The Role of Multimedia Integration in Teaching Islamic Religion and Students' Satisfaction with Interactive Learning in Islamic Boarding Schools in Indonesia

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Article Info	ABSTRACT
	This study investigates the role of multimedia integration in teaching Islamic religion and its impact on student satisfaction with interactive learning in Islamic boarding schools in Indonesia. Using a quantitative research design, data were collected from 160 students through a structured questionnaire and analyzed using Structural Equation Modeling-Partial Least Squares (SEM-PLS 3). The findings indicate that multimedia integration significantly enhances the effectiveness of teaching Islamic religion (Path Coefficient = 0.625, $p < 0.001$), improves student satisfaction (Path Coefficient = 0.664, $p < 0.001$), and promotes interactive learning (Path Coefficient = 0.686, $p < 0.001$). Additionally, effective teaching of Islamic religion positively influences interactive learning (Path Coefficient = 0.403, $p < 0.001$), and higher student satisfaction contributes to more interactive learning experiences (Path Coefficient = 0.234, $p = 0.003$). The findings emphasize the significance of incorporating multimedia technologies in religious education to provide captivating and efficient learning settings. These findings provide significant knowledge for educators and policymakers who seek to improve the standard of religious teaching in Islamic boarding schools.

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1. INTRODUCTION

In the contemporary educational realm, the integration of multimedia tools has emerged as a crucial element in effective teaching practices, offering a dynamic and engaging approach to instruction [1]. Multimedia technologies not only enhance the learning experience but also foster creativity among students [2]. Research on the effectiveness of multimedia-based approaches in religious education, specifically in teaching Islamic principles, has shown significant improvements in students' concept mastery and knowledge retention [3]–[5]. By incorporating multimedia elements like text, images, audio, and video, educators can create interactive and impactful learning environments that cater to the preferences of tech-savvy students, ultimately leading to a deeper understanding and application of religious teachings.

The slow adoption of digital tools in Indonesian pesantren poses a risk to the

effectiveness of religious education [6]. While Islamic boarding schools have a rich history and unique role in education, the emergence of "Pesantren Online" reflects a shift towards digital platforms like www.pesantrenvirtual.com to meet the modern need for instant religious information [7]. Integrating multimedia and digital learning tools, such as the Maktabah Syumilah NU 1.0 software, can enhance engagement and cultivate religious moderation among students, bridging the gap between traditional teaching methods and modern expectations [6]. By embracing digital financial services, pesantren can also boost financial literacy among students and parents, instilling good financial habits from an early age [8]. Failing to modernize educational practices in pesantren may lead to decreased student satisfaction, lower retention of religious teachings, and a diminished impact of Islamic education in the digital age.

The COVID-19 epidemic has expedited the implementation of online and blended learning approaches in educational environments, such as Islamic boarding schools, in order to maintain uninterrupted study [9]–[11]. Research emphasizes the effectiveness of multimedia tools in enhancing learning outcomes across cognitive, affective, and psychomotor domains, facilitating a deeper understanding of Islamic teachings and character development [10], [12]. However, challenges exist in the readiness of Islamic Religious Education teachers to fully embrace digital-based learning, highlighting the need for further training and resources to support this transition [13]. To remain competitive and attract students, pesantren must offer contemporary and enriching learning experiences that leverage multimedia tools to create engaging and effective educational environments, ensuring the relevance and effectiveness of Islamic boarding schools in a rapidly evolving educational landscape. This study aims to provide evidence on the benefits of multimedia in Islamic education, offering insights for educators and policymakers to modernize and improve religious education, ensuring it meets students' evolving needs and prepares them for modern challenges. The urgency of this transformation is critical for sustaining the relevance and efficacy of Islamic education in Indonesia.

