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IMPLEMENTATION OF ARTIFICIAL INTELLIGENCE AND TAHSIN AL-QUR'AN GUIDANCE IN THE DEVELOPMENT OF ELEMENTARY SCHOOL TEACHERS' COMPETENCIES

IMPLEMENTASI KECERDASAN BUATAN DAN BIMBINGAN TAHSIN AL-QUR'AN DALAM PENGEMBANGAN KOMPETENSI GURU SEKOLAH DASAR

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Abstract

Digital transformation through Artificial Intelligence (AI) offers significant potential for enhancing elementary school teacher competence, yet its implementation remains largely technical and fragmented when detached from teachers' religious and personal dimensions. This study addresses this gap by examining the integration of AI-assisted learning and Qur'anic tahsin development as a holistic model of teacher competency enhancement. Employing a qualitative case study design, the research was conducted at SD Negeri 200206 Padangsidimpuan, involving elementary school teachers, Islamic Religious Education teachers, school leadership, and facilitators of AI and tahsin training programs. Data were collected through in-depth interviews, classroom observations, and document analysis, and analyzed using an interactive analytical model with methodological triangulation. The findings reveal that the use of AI tools—such as ChatGPT, Gamma, and Canva AI—significantly improves instructional effectiveness and strengthens teachers' pedagogical and professional competencies. Furthermore, AI-integrated Qur'anic tahsin training, particularly in makhārij al-ḥurūf and tajwīd, enhances teachers' Qur'anic recitation quality while reinforcing their religious and personal competencies. This study contributes a value-based, integrative framework for teacher professional development that bridges digital innovation and Islamic educational values. Despite its potential, the model faces challenges related to digital literacy disparities, infrastructural readiness, and the need for sustained mentoring. The study advances scholarly discourse on ethically grounded AI integration in elementary education.

Keywords : Artificial Intelligence, Qur'anic Tahsin, Teacher Competency Development, Elementary Education, Technology–Religiosity Integration.

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Abstrak

Transformasi digital melalui Kecerdasan Buatan (AI) menawarkan potensi signifikan untuk meningkatkan kompetensi guru sekolah dasar, namun implementasinya sebagian besar masih bersifat teknis dan terfragmentasi ketika terlepas dari dimensi religius dan pribadi guru. Studi ini mengatasi kesenjangan ini dengan meneliti integrasi pembelajaran berbantuan AI dan pengembangan tahsin Al-Qur'an sebagai model holistik peningkatan kompetensi guru. Menggunakan desain studi kasus kualitatif, penelitian ini dilakukan di SD Negeri 200206 Padangsidimpuan, melibatkan guru sekolah dasar, guru Pendidikan Agama Islam, kepemimpinan sekolah, dan fasilitator program pelatihan AI dan tahsin. Data dikumpulkan melalui wawancara mendalam, observasi kelas, dan analisis dokumen, serta dianalisis menggunakan model analitis interaktif dengan triangulasi metodologis. Temuan ini mengungkapkan bahwa penggunaan alat AI—seperti ChatGPT, Gamma, dan Canva AI—secara signifikan meningkatkan efektivitas pembelajaran dan memperkuat kompetensi pedagogis dan profesional guru. Selain itu, pelatihan tahsin Al-Qur'an yang terintegrasi AI, khususnya dalam makhārij al-ḥurūf dan tajwīd, meningkatkan kualitas bacaan Al-Qur'an guru sekaligus memperkuat kompetensi keagamaan dan pribadi mereka. Studi ini menyumbangkan kerangka kerja terpadu berbasis nilai untuk pengembangan profesional guru yang menjembatani inovasi digital dan nilai-nilai pendidikan Islam. Terlepas dari potensinya, model ini menghadapi tantangan terkait kesenjangan literasi digital, kesiapan infrastruktur, dan kebutuhan akan pendampingan berkelanjutan. Studi ini memajukan wacana ilmiah tentang integrasi AI yang berlandaskan etika dalam pendidikan dasar.

