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Facilitating Qur'anic Literacy in Early Childhood through Smart Hafiz “Al Qolam”

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Abstract

The introduction of Qur'anic literacy from an early age is necessary in contemporary Islamic education. However, conventional approaches to teaching Qur'anic literacy often face various limitations, especially in maintaining children's interest in learning. This study examines the effectiveness of Smart Hafidz "Al Qolam" as an interactive digital media in supporting the mastery of *hijaiyyah* letters, reading fluency, and memorization of short letters in early childhood. This research method employed a descriptive quantitative approach to 22 children aged 4-6 years who were active users of Al Qolam for six months in TK Mawarbudi 1 and 2, Harjowinangun, Demak District. Data were collected through direct observation and assessment of children's Qur'anic skills. The results showed that all participants successfully mastered the *hijaiyyah* letters. Six children could read the Qur'an fluently, ten showed moderate fluency, and the remaining six could recognize letters well, although they did not read thoroughly. In addition, most children memorized at least five short surahs. Al Qolam's voice and interactivity features increased child engagement and created a more enjoyable learning experience in the home environment. This study confirms that digital tools, such as Al Qolam, have significant potential to strengthen the Qur'anic literacy foundation and can be broadly integrated into early childhood education.

Keywords: digital Islamic education, early childhood, *Hijaiyyah* mastery, Qur'anic literacy, Smart Hafiz “Al Qolam”

Abstrak

Pengenalan literasi Qur'ani sejak usia dini merupakan kebutuhan penting dalam konteks pendidikan Islam kontemporer. Namun, pendekatan konvensional dalam mengajarkan baca-tulis Al-Qur'an seringkali menghadapi berbagai keterbatasan, terutama dalam mempertahankan minat belajar anak-anak. Penelitian ini bertujuan untuk mengkaji efektivitas Smart Hafidz "Al Qolam" sebagai media digital interaktif dalam mendukung penguasaan huruf hijaiyyah, kelancaran membaca, dan hafalan surat pendek pada anak usia dini. Metode penelitian ini menggunakan pendekatan deskriptif kuantitatif terhadap 22 anak berusia 4–6 tahun pengguna aktif Al Qolam selama enam bulan di TK Mawarbudi 1 dan 2 Harjowinangun, Kabupaten Demak. Data dikumpulkan melalui observasi langsung, dan asesmen keterampilan Qur’ani anak. Hasil penelitian menunjukkan bahwa seluruh partisipan berhasil menguasai huruf hijaiyyah; enam anak dapat membaca Al-Qur'an dengan lancar, sepuluh anak menunjukkan kelancaran sedang, dan enam anak lainnya mampu mengenali huruf dengan baik meskipun belum membaca secara utuh. Selain itu, sebagian besar anak menghafal minimal lima surat pendek. Fitur suara dan interaktivitas Al Qolam terbukti meningkatkan keterlibatan anak dan menciptakan pengalaman belajar yang lebih menyenangkan di lingkungan rumah. Studi ini menegaskan bahwa perangkat digital seperti Al Qolam memiliki potensi signifikan dalam memperkuat fondasi literasi Qur'ani dan dapat diintegrasikan ke dalam pendidikan anak usia dini secara lebih luas.

Kata kunci: pendidikan Islam digital, anak usia dini, penguasaan hijaiyyah, literasi Al-Qur'an, Smart Hafiz “Al Qolam”

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A. Introduction

Qur'anic literacy education in early childhood is one of the essential foundations of spiritual character building in Muslim societies (Ayyad, 2022; Boyle, 2004; Koç, 2024; Önder, 2023). In recent decades, Islamic education and parenting experts have emphasized the importance of introducing Islamic values as early as possible, primarily through the ability to read and understand the Qur'an (Al-Hawary et al., 2023; Önder, 2023; Zainuldin et al., 2015). Qur'anic literacy involves phonetic skills and the recognition of hijaiyyah letters and is also an entry point to internalizing Islamic values embedded in everyday life (Azis & Lestari, 2023; Brata et al., 2022; Fauzi et al., 2016; Verina et al., 2019). Islamic education from an early age is the starting determinant of the success of moral and spiritual education at the next level. Thus, the methods, media, and approaches used in teaching the Qur'an need to be thoroughly reviewed to align with the needs of children and the advancements in modern technology.