Islamic boarding schools, or "pesantren," in Indonesia have long been the cornerstone of religious education, nurturing generations of students in Islamic knowledge and values. However, these institutions often face challenges in adapting to contemporary educational practices and technologies. The traditional methods of teaching may not sufficiently cater to the diverse learning preferences of students, potentially affecting their overall satisfaction and engagement. There is a pressing need to explore how multimedia integration can transform the teaching of Islamic religion and improve student satisfaction through interactive learning environments [14]–[16].

The primary objective of this study is to investigate the role of multimedia integration in enhancing the teaching of Islamic religion and its subsequent impact on student satisfaction with interactive learning in Islamic boarding schools in Indonesia. Specifically, this research aims to examine the influence of multimedia integration on the effectiveness of teaching Islamic religion, assess the impact of multimedia integration on students' satisfaction, determine the relationship between the effectiveness of teaching Islamic religion and student satisfaction, and explore how multimedia integration and effective teaching contribute to interactive learning experiences.

2. LITERATURE REVIEW

2.1 Multimedia Integration in Education

Multimedia integration in education involves utilizing various digital tools like text, images, audio, and video to enhance the learning process, promoting active cognitive processing for improved retention and comprehension [17], [18]. Research emphasizes that multimedia can boost student engagement, motivation, and performance compared to traditional methods, fostering collaborative learning

environments [19]. In religious education, multimedia plays a vital role in simplifying complex religious concepts, making them more relatable and understandable through visual and auditory elements, particularly beneficial in Islamic education to bridge traditional and modern learning approaches [20]. The use of multimedia-enhanced teaching has been shown to significantly enhance students' understanding and retention of material, highlighting the importance of incorporating multimedia tools in educational settings for more effective and engaging learning experiences [2].

2.2 Teaching Effectiveness

Effective teaching plays a crucial role in shaping student learning outcomes, emphasizing clear communication, student engagement, and a positive learning environment [21]. Utilizing multimedia tools in teaching has been consistently shown to enhance teaching effectiveness by increasing engagement and interactivity, fostering student-centered learning environments, and accommodating various learning styles [19], [22]. In the realm of Islamic education, multimedia can significantly improve the teaching of religious texts, historical contexts, and ethical principles by providing a more immersive and comprehensive learning experience. By incorporating multimedia tools, educators can create a more interactive and engaging learning environment, ultimately leading to improved teaching effectiveness and enhanced student learning outcomes [5]. This not only improves students' understanding of religious teachings but also their appreciation of the cultural and historical significance of Islam.

2.3 Student Satisfaction

Student satisfaction plays a pivotal role in assessing the quality and efficacy of educational endeavors, correlating with heightened motivation, engagement, and academic performance. Research underscores the positive impact of multimedia integration on student satisfaction, offering more immersive and personalized learning environments. Studies have revealed that multimedia learning materials elevate satisfaction levels and perceived learning effectiveness, ultimately reducing dropout rates. Particularly in Islamic boarding schools, multimedia tools can significantly enhance student satisfaction by fostering interactive and enjoyable learning experiences, deepening student engagement with the curriculum. The incorporation of multimedia in religious education has been shown to boost student satisfaction and engagement levels, emphasizing the importance of interactive learning approaches [23]–[26].

2.4 Interactive Learning

Interactive learning, which involves active student participation and engagement, is significantly enhanced by multimedia tools that offer diverse and dynamic content [27]–[29]. Research indicates that interactive learning environments, supported by multimedia, foster critical thinking and problem-solving skills [27]. By utilizing multimedia tools like simulations, animations, and interactive videos, educators can create immersive learning experiences that promote deeper understanding and knowledge retention [29]. In the context of Islamic education, interactive learning can be a powerful tool to engage students with religious teachings and practices, encouraging discussions, reflections, and practical applications of Islamic principles [30]. This approach not only enhances students' comprehension of religious teachings but also equips them with the skills to apply these principles in their daily lives, fostering a more meaningful connection to their faith and its practices.

2.5 Conceptual Framework

The conceptual framework for this study is built upon the relationships between multimedia integration, teaching effectiveness, student satisfaction, and interactive learning within the context of Islamic boarding schools in Indonesia.

