

AL-QURAN-BASED CHARACTER EDUCATION MODEL IN DIGITAL MADRASAH

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ABSTRACT

Quranic-Based Character Education in Digital Madrasah: An Ecosystem Model. Purpose: This study formulates a conceptual model for Quranic-based character education in digital madrasah amid Industry 4.0 and Society 5.0. The study employed a Systematic Literature Review (SLR) approach with a PRISMA-based systematic review design, examining scholarly books, SINTA-indexed national journal articles, reputable international journals, and relevant theses. The literature search and selection process involved identification, screening, and eligibility assessment, using predetermined inclusion criteria. The initial search yielded 50 publications, which were then selected to yield 30 scientific papers for systematic analysis. Data were analyzed using structured content analysis and cross-study thematic synthesis, thus ensuring a systematic-analytical approach to SLR rather than qualitative field research.. The study's findings demonstrate a gap between the predominantly manual practice of character education in madrasahs, and innovations in digital madrasahs that emphasize the technical aspects of the platform, over the internalization of values, digital ethics, and Quranic character formation. The study proposes an ecosystem model integrating Quranic values, digital pedagogy, the technological environment (e.g., LMS features), and institutional governance and spiritual leadership. It highlights teacher competence and ethical digital culture as prerequisites for sustainable character formation. The model enriches Islamic education theory and guides curriculum, platform, and policy design to nurture Quranic character. Future research should test it across varied madrasah contexts...

INTRODUCTION

The development of the Industrial Revolution 4.0 and the shift towards Society 5.0 has driven digitalization in almost all sectors, including Islamic education. Madrasahs, which have long been synonymous with traditional learning methods, are now beginning to transform into digital madrasahs through the use of Learning Management Systems (LMS), social media, online exam applications, and integrated information systems. This transformation opens up great opportunities to expand access, enrich learning resources, and improve managerial efficiency. However, at the same time, students are exposed to negative content, permissive popular culture, and a digital ethics crisis that has the potential to erode the internalization of Qur'anic values in everyday life (Nashir, 2024; Nurhabibi et al., 2025). The literature on Al-Qur'an-based character education is actually quite rich.

Various books and articles emphasize the urgency of re-actualizing Qur'anic values as the basis for shaping students' morals (Khamid, 2019; Markhamah et al., 2020; Ridhahani, n.d.; Yudiyanto & Fauzian, 2022). These studies highlight the importance of integrating the values of faith, worship, and character into the curriculum, school management, and institutional culture (Fepriyanti & Suharto, 2021; Gunawan, 2022). However, most of the discussion still focuses on the context of manual or traditional face-to-face learning, without elaborating on how Qur'anic values can be systematically integrated into the digital learning ecosystem in madrasahs.

Empirical research related to technology-based religious character education has also begun to emerge. Studies in junior high schools and elementary schools show that the use of YouTube, Google Classroom, WhatsApp, and other social media can support religious habits and improve students' religious character when well designed and accompanied by teacher-parent collaboration (Giantomi et al., 2021; Arjunnajata et al., 2024). Environment-based Islamic education with the integration of technology and social media has been proven to strengthen religious awareness and environmental concern (Arjunnajata et al., 2024). However, these studies still focus on public schools, elementary levels, and the context of online learning during the pandemic, and have not specifically developed a model of Qur'anic character education in the context of secondary digital madrasahs. Several studies show that Al-Qur'an-based learning is effective in improving students' spiritual literacy in terms of cognitive and memorization aspects, but is less than optimal in the affective and psychomotor domains (Supriatna, 2025). These findings indicate a gap between mastery of Qur'anic material and the internalization of Qur'anic character in actual behavior. At the same time, conceptual studies on the integration of Islamic values in the digital ecosystem emphasize that moral degradation, declining social interaction, weak family control, and the influence of global culture are serious challenges that require explicit and systematic Islamic character education design in the digital space (Nashir, 2024; Adiyono et al., 2024).

