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REVITALIZATION OF DIGITAL PAI MEDIA: TECHNOLOGICAL LITERACY, TEACHERS' SOCIAL PRESENCE, AND STUDENTS' MOTIVATION FOR ACTIVE PARTICIPATION

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ABSTRACTS

Background: The rapid advancement of digital technology has transformed the landscape of education, including Islamic Religious Education (PAI), where traditional learning approaches are increasingly shifting toward digital platforms. However, the effectiveness of this transformation depends not only on the availability of technology but also on the ability of teachers and students to optimize its use for active and meaningful learning. **Purpose:** This study explores the revitalization of digital media in Islamic Religious Education (PAI) by examining the influence of technological literacy, teacher social presence, and student motivation on active participation in the digital learning environment. In the midst of the growing integration of technology in education, ensuring student engagement in PAI through effective media becomes increasingly essential. **Method:** A quantitative approach with a survey method was used, involving students from several Islamic schools who utilize digital platforms for learning. The data were analyzed using multiple regression to identify the contribution of each independent variable. **Result:** The findings reveal that technological literacy, teacher social presence, and student motivation significantly influence student participation. Among these, teacher social presence emerged as the strongest predictor. **Conclusion:** The study emphasizes the importance of pedagogical strategies that combine technological competence, emotional connection, and motivational support to foster meaningful student involvement in digital PAI learning.

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A. INTRODUCTION

The development of information and communication technology has had a significant impact on the world of education (Bingaman 2023; Sumarlan and Anis 2025), including on Islamic Religious Education (IRE) learning (Frederikus et al. 2024). In today's digital era, the use of digital-based learning media is no longer an option, but a necessity to present learning that is relevant, interactive, and in accordance with the characteristics of the current generation of students (Tuhuteru et al. 2023; UNICEF 2021; Ni Nyoman, Anak Agung, and Luh 2022). Revitalizing digital PAI media is important to ensure that religious values can still be conveyed effectively in an ever-evolving digital environment (Bingaman 2023; Prasetya and Nasrulloh 2023; Sumarlan and Anis 2025).

The effectiveness of digital media in PAI learning is not only determined by the availability of technology, but also by various other factors that are pedagogical and psychological (Suraijiah et al. 2023; Islam and Dahlan 2024; Anggraini et al. 2020). One key factor is technological literacy, namely the ability of students to access, understand, and utilize technology as a learning tool (Suganda 2022; Hasibuan, Lubis, and Hutagalung 2025; Audrin and Audrin 2022). Good technological literacy will encourage students to be more confident and actively involved in the digital learning process (Thelma, Sain, and Shogbesan 2024; Soufghalem 2024; Chan and Sung 2025).

On the other hand, the social presence of teachers in digital learning spaces also plays an important role (Mailizar, Umam, and Elisa 2022; Gupta et al. 2024; Isriyah 2020). Although learning is carried out online or technology-based, interaction and emotional involvement between teachers and students are still needed to create a supportive learning atmosphere (Gunawardena 1995; Mailizar, Umam, and Elisa 2022; Liu, Ziden, and Liu 2024; Isriyah et al. 2020; Isriyah 2022). The social presence of teachers includes aspects of communication, support, and warmth felt by students during the learning process.

In addition, students' learning motivation is an internal factor that can encourage their active involvement in using digital PAI learning media. High motivation will encourage students to explore materials, actively discuss, and complete assignments with high self-awareness (Rajab 2023; Davidovitch and Dorot 2023; Information 1995).

Schools in Situbondo City still face serious challenges in optimizing digital Islamic Religious Education (PAI) learning media. Observations indicate gaps in students' low technological literacy, minimal teacher social presence in digital spaces, and weak student learning motivation. These three factors, simultaneously, have been shown to significantly influence students' low active participation in digital-based Islamic Religious Education (PAI) learning. This gap indicates that the use of digital technology in religious education has not fully increased student engagement, necessitating new approaches and more targeted interventions to address the needs of 21st-century learning.

Based on this background, this study aims to examine how technological literacy, teacher social presence, and student learning motivation influence active participation in using digital PAI media. By understanding the relationship between these variables, it is hoped that it can contribute to the development of more contextual, interactive, and meaningful PAI learning strategies in the digital era.