Kata Kunci : Kecerdasan Buatan, Tahsin Al-Qur'an, Pengembangan Kompetensi Guru, Pendidikan Dasar, Integrasi Teknologi-Religiusitas.

1. INTRODUCTION

Digital transformation, marked by the rapid advancement of Artificial Intelligence (AI), has brought fundamental changes to global education systems. AI enables personalized learning, automation of pedagogical tasks, analysis of learners' educational data, and the development of adaptive and contextualized instructional materials (Holmes et al., 2019). In the context of primary education, the utilization of AI has become increasingly crucial, as teachers are required to design learning experiences that are creative, effective, and responsive to the needs of 21st-century learners (OECD, 2020). Therefore, mastery of AI-based technologies constitutes an integral component of teachers' professional competency development.

Nevertheless, numerous studies indicate that the implementation of AI in education continues to face significant challenges, particularly in terms of teachers' readiness and competencies. The use of AI by educators is often limited to technical functions, such as the development of teaching materials, presentation media, or administrative tasks, without reflective and meaningful pedagogical integration (Zawacki-Richter et al., 2019). This condition results in fragmented teacher competency development, with excessive emphasis on technological aspects, while pedagogical, personal, and professional ethics dimensions receive insufficient and imbalanced attention (Published by The AACTE Committee on Innovation and Technology et al., 2014).

Islamic Religious Education plays a strategic role in shaping human resources who are faithful, ethical, and morally grounded. Teacher professionalism is a key determinant of the success of character education, requiring a balanced mastery of pedagogical, professional, and religious competencies. The ability to read the Qur'an correctly through *tahsin* guidance constitutes an essential component of the religious competence of primary school educators.

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Consequently, teacher competency development must be conducted in an integrative and contextual manner, including the utilization of AI-based educational technologies as supportive tools for effective learning, without displacing the fundamental objectives of Islamic Religious Education (Hilda Darmaini Siregar & Zainal Efendi Hasibuan, 2024).

In the Indonesian educational context, particularly at the primary school level, teacher competency development entails greater complexity. Teachers are not only expected to function as facilitators of academic learning but also as agents of character formation and moral value internalization among (Suyanto & Jihad, 2013). For Islamic Religious Education teachers and educators in values-based primary schools, religious competence is an inseparable dimension of professional identity. This competence is reflected in substantive mastery of Islamic teachings, including the ability to recite the Qur'an accurately in accordance with the principles of *makharij al-huruf* and *tajwid* (Rahmi et al., 2020).

The *tahsin* guidance of Qur'anic recitation for primary school educators is of high urgency, as the quality of teachers' recitation directly affects the quality of Islamic Religious Education instruction and the internalization of religious values among students (Anwar, 2018). Teachers with limited Qur'anic recitation skills risk transmitting incorrect recitation to learners, which may ultimately influence students' understanding and sustained practice of Islamic teachings (Doriza et al., 2023). Therefore, improving the quality of Qur'anic recitation through *tahsin* guidance represents a fundamental necessity in teacher competency development.

Empirical realities, however, reveal that a considerable number of primary school educators have not yet achieved optimal *tahsin* competence, particularly in terms of *makharij al-huruf* mastery and the application of *tajwid* rules (Kamaliah, Khairuddin, 2022). At the same time, teacher professional development programs organized by educational institutions tend to separate technology-based training from religious competency development. Technology-oriented training, including AI-related programs, primarily emphasizes the mastery of applications and digital tools, whereas *tahsin* guidance is conducted independently and remains disconnected from pedagogical and professional competency development (Maulani et al., 2024).

Such a partial approach to competency development is considered insufficient in addressing the complex challenges of education in the digital era. Twenty-first-century education demands teachers who are not only technologically proficient but also possess moral integrity, spiritual exemplarity, and high social sensitivity (UNESCO, 2019). Accordingly, an integrative approach is required to synergize the utilization of Artificial Intelligence with *tahsin* Al-Qur'an guidance within the framework of holistic competency development for primary school educators.

