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INTEGRATION OF ARTIFICIAL INTELLIGENCE IN LEARNING ISLAMIC CULTURAL HISTORY THROUGH THE SAMR MODEL IN THE INDEPENDENT CURRICULUM AT THE MTS LEVEL

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Abstract

The development of artificial intelligence (AI) provides significant opportunities for innovation in Islamic Religious Education (PAI) learning media, particularly in the subject of Islamic Cultural History (SKI). This article aims to analyze and conceptually develop AI-based PAI learning media integrated with the SAMR (Substitution, Augmentation, Modification, Redefinition) model and aligned with the principles of the Independent Curriculum. This research uses a descriptive qualitative approach with a literature review method, which examines various national and international research results regarding AI integration, the SAMR model, and PAI learning innovation. The study results indicate that the application of AI in SKI learning, such as the use of educational chatbots, automated videos based on historical texts, and augmented reality simulations, can increase student participation, understanding, and creativity. The integration of the SAMR model facilitates a shift from using technology as an aid to a transformational learning tool. At the Redefinition level , AI is able to redefine the learning experience by enabling students to interact virtually with the context of Islamic history. The application of AI in SKI learning is also in line with the spirit of the Independent Curriculum, which emphasizes flexibility, contextual learning, and the development of teachers' digital competencies. Thus, AI-based learning media has the potential to be a strategic solution in improving the quality of Islamic Education learning in an adaptive, creative, and future-oriented manner.

Keywords: History of islamic culture; Artificial intelligence; SAMR model; Independent curriculum.

INTRODUCTION

The rapid development of digital technology has transformed the face of education globally. However, many teachers still use technology merely as a substitute tool, without fundamentally changing the learning process. This situation often results in technology-based learning being less effective than conventional methods. For example, the use of PowerPoint or Google Docs merely as a substitute for a whiteboard or paper, without deeper integration with learning objectives (Blundell, Mukherjee, & Nykvist, 2022).

Advances in digital technology, particularly artificial intelligence (AI), have brought about significant changes in the world of education. Amidst these developments, Islamic Religious Education (PAI), a field focused on spiritual and moral values, is also being challenged to adapt. One important branch of PAI is Islamic Cultural History (SKI), which plays a role in instilling historical understanding, exemplary figures, and the values of Islamic civilization. However, the challenge facing SKI learning is the low level of student interest in historical material, which is perceived as monotonous and merely informative (Nisa', Lahitania, Maslahah, & Nikmah, 2025). In this context, the integration of AI-based technology presents a significant opportunity to revitalize the narrative of Islamic history through interactive and adaptive media.

The SAMR model developed by Puentedura (2012)offers a conceptual approach to assessing the level of technology integration in learning. At the Substitution and Augmentation levels, technology is used to replace conventional tools or enhance learning functions. Meanwhile, at the Modification and Redefinition levels , technology enables change and the creation of new learning

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experiences (Hamilton, Rosenberg, & Akcaoglu, 2016). The integration of AI in SKI has the potential to reach a stage of redefinition, where technology not only supports learning but also redefines the learning experience through dynamic and contextual historical visualizations.

This phenomenon is also evident in Indonesia, particularly during the COVID-19 pandemic, where online learning was implemented on an emergency basis and many teachers were not yet prepared to utilize technology optimally. As a result, the quality of learning declined, and many students experienced boredom and learning loss. This UNESCO et al. (2021) situation was exacerbated by disparities in access to digital infrastructure across regions (Bozkurt, Karakaya, Turk, Karakaya, & Castellanos-Reyes, 2022).

The urgency to improve the quality of technology integration in learning is high, because without a clear strategy, technology investments in schools will not have a significant impact on student outcomes. The SAMR (Substitution, Augmentation, Modification, Redefinition) model introduced by Puentedura (2012) offers a step-by-step framework for evaluating the extent to which technology truly transforms learning. With this model, teachers can assess their practices: whether they are simply replacing media, enhancing functionality, modifying task design, or redefining learning activities (Warsi & Rani, 2024).