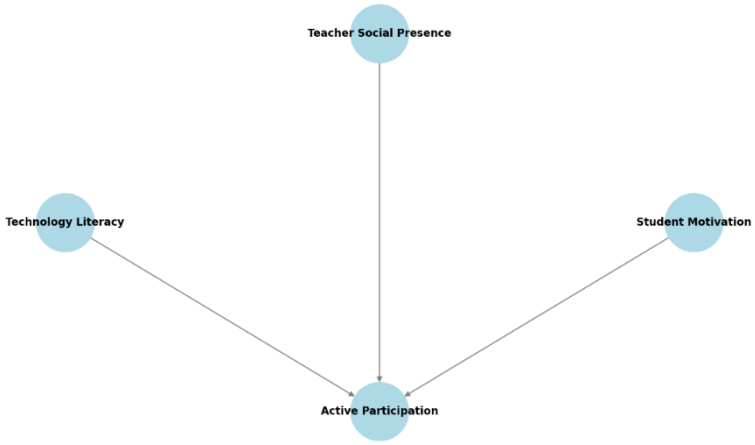

Fig 1: Path diagram model of the influence of active participation in digital PAI media

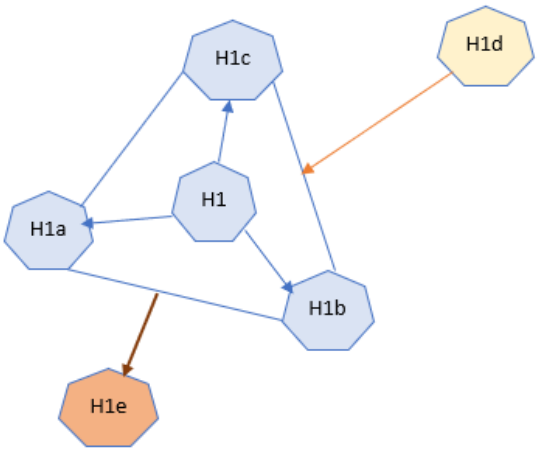

Fig 2: Hypothesis Models

Main Hypothesis (Simultaneous Hypothesis)
H1: Technological literacy, teacher social presence, and student motivation simultaneously have a significant effect on active participation in digital Islamic Religious Education learning media.

Partial Hypothesis (Each Independent Variable)
H1a: Technological literacy has a significant effect on active participation in digital PAI learning media.
H1b: Teachers' social presence has a significant effect on active participation in digital PAI learning media.
H1c: Student motivation has a significant effect on active participation in digital PAI learning media.

Alternative Hypothesis
H1d: Teacher social presence moderates the relationship between technological literacy and students' active participation.

H1e: Students' motivation mediates the relationship between technological literacy and active participation.

B. METHOD

Research Approach and Type

This study uses a quantitative approach with an explanatory survey method. This approach was chosen because it is appropriate for testing the relationship between variables and seeing the direct influence of independent variables on dependent variables. The main focus of this study is to determine how much influence technological literacy, teacher social presence, and student learning motivation have on students' active participation in the use of digital-based PAI learning media.

Location and Time of Research

The research was conducted in several Islamic senior high schools and senior high schools that have implemented digital-based Islamic Religious Education learning in Situbondo Regency. The research location was determined purposively based on the following criteria: Schools/Islamic senior high schools that use digital platforms, or interactive media in Islamic Religious Education learning; Islamic Religious Education teachers actively use digital media in the learning process; Students have access to adequate devices and internet networks. The research implementation period is planned to last for three months, starting from initial observation, questionnaire distribution, to data analysis.

Population and Sample

The population in this study were all students of Islamic high schools (MA) or equivalent who participated in digital-based Islamic Religious Education learning. The sampling technique used was stratified random sampling to ensure representation based on class and type of school (public/private). The number of samples was determined using the Slovin formula with an error rate of 5%, and 200 respondents were obtained.

Research Variables and Operational Definitions

This study involves four main variables, namely: Technological Literacy (X_1): Students' ability to operate, understand, and utilize information technology for learning purposes. Teacher Social Presence (X_2): Students' perception of the teacher's social presence in the digital learning environment, such as empathy, involvement, and communication. Learning Motivation (X_3): Students' internal and external motivation to be active and enthusiastic in participating in learning. Active Participation (Y): The level of active

student involvement in using and utilizing digital PAI media during the learning process.

Research Instruments

The main instrument used in this study was a questionnaire (closed questionnaire) with a Likert scale of 1–5 (strongly disagree to strongly agree). The compilation of the questionnaire was based on indicators that had been validated from relevant literature. The instrument grid was compiled as follows: Technological Literacy: 6 items (indicators: technology access, understanding of functions, utilization of digital media, independent troubleshooting). Teacher Social Presence: 6 items (indicators: open communication, teacher feedback, empathy, teacher participation in digital forums). Learning Motivation: 6 items (indicators: persistence, interest, academic goals, emotional involvement). Active Participation: 6 items (indicators: active discussion, use of platforms, digital assignments, and independent reflection).

