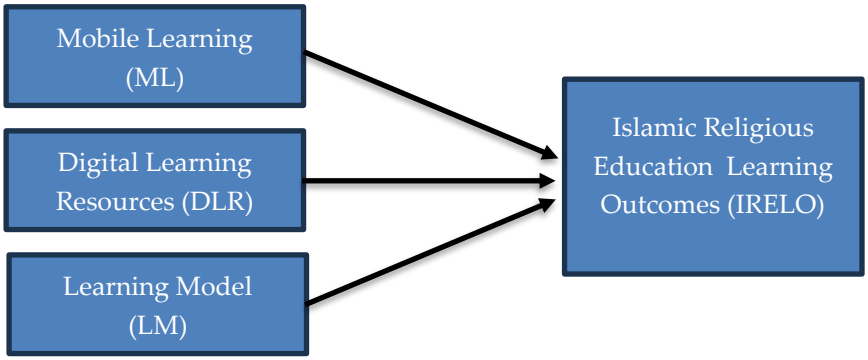

Figure 1. Research Design

This study prioritises the testing of research hypotheses to ascertain the extent of the influence among the variables under investigation: (1) Mobile learning influences learning outcomes in Islamic education. (2) Digital learning resources influence learning outcomes in Islamic education. (3) The learning model influences learning outcomes in Islamic education.

Data analysis is conducted using PLS-SEM (Hair et al., 2019). By examining all data obtained from the questionnaire using the smartPLS application, this analysis will reveal the significance of the variables and determine the magnitude of the relationships among them in this study. The Structural Equation Modeling-Partial Least Squares (SEM-PLS) analysis procedure in this study began with an evaluation of the outer model to assess the instrument's validity and reliability among 145 public and vocational high school students who returned the questionnaire. This testing was conducted through convergent validity analysis with thresholds for loading factor values above 0.70 and Average Variance Extracted (AVE) above 0.50, as well as discriminant validity testing using the Fornell-Larcker criteria or a Heterotrait-Monotrait Ratio (HTMT) value below 0.90. In addition to validity testing, the internal consistency of the indicators measuring mobile learning variables, digital learning resources, learning models, and Islamic Religious Education learning outcomes was ensured by meeting reliability criteria with Cronbach's Alpha and Composite Reliability (CR) values above 0.70.

After the measurement model is fulfilled, the analysis continues with the evaluation of the inner model and hypothesis testing through a non-parametric bootstrapping procedure using 5,000 subsamples. The evaluation of the inner model is measured based on the criteria of the coefficient of determination (R-square) to see the contribution of variance, predictive relevance (Q-square) through blindfolding with a value that must be greater than zero, and model fit using the Standardized Root Mean Square Residual (SRMR) parameter below 0.08 and the Normed Fit Index (NFI) approaching 1.00. The causal relationship between variables is stated to have a significant influence if the estimation results show a t-statistic value greater than 1.96 (or a p-value <0.05) at the 95% confidence level, which is strengthened by testing the bias-corrected and accelerated (BCa) confidence interval, where the range of values between the lower and upper limits does not cross zero.

FINDINGS AND DISCUSSION

Findings

In this section, we explain the application used as a finding, not explaining it as a reinforcement of the preliminary explanation of this research. The digital learning resources used in the instruction of Islamic Religious Education at the Senior High School level in the research location included applications such as Canva, Learning Management Systems (LMS), Google Classroom, and Quizlet. The utilisation of digital tools significantly aids both educators and students in the learning process. Various learning resources favoured by students can be accessed during instruction and when completing academic tasks. For instance, Quizlet offers a range of interactive learning activities designed to facilitate memorisation and comprehension of material through a multimedia approach and gamification techniques.

The following is an image of the Quizlet application in the context of learning, which can be utilised by both teachers and students in the study of Islamic Religious Education within this research.