The key idea of SAMR is to shift learning practices from mere efficiency to transformation (McQuirter, 2020). Initially, technology may simply streamline processes, but at a higher level, it enables new learning experiences that would not be possible without digital support. This aligns with the demands of the 21st century, where students need to master collaboration, creativity, and problem-solving skills (Sailer, Maier, Berger, Kastorff, & Stegmann, 2024).

The Indonesian context demonstrates high relevance to the SAMR model. The Merdeka Belajar policy provides flexibility for schools to innovate, including using technology to improve the quality of learning (Kemdikbudristek, 2024). The Merdeka Mengajar platform is even designed to help teachers access technology-based teaching content, assessments, and training Hakim & Abidin, 2024a). However, teacher and school readiness still varies, so implementing SAMR in the field faces challenges (Afnani & Attalina, 2025).

Previous research has shown varying results from SAMR implementation. Alfiana, Karyono, and Gunawan (2022) found an increase in critical thinking skills when the SAMR model was used in e-learning, while Niswatin and Zainiyati (2021) revealed that SAMR implementation in madrasas is still predominantly at the Substitution and Augmentation levels. Other studies highlight limited infrastructure and teachers' digital literacy as factors hindering implementation at a high level (Zulfiani, Suwarna, El Islami, & Sari, 2025).

The Independent Curriculum (Curriculum Merdeka) in Indonesia supports adaptive and project-based learning. Its core principles provide teachers with the freedom to innovate, utilize technology, and adapt methods to students' needs (Kemdikbudristek, 2024). In this context, the use of AI in Islamic Education (IS) learning aligns with the spirit of independent learning: technology is used to broaden students' understanding of Islamic history and encourage them to become independent and creative learners.

This study aims to: (1) analyze the application of the SAMR model in the development of AI-based Islamic Religious Education (PAI) learning media for Islamic Studies (SKI) subjects; (2) examine the role of AI in increasing the effectiveness and attractiveness of Islamic Religious Education (SKI) learning; and (3) identify its relevance to the principles of the Independent Curriculum and 21st-century teacher competencies. Although a number of previous studies have discussed the application of the SAMR model or the use of artificial intelligence in the learning process, studies that specifically integrate the two in the context of Islamic Cultural History learning are still very limited. Most previous studies have focused more on the implementation of SAMR in general subjects or the use of artificial intelligence as a learning aid without structuring it within a structured pedagogical transformation framework. Furthermore, there are not many studies that examine how the integration of artificial intelligence and the SAMR model can strengthen the principles of differentiation, flexibility, and independent learning that are the

hallmarks of the Independent Curriculum, especially at the Madrasah Tsanawiyah level. Therefore, this study aims to fill this gap by presenting an in-depth analysis of the role of artificial intelligence at each level of the SAMR model to improve the quality of Islamic Cultural History learning in a more innovative way and in accordance with the demands of 21st-century competencies .

Thus, this research is crucial to ensure that technology integration in schools can truly transform learning. The results are expected to be both theoretically beneficial by enriching the literature on ICT integration and practically beneficial by providing guidance for educators in developing relevant and sustainable learning innovation strategies. Thus, this research is crucial to ensure that technology investments in schools can truly transform learning. The results are expected to be both theoretically beneficial by enriching the literature on ICT integration and practically beneficial by providing guidance for educators in developing relevant and sustainable learning innovation strategies.

RESEARCH METHOD

This research uses a descriptive qualitative approach with a literature review method. The literature review was conducted through the stages of identification, selection, analysis, and synthesis, in accordance with qualitative research methodology guidelines (Moeloeng, 2016). The review process was carried out through four stages: (1) identification of relevant literature, (2) selection of sources with credibility and currency criteria, (3) content and thematic analysis, and (4) conceptual synthesis. This method was chosen because it is suitable for building a theoretical framework and conceptual reflection on the integration of AI in Islamic Education learning without requiring direct product development.