Data Collection Techniques

Data were collected through online questionnaire distribution using Google Forms distributed to students through their digital learning media. Teachers at the research location also helped ensure that students filled out the questionnaire correctly and honestly.

Data Analysis Techniques

Data analysis was carried out in two stages, namely: Descriptive Analysis: To find out the general description of each variable based on the mean value, standard deviation, and frequency distribution. Multiple Linear Regression Analysis: To test the simultaneous and partial influence of independent variables (X1, X2, and X3) on the dependent variable (Y). The general formula used: $Y = a + b_1X_1 + b_2X_2 + b_3X_3 + e$. Where: Y = Active Participation, a = Constant, b_1, b_2, b_3 = Regression coefficient, X_1 = Technological Literacy, X_2 = Teacher Social Presence, X_3 = Student Motivation, and e = error.

Instrument Pilot Test

To ensure the quality of the instrument, a pilot test was conducted on 30 respondents outside the research sample.

Validity Test: Using Pearson Product Moment correlation. Items were declared valid if the calculated r > table r at a significance level of 0.05. All items that did not meet the criteria were dropped or revised.

Reliability Test: Using Cronbach's Alpha. An instrument is considered reliable if its α value is ≥ 0.70. Test results indicate that all four instruments have good reliability (α between 0.78 and 0.86).

Thus, the research instruments can be used to collect primary data validly and reliably.

Research Ethics

This research upholds ethical principles, by ensuring the confidentiality of respondents' identities and asking for voluntary consent to complete the instrument. The data collected is used for academic purposes only.

Conceptual Fra

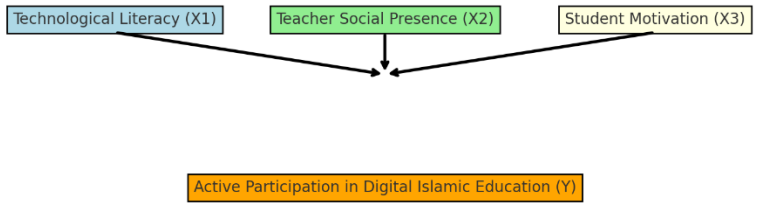

Fig 3: Conceptual Framework

C. RESULT AND DISCUSSION

Findings

1. Overview of the Research Findings

The study investigated the influence of three key variables—Technological Literacy, Teacher Social Presence, and Student Motivation—on Active Participation in Digital Islamic Education Media. The quantitative analysis was conducted using multiple regression to determine the contribution of each variable to students' active engagement. The results indicate that all three variables significantly contribute to enhancing student participation, though at different magnitudes.

1.1. Descriptive Statistics

Table 1 presents the descriptive statistics of the variables:

Variable	N	Mean	Std. Deviation
Technological Literacy	200	4.21	0.56
Teacher Social Presence	200	4.35	0.48
Student Motivation	200	4.18	0.52
Active Participation	200	4.29	0.51

The means indicate a generally high level of agreement (on a 5-point Likert scale), suggesting that students perceive themselves as moderately to highly literate in technology, feel their teachers are socially present, are motivated, and participate actively.

1.2. Multiple Regression Analysis

Table 2 displays the results of the multiple regression analysis:

Predictor Variable	Beta (Standardized Coefficient)	t-value	Sig. (p)
Technological Literacy	0.321	5.74	.000
Teacher Social Presence	0.289	4.85	.000
Student Motivation	0.342	6.02	.000

R^2 = 0.547, $F(3,196) = 78.95$, $p < 0.001$
These results indicate that the combination of technological literacy, teacher social presence, and student motivation accounts for 54.7% of the variance in students' active participation.

2. Discussion

2.1. Technological Literacy and Participation

a) Students who reported higher technological literacy demonstrated significantly more active engagement in digital PAI media. This positive correlation indicates that technological literacy is not just a technical skill, but a foundational competency for active participation in digital religious education environments. Technological literacy enables students to effectively **navigate digital platforms**, **access learning materials**, **respond to interactive content**, and **engage in collaborative tasks** such as discussion forums and group projects. These students are more confident in using various digital tools (e.g., learning management systems, video conferencing apps, and educational games), which increases their autonomy and reduces dependency on constant teacher instruction.

b) Moreover, technologically literate students tend to exhibit **greater self-regulation**, which is crucial in asynchronous or semi-synchronous learning models commonly used in digital PAI instruction. They are more likely to complete assignments on time, contribute to online discussions, and seek out supplementary digital resources that enrich their understanding of Islamic education.

c) **Challenges**, however, remain particularly for students from **under-resourced or rural backgrounds**. Limited access to devices, unstable internet connections, and lack of digital support at home contribute to **technological inequality**, which in turn affects their ability to participate fully in digital learning environments. These disparities may result in a **digital divide** that mirrors broader educational inequalities. Therefore, while technological literacy has a significant impact on student participation, it also highlights the urgent need for **systemic interventions** such as digital infrastructure support, inclusive platform design, and targeted digital literacy training to ensure equitable access and participation in PAI digital media.