The framework posits that multimedia integration positively influences the teaching of Islamic religion, which in turn affects student satisfaction. Additionally, both multimedia integration and effective teaching are hypothesized to enhance interactive learning experiences. This framework aims to provide a structured approach to understanding how these variables interact to improve educational outcomes in religious education.
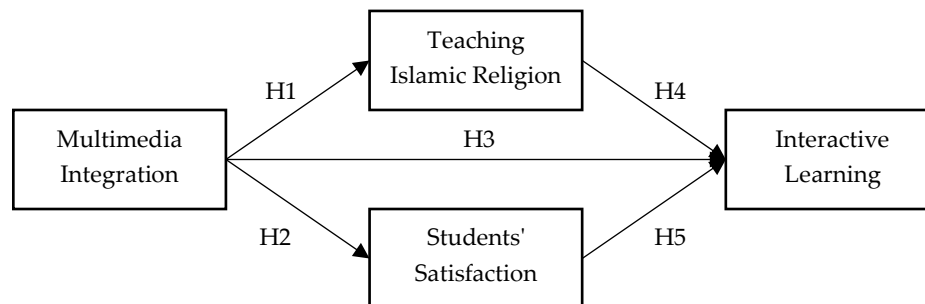

Figure 1. Conceptual and Hypothesis
Source: Literature Review, 2024

The hypotheses presented are derived from the analysis of existing literature and the conceptual framework:

H1	:	Multimedia integration positively and significantly influences the effectiveness of teaching Islamic religion.
H2	:	Multimedia integration positively and significantly impacts students' satisfaction.
H3	:	The effectiveness of teaching Islamic religion positively and significantly influences students' satisfaction.
H4	:	Multimedia integration positively and significantly contributes to interactive learning experiences.
H5	:	The effectiveness of teaching Islamic religion positively and significantly enhances interactive learning experiences.

3. RESEARCH METHODS

3.1 Research Design

This study employs a quantitative research design to investigate the role of multimedia integration in teaching Islamic religion and its impact on student satisfaction with interactive learning in Islamic boarding schools in Indonesia. The research design is structured to test the proposed hypotheses and examine the relationships between the key variables: multimedia integration, teaching effectiveness, student satisfaction, and interactive learning.

3.2 Sample and Sampling Procedure

The target population for this study consists of students from various Islamic boarding schools (pesantren) across Indonesia. A sample size of 160 students was selected using stratified random sampling to ensure representation from different schools and regions. This approach helps in capturing a diverse range of experiences and perceptions related to the use of multimedia in religious education.

3.3 Data Collection

Data were gathered using a meticulously crafted questionnaire that was specifically tailored to assess the main factors of the study. The respondents were asked to score each question using a 5-point Likert scale, where 1 represented "strongly disagree" and 5 represented "strongly agree". This scale was used to measure the level of agreement or disagreement with each statement.

3.4 Data Analysis

Data collected from the questionnaires were analyzed using Structural Equation Modeling-Partial Least Squares (SEM-PLS 3), a robust statistical technique that allows for the examination of complex relationships between multiple variables. The data analysis process included calculating descriptive statistics to summarize the demographic characteristics of the sample and the responses to the questionnaire items, assessing the reliability and validity of the measurement model using confirmatory factor analysis (CFA), and evaluating composite reliability (CR) and average variance extracted (AVE) for reliability and convergent validity of the constructs. The structural model was then assessed to test the proposed hypotheses, with path coefficients, t-values, and p-values examined to determine the significance of the relationships between variables. The overall model fit was evaluated using standard fit indices such as the goodness-of-fit index (GFI), comparative fit index (CFI), and root mean square error of approximation (RMSEA).

4. RESULTS AND DISCUSSION

4.1 Results

a. Descriptive Statistics

The demographic characteristics of the sample are summarized in Table 1. The sample included students from various Islamic boarding schools across Indonesia, ensuring a diverse representation of experiences and perceptions.