The analysis was conducted by mapping the study results into four SAMR levels, to determine the extent to which AI can be used, from substitution to redefinition. Furthermore, the discussion was linked to the Independent Curriculum policy and the demands of 21st-century digital teacher competencies. This approach aligns with (Snyder, 2019) the notion that a literature review can produce a comprehensive conceptual synthesis to strengthen the theoretical and practical foundations of a study.

RESULT AND DISCUSSION

AI Integration in SKI Learning Based on the SAMR Model

Substitution stage , AI replaces traditional media. Teachers can use AI text assistants to automatically generate biographical summaries of Islamic figures or classical Islamic civilization. For example, texts about Caliph Umar bin Khattab or the Wali Songo are generated through AI platforms like ChatGPT or Gemini, replacing manual compilation. In the Augmentation stage , AI's functionality increases: teachers can use text-to-video applications like Pictory or Lumen5 to transform historical texts into learning videos with automatic narration (Nuramila Nuramila, Ayu Hidayanti Ali, Puspita Dian Agustin, Dakia N Djou, & Eka Sartika, 2024).

Various literature shows that the majority of learning technology integration practices are still at the substitution and augmentation levels. Teachers tend to use digital tools as a substitute for conventional media without overhauling the learning design. For example, paper worksheets are switched to Google Docs or written exams are moved to Google Forms. This aligns with the results of a scoping review that found that the SAMR model is widely used to categorize practices, but transformational application is still limited Blundell et al. (2022. A similar phenomenon is seen in madrasas, which report that teachers are more comfortable using the basic level because it is consistent with old habits (Niswatin & Zainiyati, 2021).

Even at an early stage, the use of SAMR still helps improve learning efficiency. Teachers can provide faster feedback through the comment feature, and students can access materials more easily. However, the literature cautions that efficiency does not equate to improved learning quality (Hamilton et al., 2016) emphasizes that the SAMR hierarchy can be misleading if understood as higher is always better. True effectiveness lies in the alignment of technology with learning

objectives. Therefore, teachers need to be aware of not simply moving activities but rather considering meaningful redesign of learning activities.

Modification stage allows AI to create collaborative experiences. Students can use ChatGPT to discuss the value of Islamic history or build digital projects such as history blogs. AI acts as an active learning facilitator by helping clarify historical concepts or analyze events (Susanti & Amin, 2025). In the Redefinition stage , AI fundamentally changes the learning process: for example, using augmented reality (AR) to virtually visit Islamic historical sites or creating simulated "digital dialogues" with Islamic historical figures. Activities like these not only strengthen historical understanding but also build students' spiritual and emotional experiences (Fauzian, 2022).

Several studies in Indonesia highlight that limited digital infrastructure and teacher literacy contribute to suboptimal SAMR implementation. For example, in this study Wahyudi et al. (2023), teachers with sufficient access to devices were able to advance to the Modification level. However, schools with limited facilities tended to only achieve Substitution or Augmentation. This indicates an imbalance in technology integration achievements between schools, which impacts the equitable distribution of educational quality. Research (Lyddon, 2019) also found that teachers with access to digital devices can reach the Modification level of the SAMR model, while schools with limited technological facilities often only reach the Substitution or Augmentation level. Therefore, addressing these barriers is crucial for effective technology use.

Relevance to the Independent Curriculum Policy

The integration of AI aligns closely with the principles of the Independent Curriculum (*Kurikulum Merdeka*), which emphasizes contextual, differentiated, and project-based learning. AI supports personalized learning by providing materials tailored to students' needs, assisting teachers with automated formative assessments, and creating digital research-based projects (Hakim & Abidin, 2024). Teachers can use AI to tailor Islamic education content to students' abilities, while also encouraging them to explore Islamic history through creative approaches such as educational vlogs or history podcasts .