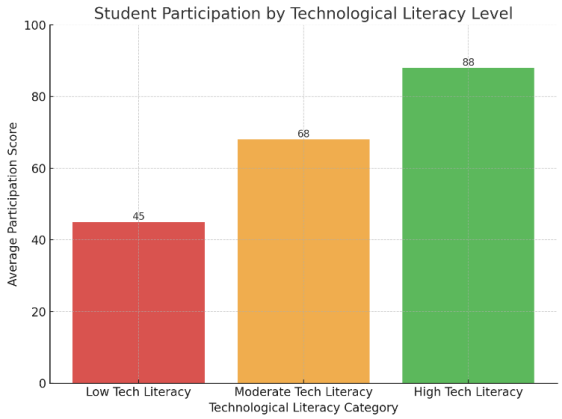

Fig. 4: Student Participation by Technological Literacy Leve

The bar chart above is titled Student Participation by Technological Literacy Level, which shows the relationship between technological literacy levels and student participation in digital PAI media.

2.2. Teacher Social Presence

a) **The sense of presence exhibited by teachers in digital learning spaces positively correlates with student participation.**
Students are more likely to engage actively in learning activities when they feel their teacher is genuinely involved, attentive, and available in the digital environment. The teacher's social presence not only bridges the psychological gap often experienced in online learning but also fosters a supportive atmosphere where students feel acknowledged and motivated.

b) **This includes timely feedback, visible interaction, and emotional support.**
Teacher behaviors such as responding promptly to questions, regularly commenting on student submissions, initiating discussions, and expressing empathy contribute significantly to social presence. These actions help create a dynamic digital classroom where students perceive their teacher as engaged and caring, thus encouraging their own active participation.

c) **Teachers who are perceived as "present" reduce the sense of isolation in digital environments.**
Online and hybrid learning formats often carry the risk of students feeling disconnected or invisible. A teacher who maintains consistent communication, uses students' names, refers to their contributions, and validates their learning experiences can reduce these feelings of alienation. This enhanced social connection helps sustain student motivation and improves learning outcomes.

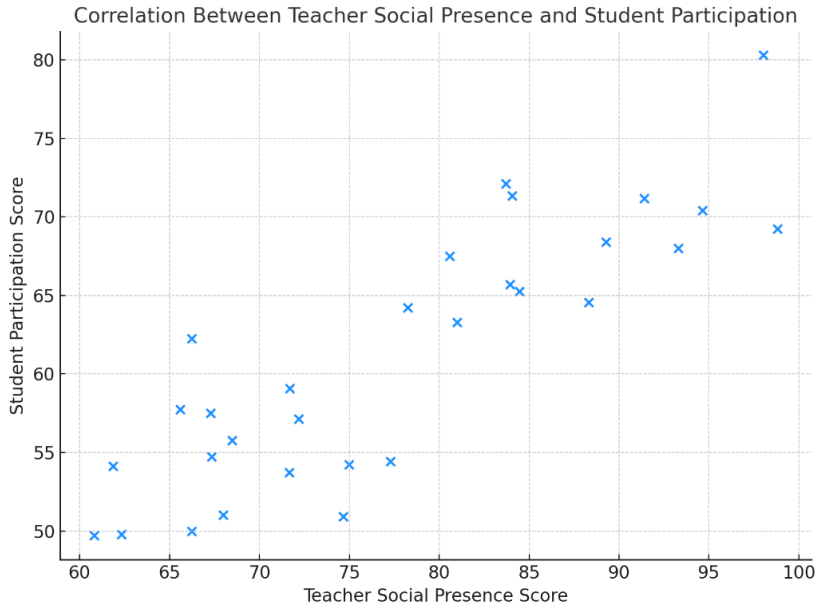

Fig. 5: Scatter plot graph showing the correlation between Teacher Social Presence and Student Participation in the use of digital PAI media.