This gap shows that, despite the existence of various models of Islamic character education in madrasahs, Islamic boarding schools, and Islamic schools (Selamat et al., 2023; Fatoni et al., 2024; Kurniawan, 2021), as well as various digital madrasah initiatives at the MI, MTs, and MA levels (Ramdhani, 2024; Wicaksono, 2024; Riza, 2024), there has not been much research that explicitly formulates a conceptual model of Al-Qur'an-based character education integrated with the digital madrasah ecosystem. Most studies are still partial: focusing on theological normative, digital technical, or managerial dimensions, without stitching them into a complete character ecosystem framework. Teachers, school principals, and parents from a phenomenological perspective are faced with a complex empirical experience, namely that students appear to be fluent in reading and memorizing the Qur'an, but are still weak in terms of behavioral consistency, media ethics, and social responsibility in the digital space. Madrasahs have invested heavily in ICT, but the features of the LMS and applications used have not been explicitly directed towards strengthening Qur'anic morals. These experiences underscore the urgency of formulating a model of Qur'anic character education that is sensitive to digital realities and compatible with the profile of digital native Muslim students.

This article is presented as a qualitative systematic literature review that specifically maps and synthesizes literature on Al-Qur'an-based character education, digital character education, digital madrasahs, and the main context of Islamic educational institutions in Indonesia. The literature sample collected is niche in nature because it combines nationally indexed Sinta publications, Scopus-based international articles, reference books, and theses related to digital madrasahs under one umbrella of analysis. From this synthesis, how the conceptual model that integrates Qur'anic values, digital pedagogy, the technological environment of madrasahs, and institutional governance into a Qur'anic character education ecosystem in digital madrasahs. The main objective of this article is to formulate a Qur'an-based character education model in digital madrasahs through a systematic review of the latest literature, as well as to explain the theoretical and practical contributions of this model to the development of Islamic education and the strengthening of digital madrasah policies. Theoretically, this article enriches the development of Islamic character education models by

incorporating the dimension of digital transformation, while practically, it provides a reference for madrasah policymakers and practitioners to design curricula, LMS features, madrasah culture, and governance that are more explicitly oriented towards the formation of Qur'anic morals in the digital age.

METHODS

This study employed a qualitative systematic literature review (SLR) to identify, assess, and synthesize research findings on Qur'anic character education in the context of digital madrasah. The study stages were structured transparently, adhering to the PRISMA 2020 reporting principles (Page et al., 2021) and literature review guidelines as a research methodology (Snyder, 2019). The results of this research were obtained through the application of a Systematic Literature Review (SLR) approach, following the PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) framework to the literature discussing Quran-based character education in the context of digital madrasah. The research approach was qualitative-descriptive, with peer-reviewed journal articles as the units of analysis. This research consisted of relevant scientific documents that met the inclusion criteria, thus focusing on mapping the methodology, findings, and trends of previous research.

The research procedure began with literature identification through several scientific databases, resulting in an initial selection of 50 articles. These articles were then selected in stages according to the PRISMA process, through title and abstract screening and a feasibility assessment based on full-text review. This process resulted in 30 articles deemed relevant and worthy of further analysis due to their direct link to Quranic values, character education, and the use of digital technology in Islamic education. The research materials consisted of national and international journal articles published between 2015 and 2025. The research instrument used a data extraction sheet developed by the researcher to gather key information from each article, including the focus of the study, the context of the educational institution, the methodological approach, and the implementation of digital-based Quranic character education. Data collection was conducted through documentation techniques, systematically and consistently reviewing each article. Data analysis was conducted using qualitative thematic analysis, grouping research findings based on similar patterns and focus. The synthesis results indicate that most studies emphasize the internalization of Quranic values through habituation and role models supported by digital media, but these are still partial and not yet integrated into a comprehensive Quranic character education model. These findings indicate the need to develop a more systematic and contextual Quranic-based character education model, tailored to the characteristics of digital madrasah.

RESULTS AND DISCUSSION

Analysis and testing of results. Based on the SLR procedure, the research results were obtained through three main steps: mapping the literature corpus, thematic grouping, and model construction. In the mapping stage, the selected literature was classified into three major clusters: (1) Al-Qur'an-based character education; (2) Islamic character education in the digital age; and (3) digital madrasah and ICT-based Islamic learning transformation. In the next stage, the researchers identified key themes in each cluster and examined their consistency across studies. The final stage was to arrange these themes into a model of the Qur'anic character education ecosystem in digital madrasah, then test the internal coherence of the model with relevant theories and empirical findings across contexts (Putra et al., 2025; Shodikin et al., 2025).

