Education and Sociedad Journal
Vol. 3 No. 2 (2025) : 83-91
Available online at https://serambi.org/index.php/esj

# Interactive Motivational Need Analysis for Mapping Digital Literacy Gaps and Learning Motivation in Islamic Religious Education

Ana Dwi Lestari✉, Sutiah, Mohamad Zubad Nurul Yaqin, Falih Akmal Wicaksono
Universitas Islam Negeri Maulana Malik Ibrahim Malang, Indonesia

**Abstract**

Islamic Cultural History (SKI) learning in the digital era faces a motivation gap in which students' high digital literacy is not accompanied by strong engagement in classroom learning. This study applied the Interactive Motivational Need Analysis (IMNA) framework to identify students' motivational and technological needs and to formulate instructional parameters based on the ARCS model (Attention, Relevance, Confidence, Satisfaction) in the Independent Curriculum Phase E. The research represents the analysis stage of a Research and Development (R&D) study employing the ADDIE model. Thirty tenth-grade students of state Islamic high school participated in the study. Data were collected through ARCS-based motivation questionnaires, classroom observations, interviews, and a diagnostic pretest, then analyzed using descriptive statistics and qualitative data analysis. The findings revealed that students' initial learning motivation was below the expected level, with an average score of 104.28 out of 160. The lowest scores were found in the Attention and Confidence dimensions. This condition was reflected in the low cognitive achievement, indicated by a pretest mean score of 32.22 on the Umayyad and Abbasid materials. Observation and interview results showed students' preference for interactive digital environments over static text-based learning. The IMNA framework ultimately identified the need for adaptive and personalized learning media, leading to the recommendation of Conversational Scaffolding Learning through the "Ruang SKI" ManyChat chatbot to enhance learning motivation and engagement.

**Keywords:** ManyChat Chatbot, Interactive Motivational Need Analysis, ARCS Model, Islamic Cultural History, Learning Motivation

**Article History:**
Received: July 2025; Revised: September 2025; Accepted: November 2025
✉**Correspondence Author:** 240101210044@student.uin-malang.ac.id
DOI: https://doi.org/10.61987/edsojou.v3i2.1987
How to Cite:
Lestari, A. D., Sutiah, S., Yaqin, M. Z. N., & Wicaksono, F. A. (2025). Interactive Motivational Need Analysis for Mapping Digital Literacy Gaps and Learning Motivation in Islamic Religious Education. *Education and Sociedad Journal, 3*(2), 83-91.

## INTRODUCTION

Islamic Religious Education (PAI) learning, especially in the subject of Islamic Cultural History (SKI) in the digital era, is faced with complex psychological and technological paradoxes. On the one hand, Generation Z students were born and grew up as digital natives who have a high level of digital literacy in their daily lives (Tatasari et al., 2025; Wiratami et al., 2023). They are very familiar with smartphone use, actively interact on social media, and are even used to utilizing artificial intelligence bases in their casual activities. But on the other hand, the high level of digital proficiency is inversely proportional to their affective condition when in a real classroom. SKI learning in madrassas is currently still often reported to trigger low motivation, boredom, and emotional passivity of students (Khikmah et al., 2024). The gap between students' digital proficiency potential and low enthusiasm for learning in conventional classrooms is an important

alarm for the methodological reconstruction of PAI learning in madrasas.

The root of the problem of low motivation stems from the inability of conventional learning instruments and media to adopt the psychological needs of students in the digital era (Agustina et al., 2025; Nurlatifah et al., 2025). SKI learning in general is still dominated by a teacher-centered strategy through monotonous lecture methods, as well as the use of printed books or worksheets that present a long, dense, and rigid chronological narrative (Harahap et al., 2025; Siswanto, 2024). The characteristics of SKI Phase E material which include complex power genealogies and the dynamics of vast civilizations such as the Umayyad and Abbasid Empires often trigger cognitive overload for students who are used to consuming fragmented digital information in a short duration (Mu'allimah et al., 2025; Rama & Lofandri, 2025). As a result, students lose attention, fail to see the relevance of the material to the reality of their lives (relevance), feel anxious or afraid of making mistakes when asked to participate (confidence), and do not get learning satisfaction due to the lack of instant feedback (satisfaction).