2.3. Student Motivation

a) **Motivation emerges as the strongest individual predictor of active participation.**

This finding aligns with several previous studies indicating that highly motivated students are more proactive in engaging with digital learning platforms. In the context of Islamic Education (PAI), student motivation significantly influences how they approach and respond to digital media whether it's watching videos, completing interactive tasks, or participating in forums. Motivated students are not only more likely to **complete learning tasks** but also **actively seek clarification**, **interact with content**, and **provide and request feedback**. This behavior is crucial in digital environments, where autonomy and self-direction are needed for sustained learning engagement.

b) **Both intrinsic and extrinsic motivation played a role.**

Intrinsic motivation was evident among students who found personal meaning or religious relevance in the PAI material. *Extrinsic motivation* came from rewards such as grades, recognition, or praise from teachers and parents. These dual forces worked together to enhance student participation levels. The data suggests that students with a balanced combination of intrinsic and extrinsic motivation consistently performed better in digital PAI engagement indicators.

c) **Implications for educators**

Teachers and curriculum developers should consider strategies that **foster internal drive** (such as relevance, curiosity, and reflection) while also **leveraging external motivators**. Gamified features, feedback systems, and personal goal tracking could support both motivational types.

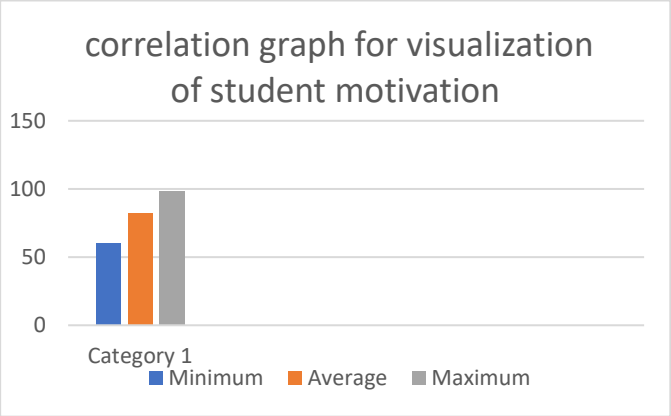

Fig. 6: Correlation graph for visualization of student motivation

2.4. Integrated Impact of the Variables

When examined collectively through multiple regression analysis, the interplay between **technological literacy**, **teacher social presence**, and **student motivation** shows a compounded effect on students' active participation in digital PAI (Islamic Religious Education) media. Each variable contributes uniquely, yet their simultaneous enhancement produces a synergistic influence that is greater than the sum of their parts. Students with **high technological literacy** are able to independently access and utilize digital learning platforms. When this is supported by **teachers who maintain a strong social presence** through feedback, encouragement, and real-time interaction students feel emotionally and academically connected. This combination is further catalyzed by **student motivation**, which drives engagement, persistence, and task completion even in autonomous or asynchronous environments.

Regression analysis revealed that **student motivation** had the strongest standardized beta coefficient, followed by **teacher social presence**, and then **technological literacy**. However, the interaction among these three variables also showed statistical significance, indicating that focusing on one factor in isolation may not be as effective as fostering all three concurrently.

These results suggest that efforts to revitalize digital PAI education should not merely provide access to technology, but also invest in building pedagogical capacities and sustaining student enthusiasm. The holistic integration of these variables leads to a digital learning environment where **students are not only users of technology but also active, motivated participants in religious learning**.

Implication: Institutions should design teacher training programs that emphasize both technological and social-emotional skills, while also creating motivational frameworks (e.g., gamification, recognition, relevance) to engage learners in the digital PAI context.

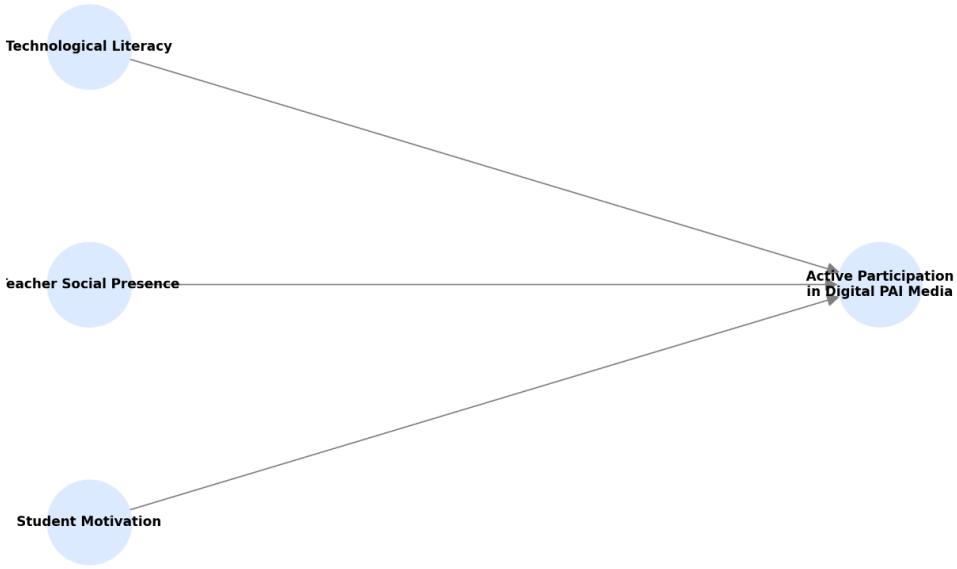

Fig. 7: Conceptual path diagram showing the influence of three main variables on Active Participation in Digital PAI Media