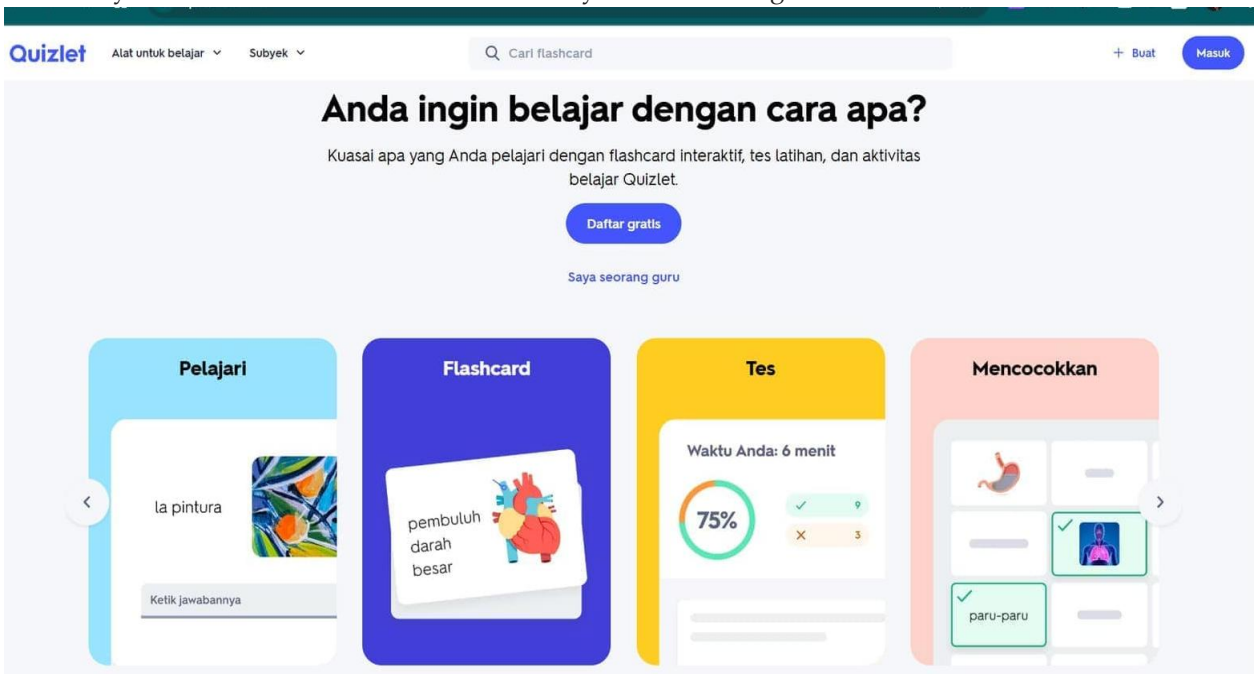

Figure 2. The Quizlet application, accessible at: https://quizlet.com/id

As illustrated in Figure 2 above, several digital learning resources are available for Islamic Education (PAI) teachers to utilise in their teaching, particularly within senior high schools. The Quizlet application significantly enhances the use of digital materials and resources in PAI instruction. It not only facilitates the learning process but also engages students, thereby fostering motivation to learn.

Furthermore, learning outcomes can be influenced by various variables. In the validation of the research instruments for this study, numerous questions were found to be accepted as valid, while only a few items, specifically questions P3, S1, S2, X2, Y2, Y6, and X1, were deemed invalid. This determination was based on the validation threshold used in the Structural Equation Modelling (SEM) analysis, set at 0.70; values below this threshold are considered invalid.

Table 2. Results of Instrument Validity

Question	Digital Learning Resources	Islamic Religious Education Learning Outcomes	Learning Model	Mobile Learning
P1		0.751		
P2		0.791		
P3		0.638		
P4		0.703		
P5		0.776		
S1	0.573			
S2	0.630			
S3	0.809			
S4	0.768			
S5	0.742			
X2				0.564
X3				0.795
X4				0.770
Y1			0.743	
Y2			0.697	
Y3			0.790	
Y4			0.796	
Y5			0.808	
Y6			0.624	
X1				0.605

A value above 0.700 is deemed valid, whereas any computed result below 0.700 is considered invalid and is excluded from the calculations used to assess the hypotheses of this research. The reliability results for each variable can be found in Table 3, specifically regarding the Composite Reliability (rho_c) as follows:

Table 3. Results of Variable Reliability

	Cronbach's alpha	Composite reliability (rho_a)	Composite reliability (rho_c)	Average variance extracted (AVE)
Digital Learning Resources	0.747	0.759	0.833	0.504
Islamic Religious Education Learning Outcomes	0.786	0.798	0.853	0.539
Learning Model	0.838	0.844	0.882	0.556
Mobile Learning	0.639	0.667	0.781	0.477

Based on the results of the measurement model testing (outer model) using SEM-PLS, the evaluation of convergent validity and construct reliability for the four latent variables generally met methodological requirements. However, there were specific notes regarding the Mobile Learning construct. The convergent validity test measured through the Average Variance Extracted (AVE) parameter showed that three main variables—namely Digital Learning Resources (0.504), Islamic Religious Education Learning Outcomes (0.539), and Learning Model (0.556)—had exceeded the ideal threshold set at 0.50. This empirical evidence shows that more than 50% of the variance in these indicators was explained by each latent variable. Meanwhile, the Mobile Learning construct has an AVE value of 0.477, which is slightly below the threshold of 0.50, but in contemporary PLS-SEM

methodology literature, an AVE value between 0.40 and 0.50 can still be tolerated and declared acceptable as long as the Composite Reliability value of the construct has met the requirements above 0.70.

The strengthening argument regarding the feasibility of all constructs in this study is convincingly supported by the reliability test results, in which the Composite Reliability (rho_c) for all latent variables exceeds the standard threshold of 0.70. In detail, the highest level of internal consistency is shown by the Learning Model construct, with a rho_c value of 0.882, followed by Islamic Religious Education Learning Outcomes (0.853), Digital Learning Resources (0.833), and Mobile Learning (0.781). This situation is reinforced by the Composite Reliability value (rho_a), which consistently moves above 0.70 for the three main constructs and approaches the safe limit for the Mobile Learning construct (0.667). In the Cronbach's Alpha parameter, the Digital Learning Resources construct (0.747), Islamic Religious Education Learning Outcomes (0.786), and Learning Model (0.838) are proven to be very reliable because they are above 0.70. At the same time, the Mobile Learning value of 0.639 is still considered moderate and acceptable for quantitative research in the field of social sciences and education. Thus, all instruments used to measure the interaction between digital teaching and learning outcomes in Islamic Religious Education among 145 students at this State High School/Vocational High School have a solid foundation in reliability and validity to proceed to the stage of testing the structural model (inner model).