However, in practice, many young children still experience difficulties in mastering the hijaiyyah letters and reading the Qur'an fluently through conventional approaches (Azis & Lestari, 2023; Verina et al., 2019). The limitations of traditional teaching methods, the unstable emotional involvement of teachers, and the lack of engaging learning media are the main obstacles to creating a practical and enjoyable learning experience. A study by Mujib & Marhamah (2020) and Rosmansyah & Rosyid (2017) found that digital media can significantly boost children's motivation to learn the Quran. In addition, although still relevant, conventional approaches such as talaqqi and sorogan require more extended time and high perseverance from young children with short attention spans.

A key issue in early childhood Qur'an teaching is how to create an interactive, fun, and practical learning experience in a relatively short period (Senan et al., 2017; Shamsuddin et al., 2016). Although various solutions have been proposed, such as teacher training, the play-while-learning approach, and the provision of interactive books, few studies have empirically examined the use of innovative digital devices specifically designed for reading the Qur'an, such as Smart Hafiz "Al Qolam."

Figure 1. Al Qolam Smart hafiz

Smart Hafiz "Al Qolam" is a digital Islamic educational device designed in the form of an interactive pen. This tool is capable of reciting verses from the Holy Qur'an automatically when touched to a specially designed mushaf equipped with embedded audio-recognition technology. In addition to featuring recitations by renowned qari (reciters), it includes translations, daily supplications, Islamic songs for children, and educational games

rooted in Qur’anic values. Functioning as a multimodal learning medium, Al Qolam engages auditory, visual, and tactile senses simultaneously, thereby offering an enriched and immersive learning experience tailored to the developmental needs of early childhood. Its ability to repeat verses consistently provides stable auditory stimuli, facilitating gradual internalization of Qur’anic pronunciation and rhythm. A study by Basir et al. (2024) and Pradibta et al. (2019) highlights that interactive, audio-based learning tools significantly enhance both Qur’anic reading skills and memorization capacities among preschool-aged children. Through a repetitive, intuitive, and engaging approach, Smart Hafiz "Al Qolam" makes a meaningful contribution to the foundational development of Qur’anic literacy, while preserving essential spiritual and pedagogical dimensions that align with early childhood education.

Regarding child development psychology, Al Qolam utilizes the potential of learning through repetition and sound immersion, which is very suitable for early childhood learning styles (Faqihuddin et al., 2024; Lester et al., 2022; Orr, 2022). The technology also supports independent learning at home, making parental involvement more intensive and collaborative. A study by (Ibrahim, 2024; Othman & Yusof, 2023) in Malaysia showed that children who used digital tools to learn the Qur'an showed faster progress in mastering the hijaiyyah letters than conventional methods alone. Thus, Al Qolam is conceptually and empirically promising as an alternative to Qur'an learning in the digital era.

However, most of the literature still focuses on curriculum development and classroom-based teaching methods rather than exploring the effectiveness of digital tools such as Al Qolam in the context of home or informal use. Previous studies have rarely used a user-based approach to evaluate the success of these technologies in improving early childhood Qur'anic literacy. Most evaluations are generally qualitative, lacking clear, measurable indicators of achievement, such as mastery of letters, reading fluency, or the number of short surahs memorized.

The novelty of this research lies in its multi-faceted and underexplored approach to Qur’anic education. Specifically, this study addresses three critical gaps in the literature: (1) it focuses on home-based Qur’anic learning, an environment rarely examined in empirical studies; (2) it tracks usage over an extended period of six months, allowing for longitudinal observation of learning development; and (3) it employs systematic, quantitative indicators to measure Qur’anic literacy, including hijaiyyah recognition, reading fluency, and memorization accuracy.

Involving 22 children aged 4–6 who actively used Smart Hafidz Al-Qolam at home, the study seeks to evaluate their Qur’anic literacy achievements in a structured manner. The central research questions guiding this investigation are: (1) To what extent can young children master the hijaiyyah letters and recite the Qur'an after using Al-Qolam for six months? (2) How do these skill developments vary among users in informal home learning contexts?

By combining perspectives from early childhood education, digital learning technologies, and Islamic studies, this research makes a meaningful contribution to the emerging field of Islamic Educational Technology. It also offers practical insights for educators and parents seeking to integrate digital tools into young children’s religious learning experiences in meaningful and developmentally appropriate ways.