Previous troubleshooting efforts have generally focused on digitizing teaching materials in a one-way manner, such as moving book text to static PDF format, using presentation slides, or uploading videos to Google Drive. However, this approach to administrative digitalization has not touched the deepest aspects of student needs, namely two-way interaction and personal management of students' motivational conditions (V. W. Afriani & Nasution, 2025; Hidayatullah, 2025). Need analysis conducted by educators is often general and only oriented towards cognitive completeness, without specifically mapping the affective-motivational aspects that underlie student learning behavior in the digital era (Safitri et al., 2025). Therefore, a needs analysis approach is needed that is more comprehensive, responsive, and able to marry the aspect of interactive technology with the psychological component of student learning.

This research is here to offer novelty through the formulation of the concept of Interactive Motivational Need Analysis (IMNA). The IMNA concept is a learning needs analysis framework that integratively maps students' affective gaps using John Keller's ARCS (Attention, Relevance, Confidence, Satisfaction) motivational model which is aligned with the spirit of the Independent Curriculum. Through the IMNA analysis knife, the psychological dynamics of digital native students at MAN 2 Magetan were dissected in depth to formulate the characteristics of their actual learning needs.

The purpose of this study is to comprehensively map the gap between digital literacy and student learning motivation, as well as formulate the parameters of motivational-based PAI instructional needs. The results of this mapping through IMNA are expected to be a strong theoretical foundation for educators and educational technology developers in designing a future PAI learning ecosystem—especially based on conversational technology (chatbot)—which is not only digitally sophisticated, but also humanistic, adaptive, and able to arouse students' passion for learning in madrasas.

## RESEARCH METHOD

This research is part of the analysis phase in a series of research and development (R&D) using the ADDIE model (Asnawati & Sutiah, 2023; Yuyun Asnawati & Sutiah, 2023). The main focus of this article is to apply the Interactive Motivational Need Analysis (IMNA) framework to map the gap between digital literacy and student learning motivation. The research was carried out at MAN 2 Magetan by involving 18 test subjects of class X. The approach used in this study is a combination of descriptive, quantitative and qualitative to get a comprehensive picture of instructional needs.

The data collection process is carried out through the integration of four main instruments which include affective test instruments, observation, interviews, and cognitive tests. Students'

affective data were collected using the ARCS-Based Motivation Questionnaire in the form of a structured closed instrument with a Likert scale consisting of 32 statements. This questionnaire is designed to measure the four main dimensions of motivation, namely Attention, Relevance, Confidence, and Satisfaction. Before the main data collection was carried out, this questionnaire instrument had been tested for reliability on 30 respondents and was declared very reliable with a Cronbach's Alpha coefficient of 0.940. To strengthen the questionnaire data, the researcher used the Classroom Observation Sheet to record qualitative data on the dynamics of involvement, attention span, and the level of student passivity during the conventional SKI learning process. Furthermore, the Structured Interview Guidelines are also applied to SKI subject peer teachers and student representatives to explore in-depth data on the patterns of daily casual digital technology utilization, as well as the psychological-cognitive obstacles felt by students in understanding historical material that is narrative. As a complementary instrument, the Initial Diagnostic Test (Pretest) in the form of an objective test instrument is given to measure students' initial cognitive competence in the material of the Umayyad and Abbasid Empires in order to see the baseline of students' understanding before media intervention is carried out.

All data collected is then processed based on the characteristics of the data cluster using the help of statistical software and qualitative analysis. Quantitative data sourced from the ARCS motivation questionnaire was analyzed using descriptive statistical techniques to determine the mean value, standard deviation, and percentage achievement in each motivation component with the help of SPSS software. Meanwhile, qualitative data obtained from interviews and field observations were analyzed interactively using the Miles and Huberman model, which included the stages of data reduction, data display, and conclusion drawing. In the final stage of analysis, the synthesis of the two data sets is converted into an IMNA requirement parameter matrix. This matrix serves to map the gap as a whole as well as formulate recommendations for the development of chatbot-based interactive media that are adaptive to the characteristics and psychological needs of madrasah students in the digital era.