The integration of AI and *tahsin* Al-Qur'an holds strategic relevance for holistic teacher competency development. AI utilization can strengthen pedagogical and professional competencies through more effective instructional planning, innovative learning media development, and data-driven learning evaluation (Holmes et al., 2019). Meanwhile, *tahsin* Al-Qur'an guidance serves as a foundational mechanism for reinforcing teachers' personal and religious competencies, as reflected in their attitudes, exemplary conduct, and the quality of educational interactions with students (Anwar, 2018).

To date, scholarly studies that specifically examine the integration of Artificial Intelligence and *tahsin* Al-Qur'an guidance in the development of primary school educators' competencies remain scarce. Most existing research addresses AI in education in general terms (Zawacki-Richter et al., 2019) or focuses on Qur'anic recitation development separately,

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without integrating both dimensions into a unified conceptual and implementative framework. This limitation indicates a clear research gap that needs to be addressed to produce a competency development model that is responsive to the challenges of digital-era education while remaining rooted in Islamic values.

Based on this background, the research questions of this study focus on: (1) how Artificial Intelligence is implemented in the learning processes by primary school educators; (2) how *tahsin* Al-Qur'an guidance is conducted in developing educators' religious competencies; and (3) how the integration of Artificial Intelligence and *tahsin* Al-Qur'an guidance contributes to the holistic development of primary school educators' competencies. In addition, this study examines the challenges faced by educators in integrating AI and *tahsin* Al-Qur'an guidance into instructional practice, as well as the implications of such integration for strengthening pedagogical, professional, and personal competencies.

Accordingly, this study holds both academic and practical significance. Academically, it is expected to enrich scholarly discourse on the integration of technology and religious values in primary education. Practically, the findings are anticipated to serve as a reference for policymakers and educational practitioners in designing holistic, integrative, and sustainable teacher competency development programs. Therefore, this article aims to examine the implementation of Artificial Intelligence integrated with *tahsin* Al-Qur'an guidance in the development of primary school educators' competencies.

2. RESEARCH METHOD

This study adopts a qualitative approach employing a case study design. A qualitative methodology was selected because the research seeks to gain an in-depth understanding of the implementation process of Artificial Intelligence integrated with *tahsin* Al-Qur'an guidance in the development of primary school teachers' competencies. This approach enables the researcher to explore meanings, lived experiences, and educational practices within their natural and complex settings (Hasibuan et al., 2024).

The case study design is considered appropriate as the research focuses on examining a contemporary phenomenon situated in a real-life context, where the boundaries between the phenomenon and its contextual conditions are not clearly delineated (Yin, 2018). Through this design, the study aims to comprehensively capture the practices of integrating AI and *tahsin* Al-Qur'an guidance within a specific educational institution.

The research site was purposively selected at a public primary school that has implemented AI-based learning technologies and established a *tahsin* Al-Qur'an development program for educators, namely SD Negeri 200206 Padangsidimpuan. Research participants were determined using purposive sampling, whereby informants were selected based on predefined criteria aligned with the research objectives (Hasibuan, 2015). The participants included primary school teachers—particularly Islamic Religious Education teachers—the school principal or coordinator of teacher professional development, as well as facilitators involved in AI training and *tahsin* Al-Qur'an instruction.

Data were collected through multiple qualitative techniques, including in-depth interviews, classroom and program observations, and document analysis. In-depth interviews were conducted to elicit teachers' perceptions, experiences, and challenges related to the use of AI and participation in *tahsin* Al-Qur'an guidance. Observations were undertaken to examine the actual practices of AI utilization in instructional activities and the implementation of *tahsin* programs. Document analysis was used to review learning modules, AI-based

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instructional media, student worksheets, and official documents related to the *tahsin* Al-Qur'an program (Creswell et al., 2015).

Data analysis was conducted iteratively using an interactive analytical model comprising data condensation, data display, and conclusion drawing (Miles et al., 2014). To ensure trustworthiness and rigor, the study employed source and method triangulation, as well as member checking by confirming research findings with participants, thereby enhancing the credibility and validity of the results.