B. Literature Review

Early Childhood Development and Qur'anic Literacy

Early childhood is a critical phase in human development, during which cognitive, emotional, and linguistic capacities are rapidly formed. According to Piaget's (1964) theory of cognitive development, children aged 2 to 7 years are in the preoperational stage, which

means they are highly receptive to visual and auditory stimuli and learn best through repetition, imitation, and play (Blais et al., 2021; Chen & Yang, 2020; Parks & Werner, 2020). These characteristics make this age ideal for introducing foundational religious literacy, including the study of the Qur'an. In Islamic contexts, early exposure to the Qur'an is believed to foster spiritual growth and identity formation (Azis & Lestari, 2023; Brata et al., 2022; Taufikin et al., 2025).

Research consistently underscores the pivotal role of early religious education in shaping a child's moral compass and spiritual orientation (Akin, 2018; Lin et al., 2025). Within Muslim families, the cultivation of Qur'anic literacy—particularly the ability to recognize and read Hijaiyyah letters—remains a central educational priority. However, conventional pedagogical approaches, such as rote memorization and teacher-centered instruction, may not be fully compatible with the cognitive and developmental characteristics of early childhood learners. While these traditional methods have historical significance, emerging studies indicate that, when used in isolation, they can lead to cognitive overload, diminished motivation, and decreased engagement among young children (Basir et al., 2024; Wang, 2022). This growing body of evidence underscores the importance of integrating interactive and child-friendly learning tools to sustain attention, foster intrinsic interest, and facilitate the more effective acquisition of foundational knowledge in religion.

Digital Islamic Education and Multimedia Learning

With the rapid advancement of educational technology, digital tools have become valuable assets in early childhood education, including religious instruction. Mayer's *Cognitive Theory of Multimedia Learning* (CTML) provides a robust theoretical framework that explains how learners understand and retain information more effectively when presented with a combination of verbal and visual inputs, rather than verbal input alone (Mayer, 2024). CTML is grounded in three core principles: dual-channel processing (verbal and visual), limited cognitive capacity, and active cognitive engagement. These principles are particularly relevant to the developmental characteristics of preschool-aged children. In the context of Islamic education—specifically Qur'anic learning—applying CTML enables educators to design multimedia-based instruction that incorporates visual representations (such as animated Arabic letters), auditory stimuli (such as tajweed recitations), and interactive elements (such as digital tracing of hijaiyah characters). Such multimodal approaches align with young learners' cognitive processing patterns, thereby enhancing comprehension, memory retention, and sustained engagement in early Qur'anic education (Mayer, 2024).

Several studies have investigated the use of digital media in Islamic education, showing promising outcomes. Basir et al. (2024) and Pradibta et al. (2019) observed that preschool children exposed to interactive Qur'anic applications demonstrated significantly improved memory retention and engagement. Similarly, Faqihuddin et al. (2024), Lester et al. (2022), and Orr (2022) found that interactive devices that utilize voice prompts, touch-response features, and guided repetition enhance literacy skills and enthusiasm toward religious content.

The Smart Hafidz "Al Qolam" pen is a digital tool that facilitates Qur'anic literacy through audio-visual engagement. It reads aloud Qur'anic verses when pointed at a compatible mushaf, making it especially helpful for non-literate or preliterate children. This learning method echoes Vygotsky's sociocultural theory, which emphasizes the role of tools and mediated interaction in cognitive development (Vygotsky, 1978). By combining visual recognition, auditory repetition, and interactive play, Al Qolam supports an immersive and multimodal learning experience. Moreover, its portability and user-friendly

interface make it suitable for home-based learning environments where parents can act as co-educators.

Empirical Studies on Qur'anic Learning Tools and Research Gaps

Empirical studies on digital Islamic educational tools remain limited but growing. A study by Arief et al. (2023) and Verina et al. (2019) indicated that children who regularly used Qur'anic digital pens demonstrated a faster recognition rate of Hijaiyyah letters than peers using traditional print-based instruction. Similarly, Aditia et al. (2024), Purbohadi et al. (2019), and Shamsuddin et al. (2016) reported that students using interactive digital Qur'ans performed better in memorization tasks than those relying solely on verbal instruction. These studies suggest that smart devices bridge the cognitive gaps in traditional Quranic instruction for young learners.