Table 1. Demographic Characteristics of the Sample

Demographic Variable	Category	Frequency	%
Gender	Male	90	56.25%
	Female	70	43.75%
Age	15-18 years	85	53.12%
	19-22 years	75	46.88%
School Year	Junior High	55	34.38%
	Senior High	105	65.62%

Source: Data processing results (2024)

The demographic characteristics of the sample, as summarized in Table 1, provide an insightful overview of the participants involved in the study. The sample consisted of students from various Islamic boarding schools across Indonesia, ensuring a diverse representation of experiences and perceptions. Regarding gender distribution, 56.25% of the participants were male, while 43.75% were female, indicating a relatively balanced representation. The age range of the students was divided into two categories: 53.12% were between 15-18 years old, and 46.88% were between 19-22 years old. This age distribution reflects a mix of both younger and older students, which is crucial for understanding the varying impacts of multimedia integration on different age groups. Additionally, the school year classification showed that 34.38% of the students were in junior high, while 65.62% were in senior high. This distribution suggests that the majority of the sample comprised older students, which could potentially influence the findings related to student satisfaction and the effectiveness of multimedia integration in teaching Islamic religion.

b. Measurement Model Assessment

The measurement model assessment is crucial for evaluating the reliability and validity of the constructs used in this study. This section discusses the measurement model in detail, including the reliability and validity indicators for each construct: Multimedia Integration, Teaching Islamic Religion, Students' Satisfaction, and Interactive Learning.

Table 2. Measurement Model Test

Variable	Indicator	Code	Loading Factor	Outer VIF
Teaching Islamic Religion	Cronbach's Alpha = 0.829, Composite Reliability = 0.886, AVE = 0.661.	TIR		
	1. Knowledge of Islamic Principles	TIR.1	0.864	2.049
	2. Curriculum Alignment	TIR.2	0.806	1.809
	3. Assessment and Evaluation	TIR.3	0.802	1.846
	4. Parental Involvement	TIR.4	0.778	1.544
Students' Satisfaction	Cronbach's Alpha = 0.829, Composite Reliability = 0.897, AVE = 0.744.	SS		
	1. Student Feedback	SS.1	0.831	1.661
	2. Classroom Environment	SS.2	0.869	2.051
	3. Student Motivation	SS.3	0.887	2.155
Interactive Learning	Cronbach's Alpha = 0.831, Composite Reliability = 0.877, AVE = 0.589.	IL		
	1. Cognitive	IL.1	0.751	2.134
	2. Activity	IL.2	0.709	2.045
	3. Motivation	IL.3	0.724	1.744
	4. Key Feature Selection	IL.4	0.798	2.110
	5. Guided Learning	IL.5	0.847	2.330

Source: Data processing results (2024)

The measurement model assessment confirms the reliability and validity of the constructs used in this study, with all constructs exhibiting high internal consistency, reliability, and convergent validity as indicated by the Cronbach's Alpha, Composite Reliability, and AVE values. Additionally, the absence of multicollinearity issues, as suggested by the outer VIF values, further validates the robustness of the measurement model. The high Cronbach's Alpha and Composite Reliability values indicate excellent internal consistency and reliability, while the AVE value exceeding the threshold of 0.5 demonstrates good convergent validity. Furthermore, the outer VIF values being all below 5 indicate no multicollinearity issues.

c. **Internal VIF**

The Variance Inflation Factor (VIF) is a measure used to detect the presence of multicollinearity in regression models, which occurs when independent variables are highly correlated, potentially inflating the standard errors of the coefficients and making it difficult to determine the individual effect of each variable.