3. RESULT AND DISCUSSION

a. Introducing Artificial Intelligence to Enhance Classroom Learning Effectiveness

Artificial Intelligence (AI) in education refers to a range of intelligent technologies designed to support teaching and learning processes through machine capabilities such as learning from data, pattern recognition, real-time analysis, automated feedback, and algorithm-driven decision-making. These technologies include, but are not limited to, intelligent tutoring systems, content adaptation tools, and adaptive learning platforms (Prasetyo et al., 2025). Rather than replacing teachers, AI functions as a strategic pedagogical tool that enriches instructional practices and enhances overall learning effectiveness.

One of the primary theoretical foundations underpinning the use of AI in classroom settings is adaptive and personalized learning. AI systems are capable of analyzing learners' behavioral and performance patterns, allowing instructional content and learning strategies to be adjusted according to individual needs. This learner-centered approach provides real-time feedback, targeted reinforcement based on errors, and content recommendations aligned with students' levels of understanding, thereby fostering higher engagement and improved learning outcomes (Merino-Campos, 2025).

Contemporary learning theories emphasize that teachers should prioritize meaningful interaction with students, instructional design, and character development. AI supports this orientation by automating routine and administrative tasks, such as formative assessment, scheduling, grading, and the generation of basic instructional materials. As a result, teachers are afforded greater time and cognitive resources to engage in pedagogically meaningful activities that have a more direct impact on student learning (Prasetyo et al., 2025). This automation contributes to enhanced instructional effectiveness by enabling educators to focus on high-value pedagogical functions.

In addition, AI offers robust learning analytics capabilities through the real-time processing of educational data. These analytical functions allow educators to identify students' learning difficulties, recognize performance trends, and generate automated recommendations for remedial instruction or enrichment activities. Immediate feedback of this nature enables learners to address misconceptions more efficiently while assisting teachers in designing data-informed instructional strategies (Sholeh et al., 2024).

Recent scholarly literature conceptualizes AI not as a standalone tool, but as a component of an integrated learning ecosystem. This ecosystem typically encompasses: (1) adaptive learning systems that tailor instructional content to individual learners; (2) intelligent tutoring

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systems that provide personalized guidance and scaffolding; (3) learning analytics and dashboard technologies that support teachers in monitoring classroom progress; and (4) human–machine collaboration frameworks that emphasize a balanced relationship between AI technologies and teachers' roles as facilitators of learning (Aldyandra et al., 2024).

Emerging educational theories increasingly incorporate the concept of *humanistic AI*, which advocates for the ethical and human-centered application of AI in educational contexts. From this perspective, AI is positioned as a supportive mechanism that enhances the quality of teacher–student relationships while preserving the teacher's role as a moral, social, and pedagogical guide. AI is therefore not intended to replace human interaction, but to strengthen the human dimensions of education.

The effective integration of AI in classroom instruction must be grounded in established educational theories, including: (1) constructivist learning theory, which emphasizes learners' active construction of knowledge through personalized learning experiences; (2) social learning theory, which highlights the importance of social interaction among teachers and students, supported by AI-enhanced learning media; and (3) cognitive load theory, wherein AI assists in reducing learners' cognitive burden through efficient content delivery and timely feedback (Merino-Campos, 2025). Collectively, these theoretical perspectives explain why AI can enhance learning effectiveness when employed as a complement to well-designed instructional strategies.

Despite its considerable pedagogical potential, the application of AI in education also presents theoretical and practical challenges. These include teachers' digital literacy levels, institutional infrastructure readiness, ethical considerations related to data privacy, and the need for specialized professional development to ensure effective AI integration (Sholeh et al., 2024). Consequently, AI should not be regarded as a quick or universal solution, but rather as a technology that requires a carefully designed, pedagogy-driven implementation framework.