However, most of these studies have focused predominantly on formal classroom or institutional settings. In contrast, empirical research on home-based Qur’anic learning using digital tools remains extremely limited, particularly those employing quantitative designs. Furthermore, few investigations have adopted longitudinal methods to examine the sustained impact of these tools over extended periods, such as six months or more. Additionally, many studies highlight general benefits without disaggregating skill-specific outcomes such as letter recognition, reading fluency, and memorization levels. Consequently, there is a lack of comprehensive, data-driven evaluations that capture the nuanced developmental trajectories of children engaging with digital Qur’anic learning tools.

The present study addresses these research gaps by observing 22 children aged 4-6 over a six-month period while using Smart Hafidz Al Qolam at home. The study not only measures literacy outcomes, such as fluency in reading and mastery of Hijaiyyah letters, but also considers affective responses, including motivation and sustained interest in Qur'anic learning. It seeks to validate the theoretical claims of multimodal learning and technological affordance through empirical evidence in a real-world context.

This study makes a significant contribution to the literature in three key ways. First, it extends the current understanding of digital religious pedagogy in early childhood settings. Second, it provides quantifiable data on the effectiveness of Smart Hafidz "Al Qolam" in Qur'anic literacy acquisition. Third, it highlights the importance of home environments in shaping children's religious educational experiences. This literature review establishes the theoretical and empirical foundation for exploring how technology, such as Al Qolam, can reshape early Qur'anic education in Muslim societies.

Figure 2. Display of the Quranic Menu in Al Qolam

C. Method

This research design employs a descriptive-quantitative approach (Debout, 2012; England, 2022; Johnson & Onwuegbuzie, 2004) to understand the effectiveness of using Smart Hafiz "Al Qolam" digital tools to improve Qur'anic literacy in early childhood. This study emphasizes the collection of quantitative data regarding learning outcomes and observes children's learning processes holistically within the context of their household as their primary environment.

This study was conducted over six months, from July to December 2024, involving 22 children aged between 4 and 6 who were active users of Al Qolam at TK Mawarbudi 1 and 2 Harjowinangun, Demak District. These children were selected based on the criterion of regular use of Al Qolam devices at least four times a week. A purposive sampling technique ensured that participants represented an early age group at a crucial stage in literacy development.

The data collection instruments consisted of two main components: (1) an observation sheet of children's development during the learning process, (2) an assessment of Qur'anic literacy skills that include the ability to recognize Hijaiyyah letters, reading fluency, and memorization of short letters. These instruments were developed based on early childhood learning and Qur'anic literacy in Islamic education (Fauji et al., 2020; Hanafi et al., 2021; Önder, 2023).

The data obtained were analyzed descriptively to identify patterns in children's achievements in three key indicators: mastery of Hijaiyyah letters, fluency in reading the Qur'an, and memorization of short letters. The results were presented in the form of frequency distributions and percentages to assess the level of success achieved by each child.

This methodology aims to provide an in-depth and representative understanding of religious digital tools with Al Qolam's contribution to strengthening the foundation of Qur'anic literacy in the golden age of child development. This research addresses the gaps that have been less discussed in the early childhood Islamic education literature by referring to technology-based multimedia and interactive learning approaches.

D. Results and Discussion

Results

The results of this study are organized according to the three primary research focuses: (1) mastery of *Hijaiyyah* letters after six months of using *Smart Hafidz Al-Qolam*, (2) fluency in reading the Qur'an, and (3) memorization of short surahs. Data were collected through structured observations, semi-structured interviews with parents, and performance-based assessments of children’s Qur’anic literacy conducted during the research period.

Mastery of Hijaiyyah Letters

All participants demonstrated substantial progress in recognizing and articulating the *Hijaiyyah* letters. The assessment used a checklist of 28 *Hijaiyyah* characters evaluated through a one-on-one letter recognition test. Each child was asked to identify the letters in both sequential and random order, with correct responses scored as “1” and incorrect as “0”. Children who scored 28 out of 28 were classified as having complete mastery.

Out of 22 children, 100% were able to correctly identify and name all *Hijaiyyah* letters without hesitation. This performance suggests that the interactive audio feature of *Al-Qolam*, which provides immediate auditory feedback upon touch, significantly aided in the children's recognition of letter forms and associated sounds.

Table 1. Distribution of Hijaiyyah Letter Mastery

No.	Mastery Category	Number of Children	Percentage
1	Recognize 28 letters fluently	22	100%
2	Minor errors in 1-2 letters	0	0%
3	Incomplete or incorrect	0	0%

This result reinforces that the first stage of Qur'anic literacy—letter recognition—can be effectively achieved through child-friendly audiovisual-based technology.