The Concept Of Character Education Based On The Qur'an

The literature shows that Al-Qur'an-based character education stems from the understanding of humans as servants and caliphs who are morally responsible before Allah. Core values such as honesty (*ṣidq*), trustworthiness, responsibility, justice, patience, and social awareness form the main foundation for character building (Khamid, 2019; Markhamah et al., 2020). Qur'anic character education is considered effective when it includes the dimensions of knowledge of values (knowing), affective commitment (desiring), and practical application (doing), in line with Lickona's three-component model of character (Gunawan, 2022). Other literature reviews emphasize the importance of integrating Qur'anic values into the entire education ecosystem: curriculum, learning process, school culture, and institutional management (Nurkhamidah et al., 2022; Yudiyanto & Fauzian, 2022). This integration is not only in the form of adding material on moral verses, but also in the form of school policies that are consistent with Qur'anic values, as well as the exemplary behavior of teachers and institutional leaders (Fepriyanti & Suharto, 2021; Selamat et al., 2023). However, almost all of these studies still operate within the framework of manual learning, face-to-face interaction, and pre-digital institutional culture.

The Practice Of Qur'anic Character Education In Educational Institutions

Empirical studies in Islamic schools, madrasas, and Islamic boarding schools show a variety of strategies for implementing Qur'anic character education. The main strategies include habitual worship (*tadarus*, congregational prayer, communal prayer), instilling a religious culture, teacher role modeling, strengthening religious extracurricular activities, and monitoring the social environment of students (Supriani, 2022; Fatoni et al., 2024; Kurniawan, 2021). At the Modern Muhammadiyah Kwala Madu Islamic Boarding School, for example, the santri character model is built through a combination of 7K and 6M values that are internalized through a system of habit formation and role modeling (Selamat et al., 2023). Supriatna's (2025) research shows that Al-Qur'an-based learning can improve students' spiritual literacy in cognitive and memorization aspects, but still leaves challenges in the affective and psychomotor dimensions. This indicates that approaches that rely on memorization and reinforcement of normative knowledge do not automatically result in the internalization of values in daily behavior. Family involvement and the social environment have also been proven to be crucial in strengthening the sustainability of Qur'anic character habits outside the classroom (Fepriyanti & Suharto, 2021).

The Concept And Implementation Of Digital Madrasahs And Digital Character Education

The third cluster describes how Islamic educational institutions are adapting to the digital age. Studies at MIN 2 and MAN 2 in Malang show that digital madrasah policies focus on transforming learning processes, data management, and ICT infrastructure (Ramdhani, 2024; Wicaksono, 2024; Khusnah, 2024). The use of LMS, exam applications, and academic information systems improves learning efficiency and access. However, the explicit integration of Qur'anic values into digital feature design, character assessment rubrics, and platform usage ethics has not been systematically addressed. Meanwhile, studies on character education in the digital age highlight challenges such as moral degradation, declining quality of social interaction, weak family control, and the penetration of global culture through digital media (Nashir, 2024; Nurhabibi et al., 2025). Several studies propose the internalization of the four characteristics of the Prophet Muhammad *ṣiddīq*, *amānah*, *tablīgh*, and *faṭānah* as a framework for Islamic character in the digital age, as well as the importance of Islamic digital ethics to guide media use (Nashir, 2024). Other studies show that the integration of technology and social media in PAI learning can improve religious character when designed with a collaborative

teacher-parent approach and supported by value-laden content (Giantomi et al., 2021; Arjunnajata et al., 2024; Pulungan, 2025).

An Integrative Model Of Character Education Based On The Qur'an In Digital Madrasah

Thematic synthesis of the three clusters resulted in a conceptual model of a Qur'an-based character education ecosystem in digital madrasahs. This model consists of four interconnected main components: (1) Qur'anic values and sources, (2) Qur'anic digital pedagogy, (3) the technological environment of digital madrasahs, and (4) institutional governance and spiritual leadership. The first component places the Qur'an as the primary source of values that are translated into character profiles, behavioral indicators, and character learning objectives. The second component emphasizes the recontextualization of classical methods (exemplary behavior, habituation, advice) into digital pedagogy through multimedia content, interactive modules, and performance-based assessments that evaluate the dimensions of knowledge, attitude, and behavior in the digital space (Putra et al., 2025; Islamy, 2024). The third component utilizes LMS, evaluation applications, and official madrasah social media as a “digital tarbiyah space” with special features such as character dashboards, worship reminders, Qur'anic discussion forums, and media activity logs integrated with Iami digital iika (Giantomi et al., 2021; Arjunnajata et al., 2024). The fourth component emphasizes the role of madrasah principals and teachers as transformational spiritual leaders who orchestrate policies, culture, and digital systems to ensure consistency between the Qur'anic vision and the madrasah's digital practices (Selamat et al., 2023; Fatoni et al., 2024).