In the context of primary education, AI serves as an enabling technology that enhances learning effectiveness through adaptive instruction, personalized content delivery, pedagogical task automation, and learning analytics. Its use supports teachers in designing instruction that is more responsive to students' diverse needs while maintaining the teacher's central role as a facilitator of learning and character development. When implemented appropriately, AI contributes to the strengthening of teachers' pedagogical and professional competencies. However, its effectiveness is highly contingent upon educators' readiness, digital literacy, and adherence to pedagogical and ethical principles. Therefore, the introduction of AI should be integrated holistically with the reinforcement of teachers' personal and religious competencies, including *tahsin* Al-Qur'an guidance, to support the sustainable development of primary school teacher competencies.

b. The Utilization of ChatGPT in Learning Module Development

ChatGPT represents a form of generative Artificial Intelligence based on large language models, developed to generate human-like textual output through Natural Language Processing (NLP) and deep learning mechanisms in response to user input (Holmes et al., 2019). Within

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educational settings, ChatGPT is increasingly adopted as a supportive instrument for designing instructional materials, including learning modules, by facilitating content development that is structured, contextually relevant, and responsive to learners' diverse needs.

From a theoretical standpoint, the integration of ChatGPT into learning module development is consistent with adaptive learning and personalized instruction paradigms, which emphasize the alignment of learning materials with students' cognitive characteristics and learning preferences. Generative AI enables educators to efficiently formulate learning objectives, content explanations, contextualized examples, practice tasks, and assessment components based on predefined learning outcomes. This process reinforces learner-centered learning principles by positioning students as active participants in knowledge construction rather than passive recipients of instructional content (Luckin & Holmes, 2016).

When examined through the framework of Cognitive Load Theory, ChatGPT supports educators in organizing instructional modules using simplified, sequential, and concept-focused language structures. Such organization contributes to minimizing learners' cognitive load, thereby enhancing information processing efficiency and promoting deeper conceptual understanding (Sweller et al., 2011). Clearly articulated and systematically arranged materials allow learners to integrate new knowledge more effectively with existing cognitive schemas.

Empirical evidence further suggests that the application of generative AI technologies, including ChatGPT, in instructional material development can improve both the efficiency and quality of instructional design. Professional development programs that incorporate ChatGPT have been reported to strengthen teachers' capabilities in producing more creative, coherent, and learner-oriented learning modules, while simultaneously reducing the time required for instructional planning (Xiaoming Zhai, n.d.). In elementary education training contexts, ChatGPT has been utilized to generate preliminary module drafts, which are subsequently refined and validated by teachers to ensure curricular alignment and contextual relevance.

Despite these advantages, scholarly literature emphasizes that ChatGPT should not function as an autonomous or primary source of instructional content without pedagogical oversight. AI-generated outputs may contain conceptual inaccuracies, embedded biases, or inconsistencies with curricular frameworks if they are not subjected to critical evaluation. Consequently, ChatGPT should be positioned as a co-creator or pedagogical assistant that complements teachers' professional expertise rather than replacing their instructional role.

In summary, the utilization of ChatGPT in learning module development constitutes a strategic approach to enhancing teachers' professional and pedagogical competencies by improving efficiency, creativity, and instructional design quality, provided that its implementation remains critical, ethical, and firmly grounded in established pedagogical principles.

c. The Utilization of Gamma for Developing Instructional Presentations

Gamma is an Artificial Intelligence–based platform that integrates natural language processing and generative design technologies to support the automated, structured, and visually driven creation of instructional presentations. In educational contexts, Gamma

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functions as a pedagogical support tool that enables teachers to develop presentation materials aligned with learning objectives, logical content sequencing, and effective visual representations without requiring advanced design expertise (Holmes et al., 2019).

From a theoretical perspective, the adoption of Gamma is consistent with the Cognitive Theory of Multimedia Learning, which posits that learning is more effective when information is delivered through well-organized combinations of textual and visual elements. The concise, hierarchical visual structures generated by Gamma contribute to reducing extraneous cognitive load and enhancing learners' conceptual understanding, particularly in primary education settings (Mayer, 2020).