## FINDINGS AND DISCUSSION

### Findings

### Test the Validity and Reliability of the Motivational Questionnaire Instrument

Before mapping the distribution of responses and students' psychological conditions in the field, the researcher first conducted a validity and reliability test of the ARCS motivation questionnaire instrument. This process is crucial to ensure that the 32 statements used in the questionnaire have legitimate internal accuracy and consistency as a scientific measuring tool. The test was carried out by involving 30 students of class X as trial respondents. All data from 30 respondents were declared 100% valid without any data being excluded, so that the entire data was suitable to proceed to the reliability analysis stage. After verifying the validity of the data filling, a reliability coefficient is calculated to measure the internal consistency of the 32 items of the motivational questionnaire statement. The results of descriptive statistical analysis for the reliability of this instrument are presented in summary Table 1.

Table 1. Reliability Statistics Motivation Questionnaire

| Cronbach's Alpha | N of Items | Eligibility Criteria |
|---|---|---|
| 0,940 | 32 | Highly Reliable |

The value of Cronbach's Alpha coefficient of 0.940 was obtained for 32 statement objects. Considering that the value of the resulting coefficient is much greater than the generally determined standard threshold, which is 0.60, the motivation questionnaire instrument in this

study is stated to have a very high level of reliability (Very Reliable). These statistical findings scientifically prove that all the items of the designed instrument have excellent internal consistency and are free from measurement bias. Thus, this ARCS model-based motivation questionnaire is declared valid, stable, and trustworthy to be used as the main instrument in mapping the initial motivation profile and affective gap of students at the next stage of analysis.

### Description of Raw Data Distribution Motivational Baseline Questionnaire

After the instrument was declared to meet the requirements for validity and reliability, the raw data from the questionnaire filled out by 18 respondents was tabulated micro. This stage aims to photograph the tendency of students' answer choices on each statement item before they get new learning media interventions. The results of the descriptive statistical calculation of the 18 students' responses to each statement item are presented integratively in Figure 1.

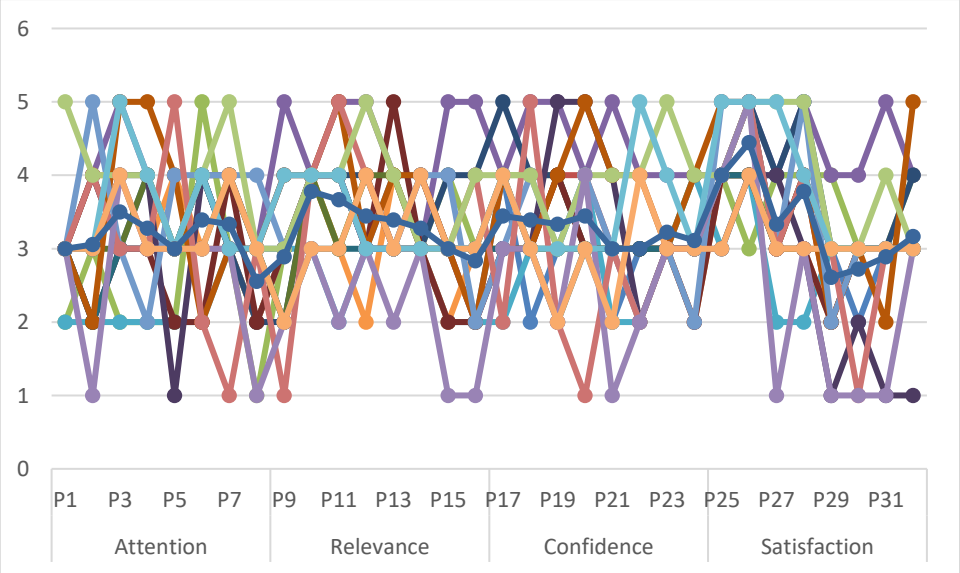


Figure 1. Trend of Average Score Fluctuations per Item of Student ARCS Motivation

Based on the visualization in Figure 1, the thick blue line in the middle maps the average trend graph of class X micro-from points P1 to P32. It can be seen that on the Attention dimension, the graph has a fairly sharp drop in item P8, which confirms that the student's attention span is very limited when exposed to conventional linear historical texts. On the other hand, in the Satisfaction dimension, the graph shows a movement trend that tends to be more stable but remains in the medium score range (score 3). The presence of thin lines in the background of Figure 1 shows a range of variation in answers between individuals, where the most dynamic and extreme fluctuations occur in the Confidence dimension (P17-P24). This dominant cumulative mean line movement pattern is below the ideal score of 4.00 visually confirms that students are in a state of affective saturation and require adaptive interactive media intervention.