The data presented in Table 2 indicate that reliability coefficients exceeding 0.700 indicate a high level of reliability, as evidenced by the Composite Reliability (rho_c) column. This research has established a significance level (alpha α), which is conventionally set at 0.05 (5%) or 0.01 (1%). This value represents the acceptable risk of error that the researcher is willing to tolerate when rejecting the null hypothesis (H0), which is presumed to be true. Furthermore, the research findings reveal that the significance values exceed 0.05 for each question item across all research variables, as illustrated in the subsequent table:

Table 4. Results of P Values (question item values)

Variabel	Original sample (O)	Sample mean (M)	Standard deviation (STDEV)	T statistics (|O/STDEV|)	P values
P1 <- IRELO	0.751	0.749	0.052	14.361	0.000
P2 <- IRELO	0.791	0.788	0.044	17.787	0.000
P4 <- IRELO	0.703	0.703	0.083	8.515	0.000
P5 <- IRELO	0.776	0.769	0.063	12.319	0.000
S3 <- DLR	0.809	0.808	0.046	17.413	0.000
S4 <- DLR	0.768	0.766	0.049	15.736	0.000
S5 <- DLR	0.742	0.736	0.088	8.471	0.000
X3 <- ML	0.795	0.795	0.041	19.635	0.000
X4 <- ML	0.770	0.769	0.059	13.046	0.000
Y1 <- LM	0.743	0.736	0.079	9.439	0.000
Y3 <- LM	0.790	0.780	0.071	11.203	0.000
Y4 <- LM	0.796	0.800	0.054	14.687	0.000
Y5 <- LM	0.808	0.806	0.051	15.937	0.000

The results of the outer loadings (factor loadings) estimation using the PLS-SEM algorithm indicate that all indicators exhibit very strong convergent validity and are statistically significant in reflecting their respective constructs. Based on empirical data, all outer loading values of indicators P1, P2, P4, P5 (in the IRELO variable), S3, S4, S5 (in the DLR variable), X3, X4 (in the ML variable), and Y1, Y3, Y4, Y5 (in the LM variable) have exceeded the standard ideal criteria of 0.70, with a range of values moving from the lowest 0.703 (P4) to the highest 0.809 (S3). The reliability of these indicators is

strengthened by the results of the bootstrapping test, where the t-statistic value of each reflexive relationship is far above the critical threshold of 1.96 (with the lowest t-value of 8.471 in S5 and the highest of 19.635 in X3) and is supported by an absolute significance p-value of 0.000 ($p < 0.05$). Thus, it can be confidently concluded that all instrument items exhibit high accuracy and stability in measuring the empirical manifestations of the digital learning process, instructional models, and the achievement of Islamic Religious Education learning outcomes among 145 students in the field.

The clarification of the hypothesis-testing results, as indicated by the P-value, is shown in Figure 3. The hypothesis test for the mobile learning (ML) variable regarding Islamic Religious Education Learning Outcomes (IRELO) was not substantiated and was therefore rejected, as the P value is 0.074, which is greater than 0.05. Conversely, for the variables of Digital Learning Resources (DLR) and Learning Model (LM) in relation to Islamic Religious Education Learning Outcomes (IRELO), the hypotheses were accepted and found to be significant, with P values of 0.007 and 0.000, both of which are less than 0.05. This is clearly illustrated in the following Figure 3:

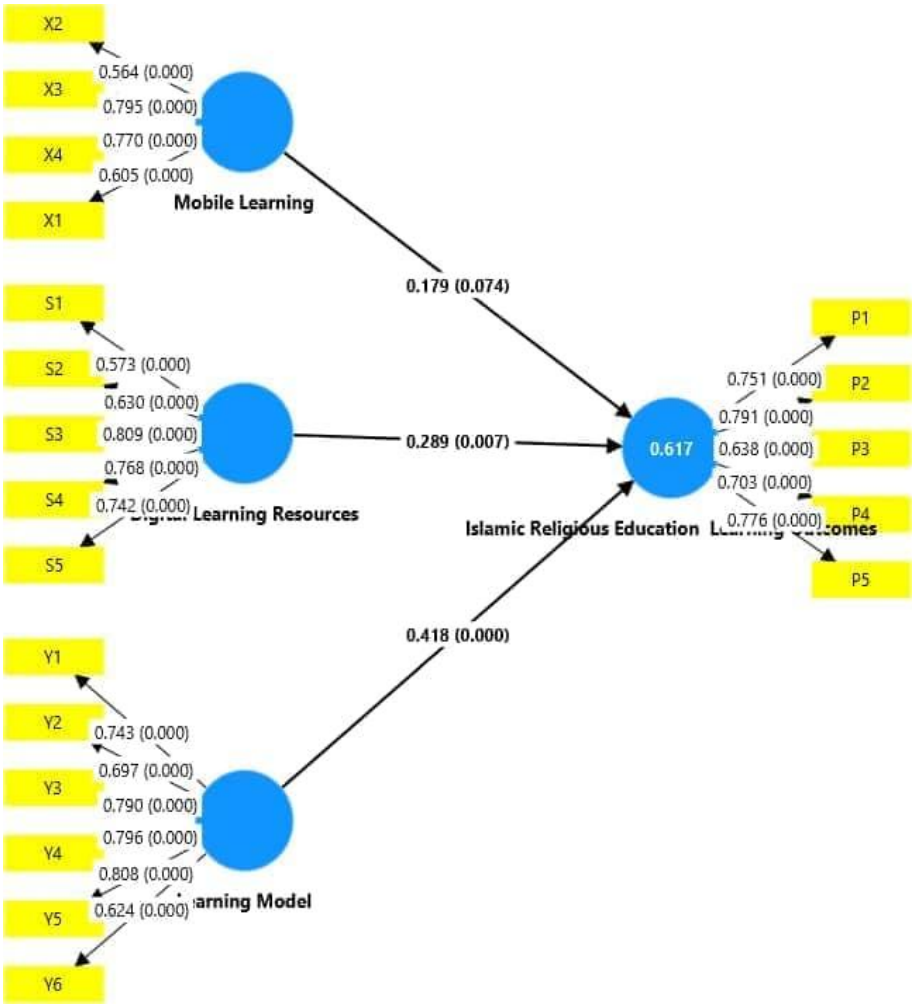

Figure 3. Results of the hypothesis testing

Based on Figure 3, the items in the questionnaire have significance values below 0.05 and above 0.70, categorising them as valid items. Conversely, the hypothesis concerning the variables that exert a significant influence is represented by a significance value of 0.000 or less than 0.05. Those exceeding this threshold are deemed to have no effect, resulting in the rejection of the hypothesis (ML) in relation to (IRELO).

In the structural model evaluation (inner model), the endogenous construct of Islamic Religious Education Learning Outcomes has a coefficient of determination (R2, or R-square) of 0.617, as indicated by the number in the blue circle for the construct. This value indicates that 61.7% of the variation in Islamic Religious Education learning outcomes is explained by the variables Mobile Learning, Digital Learning Resources, and Learning Model, while the remaining 38.3% is attributable to factors outside the research model. Partial hypothesis testing indicates different directions of influence and levels of significance for the three predictor variables.

The path coefficient for the influence of Mobile Learning on Islamic Religious Education Learning Outcomes is 0.179 ($p = 0.074$), indicating that the effect is not statistically significant because the p-value is above the 0.05 threshold. Conversely, the path between Digital Learning Resources and Islamic Religious Education Learning Outcomes was significant, with a path coefficient of 0.289 and a p-value of 0.007 ($p < 0.05$). The Learning Model construct had the strongest influence on Islamic Religious Education Learning Outcomes, with a path coefficient of 0.418 and an absolute p-value of 0.000 ($p < 0.01$).

Meanwhile, in the measurement model (outer model), the loading factor values and p-values for each construct assessment indicator are also clearly displayed next to the reflexive arrows. All indicators in the Mobile Learning variables (X1 to X4), Digital Learning Resources (S1 to S5), Learning Model (Y1 to Y6), and Islamic Religious Education Learning Outcomes (P1 to P5) demonstrated an absolute significance p-value of 0.000. Although indicators X1, X2, S1, S2, Y2, Y6, and P3 have loading weights below 0.70, this visualization confirms that all manifest items have a statistically valid contribution in establishing the existence of their respective latent constructs in the model.

Discussion

The empirical findings in this study demonstrate that the combined use of mobile learning (ML), digital learning resources (DLR), and learning models (LM) accounted for 61.7% of the variation in Islamic Religious Education Learning Outcomes (IRELO) among 145 public high school and vocational high school students. The results of this simultaneous interaction provide concrete confirmation supporting the main tenets of constructivist learning theory, where religious knowledge is no longer simply transferred passively from teacher to student, but rather is actively constructed by students through the manipulation of digital resources and the flexibility of device accessibility, structured within the syntax of an adaptive instructional model. Partially, although mobile learning requires the mediation of a mature learning model for optimal impact due to its insignificant independent influence value, the presence of digital learning resources and the appropriateness of the learning model have been strongly proven to be key pillars in accelerating students' cognitive understanding and internalization of affective values in Islamic Education.

However, this study has contextual limitations that require attention, particularly the sample size, which only included 145 eleventh-grade students from two public schools, including senior high schools (SMA) and vocational high schools (SMK). The cross-sectional nature of quantitative data collection through questionnaires distributed via WhatsApp also limited the depth of analysis in capturing longitudinal changes in students' spiritual behavior or character habituation. Furthermore, the Average Variance Extracted (AVE) value for the mobile learning variable, which fell slightly below the ideal threshold, indicates indicator variation that requires further instrument refinement to more comprehensively capture the digitalization phenomenon in future research.