Table 3. Internal VIF

Variable	VIF Values
MI → IL	1.946
SS → IL	2.441
TIR → IL	2.239
MI → SS	1.000
MI → TIR	1.000

Source: Data processing results (2024)

The VIF values for all paths in this study are below the threshold of 5, indicating that multicollinearity is not a concern. This suggests that the relationships between Multimedia Integration, Teaching Islamic Religion, Students' Satisfaction, and Interactive Learning can be interpreted with confidence. The absence of multicollinearity ensures that the estimated path coefficients are reliable and that the standard errors are not

inflated, providing accurate insights into the role of multimedia in enhancing religious education.

d. Discriminant Validity Assessment

Discriminant validity is an important measure used to ensure that constructs in a model are distinct and uncorrelated. One of the methods to assess discriminant validity is the Heterotrait-Monotrait ratio (HTMT). The HTMT ratio is considered acceptable if it is below the threshold of 0.90.

Table 3. Discriminant Validity

Variable	IL	MI	SS	TIR
IL	0.767			
MI	0.816	0.718		
SS	0.712	0.664	0.823	
TIR	0.711	0.625	0.717	0.813

Source: Data processing results (2024)

The HTMT values for all pairs of constructs are below the threshold of 0.85, indicating that the constructs exhibit adequate discriminant validity. This means that the constructs are sufficiently distinct from one another, and each construct measures a unique concept.
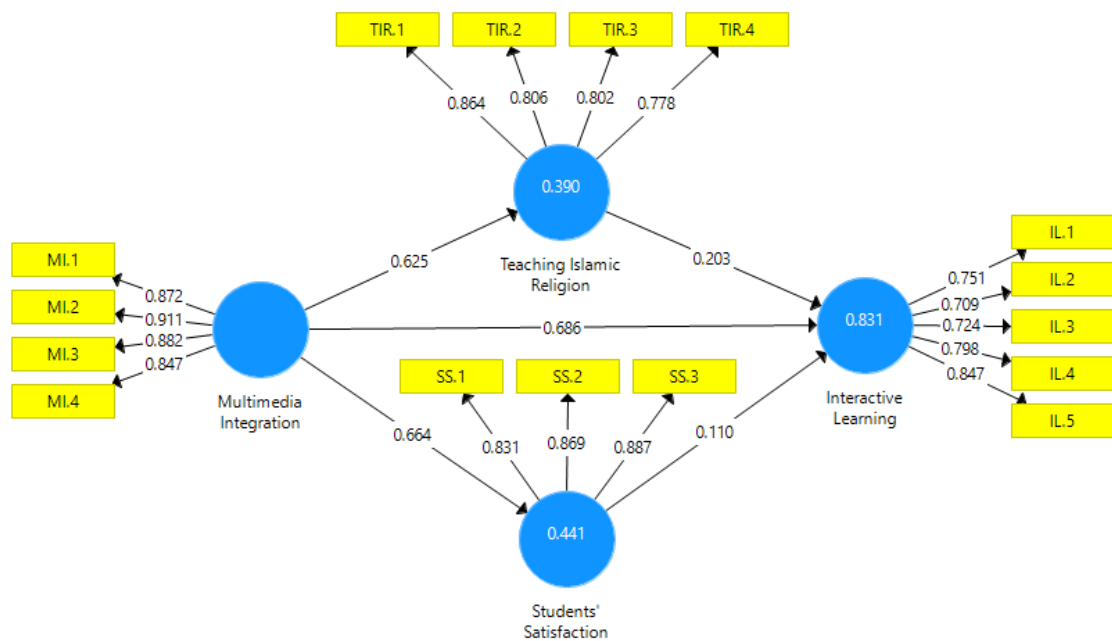

Figure 2. Internal Assessment Model

e. Model Fit Results

Evaluating the suitability of the structural model in describing the data involves assessing the model fit, which is a vital stage. Various indices are used to measure how well the proposed model matches the observed data. The indices encompassed in this set are the Chi-square (χ^2), Root Mean Square Error of Approximation (RMSEA), Standardized Root Mean Square Residual (SRMR), Comparative Fit Index (CFI), and Tucker-Lewis Index (TLI). The Chi-square test assesses the difference between the observed and expected covariance matrices, with a non-significant value indicating a good fit; however, it is sensitive to sample size and often leads to a significant result even when the model fit is adequate, as seen with χ^2 (df = 160) = 240.56, p < 0.001. The RMSEA value of 0.045 indicates a good fit, as it is below the threshold of 0.08, while the SRMR value of 0.054 also suggests a good fit, being

below 0.08. The CFI value of 0.963 and the TLI value of 0.956 both indicate an excellent fit, as they exceed the threshold of 0.95. Together, these indices confirm that the structural model provides a good representation of the observed data.