### Average Distribution of Scores per ARCS Motivation Component

To get a more structured picture of the affective aspects of students, the 32 statements that have been tabulated in the previous stage are grouped into four main dimensions of the ARCS motivation model, namely Attention, Relevance, Confidence, and Satisfaction (Satisfaction). This grouping is derived using descriptive statistical techniques to calculate the actual average score achieved by students in each component before the intervention of the "SKI Room" media. The average distribution of the ARCS motivation baseline score is presented in Table 2.

Table 2. Average Distribution of Baseline Scores of Students' ARCS Motivation Components

| ARCS Motivation Components | Actual Gap Indicators | Actual Average Score | Maximum Ideal Score | Eligibility Categories |
|---|---|---|---|---|
| Attention | Saturated with chronological narratives, short attention spans on printed texts. | 24,15 | 40,00 | Low |
| Relevance | The material is felt abstract, rigid pedigree, and far from everyday digital culture. | 26,40 | 40,00 | Enough |
| Confidence | Anxious, afraid of responding incorrectly in class, passive in conventional forums. | 25,22 | 40,00 | Low |
| Satisfaction | Lack of instant appreciation, no tracking of independent learning progress. | 28,50 | 40,00 | Enough |
| **Total Skor Baseline** | **Cumulative Conditions of Initial Motivation** | **104,28** | **160,00** | **Enough** |

The cumulative total initial motivation baseline score of class X MAN 2 Magetan students is 104.28 from a maximum ideal score of 160.00. This number puts the student's initial affective condition in the "Sufficient" category, but it has a critical note on several fundamental dimensions. The Attention component recorded the lowest actual average score, which was 24.15 out of a maximum score of 40.00, which indicated a serious problem in terms of maintaining students' focus and attractiveness to the material presented.

Not much different conditions are also shown in the Confidence component which only achieved an average score of 25.22. The low achievement in this confidence aspect empirically confirms that the conventional classroom atmosphere that tends to be teacher-centered creates psychological pressure for students, so they choose to be passive in order to avoid the risk of incorrect answers in answering questions. Meanwhile, the Relevance (26.40) and Satisfaction (28.50) components were in the "Sufficient" category, indicating that although students understood the theoretical importance of historical value, they did not feel optimal emotional satisfaction due to the absence of an adaptive and instant feedback system. Theoretically, the score distribution data in Table 2 confirms that the aspects of Attention and Confidence are the two most crucial gaps that must be immediately intervened through the reconstruction of interactive learning media.

## Integration of Baseline Cognitive Impact and Qualitative Needs Analysis (IMNA)

The low graph of students' learning motivation in the four dimensions of ARCS is linearly proportional to the achievement of their initial cognitive competence in the field. Based on the results of descriptive statistical analysis of the Initial Diagnostic Test (Pretest) of Umayyad and Abbasid Empires, very worrying cognitive baseline data was obtained, where the average score (mean) of class X students only touched 32.22 out of a maximum score of 100. The range of values moves from a very low minimum score of 10.00 to a maximum score of only 70.00. This low initial cognitive score is the third empirical evidence that confirms that the accumulation of dense, abstract, and presented historical texts through a one-way scheme is not able to be well absorbed by the students' cognitive structure (see Table 3).

Table 3. Results of Descriptive Analysis of Students' Cognitive Baseline (Pretest)

| Test Variables | Number of Students (N) | Minimum Score | Maximum Value | Track-Track (Mean) | Standard Deviation |
|---|---|---|---|---|---|
| Pretest of SKI Learning Outcomes | 18 | 10,00 | 70,00 | **32,22** | 17,67 |

To confirm these quantitative findings, the researcher triangulated the data through class observation sheets and structured interview guidelines. The results of class observations show an interesting and paradoxical phenomenon: in the midst of the collapse of students' attention to the

teacher's lectures, most students are agile in operating smartphones secretly under the desk. The results of in-depth interviews with student representatives revealed that they have high casual digital literacy and are used to using artificial intelligence (AI)-based applications for daily needs, but they feel alienated by the thick and rigid format of SKI textbooks. Educators of SKI subjects at MAN 2 Magetan also admitted that there were great difficulties in stimulating student activity due to the limitations of instructional media that were adaptive to the characteristics of digital natives.