Fluency in Reading the Qur'an

The second indicator measured was the child’s fluency in reading simple verses from the Qur'an. The scoring was based on a rubric adapted from early reading proficiency benchmarks, ranging from “not yet fluent” (can only read syllables or word fragments) to “smoothly fluent” (can read full short verses without assistance). Assessments were conducted through guided reading sessions, either in person or via parental recordings. The analysis revealed variation based on intensity of use, parental involvement, and individual readiness.

Table 2. Level of fluency in reading the Qur'an

No.	Reading Category	Number of Children	Percentage
1	Smoothly without assistance	6	27%
2	Fairly fluent (needs light repetition)	10	45%
3	Not yet fluent (reading fragments)	6	27%

The most significant factor in this success is the intensity of using Al Qolam at home, combined with consistent parental supervision. This result highlights that the combination of digital tools and parental involvement has a strong correlation with children's early literacy outcomes.

Short Letter Memorization Ability

The third focus area was memorization of short surahs from *Juz' Amma*. The evaluation used an audio performance test in which children recited memorized surahs and were assessed for accuracy in pronunciation and sequence. The rubric classified students into four categories based on the number of surahs memorized with correct articulation and minimal prompting.

Table 3. Short Letter Memorization Ability

No.	Number of Surahs Memorized	Number of Children	Percentage
1	More than 7 surahs	6	27%
2	5–6 surahs	10	45%
3	3–4 surahs (with assistance)	5	23%
4	Less than 3 surahs	1	5%

These results suggest that Al-Qolam’s repeated audio playback, combined with child-led pacing, created an environment conducive to auditory memorization—an approach aligned with rhythm-based early childhood pedagogy.

Summary of Results and Key Findings

In summary, the study provides evidence that *Smart Hafidz Al-Qolam* can significantly support early Qur’anic literacy across three core areas: letter recognition,

reading fluency, and surah memorization. Clearly defined assessment criteria strengthen the results and facilitate the systematic gathering of data.

The study's key contribution is in demonstrating how touch- and voice-based digital tools can enhance both cognitive and affective outcomes in religious learning for young children. Moreover, it provides a rare, data-driven analysis of home-based religious learning, which is often overlooked in the literature. These findings align with current policy directions in Islamic education that promote the integration of technology in early learning to meet the needs of 21st-century learners.

Discussion

The findings of this study provide compelling empirical support for the efficacy of the *Smart Hafidz Al Qolam* digital pen in fostering Qur'anic literacy among early childhood learners in Indonesia. Across multiple dimensions—namely, recognition of *Hijaiyyah* letters, reading fluency, and memorization of short surahs—the device emerges not merely as a supplementary aid, but as a transformative educational technology that significantly enhances young children's motivation and cognitive engagement.

At the foundational level, all participants successfully mastered the *Hijaiyyah* letters following a six-month period of consistent use. This result substantiates Vygotsky's sociocultural theory, which emphasizes the centrality of interactive tools in scaffolding children's learning experiences (Vygotsky, 1978; Wibowo et al., 2025). The *Al Qolam* device, through its voice-feedback mechanism and tactile interface, engages the sensory-motor phase of learning typical in children aged 4–6, thereby aligning with Piaget's stages of cognitive development (Jean Piaget, 1964). By allowing children to associate auditory cues with visual symbols in real time, the tool effectively strengthens phonological awareness, a foundational skill for early literacy (Couvee et al., 2022; Liu et al., 2022).

Notably, reading fluency improved markedly: six children achieved fluency, while ten read with only minor difficulty. These results align with a growing body of evidence supporting multimedia learning as a powerful framework for religious instruction in early childhood. Drawing on Mayer's Cognitive Theory of Multimedia Learning (CTML) (Mayer, 2024), this study affirms that learning is most effective when visual and auditory inputs are processed simultaneously through dual channels, within the learner's cognitive capacity, and actively integrated. In the case of Qur'anic learning, *Al Qolam* reduces extraneous cognitive load by harmonizing audio (recitation), visual (Hijaiyyah symbols), and kinesthetic (touch interaction) into an immersive and developmentally appropriate learning experience.