Viewed through the lens of instructional design, Gamma supports rapid instructional design approaches by assisting educators in constructing systematic and efficient presentation frameworks. The AI-driven features of Gamma facilitate idea organization, content flow structuring, and visual layout alignment with instructional goals, thereby strengthening teachers' pedagogical and professional competencies in lesson planning and material development (Branch & Kopcha, 2014).

Evidence from teacher training practices indicates that the use of AI-based presentation platforms improves planning efficiency and the visual quality of instructional materials. By delegating technical design tasks to AI, teachers are able to concentrate more fully on instructional substance and meaningful classroom interaction. These findings align with the concept of teacher augmentation, which conceptualizes AI as a means of extending teachers' professional capacity rather than replacing their instructional role (Luckin & Holmes, 2016).

Nevertheless, existing scholarship emphasizes that the application of AI in instructional design requires ongoing pedagogical oversight and critical reflection. AI-generated materials must be carefully validated to ensure alignment with learners' developmental characteristics, cultural contexts, and intended learning outcomes. Accordingly, Gamma should be positioned as a strategic pedagogical tool that is employed ethically, reflectively, and in accordance with established pedagogical principles to effectively enhance learning outcomes.

d. The Utilization of Canva AI in Developing Student Worksheets (LKPD)

Canva AI is an Artificial Intelligence–based educational design platform that integrates generative design, text-to-design technology, and AI-assisted layout features to support educators in producing visual learning materials efficiently and systematically (Holmes et al., 2019). In educational practice, Canva AI is widely used to design Student Worksheets (LKPD) that are not only visually engaging but also aligned with instructional objectives and learner-centered learning activities.

Theoretically, the application of Canva AI in LKPD development can be explained through the Cognitive Theory of Multimedia Learning, which asserts that learners achieve better understanding when information is presented through a well-integrated combination of textual and visual elements (Mayer, 2020). Worksheets designed with relevant visuals, icons, and illustrations support balanced processing through visual and verbal channels, thereby enhancing learners' conceptual comprehension.

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Furthermore, Canva AI–based worksheet design is closely associated with Cognitive Load Theory, which emphasizes the importance of managing learners' cognitive capacity to prevent information overload that may hinder learning processes. Canva AI assists teachers in structuring LKPD in a concise, hierarchical, and task-focused manner, effectively reducing extraneous cognitive load and facilitating more efficient learning experiences (Sweller et al., 2011).

From an instructional design perspective, Canva AI supports learner-centered learning and rapid instructional design approaches. Teachers can easily develop worksheets that incorporate exploratory, reflective, and collaborative learning activities aligned with intended learning outcomes. In this context, AI functions as a design assistant that visualizes instructional ideas, while pedagogical control remains firmly with teachers as the primary designers of learning experiences (Branch & Kopcha, 2014).

The use of Canva AI is also consistent with the concept of teacher augmentation, which conceptualizes AI as a means of expanding teachers' professional capacity rather than replacing their instructional role (Luckin & Holmes, 2016). Canva AI enhances efficiency, creativity, and the overall quality of LKPD, enabling teachers to devote greater attention to learning facilitation and meaningful educational interaction with students.

Empirical evidence from teacher training practices, particularly at SD Negeri 200206 Padangsidimpuan, demonstrates that the use of Canva AI in developing thematic LKPD significantly improves visual quality and instructional clarity. Teachers reported that AI-assisted worksheets were more engaging, easier for students to understand, and effective in increasing active student participation during learning activities (Interview data, teachers of SD Negeri 200206 Padangsidimpuan). These findings reinforce prior research indicating that the integration of AI into instructional material design can enhance learning effectiveness when implemented reflectively and pedagogically.