As a culmination of the entire series of quantitative and qualitative findings above, the researcher formulated formal instructional need parameters that were synthesized into the framework of Interactive Motivational Need Analysis (IMNA). This IMNA matrix concludes that to close the gap between students' digital agility and low motivation to learn SKI, madrasas need a revolutionary reconstruction of PAI learning media. This need parameter requires the presence of media that is able to "humanize technology", which is to transform the rigid historical narrative of the Umayyad and Abbasid Empire into an interactive digital conversation format (Conversational Scaffolding Learning), based on small pieces of material (microlearning), providing freedom of self-paced learning time), and provides instant automatic feedback in less than 1 second. The final recommendation from the IMNA needs analysis is the basis for the urgency of developing the ManyChat chatbot-based learning media "Ruang SKI" as a cutting-edge solution in the era of the Independent Curriculum Phase E.

## Discussion

The formulation of the concept of Interactive Motivational Need Analysis (IMNA) as an analysis knife in this study succeeded in revealing the existence of a big paradox between digital readiness (digital readiness) and the actual learning motivation of madrasah students in the era of the Independent Curriculum. Quantitative findings showing the low scores of the Attention (24.15) and Confidence (25.22) components and the fall in the average pretest score to 32.22 emphasized that the dominance of conventional lecture methods had a fatal effect on the collapse of students' cognitive focus. Theoretically, the phenomenon of mass boredom in the narrative-chronological material of SKI is in line with the concept of Cognitive Overload Theory initiated by John Sweller. Sweller stated that human working memory has a very limited capacity to process new information. When digital native students are forced to consume long, linear, and abstract historical narrative texts in one direction, their cognitive channels experience severe overload, which manifests directly as a loss of attention in the classroom.

The paradoxical condition in which students are agile in playing gadgets under the table but passive in conventional forums indicates that the main problem in the field is not the lack of digital literacy, but the failure of the instructional environment in adapting media. This is in line with the basic assumption of John Keller's ARCS motivation model, which asserts that learning motivation is not a static internal commodity, but rather the result of engineering the design of a learning environment that is responsive to the psychological needs of students (Keller, 1987, 2010). The low aspect of student confidence at MAN 2 Magetan proves that analog classes tend to provide high social pressure (high anxiety), where students are afraid of being judged by their peers if they answer the wrong answer. This finding is reinforced by previous research that states that Generation Z students have screen-smart characteristics but tend to be mentally vulnerable (fragile) in direct academic social interactions (Ariyani WARDHANA et al., 2025; Seituni & Isriyah, 2025; Suwahyu, 2024). Therefore, through the perspective of IMNA, the researcher argues that solving the problem of motivation in madrassas can no longer be solved by pseudo-administrative digitization such as simply moving printed text to a static PDF file on Google Drive because it only transfers analog boredom into digital media without any touch of interactivity.

The final synthesis of the IMNA framework gave birth to a new parameter recommendation for the PAI learning media architecture, namely the importance of implementing an interactive chatbot-based Conversational Scaffolding Learning (CSL) strategy . In contrast to research that only focuses on the use of a one-way Learning Management System (LMS), conversational AI media such as ManyChat offers students broad learning autonomy (learner control) (F. Afriani et al., 2024; Smutny & Schreiberova, 2020; Yin et al., 2025). From the perspective of the Independent Curriculum Phase E, which is oriented towards independence, the microlearning interaction model (dividing the genealogical texts of the Umayyad and Abbasid Empires into small chat units) and branching systems in chatbots provide a pressure-free space for students to set their own learning rhythms (self-paced learning) (Ani Daniyati et al., 2023; Saleh et al., 2025).