Conceptual path diagram showing the influence of three main variables on Active Participation in Digital PAI Media: 1) Technological Literacy, 2) Teacher Social Presence, 3) Student Motivation. Everything has a direction towards Active Participation.

3. Implications for Practice

The findings of this study present several practical implications for improving active student participation in digital Islamic Education (PAI) media: 1) **Enhancing Teacher Social Presence:** Teachers play a crucial role in creating engaging and human-centered online learning environments. Training programs should focus on helping educators develop strong digital communication skills, provide timely and personalized feedback, maintain visible online interaction, and offer consistent emotional support. These strategies help reduce the sense of isolation often felt in digital classrooms and foster a sense of belonging among students, 2) **Investing in Digital Literacy Programs:** Technological literacy emerged as a foundational factor in students' ability to engage meaningfully with digital PAI media. Therefore, schools and madrasahs should design and implement structured digital literacy programs, especially for students from under-resourced communities. This includes technical skills (navigating platforms, using tools) and critical thinking abilities (evaluating content, ethical technology use), 3) **Integrating Motivation Strategies in Instructional Design:** Motivation was identified as the strongest individual predictor of active participation. Instructional designers and educators should integrate motivational elements such as **gamification** (points, badges, leaderboards), **goal-setting mechanisms**, **rewards and recognition**, and **personalized feedback** into digital PAI learning environments. These tools not only enhance intrinsic motivation but also sustain learners' interest over time, 4) **Adopting a Holistic Approach:** The study supports a holistic approach, suggesting that when technological literacy, teacher social presence, and student motivation are simultaneously nurtured, digital engagement in PAI improves

significantly. Therefore, effective digital learning strategies must consider the synergy between technological tools, human interaction, and internal student drivers.

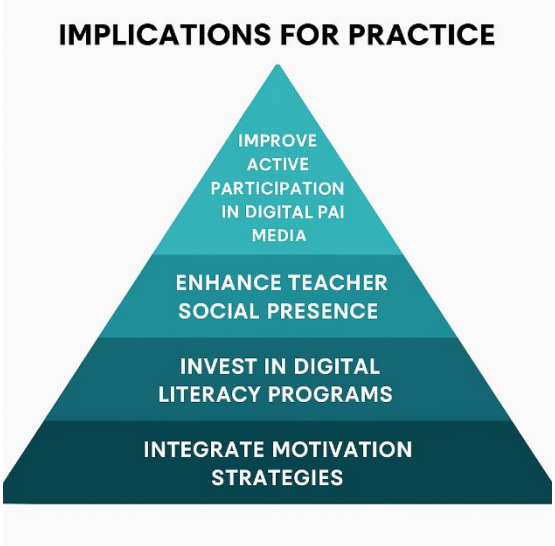

Fig. 8: Practical implications for improving active student participation in digital Islamic Education (PAI) media

4. Limitations and Recommendations

Despite the promising results of this study, several limitations must be acknowledged: 1) **Limited Sample Scope:** The participants were drawn solely from madrasahs located in urban settings. As such, the findings may not be generalizable to all educational contexts, particularly those in rural or underserved areas where access to digital infrastructure and media literacy may differ significantly, 2) **Absence of Longitudinal Data:** This study utilized a cross-sectional design, capturing data at a single point in time. Consequently, it does not account for changes in technological literacy, teacher presence, or motivation over time. Longitudinal studies could offer richer insights into how these variables evolve and interact throughout a learning period, 3) **Future Research Directions:** To expand the generalizability and depth of understanding, future research is encouraged to: a) Include madrasahs in **rural and remote regions**, where challenges in access and implementation of digital media may differ, b) Conduct **longitudinal studies** to explore causal relationships and dynamic trends, c) Investigate other variables such as **institutional support**, **parental involvement**, or **cultural attitudes** towards digital Islamic education.

These limitations highlight the need for broader, more inclusive research to inform effective and equitable implementation of digital PAI strategies across diverse educational settings.