The theoretical significance of this study lies in expanding the literature on the integration of educational technology in the domain of normative religious education, while also reinforcing the urgency of modern learning models as a key variable orchestrating digital devices in the classroom. Practically, the implications of this research provide strategic guidance for Islamic Religious Education teachers and school policymakers to focus investments beyond mobile hardware procurement and to prioritize developing teachers' digital pedagogical capacity to design interactive instructional models

and to provide a rich, contextual, and engaging repository of digital learning resources for the younger generation.

The results of the aforementioned research indicate that the variable of mobile learning (ML) does not have a significant effect on Islamic Religious Education Learning Outcomes (IRELO), as evidenced by a p-value of 0.074, which exceeds the threshold of 0.05. This study presents a divergence from previous research findings, such as those conducted in earlier studies (Hamdani, 2021). Hamdani explains that the utilisation of mobile learning can enhance learners' motivation and knowledge. Furthermore, Hamdani's research underscores the importance of adopting mobile learning as an alternative instructional model, ensuring it is tailored to the characteristics of the subject matter.

Meanwhile, the study conducted by Kulbi et al. (Kulbi, 2019) found that the discovery of the use of mobile learning is perceived as effective and engaging for students in the context of Islamic Education (PAI). While it does not directly affect learning outcomes, this research presents findings indicating a tendency towards the use of mobile learning in relation to PAI learning outcomes. This is further supported by other studies that discuss the application of mobile learning in Islamic education (Zh et al., 2024).

In relation to the variable of Digital Learning Resources (DLR) concerning Islamic Religious Education Learning Outcomes (IRELO), the hypothesis is accepted. It is statistically significant at 0.000 < 0.05, as indicated by research that highlights the utilisation of artificial intelligence in the learning process (Fathur Rohiem & Aulya Salsabila, 2024), As artificial intelligence (AI) can serve as a contemporary learning resource that aligns with current advancements, the utilisation of media in education remains a subject of debate. This discourse revolves around whether media should be regarded primarily as a source of learning or as a tool for learning. Nonetheless, it is evident that media has been integrated across all subjects Erlina et al., 2018).

The use of digital learning resources (DLR) in the modern educational landscape has transformed from a mere supplementary tool into a key pillar determining instructional effectiveness and academic relevance. Based on findings from the latest scientific literature, DLR plays a crucial role due to its ability to facilitate real-time personalized learning, where learning materials and rhythms can be flexibly adapted to the cognitive pace and unique characteristics of each learner.

In the digital era of education, the selection of media and learning resources has become paramount (Salehudin et al., 2021). The sources of learning have become exceedingly diverse and can be tailored to the themes being employed. As demonstrated in Muryani's research, her findings highlight innovations in digital learning and pedagogical strategies (Sugiyanto et al., 2024), Other research concerning the utilisation of learning resources through the use of audio media to stimulate children's memory and concentration in their studies indicates that, to support the optimal growth and development of children during their golden age, the presence of education for early childhood is of paramount importance (Muchsinun & Salehuddin, 2023).

Digital learning resources are related to the learning outcomes of Islamic religious education, as evidenced by previous research conducted by Rafiq, which highlights the central role of digital materials in digital learning (Rafiq et al., 2024), Syahril's research also identified that the influence of digital learning resources on the learning outcomes of Islamic Education (PAI) is significant, accounting for 29.40% (Syahril et al., 2024). The research conducted by Hastri Rosiyanti and Rahmita Nurul Muthmainnah is also supported (Rosiyanti & Muthmainnah, 2018). The title of the study is "The Influence of Gadget Use as a Learning Resource on the Learning Outcomes of Basic Mathematics." Based on the results of this research, it is evident that there is a significant impact of gadget usage as a learning resource on the learning outcomes in Basic Mathematics.

In line with the research conducted by Siti Zulaiha B. Abas and Supi'ah, their findings indicate that the process of developing learning resources undertaken by teachers in a creative and collaborative manner significantly enriches the teaching materials and supports the achievement of students' spiritual, social, and academic competencies. The research results have demonstrated that with the support of training, responsive school policies, and the innovative spirit of teachers, digital-based learning in Islamic Education (PAI) can be effectively implemented (Abas & Supi'ah, 2025).

Subsequently, in relation to the variable of Learning Model (LM) impacting Islamic Religious Education Learning Outcomes (IRELO), the statistical significance was observed at 0.000, which is less than the threshold of 0.05; thus, the research hypothesis is accepted. This finding aligns with several previous studies, including that of Mayasari, who identified that the principles of teaching and learning activities in Islamic religious education encompass, among other aspects, a focus on students' needs, the stimulation of student motivation, lifelong learning habits, the integration of competencies, and the preservation of innate qualities (Mayasari et al., 2023).

The research conducted by Putri Oktavia and Khusnul Khotimah identifies the development of Islamic education learning methods in the digital era. The significance of adapting to the digital age has been established, highlighting that such adaptation in Islamic education is essential for maintaining relevance and engagement with students. The ability to integrate technology into teaching methods creates new opportunities and responds to evolving learning styles (Oktavia & Khotimah, 2023).