The researcher views that instant automatic responses of less than 1 second (immediate feedback) and personal communicative approaches (First Name Tag) in chatbots act as a form of "technological humanization" that effectively meets the Satisfaction aspect of students. When students get a digital quiz wrong, chatbots provide supportive verbal reinforcement without judgment, which is psychologically capable of restoring their lost confidence in a real classroom. Thus, this discussion based on the concept of IMNA succeeded in proving theoretically that the integration of digital platform automation and ARCS motivation management is the main key to transforming the historical material of Islamic civilization into a digital dialogue that is alive, meaningful, and relevant to the soul of today's generation.

## CONCLUSION

The Interactive Motivational Need Analysis (IMNA) framework effectively identified a significant motivational and technological gap among tenth-grade students in Islamic Cultural History (SKI) learning. Although students demonstrated high levels of casual digital literacy, their learning motivation and cognitive achievement remained relatively low, particularly in the Attention and Confidence dimensions of the ARCS model, as reflected in the low pretest performance. The findings indicate that conventional text-based instructional media are insufficient to accommodate the learning characteristics of digital-native students who prefer interactive and technology-mediated environments. Based on the IMNA diagnosis, the study formulated key instructional design parameters emphasizing the integration of digital automation and motivational support within Islamic Religious Education. Consequently, Conversational Scaffolding Learning (CSL) through the “Ruang SKI” ManyChat chatbot is recommended as an adaptive, personalized, and microlearning-based approach to enhance student engagement and learning outcomes. Theoretically, this research contributes by introducing IMNA as a novel framework for assessing affective and technological learning needs prior to instructional product development. However, as the study was limited to the analysis phase with a relatively small sample from a single Islamic senior high school, future research should validate and implement the proposed model on a larger scale and explore the integration of advanced generative artificial intelligence technologies to support more dynamic and adaptive learning interactions.

## ACKNOWLEDGMENT

The authors would like to express their sincere gratitude to the principal, teachers, and students of MAN 2 Magetan for their valuable participation, cooperation, and support throughout the research process.

## REFERENCES


Afriani, F., Suyato, S., Devi, I., Syafitri, A., Harahap, N. I. Y., & Simbolon, A. M. Y. (2024). Case Study: Impact Analysis of Educational Chatbot Use in Supporting Students in the Online Learning Process. *Jurnal Inovasi Teknologi Pendidikan, 11*(4), 439–453. https://doi.org/10.21831/jitp.v11i4.69941

Afriani, V. W., & Nasution, M. I. P. (2025). Digitization and Development of Educational Information Systems. *As-Salam: Journal Islamic Social Sciences and Humanities, 3*(4), 31–41. https://doi.org/10.66867/as.v3i4.146

Agustina, S. P., Ramayani, N., & Putri, D. A. E. (2025). Digital Technology Integration Strategies in Learning Media to Increase Student Learning Motivation: Learning Media. *Innovative: Journal of Social Science Research, 5*(3), 603–611. https://doi.org/10.31004/innovative.v5i3.19061

Asnawati, Y., & Sutiah. (2023). Canva App-Based Animated Video Media Development to Increase Student Learning Motivation. *Journal of Islamic Education, 5*(1), 64–72. https://doi.org/10.18860/jie.v9i1.22809

Asnawati, Y., & Sutiah. (2023). Canva Application-Based Animation Video Media Development to Increase Student Learning Motivation. *Journal of Islamic Education, 5*(1), 64–72.

Daniyati, A., Saputri, I. B., Wijaya, R., Septiyani, S. A., & Setiawan, U. (2023). Konsep Dasar Media Pembelajaran. *Journal of Student Research, 1*(1), 282–294. https://doi.org/10.55606/jsr.v1i1.993

Harahap, A. M., Marisa, S., & Mustapa, M. (2025). Teachers' Strategies to Improve Students' Communication Skills in Islamic Cultural History Learning at SMP IT Arisa Medan. *Innovative: Journal of Social Science Research, 5*(4), 8648–8668. https://doi.org/10.31004/innovative.v5i4.21010

Hidayatullah, M. S. (2025). Transformation of Education Administration in Elementary Schools: Towards Modern and Adaptive School Management. *Khatulistiwa, 6*(1), 1–14. https://doi.org/10.69901/kh.v6i1.338

Keller, J. M. (1987). Development and Use of the ARCS Model of Instructional Design. *Journal of Instructional Development, 10*(3), 2–10. https://doi.org/10.1007/BF02905780