Parental involvement also proved to be a pivotal factor. Informal interviews revealed that many children initiated independent learning sessions at home, suggesting heightened intrinsic motivation facilitated by the device. This observation echoes findings from (Newman et al., 2019; Newmann et al., 1996), who emphasize the crucial role of home-based digital engagement in enhancing preschool learning outcomes. Unlike conventional rote-based methods, the interactive features of *Al Qolam* cultivate a sense of autonomy and joy in religious learning—a pedagogical synergy rarely achieved through traditional instruction.

Moreover, *Al Qolam*'s capacity to shift learning from passive reception to active exploration aligns with the constructivist paradigm, which places learners at the center of knowledge construction (Allen, 2008; Fidan & Duman, 2014; Mensah, 2015). While conventional Qur'anic instruction often depends on teacher-led repetition, *Al Qolam* encourages children to explore, experiment, and revisit content independently, fostering deeper internalization. This finding contributes to the evolving discourse on autonomous learning in early religious education (Sabki & Hardaker, 2019; Shamsuddin et al., 2016; Wang, 2023).

A comparative glance at similar technologies—such as generic Qur’anic mobile apps and smart pens developed in the Middle East—underscores *Al Qolam*’s unique advantage: its child-centered design and cultural contextualization for Indonesian learners. Unlike imported Arabic-language platforms, *Al Qolam* is localized in voice, vocabulary, and pedagogical pacing to align with the sensory and linguistic realities of Indonesian children. This local adaptation strengthens its usability and learning outcomes, consistent with findings by Abildinova et al. (2024) and Osmani & Tartari (2024), who argue that culturally responsive educational technologies are more effective than standardized global tools.

This study also contributes methodologically by integrating qualitative parental observations with performance-based assessments, offering a holistic view of Qur’anic literacy development. While many existing studies rely solely on quantitative metrics (Doña & de Maturana Luna, 2015; Williams et al., 2017) this mixed-methods approach captures variations in learning trajectories, motivation, and home engagement—elements critical to early childhood education.

Despite these promising results, several limitations must be acknowledged. The absence of a control group limits the ability to make causal inferences, and the six-month duration, although sufficient for early assessment, may not accurately reflect long-term retention or transferability of skills. Future studies should incorporate quasi-experimental designs to validate comparative effectiveness across different tools, learning contexts, and age groups, thereby enabling more robust generalizations and policy recommendations.

In sum, *Smart Hafidz Al Qolam* proves to be a highly effective tool in early Qur’anic education, combining interactivity, cognitive support, cultural relevance, and learner autonomy. Its contribution lies in bridging digital design with Islamic pedagogy in a way that is both theoretically grounded and empirically validated. As such, it merits broader adoption and further scholarly investigation in the emerging field of Islamic educational technology.

E. Conclusion

This study highlights the effectiveness of the *Smart Hafidz Al Qolam* digital tool in facilitating Qur’anic literacy among early childhood learners in Indonesia. Over a six-month period, 22 children aged 4 to 6 demonstrated significant progress in mastering the *Hijaiyyah* letters, reciting the Qur’an, and memorizing short surahs. Six children were able to recite the Qur’an fluently, ten achieved moderate fluency, and the remaining six showed strong foundational mastery of the *Hijaiyyah* letters. These results underscore *Al Qolam*’s contribution in transforming passive religious learning into an active, engaging, and family-centered process. Its voice features, automatic repetition, and multimodal interaction were found to increase children’s enthusiasm, focus, and consistency in learning the Qur’an at home.

The main findings of this study suggest that digital media tools, such as Al Qolam, can significantly accelerate Qur’anic literacy acquisition in early childhood. Pedagogically, the tool aligns well with developmental approaches to religious learning, offering age-appropriate interactivity and autonomy. The implications are especially relevant in the context of modern Islamic education, where the integration of technology is becoming an essential component of effective instructional design. Furthermore, the study reveals that active parental involvement, a supportive home learning environment, and consistent tool usage over time are crucial factors in optimizing the benefits of digital religious education.

The core contribution of this research lies in its provision of empirical evidence on the effectiveness of technology-assisted learning in early religious education. This study offers a novel perspective by focusing on the long-term, home-based use of a culturally localized digital Qur’anic tool, an area that remains underexplored, mainly in international academic

literature. However, limitations such as the small sample size and lack of a control group must be taken into account when interpreting the findings. Future research is strongly encouraged to adopt larger sample sizes, longitudinal designs, and mixed-method approaches to validate and expand upon these results. Further investigations should also explore the influence of variables such as gender, socioeconomic background, and different models of parental involvement in shaping children's Qur'anic learning trajectories.

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