The role of teachers in this context does not significantly impact the empowerment of students. They emphasise pedagogy primarily on the content aspect of knowledge. They function merely as conduits, whose sole purpose is to transfer knowledge to students. The teacher assumes the role of an expert who imparts knowledge to learners. Their teaching methods are passive, characterised by a lack of creativity in contextualising understanding in relation to the social needs of the community. Research conducted by Abdul Halim reveals that the teaching methods employed by teachers of Islamic Religious Education (PAI) predominantly utilise demonstration and group learning methods to instil multiculturalism and its associated values (Halim, 2022), The utilisation of learning models in Islamic education significantly impacts both the learning process and the outcomes of student achievement (Aliasmin, 2020; Said & Zubair, 2024; Suryani, 2013; Yusuf, 2024).

The latest learning models over the past two decades, such as the flipped classroom (Gawise et al., 2021), have shown that momentum is being gained in the realm of learning, particularly as the Covid-19 pandemic has provided a significant impetus for change. The implementation of the flipped classroom model, in conjunction with integrated learning approaches, has become more pronounced. The integrative elements are particularly evident during the stages of integrated learning, especially in the phases of analysis, exploration, formulation, presentation, and application. The execution of the learning process is supported by a diverse array of learning media and educational resources. (Rahman, 2021), Beginning with Zoom meetings, Quizizz, educational videos, summaries of subject matter in PowerPoint format, the provision of learning facilities, particularly school e-learning, and the creativity of teachers in preparing various types of media and learning resources utilised (Nurhidin, 2017, 2022).

CONCLUSION

This research succeeded in proving empirically that the simultaneous interaction between mobile learning, digital learning resources, and learning models contributed 61.7% to the achievement of Islamic Religious Education learning outcomes for 145 class Theoretically, these findings strengthen the relevance of constructivist theory in digital era religious education, while practically providing strategic recommendations for educators to shift the focus of investment from simply procuring hardware towards developing digital pedagogical capacity and enriching contextual learning resource

repositories. However, this research has limitations in terms of generalizability due to limited sample coverage and a cross-sectional design that cannot longitudinally track students' spiritual character habituation, thus opening up opportunities for future research to refine the instrument and expand the analytical context.

REFERENCES

Abas, S. Z. B., & Supi'ah. (2025). Integrasi Teknologi Digital dalam Pengembangan Sumber Belajar PAI yang Kontekstual dan Relevan. *AT-TARBIYAH: Jurnal Penelitian Dan Pendidikan Agama Islam*, *2*(2), 391–402. https://www.journal.staittd.ac.id/index.php/at/article/view/395

Adeshina, A. E. (2024). The Transformative Role of Digital Resources in Teaching and Learning. *Open Journal of Educational Development*, *5*(1), 1–9. https://doi.org/10.52417/ojed.v5i1.520

Ahmad, K. A., Asni, F., Hasbulah, M. H., Hashom, H., Mustafa, W. A., Noor, A. M., Tambak, S., & Nasir, K. (2025). Mobile Learning of Islamic Studies: A Comprehensive Review. *Journal of Advanced Research in Applied Sciences and Engineering Technology*, *2*(2), 211–224. https://doi.org/https://doi.org/10.37934/araset.48.2.211224 211

Aliasmin. (2020). Penggunaan Metode Discovery Learning pada Pembelajaran PAI untuk Meningkatkan Hasil Belajar Siswa Kelas VII SMP Negeri 10 Seluma. *GHAITSA: Islamic Education Journal*, *1*(1), 42–48. https://doi.org/10.62159/ghaitsa.v1i1.43

Antoni, A. (2023). Konsep Aplikasi Mobile Pembelajaran dan Media Sosial pada Pembelajaran Pendidikan Agama Islam. *Jurnal CENDEKI : Media Komunikasi Penelitian dan Pengembangan Pendidikan Islam*, *15*(02), 374–384. https://doi.org/https://doi.org/10.37850/cendekia

Asante, K., & Novak, P. (2024). When The Push and Pull Factors in Digital Educational Resources Backfire: The Role of Digital Leader in Digital Educational Resources Usage. *Education and Information Technologies*, *29*, 6553–6578. https://doi.org/https://doi.org/10.1007/s10639-023-12095-8

Creswell, J. W. (2013). *Research Design Qualitative Quantitative and Mixed Method Approaches*. Sage-Publications.

Danish, J., & Hmelo-Silver, C. E. (2020). On Activities and Affordances for Mobile Learning. *Contemporary Educational Psychology*, *60*, 101829. https://doi.org/https://doi.org/10.1016/j.cedpsych.2019.101829

Erlina, D., Marzulina, L., Pitaloka, N. L., Astrid, A., Yansyah, F., & Mukminin, A. (2018). Research on Educational Media: Balancing between Local and Target Language Cultures in English Electronic Textbooks. *Turkish Online Journal of Educational Technology - TOJET*, *17*(2), 111–119. https://eric.ed.gov/?id=EJ1176161

Fathur Rohiem, A., & Aulya Salsabila, A.-Z. (2024). The Etichal Influence of Artificial Inteliigence (AI) in Religious Education: Implications, Challenges and Innovative Perspectives on the Merdeka Curriculum. *Science and Education*, *3*, 81–88. https://sunankalijaga.org/prosiding/index.php/icrse/article/view/1160

Fred, A. (2019). *Metode Penelitian Kuantitatif*. Prenmedia.