Furthermore, the Independent Curriculum emphasizes the profile of Pancasila students who are adaptive, critical thinkers, and creative (Agung, 2025) . AI directly contributes to the development of these skills by encouraging students to think reflectively about Islamic history and relate it to contemporary realities. Thus, AI is not simply a tool, but a pedagogical instrument that transformatively broadens the horizons of Islamic education.

Level Modification allows teachers to design significant collaborative activities. An example is the use of online documents for shared projects that can be edited in real time, which expands students' opportunities to learn from their peers. Studies have Alfiana et al. (2022)shown that integrating technology with the SAMR model significantly improves students' critical thinking skills. This confirms that the use of technology to redesign tasks can bring about real changes in learning outcomes.

In the Redefinition stage, technology enables previously impossible tasks. The most obvious example is the use of virtual reality for geography learning or augmented reality to understand science concepts. Research Sahronih et al. (2023)shows that AR can improve elementary school students' understanding of science material. While this implementation is still limited, it holds great potential to enrich learning experiences and foster 21st-century skills.

However, other research has found barriers to achieving the highest level of SAMR. (Zulfiani et al., 2025) highlighted that many teachers in developing countries stop at the basic level due to limited training and infrastructure. However, achieving this redefinition requires teacher competencies that are not only technical but also pedagogical. This situation highlights the importance of ongoing mentoring so teachers can utilize technology to create learning innovations.

Policy engagement is a key factor in successful integration. The Merdeka Mengajar platform launched by the Ministry of Education, Culture, Research, and Technology helps teachers access

technology-based teaching tools. Studies (Hakim & Abidin, 2024) report that this platform has positively contributed to improving the skills of vocational teachers. Teachers can more easily access digital learning materials and adopt the SAMR model at the modified and redefined levels. However, the study also cautions that without improving teachers' digital literacy, the platform's utilization will not be optimal.

The Relationship between SAMR and the Implications of Islamic Education Teacher Competence in SKI Learning

The application of the SAMR model in Islamic Education (SKI) learning must be directly directed at strengthening students' understanding of Islamic historical narratives, the exemplary role models, and the values of Islamic civilization. The Independent Curriculum emphasizes flexibility and student-centered learning (Nafa et al., 2025) . This aligns with the level of modification and redefinition of the SAMR model, which allows students to construct knowledge through innovative learning experiences. Research Afnani & Attalina (2025a)shows that teacher readiness influences the extent to which technology can be integrated into the Independent Curriculum. Teachers with sufficient digital competency are more likely to utilize technology to create project-based assignments. Therefore, teachers with less technological skills will face obstacles in keeping up with changes and adapting learning to the characteristics of students growing up in the digital era (Surahman et al., 2025) .

Teachers play a central role in ensuring effective AI integration. However, most Islamic Education (PAI) teachers lack sufficient digital literacy to harness the potential of AI in learning (Widaningrum et al., 2024). Therefore, improving digital competency and providing AI-based training is an urgent need. By mastering the SAMR model, teachers can assess the extent to which the technology they use truly transforms learning, rather than simply adding technical functions. Based on this, teachers act as digital learning designers capable of optimizing AI pedagogically and ethically. Therefore, teachers play a crucial role as digital learning designers by optimizing AI pedagogically and ethically. They are responsible for integrating AI tools into the classroom while ensuring that these technologies enhance personalized learning and support student engagement (Fatima, 2024) .

Research (King et al., 2022) confirms that effective use of SAMR goes beyond classification and serves as a means for teacher reflection. In the Indonesian context, this means teachers need to understand when technology is used for efficiency, when for modification, and when for redefinition. With this kind of reflection, teachers can leverage the flexibility of the Independent Curriculum to choose strategies that best suit students' needs.