Keller, J. M. (2010). *Motivational Design for Learning and Performance: The ARCS Model Approach*. Springer US. https://doi.org/10.1007/978-1-4419-1250-3

Khikmah, L. L., Maharani, S., & Hidayah, U. (2024). Innovation in Islamic Cultural History (SKI) Learning in Overcoming Learning Fatigue at Madrasah Ibtidaiyah KHR Ilyas Maduretno. *Social, Humanities, and Educational Studies (SHES): Conference Series, 7*(3). https://doi.org/10.20961/shes.v7i3.91799

Mu'allimah, H. Y. R., Choli, I., Sutiono, Badrah Uyuni, N. K., Fahrany, S., Diana, R., & Rosita, I. (2025). *Transformasi Pembelajaran Pendidikan Agama Islam di Era Digital: Teori, Praktik, dan Tantangan*. PT Penerbit Qriset Indonesia.

Nurlatifah, Rilla, D., & Gusmaneli. (2025). The Role of Digital Technology in Increasing Students' Learning Motivation. *Jurnal Pendidikan Sains dan Teknologi Terapan, 2*(4), 386–392.

Rama, A., & Lofandri, W. (2025). The Augmented Reality Paradigm in Sports Training: A Conceptual Study of Cognitive Load Theory. *SCHOULID: Indonesian Journal of School Counseling, 10*(2), 259–276. https://doi.org/10.23916/086248011

Safitri, A. A., Sumadi, C. D., & Setyawan, A. (2025). Analysis of Learning Assessment Needs Through a Learning Theory Approach in Class IV SDI. *Pendas: Jurnal Ilmiah Pendidikan Dasar, 10*(4), 214–228. https://doi.org/10.23969/jp.v10i04.34047

Saleh, M., Amaliah, M., & Yaumi, M. (2025). Multimedia in PAI Learning: Concepts and Theories, Multimedia Variety, Development Steps. *Jurnal Teknologi Pendidikan dan Pembelajaran, 3*(2), 642–650.

Seituni, S., & Isriyah, M. (2025). Revitalization of Digital PAI Media: Technological Literacy, Teachers' Social Presence, and Students' Motivation for Active Participation. *Edukasi Islami: Jurnal Pendidikan Islam, 14*(3), 927–948. https://doi.org/10.30868/ei.v14i03.8617

Siswanto, S. (2024). Analysis of Islamic Education on the Teaching of Islamic Cultural History. *Jurnal Manajemen Islam, 1*(1), 41–60.

Smutny, P., & Schreiberova, P. (2020). Chatbots for Learning: A Review of Educational Chatbots for the Facebook Messenger. *Computers & Education, 151*, 103862. https://doi.org/10.1016/j.compedu.2020.103862

Suwahyu, I. (2024). The Role of Technological Innovation in the Transformation of Islamic Education in the Digital Era. *Referensi Islamika: Jurnal Studi Islam, 2*(2), 28–41. https://doi.org/10.61220/ri.v2i2.003

Tatasari, T., Ambadar, R. T., & Agustin, N. A. F. (2025). The Influence of Digital Content on Generation Z in the Utilization of Social Media and Digital Native in the City of Surabaya. *Social Sciences Journal, 3*(1), 59–66. https://doi.org/10.59971/ssj.v3i1.185

Wardhana, A., Nandiwardhana, A., Kasmo, A., Haningsih, L., & Irvan, M. (2025). Driving MSME Digital Transformation in Meruya Selatan: The Role of ManyChat AI in Sustainable Growth and Intelligent Automation. *ICCD, 7*(1). https://doi.org/10.33068/iccd.v7i1.912

Wiratami, N. L., Widiastuti, N. K. C., & Elysiana, N. P. D. (2023). The Influence of Digital Literacy on Generation Z on Improving Literacy Culture to Produce a Quality Generation of the Nation's Successors in the Era of Science and Technology Advancement. *Prosiding Pekan Ilmiah Pelajar (PILAR), 3*, 406–417.

Yin, J., Xu, H., Pan, Y., & Hu, Y. (2025). Effects of Different AI-Driven Chatbot Feedback on Learning Outcomes and Brain Activity. *NPJ Science of Learning, 10*(1), 17. https://doi.org/10.1038/s41539-025-00311-8