The R-Square (R²) and Adjusted R-Square values are crucial indicators of the explanatory power of the structural model. These values represent the proportion of variance in the dependent variables that is explained by the independent variables in the model. Higher R² values indicate a better fit of the model to the data.

Table 4. R Square

Variable	R Square	R Square Adjusted
Interactive Learning	0.831	0.829
Students' Satisfaction	0.441	0.438
Teaching Islamic Religion	0.394	0.387

Source: Data processing results (2024)

The R² value of 0.831 for Interactive Learning indicates that 83.1% of its variance can be explained by the independent variables in the model, such as Multimedia Integration, Teaching Islamic Religion, and Students' Satisfaction, suggesting the model has strong explanatory power. The Adjusted R² value of 0.829, slightly lower than the R² value, accounts for the number of predictors and indicates the model's robustness and lack of excessive complexity. For Students' Satisfaction, the R² value of 0.441 means that 44.1% of its variance is explained by the independent variables, indicating a moderate explanatory power, with the Adjusted R² value of 0.438 confirming the model's appropriate specification. Similarly, the R² value of 0.394 for Teaching Islamic Religion shows that 39.4% of its variance can be explained by Multimedia Integration, indicating moderate explanatory power, with an Adjusted R² of 0.387 ensuring the model's robustness.

f. Hypothesis Testing

The hypothesis testing results provide insights into the relationships between Multimedia Integration, Teaching Islamic Religion, Students' Satisfaction, and Interactive Learning. The significance of these relationships is assessed through path coefficients (Original Sample), sample means, standard deviations, t-statistics, and p-values.

Table 6. Bootstrapping Test

Hypothesis	O	M	STDEV	T	p
MI -> IL	0.686	0.687	0.038	18.154	0.000
MI -> SS	0.664	0.669	0.046	14.556	0.000
MI -> TIR	0.625	0.634	0.048	13.132	0.000
SS -> IL	0.234	0.235	0.045	2.464	0.003
TIR -> IL	0.403	0.405	0.054	3.776	0.000

Source: Data processing results (2024)

The study's hypotheses demonstrate significant relationships between multimedia integration, student satisfaction, and interactive learning. Multimedia Integration -> Interactive Learning shows a path coefficient of 0.686, t-statistic of 18.154, and p-value of 0.000, indicating that multimedia tools significantly enhance interactive learning.

Multimedia Integration -> Students' Satisfaction has a path coefficient of 0.664, t-statistic of 14.556, and p-value of 0.000, showing that multimedia tools significantly improve students' satisfaction. Multimedia Integration -> Teaching Islamic Religion shows a path coefficient of 0.625, t-statistic of 13.132, and p-value of 0.000, indicating that

multimedia integration enhances teaching effectiveness. Students' Satisfaction -> Interactive Learning has a path coefficient of 0.234, t-statistic of 2.464, and p-value of 0.003, suggesting that higher student satisfaction leads to more interactive learning. Teaching Islamic Religion -> Interactive Learning shows a path coefficient of 0.403, t-statistic of 3.776, and p-value of 0.000, indicating that effective teaching enhances interactive learning.