Overall, the research findings demonstrate that the implementation of SAMR in the Independent Curriculum opens significant opportunities for educational transformation. However, fully realizing this potential requires increased teacher capacity, the provision of digital infrastructure, and policy sustainability. As emphasized Snyder (2019b), a literature review can help map practical, evidence-based strategies. With a strong theoretical foundation, SAMR can serve as a bridge between the concept of learning innovation and real-world practice in schools. Similarly, AI-based learning media can effectively enhance Islamic education teaching by creating engaging videos and animations. This integration serves not only as a technical tool but also enriches the pedagogical approach, making historical events and the socio-cultural context of Islam more immersive for students (Lahitania et al., 2025) .

Technology integration practices in schools are still predominantly at the substitution and augmentation levels. This is consistent with international reviews that found teachers tend to use technology as a substitute for conventional media, rather than as an instrument for creating new learning experiences (Blundell et al., 2022b). The application of artificial intelligence in SKI learning shows significant transformational potential when combined with the SAMR model framework. At the substitution and augmentation levels , AI technology only serves to replace or enhance the effectiveness of conventional media.

At the Modification and Redefinition level , AI enables the creation of new learning activities such as augmented reality- based Islamic history simulations , automated video production from historical texts, and the use of chatbots for reflective discussions on the values of Islamic civilization. These findings indicate that AI-based learning can shift the paradigm of Islamic Islamic history teaching from mere knowledge transfer to a creative process involving students' critical and collaborative thinking. Thus, AI functions not only as a technological tool but also as a cognitive mediator that fosters dynamic interactions between students and Islamic history materials. With increasing teacher competence, the integration of SAMR and AI in Islamic Islamic history not only reduces student boredom with historical materials but also encourages the development of 21st-century skills such as creativity, collaboration, and critical thinking skills about the development of Islamic civilization. This approach aligns with the Pancasila Student Profile and the principles of the Independent Curriculum, which emphasize student-centered, contextual, and flexible learning, and aligns with the principles of the Independent Curriculum and the values of the Pancasila Student Profile through character building, collaborative projects, and meaningful learning activities (Rahmawati et al., 2025) .

On the other hand, several studies highlight the limitations of the SAMR model when understood hierarchically without considering context. Hamilton et al. (2016b)emphasized that not all higher levels are automatically better, as effectiveness is still influenced by learning objectives, student characteristics, and teacher readiness. From a pedagogical perspective, this analysis also confirms that the successful integration of AI into SKI learning is highly dependent on teacher competence. Teachers with digital literacy and a sound understanding of technological pedagogy will be able to manage AI wisely and ethically. Therefore, teachers are required to master digital literacy and technology-based pedagogy to teach effectively in 21st-century learning (Abidin, 2023) . Based on this, digital literacy is considered a form of literacy that can improve teacher performance (Haz & Sugianto, 2022) . The tendency of some teachers to only use AI as an assistive medium needs to be addressed through ongoing professional training so they can implement the technology to the Redefinition level in SAMR. The Merdeka Belajar Curriculum provides flexibility to teachers and students, and encourages student-centered learning (Setiadi, 2024) , which is in line with the transformational spirit of SAMR. Studies on teacher readiness for this curriculum show that increasing digital competency significantly influences the success of technology integration (Afnani & Attalina, 2025b). With policy support, ongoing training, and the provision of adequate infrastructure, teachers will be more confident in adopting learning strategies that involve modifying and even redefining tasks. Therefore, SAMR can be a reflective and operational instrument for teachers to connect technological innovation with national curriculum practices.

CONCLUSION

The application of artificial intelligence in the development of Islamic Religious Education (PAI) learning media, particularly in Islamic Religious Education (SKI), can deliver interactive, contextual, and inspiring learning innovations. The integration of AI with the SAMR model enables a transformation from conventional learning to meaningful digital experience-based learning. At the redefinition level, AI not only enriches access to information on Islamic history but also creates new learning spaces that are more collaborative, immersive, and spiritually valuable. This implementation aligns with the spirit of the Independent Curriculum, which provides teachers with the freedom to innovate and adapt learning strategies. Going forward, improving teachers' digital competencies and supporting policies for the development of AI-based media will be strategic steps in realizing PAI that is relevant to the era of artificial intelligence.

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