Gawise, Tarno, & Lestari, A. A. (2021). Efektifitas Pembelajaran Model Flipped Classroom masa Pandemi Covid-19 terhadap Hasil Belajar di Sekolah Dasar. *Edukatif: Jurnal Ilmu Pendidikan*, *3*(1), 246–254. https://doi.org/10.31004/edukatif.v3i1.328

Ghony, H. M. D., & Almanshur, F. (2009). *Metodologi Penelitian Pendidikan: Pendekatan Kuantitatif* (1 februari). UIN-Malang Press.

Hair, J. F., Risher, J. J., Sarstedt, M., & Ringle, C. M. (2019). When to use and how to report the results of PLS-SEM. *European Business Review*, *31*(1), 2–24. https://doi.org/10.1108/EBR-11-2018-0203

Halawa, A., Telaumbanua, A., & Zebua, Y. (2022). Penerapan Model Pembelajaran Cooperative Learning Untuk Meningkatkan Hasil Belajar Siswa. *EDUCATIVO: Jurnal Pendidikan*, *1*(2), 582–589. https://doi.org/https://doi.org/10.56248/educativo.v1i2.84

Halim, A. (2022). Model Pembelajaran Multikulturalisme Guru Pendidikan Agama Islam. *Chalim*

Journal of Teaching and Learning, *2*(1), 66–76. https://doi.org/10.31538/cjotl.v2i1.274

Hamdani. (2021). Peningkatan Motivasi Belajar dan Pengetahuan Peserta Didik Penerapan Mobile Learning pada Mata Pelajaran Pendidikan Agama Islam. *Jurnal Pendidikan Agama Islam Al-Thariqah*, *6*(2). https://doi.org/10.25299/al-thariqah.2021.vol6(2).7970

Indrawati, N., & Desky, A. Y. D. (2024). How to Improve Elementary School Student Learning Outcomes by Implementing the Articulation Type Cooperative Learning Model?. *Journal of Indonesian Primary School*, *1*(2), 32–37. https://doi.org/10.62945/jips.v1i2.342

Kulbi, S. Z. (2019). Mobile Learning Berbasis Android Sebagai Media Pembelajaran Pendidikan Agama Islam. *Nazhruna: Jurnal Pendidikan Islam*, *2*(3), 385–406. https://doi.org/https://doi.org/10.31538/nzh.v2i3.1110

Mayasari, A., Arifudin, O., & Kartika, I. (2023). Penerapan Model Pembelajaran Nilai melalui Pendidikan Agama Islam dalam Membentuk Karakter Siswa. *Antologi Kajian Multidisiplin Ilmu (Al-Kamil)*, *1*(1), 47–59. https://ojs.iai-rakeyansantang.ac.id/index.php/alkamil/article/view/419

Muchsinun, A., & Salehuddin, M. (2023). Pengaruh Rekaman Audio terhadap Kemampuan Menghafal pada Anak Usia Dini. *SELING: Jurnal Program Studi PGRA*, *9*(2), 171–181. https://doi.org/10.29062/seling.v9i2.1715

Mukrimaa, S. S., Nurdyansyah, Fahyuni, E. F., & Yulia Citra, A. (2016). Metode Penelitian Kuantitatif. In *Jurnal Penelitian Pendidikan Guru Sekolah Dasar* (Vol. 6, Issue August).

Nurhidin, E. (2017). Inovasi Pembelajaran Pendidikan Agama Islam (PAI) melalui Pemanfaatan Media Pembelajaran Kontekstual dan Pengembangan Budaya Religius Di Sekolah. *Kuttab*, *1*(1), 1–14. https://doi.org/10.30736/kuttab.v1i1.95

Nurhidin, E. (2022). Implementasi Model Pembelajaran Kelas Terbalik pada Pembelajaran Pendidikan Agama Islam di Sekolah Dasar Islam Terpadu. *Eduprof : Islamic Education Journal*, *2*(1), 61–67. https://doi.org/https://doi.org/10.47453/eduprof.xxx

Oktavia, P., & Khotimah, K. (2023). Pengembangan Metode Pembelajaran Pendidikan Agama Islam di Era Digital. *An Najah: Jurnal Pendidikan Islam Dan Sosial Agama*, *02*(05), 1–9. https://journal.nabest.id/index.php/annajah/article/view/167

Rafiq, S., Iqbal, S., & Afzal, A. (2024). The Impact of Digital Tools and Online Learning Platforms on Higher Education Learning Outcomes. *Al-Mahdi Research Journal (MRJ)*, *5*(4), 359–369. https://doi.org/10.36948/ijfmr.2025.v07i01.29499

Rahman, D. (2021). Pemanfaatan Internet Sebagai Sumber Belajar dan Informasi. *Jurnal Perpustakaan Dan Informasi*, *1*(1), 9–14. https://doi.org/10.24952/ktb.v3i2.3087