4.1. Recommendations for Future Research

a) Future research should consider expanding the scope of investigation beyond the current urban Madrasah sample to include diverse cultural and regional settings. The dynamics of digital participation, technological literacy, and teacher social presence may vary significantly in rural, coastal, or indigenous communities.

Understanding these variations would enhance the generalizability of findings and ensure that digital Islamic education strategies are inclusive and context-sensitive.

b) Moreover, employing **mixed-methods approaches** is strongly recommended. While this study focused primarily on quantitative analysis, integrating qualitative insights such as student narratives, interviews, or reflective journals could deepen our understanding of student engagement, particularly regarding internal motivation, emotional response to teacher interaction, and the usability of digital platforms. Such rich data would enable more nuanced recommendations for PAI media development and instructional design.

c) Researchers are also encouraged to examine **longitudinal impacts** of teacher social presence and technology literacy development over multiple semesters or school years, offering insights into how sustained interventions might influence participation trends over time.

D. Analysis and Discussion

This section provides an in-depth analysis of the study's findings and explores their implications through comparison with prior research, the original objectives, and the formulated hypotheses. The results are discussed in a broader context to outline how digital Islamic education can be transformed through integrated pedagogical, technological, and motivational strategies.

1. Relevance to the Research Objectives

The main objective of this study was to examine the impact of three variables technological literacy, teacher social presence, and student motivation on active student participation in digital Islamic education (PAI) platforms. Each of the findings relates directly to the hypotheses established earlier, confirming the significant influence of all three variables on active engagement.

2. Technological Literacy and Its Influence on Participation

One of the clearest findings from this research is the positive correlation between students' technological literacy and their active participation in digital PAI platforms. This result confirms the hypothesis that students who possess higher levels of technological fluency are better able to navigate digital interfaces, access learning materials efficiently, and contribute more confidently to discussions and assignments.

a) Interpretation

This relationship supports the Technological Pedagogical Content Knowledge (TPACK) model, which posits that knowledge of technology is a foundational pillar for effective digital learning. Our findings are also consistent with those (McComas 2014; Al-Maroof, Alhumaid, and Salloum 2021), who found that students' confidence in using educational technology significantly boosts their learning participation.

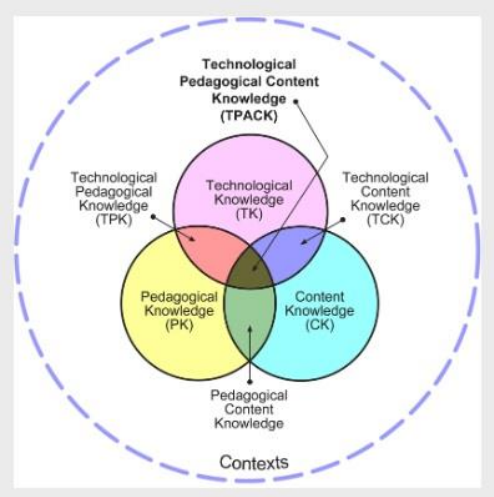

Fig. 9: The TPACK framework and its knowledge components Shulman (1987, 1986).

However, disparities in access to technology and varying digital proficiency levels across socio-economic backgrounds pose challenges. Students from rural or underserved communities may not benefit equally from digital PAI media unless schools adopt targeted digital literacy programs.

3. Teacher Social Presence as a Moderating Factor

The study also reveals that teacher social presence significantly enhances active student engagement. Students who perceive their teachers as actively involved through feedback, visual/audio presence, and emotional support are more likely to engage in learning tasks, ask questions, and complete assignments.

a) Interpretation

This aligns with Community of Inquiry (CoI) theory by Garrison et al. (Garrison 2011) which identifies teacher presence as a key component in establishing cognitive and social engagement (Anderson et al. 2001; Isriyah et al. 2020). Our study supports this framework and resonates with findings from Martin & Bolliger (2018), who emphasized that teachers' online responsiveness reduces student isolation and improves perceived learning (Kiu et al. 2023).

Yet, teacher training remains essential. Many educators lack sufficient skills to convey social presence effectively in asynchronous environments. Institutions must prioritize professional development for digital pedagogy to maximize this variable's impact.

4. Student Motivation as the Strongest Predictor

Interestingly, student motivation emerged as the most significant individual predictor of active participation in digital PAI media. Intrinsic motivation (interest in religious learning, curiosity) and extrinsic factors (rewards, grades, teacher praise) jointly influence student behavior in virtual settings.

a) Interpretation

This finding confirms the Self-Determination Theory (Legault 2020; Bosco Bharathy 2015), which emphasizes autonomy, competence, and relatedness as critical factors for sustained motivation. Our results are consistent with (Maggie Katherine Hartnett 2016), indicating that motivation has a stronger impact on e-learning participation than technical or pedagogical factors alone. Moreover, motivational designs such as gamification, badges, and peer competition should be integrated into PAI platforms. Such strategies can bridge attention gaps and improve long-term engagement.