Nevertheless, existing literature emphasizes that the use of Canva AI requires continuous pedagogical evaluation. Excessive emphasis on visual elements may obscure instructional objectives if not carefully managed. Therefore, Canva AI should be positioned as a strategic instructional tool that supports the enhancement of teachers' pedagogical and professional competencies, rather than substituting teachers' central role in instructional planning.

e. Training to Improve Qur'anic Reading Proficiency for Primary School Teachers: Strengthening Makharij al-Huruf

Makharij al-huruf constitute a fundamental component of tajwid science, determining the accuracy and validity of Qur'anic recitation. Al-Jazari emphasized that mastery of articulation points and phonetic characteristics is essential for correct Qur'anic recitation, as phonetic inaccuracies may alter lexical meaning (Al-Fadhli, 2019). In primary education, teachers' Qur'anic reading competence is critical, as teachers serve as both linguistic and religious models for students.

The integration of Artificial Intelligence (AI) in tahsin (recitation refinement) training is grounded in technology-enhanced learning and audio-visual phonetic learning theories, which

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highlight the effectiveness of visualization, instant feedback, and data-driven repetition in phonetic skill development (Mayer, 2020). AI enables speech recognition, visualization of articulation mechanisms, and automated error correction, thereby strengthening tashih processes that traditionally rely solely on instructor feedback.

AI-integrated makharij al-huruf training was implemented at SD Negeri 200206 Padangsidimpuan, involving classroom teachers and Islamic education teachers. The program was designed as a blended tahsin training model combining classical instruction, guided practice, and AI-supported Qur'anic learning applications.

The training stages included:

1) initial diagnostic assessment using participants' voice recordings analyzed through AI-based speech recognition;
2) Theoretical instruction on makharij al-huruf supported by animated visualizations of tongue, lip, and oral cavity positions;
3) Guided pronunciation practice with real-time AI feedback and instructor correction;
4) Individual and group Qur'anic reading practice; and
5) Pedagogical reflection focusing on classroom implementation.

This approach aligns with an integrative behaviorist–cognitive framework, in which repetitive reinforcement is combined with cognitive awareness of phonetic errors (Skinner, 2019).

Observational findings revealed that prior to training, most teachers struggled to differentiate letters with similar articulation points, such (د–ض) ,(ص–س) ,(س–ش), and (ت–ط). These errors were largely habitual and unrecognized due to prolonged teaching practices. Following the implementation of AI applications that visualized articulation points and provided real-time audio feedback, participants demonstrated significantly increased phonetic awareness. Teachers were able to independently identify and correct errors through repeated practice, accompanied by heightened engagement, confidence, and participation during training sessions (Observation data, SD Negeri 200206 Padangsidimpuan).

In-depth interviews indicated that AI integration provided a more reflective learning experience. Teachers reported reduced dependence on instructor correction and increased autonomy in recognizing and correcting errors. Participants also expressed intentions to apply similar AI-supported approaches in Islamic education classrooms as supplementary tools for students' Qur'anic reading practice (Interview data, teachers of SD Negeri 200206 Padangsidimpuan).

As a case study, trained teachers applied the acquired competencies in routine Qur'anic reading activities. The use of audio exemplars and visual articulation aids resulted in improved pronunciation clarity and greater student responsiveness to corrective feedback. These outcomes indicate that enhanced teacher competence directly influences the quality of Islamic religious education and students' internalization of religious values.

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f. Training to Improve Qur'anic Reading Proficiency for Primary School Teachers: Deepening Tajwid Knowledge

Tajwid is a specialized discipline governing the correct recitation of the Qur'an, encompassing articulation rules, phonetic precision, vowel length, and recitation laws established by classical qira'at scholars. Al-Jazari affirmed that reciting the Qur'an with proper tajwid is obligatory, as violations of tajwid rules may distort both pronunciation and meaning (Al-Fadhli, 2019). In primary education, teachers' mastery of tajwid holds strategic importance, as teachers function as the primary recitation reference for students.

The integration of AI in tajwid training draws upon technology-enhanced learning, multimedia learning, and learning analytics theories, which emphasize visualization of abstract concepts, immediate feedback, and data-driven learning processes (Mayer, 2020). AI facilitates objective analysis of Qur'anic recitation through speech recognition, tajwid error detection, and real-time corrective recommendations, thereby strengthening traditional tashih methods that rely heavily on subjective auditory judgment.