Rahmawati, Y. P., & Salehudin, M. (2021). Optimalisasi pembelajaran abad 21 pada SMP dan SMA. *Journal of Instructional and Development Researches*, *1*(3), 112–122. https://doi.org/10.53621/jider.v1i3.67

Ritiauw, S. P., Mahananingtyas, E., Silawanebessy, W. J. B., & Huliselan, A. (2021). Penerapan Model Value Clarification Technique (VCT) dalam Meningkatkan Hasil Belajar Siswa Kelas IV SD Muhammadiyah Ambon. *Pedagogika: Jurnal Pedagogika Dan Dinamika Pendidikan*, *9*(2), 87–99. https://doi.org/10.30598/pedagogikavol9issue2page87-102

Rosiyanti, H., & Muthmainnah, R. N. (2018). Penggunaan Gadget Sebagai Sumber Belajar Mempengaruhi Hasil Belajar Pada Mata Kuliah Matematika Dasar. *FIBONACCI: Jurnal Pendidikan Matematika Dan Matematika*, *4*(1), 25. https://doi.org/10.24853/fbc.4.1.25-36

Said, M., & Zubair, M. (2024). Hakekat Pembelajaran Digital dalam Pendidikan Islam. In *Jurnal Ilmiah Profesi Pendidikan* (Vol. 9, Issue 3, pp. 1699–1703). Universitas Mataram. https://doi.org/10.29303/jipp.v9i3.2492

Salehudin, M. (2023). Menggunakan Model Pembelajaran untuk Implementasi Computational Thinking bagi Guru Madrasah. *Edusaintek: Jurnal Pendidikan, Sains Dan Teknologi*, *10*(2), 407–425. https://doi.org/10.47668/edusaintek.v10i2.780

Salehudin, M., Nasir, M., Hamzah, S. H., Toba, R., Hayati, N., & Safiah, I. (2021). The Users' Experiences in Processing Visual Media for Creative and Online Learning Using Instagram. *European Journal*

of Educational Research, *10*(4), 1669–1682. https://doi.org/10.12973/eu-jer.10.4.1669

Slavin, R. E. (2022). Cooperative Learning in Elementary Schools. *Contemporary Issues in Primary Education. Routledge*, 102–111.

Solihah, A., Yusuf Aditya, D., & Saefullah Kamali, A. (2022). Pengaruh Gaya dan Kemandirian Belajar terhadap Pemahaman Konsep Matematika Siswa. *Berajah Journal*, *2*(2), 231–240. https://doi.org/10.47353/bj.v2i2.82

Sudeka, M., & Setiawan, A. (2024). FlowEdu: Aplikasi Mobile Sebagai Media Pembelajaran Flowchart dengan Fitur Puzzle Drag and Drop. *Jurnal Pendidikan Informatika Dan Sains*, *13*(2), 102–110. https://doi.org/10.31571/saintek.v13i2.5195

Sugiono. (2016). Metode Penelitan Kuantitatif, kualitatif dan R&D. *Bandung: Alfabeta*.

Sugiyanto, Muryani, C., & Ni'matussyahara, D. (2024). Strengthening Student Empathy in GeoCapabilities : Digital learning innovations and pedagogical strategies for disaster mitigation. *Contemporary Educational Technology*, *16*(3). https://doi.org/10.30935/cedtech/14913

Suryani, N. (2013). Pengembangan Model Internalisasi Nilai Karakter dalam Pembelajaran Sejarah Melalui Model Value Clarifiication Technique. *Paramita: Jurnal Pendidikan Sejarah*, *23*(2), 208–219. https://doi.org/10.15294/paramita.v23i2.2674

Syah, I., Latif, N. latifa, & Kasma, K. (2024). Model Pembelajaran Kooperatif dalam Pendidikan Agama Islam untuk Meningkatkan Kerjasama Siswa. *JUPENJI: Jurnal Pendidikan Jompa Indonesia*, *3*(4), 29-35. https://doi.org/10.57218/jupenji.Vol3.Iss4.1330

Syahril, Ilyasin, M., & Janah, F. (2024). Pengaruh Sumber Belajar Digital dan Gaya Belajar Terhadap Hasil Belajar Pendidikan Agama Islam (PAI). *Edusaintek: Jurnal Pendidikan, Sains Dan Teknologi*, *11*(3), 1055–1066. https://doi.org/https://doi.org/10.47668/edusaintek.v11i3.1099

Yusuf, M. (2024). Penggunaan Artificial Intelligence (AI) dalam Meningkatkan Literasi Digital pada Lembaga Pendidikan Islam. *AKSI: Jurnal Manajemen Pendidikan Islam* (Vol. 2, Issue 2, pp. 109–118). Sekolah Tinggi Agama Islam Hasan Jufri Bawean. https://doi.org/10.37348/aksi.v2i2.360

Zh, M. H. R., Thaariq, Z. Z. A., & Ardiansyah, A. (2024). Mobile Learning: Future Learning Technologies for Islamic Formal Education (A Literature Study). *Proceedings of International Conference on Education*, *2*(1), 370–377.