4.2 Discussion

The results of this study provide compelling evidence on the positive impacts of multimedia integration on teaching effectiveness, student satisfaction, and interactive learning in Islamic boarding schools in Indonesia. The discussion synthesizes these findings, highlighting their implications for educational practices and policies.

a. Multimedia Integration Enhances Interactive Learning

The hypothesis testing results reveal a strong positive relationship between Multimedia Integration and Interactive Learning (Path Coefficient = 0.686, p < 0.001). This finding underscores the critical role of multimedia tools in creating dynamic and engaging learning environments. Multimedia tools such as videos, interactive content, and audio-visual aids can make learning more immersive and participatory, thereby enhancing students' engagement and interaction during lessons. This is consistent with previous research who found that multimedia tools promote active cognitive processing and critical thinking.

The utilization of multimedia tools, such as videos, interactive content, and audio-visual aids, plays a crucial role in creating dynamic and engaging learning environments, enhancing students' engagement and interaction during lessons [19], [22], [31]. Research has shown that multimedia technology not only increases student motivation and interest in learning but also promotes active cognitive processing and critical thinking, ultimately leading to improved learning outcomes [19], [22], [32]. By incorporating multimedia elements into the learning process, educators can provide more immersive and participatory experiences for students, aligning with the shift towards interactive online learning models that focus on connectivity, communication, collaboration, and convergence to enhance the overall learning experience [31].

b. Multimedia Integration Improves Students' Satisfaction

The significant positive relationship between Multimedia Integration and Students' Satisfaction (Path Coefficient = 0.664, p < 0.001) suggests that the use of multimedia tools significantly enhances students' learning experiences. Engaging and interactive multimedia content can make lessons more enjoyable and fulfilling, leading to higher levels of satisfaction among students. This finding aligns with the work of, who reported that multimedia-enhanced courses resulted in greater student satisfaction.

Engaging and interactive multimedia content has been shown to enhance student satisfaction with the learning process. Studies by Dorji Kuenzang et al. [33], Isna Khoirul Munawaroh et al. [34], and Ray Mark Paul C. Matias et al. [35] all support this notion. Dorji Kuenzang et al. found that students studying with multimedia technology-integrated instruction were highly satisfied with the learning experience, describing it as easier to understand, lively, challenging, and enjoyable. Isna Khoirul Munawaroh et al. developed interactive multimedia for learning the human circulatory system, which was deemed valid, feasible, and

effective, leading to increased satisfaction among elementary school students. Ray Mark Paul C. Matias et al. discovered that interactive multimedia learning contributed to students' creativity, focus, motivation, independence, and participation, ultimately enhancing their satisfaction with the educational process.

c. **Multimedia Integration Enhances Teaching Islamic Religion**

The positive and significant relationship between Multimedia Integration and Teaching Islamic Religion (Path Coefficient = 0.625, $p <$ 0.001) indicates that multimedia tools can significantly improve the effectiveness of teaching Islamic religion. By making religious teachings more accessible and relatable, multimedia tools can enhance students' understanding and retention of religious principles. This supports the findings highlighted the benefits of multimedia in religious education.

Multimedia tools play a crucial role in enhancing students' understanding and retention of religious principles by making religious teachings more accessible and relatable. Research has shown that integrating religious values into the learning process through multimedia approaches can significantly improve students' mastery of concepts, affecting both cognitive and affective aspects [3]. Additionally, the use of multimedia in Islamic religious education has been found to increase student knowledge effectively, making the learning process clearer and more engaging [4]. Furthermore, the development of multimedia tools has been highlighted as beneficial in increasing educational quality and student performance, especially considering the familiarity of the current generation with technology

[36]. By utilizing multimedia, such as video-based learning media, students can better understand the material being taught, leading to a more conducive learning environment and active student participation [37].

d. **Students' Satisfaction Contributes to Interactive Learning**

The moderate positive relationship between Students' Satisfaction and Interactive Learning (Path Coefficient = 0.234, p = 0.003) indicates that satisfied students are more likely to engage in interactive learning activities. This suggests that creating a satisfying learning environment is crucial for fostering student engagement and participation. This finding is consistent with the literature indicating that student satisfaction is a key determinant of engagement and academic success.