AI-based tajwid training was conducted at SD Negeri 200206 Padangsidimpuan using a blended learning model that combined face-to-face instruction, independent practice, and AI-supported Qur'anic learning applications. Training content focused on frequently misapplied tajwid rules, including nun sakinah and tanwin, mim sakinah, madd, qalqalah, and waqf and ibtida'.

Training stages included initial tajwid competence mapping through AI-analyzed recitation recordings, theoretical instruction with interactive visualization, guided recitation practice with real-time AI feedback, instructor-led reinforcement, and pedagogical reflection on classroom application.

This instructional approach aligns with constructivist learning theory, emphasizing active and reflective learning, as well as Cognitive Load Theory, wherein AI-supported visualization and feedback reduce cognitive burden when processing complex tajwid rules (Sweller et al., 2011).

Observational data indicated that prior to training, most teachers possessed theoretical knowledge of tajwid but demonstrated inconsistent application during recitation. Common errors included inaccurate madd implementation, improper ghunnah articulation, and incorrect stopping points that affected verse meaning. Following AI integration, participants showed marked improvement in error awareness and corrective accuracy. AI-assisted feedback enabled precise identification and repeated correction of errors, resulting in increased engagement and reduced anxiety during recitation practice.

Interview findings revealed that AI-based learning provided more objective and personalized feedback. Teachers noted that AI feedback helped identify previously unnoticed errors, particularly in madd and ghunnah application. Participants also reported greater confidence and willingness to read aloud, as initial corrections were provided by the system before instructor confirmation (Interview data, teachers of SD Negeri 200206 Padangsidimpuan).

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As a practical application, trained teachers implemented AI-informed tajwid strategies in classroom Qur'anic reading sessions. Students demonstrated improved accuracy in madd, ghunnah, and waqf application and increased participation during recitation activities. Teachers reported that tajwid instruction became more structured, engaging, and meaningful, emphasizing correctness alongside fluency (Interview data, teachers of SD Negeri 200206 Padangsidimpuan).

Overall, AI-integrated tajwid training contributes significantly to the holistic development of primary school teachers' competencies. AI enhances pedagogical and professional competencies through data-driven and reflective learning, while tajwid training strengthens teachers' religious and personal competencies. This integration demonstrates that technology can function as a strategic tool to enhance the quality of Islamic education without displacing its spiritual and ethical foundations.

4. CONCLUSION

Based on the research findings, the integration of Artificial Intelligence in primary school learning through platforms such as ChatGPT, Gamma, and Canva AI has effectively supported the planning, implementation, and evaluation of instructional activities. AI functions as a pedagogical support tool that enhances teachers' work efficiency, improves the quality of instructional materials, and increases student engagement, thereby contributing to the strengthening of educators' pedagogical and professional competencies. Nevertheless, the effectiveness of AI implementation remains contingent upon factors such as teachers' digital literacy, infrastructure readiness, and reflective teaching capacity.

The tahsin al-Qur'an development program conducted at SD Negeri 200206 Padangsidimpuan, encompassing the refinement of makharij al-huruf and the deepening of tajwid knowledge, has demonstrably enhanced teachers' religious and personal competencies. The integration of AI through voice analysis, phonetic visualization, and real-time feedback mechanisms strengthened the tashih process in a more objective and systematic manner, while also increasing teachers' phonetic awareness, accuracy in tajwid application, and self-confidence in Qur'anic recitation.

The combined integration of AI in instructional practices and tahsin al-Qur'an training has resulted in a holistic model of teacher competency development that is adaptive to the demands of the digital era while remaining firmly grounded in Islamic values. However, challenges related to limited AI literacy, the need for sustained professional mentoring, and the establishment of clear ethical and pedagogical frameworks underscore the importance of adopting an integrative and sustainable approach to teacher professional development.

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