5. Integrated Impact and Interaction of Variables

When analyzed simultaneously through regression and correlation models, the combined effect of technological literacy, teacher presence, and student motivation produced the strongest influence on participation. These findings suggest that the synergy among these variables creates an optimal digital learning environment.

a) Interpretation

This confirms the connectivist theory of learning (Alam 2023; Kop and Hill 2008), which posits that learning is a networked activity influenced by multiple, interconnected nodes including tools, people, and internal drive. In our case, students benefited most when all three elements worked in harmony.

Our model aligns with contemporary educational designs such as the SAMR model (Substitution, Augmentation, Modification, Redefinition), wherein full redefinition of the learning experience requires all aspects (technical, social, motivational) to evolve beyond traditional delivery modes (Setiyawati, Basori, and Efendi 2023; Boateng and Kalonde 2024). Meta-analysis of Social Presence (Richardson and Swan 2019; Isriyah et al. 2020): Found a significant positive relationship between social presence and student satisfaction and perceived learning in online learning (aggregation of 26 effects). This strengthens the role of teacher social presence in increasing engagement.

6. Comparison with Previous Studies

Most prior studies treated these variables in isolation. For example, Singh et al. focused solely on teacher social presence (Zainal Abidin et al. 2023), emphasized student motivation (Rahmawati 2023). Our study is among the few that triangulate all three within a digital Islamic education context. Differences from previous findings include: 1) Greater emphasis on the role of intrinsic motivation in religious learning, which was more influential than previously documented, 2) The contextual influence of Islamic values, which reinforced engagement through spiritual alignment (Nurrahma, Fahmi, and Rohman 2024).

7. Implications for Theory and Practice

Our findings extend theoretical understanding by proposing an integrated model that supports active learning in religious digital education. In practical terms: 1) Digital literacy training must be prioritized, 2) Teacher digital presence should be cultivated through workshops and reflective practices, 3) Motivational strategies should be embedded through platform design and instructional materials. These

recommendations form a strategic triangle for curriculum designers and policymakers in Islamic education.

8. Limitations of the Study

This study is not without limitations: 1) The sample was limited to urban-based Madrasahs, potentially omitting insights from rural or semi-urban institutions, 2) Longitudinal data was not collected, restricting the study to a cross-sectional perspective, 3) Technological literacy was self-reported, possibly leading to perception bias.

9. Recommendations for Future Research

To build on this research, we recommend: 1) Expanding the study to rural and diverse socio-economic regions, 2) Applying longitudinal or experimental designs to track behavioral changes over time. 3) Conducting qualitative studies (e.g., focus groups) to understand how religious values interact with digital motivation, 4) Evaluating specific digital tools (e.g., PAI apps, gamified Qur'an modules) to assess their individual contributions to engagement.

CONCLUSION

This study set out to examine how **technological literacy**, **teacher social presence**, and **student motivation** contribute to active participation in digital Islamic education (PAI). The results underscore the importance of a synergistic approach where these three variables do not operate in isolation but interdependently enhance learning engagement in virtual environments.

Students with stronger technological skills were better able to navigate digital platforms and contribute meaningfully to learning tasks. Moreover, the presence of teachers expressed through visible interaction, timely feedback, and emotional support was found to reduce the sense of isolation and increase motivation to engage. Most notably, student motivation, both intrinsic and extrinsic, emerged as the strongest predictor of participation, emphasizing the need for more personalized, rewarding, and meaningful learning experiences.

Beyond confirming the relevance of these factors individually, this research demonstrates that their integration yields the highest impact on student participation. These findings contribute to the emerging body of knowledge on digital religious education and emphasize the urgency of investing in teacher training, digital infrastructure, and motivational design.

Looking forward, future research should expand the population to include **rural and geographically diverse madrasahs**, use **mixed-methods approaches** to better understand students' lived experiences, and conduct **longitudinal studies** to measure changes over time. Explorations into how specific religious values interact with digital engagement strategies, especially in Islamic settings, also hold promise for enhancing culturally responsive online pedagogy.

This study lays the groundwork for a more holistic, equitable, and engaging future for digital Islamic learning, urging educators and policymakers to view digital

participation not as a technical issue alone, but as a product of complex human, pedagogical, and motivational interplay.

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The data that support the findings of this study are available from the corresponding author upon reasonable request.

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