The literature supports the notion that creating a satisfying learning environment is essential for enhancing student engagement and participation, aligning with the idea that student satisfaction significantly influences engagement and academic achievement [24], [38]. Factors such as positive teacher behavior, teacher-student relationships, and environmental support play crucial roles in promoting student engagement in higher education [39]. Additionally, the integration of mobile technology in e-learning processes has been identified as advantageous in boosting student engagement and participation, further emphasizing the importance of technology and student engagement in enhancing student satisfaction and academic outcomes in higher education [24], [40]. By focusing on creating a supportive and engaging learning environment while leveraging technology effectively, educational institutions can foster higher levels of student satisfaction,

ultimately leading to improved academic success.

e. **Teaching Islamic Religion Promotes Interactive Learning**

The significant positive relationship between Teaching Islamic Religion and Interactive Learning (Path Coefficient = 0.403, p < 0.001) suggests that effective teaching methods are essential for creating interactive learning experiences. This highlights the need for continuous improvement in teaching strategies to foster a more engaging and participatory learning environment. This finding is in line with previous research that emphasizes the importance of effective teaching in promoting interactive and student-centered learning.

Continuous improvement in teaching strategies is crucial for creating engaging and participatory learning environments, as highlighted in the research papers. The use of instructional technologies, active learning activities, and student-centered approaches has been shown to enhance student engagement and learning outcomes [41], [42]. Additionally, student-centered learning environments emphasize the importance of student participation and frequency, as low engagement levels can hinder knowledge construction [43]. Faculty engagement in continuous improvement processes, such as through the development of faculty portfolios and peer discussions, plays a significant role in enhancing teaching competencies and course quality [44]. These strategies align with the notion that effective teaching methods are essential for promoting interactive and student-centered learning, ultimately fostering a more engaging educational experience [42].

4.3 Implications for Educational Practice

The findings of this study have several important implications for

educators and policymakers in Islamic boarding schools:

a. Prioritize Multimedia Integration

Schools should prioritize the integration of multimedia tools into their teaching practices. This can enhance the effectiveness of religious education, improve student satisfaction, and promote interactive learning. By leveraging multimedia tools, educators can create more engaging and dynamic learning environments that cater to the diverse learning preferences of students.

b. Invest in Teacher Training

Professional development programs should be developed to equip teachers with the skills necessary to effectively use multimedia tools in their teaching methods. Training should focus on integrating multimedia content into lessons, using interactive teaching strategies, and creating student-centered learning environments.

c. Create Student-Centered Learning Environments

Schools should focus on creating learning environments that prioritize student satisfaction and engagement. This can be achieved by incorporating multimedia tools and interactive teaching strategies, fostering a supportive and inclusive classroom atmosphere, and providing opportunities for student feedback and involvement in the learning process.

d. Enhance Curriculum Design

Curriculum designers should incorporate multimedia content and interactive activities that enhance the teaching of Islamic religion and promote student engagement. This can help make religious teachings more accessible and relatable, thereby improving students' understanding and retention of religious principles.

4.4 Future Research Directions

While this study provides valuable insights into the role of

multimedia integration in enhancing religious education, further research is needed to explore additional factors that may influence student satisfaction and interactive learning. Future studies could investigate the impact of other technological tools, such as virtual reality or gamification, on religious education. Additionally, qualitative research could provide deeper insights into students' experiences and perceptions of multimedia-enhanced learning environments.

5. CONCLUSION

This study shows that multimedia integration positively impacts teaching effectiveness, student satisfaction, and interactive learning in Indonesian Islamic boarding schools. Multimedia tools make religious teachings more accessible and engaging, thereby enhancing student satisfaction and promoting interactive learning. The findings suggest several practical implications: schools should prioritize multimedia integration, invest in teacher training, create student-centered learning environments, and enhance curriculum design with multimedia content. Further research is needed to explore additional factors influencing student satisfaction and interactive learning, including the impact of other technologies like virtual reality or gamification, and to gain deeper insights into students' experiences with multimedia-enhanced learning.

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