Overall, the results of the study show that the proposed model fills the gap between normative studies of Qur'anic character education and technical initiatives for digital madrasahs. This model also provides an operational framework that can be empirically tested in various digital madrasah contexts in further research, for example through trials of Qur'anic-based LMS development, evaluation of the effectiveness of digital character programs, or comparative studies across madrasahs. Based on the synthesis of the above theories and findings, this article formulates a conceptual model that can be simply described as follows:

Table 1. Conceptual model of quran-based character education in digital madrasahs.

Dimension	Main components	Implementation in digital madrasahs
Qur'anic values	Tawhid, šidq, trustworthiness, responsibility, justice, benevolence	Determination of character indicators in lesson plans, modules, and digital character reports
Pedagogy	Al-Qur'an-based Islamic Education, reflective assignments, Islamic project-based learning	Thematic interpretation e-portfolio assignment, reflection journal on LMS
Digital Environment	LMS, attendance application, social media, information system	Worship reminder feature, digital Quran recitation content, character dashboard
Institutional	Spiritual leadership, madrasah culture, parent collaboration	Digital ethics policy, parental involvement through the digital madrasah portal

This model positions the digital madrasah as an ecosystem that connects Qur'anic values, learning strategies, technology platforms, and institutional governance within an integrative framework. The conceptual foundation of this article stems from the idea that character formation in madrasahs, especially in the digital era, cannot be understood as the result of a single intervention (e.g., solely teaching values, solely using an LMS, or solely using school policies), but rather as the product of a mutually influencing ecosystem. This perspective aligns with developmental ecology theory, which asserts that behavioral/character development is shaped by layered interactions

between individuals and their environments (from microsystems to macrosystems, including the dynamics of change over time). The environment in a digital madrasah is not only the classroom and school culture, but also a platform-based interaction space (LMS, digital attendance, parent portals, and social media) that regulates the rhythm of students' daily activities and shapes habits.

From a normative perspective, this article positions Qur'anic values as the core values that guide the entire system. Values such as monotheism, *ṣidq* (honesty), *amanah* (trustworthiness), responsibility, justice, and *ihsan* (goodness of character) are understood not merely as teaching materials, but as moral standards that must be operationalized as character indicators. The concept of *ihsan*, which refers to worship as if seeing God; if not, believing that God sees, provides a psychological and spiritual foundation for self-awareness (*muraqabah*) that is highly relevant for integrity and ethical behavior in online spaces. Thus, Qur'anic values in this model serve as a compass for determining the direction of character achievement and serve as a reference in developing indicators in lesson plans, modules, and digital character reports.

The process of internalizing values in this model refers to a character education approach that emphasizes the integration of moral understanding, moral commitment/affect, and moral action (moral knowing, moral feeling, and moral action). Therefore, the pedagogical dimension is designed as a reflective and applicable instillation mechanism: Quran-based Islamic Religious Education learning is complemented by reflection assignments, Islamic projects, and behavioral evidence through learning trails (e.g., thematic interpretation e-portfolios and reflection journals in the Learning Management System). In online learning, the quality of internalization is also influenced by the presence of instructors, reflective cognitive processes, and the social relationships within the learning community that support meaningful learning experiences.

To ensure that pedagogy and values are inseparable from digital practice, the digital environment is positioned as a space for habituation through prayer reminder features, digital *tadarus* content, and a character dashboard used to reinforce value consistency and provide behavioral feedback. At the same time, technological integration requires learning design competencies that integrate content (Qur'anic values), pedagogy (reflection/projects), and technology (LMS/information systems), as emphasized by the TPACK/TPCK framework. This entire ecosystem requires maintaining value alignment at the institutional level. This is where the institutional dimension plays a role through spiritual leadership, madrasa culture, and parental collaboration. Spiritual leadership theory emphasizes the role of vision, hope/faith, and compassion in building value congruence across organizational levels so that digital ethics policies, role models, and parental involvement through the madrasa portal move in a unified direction. Philosophically, this framework is strengthened by the concept of *ta'dib* (education as the formation of etiquette), which places etiquette at the core of Islamic education. In digital madrasas, etiquette is expanded to include etiquette for learning and interacting online (Qur'anic digital etiquette).

Based on these foundations, this article formulates a conceptual model of the Qur'anic Digital Character Ecosystem: Qur'anic values as the normative core; projective reflective pedagogy as the internalization mechanism; the digital environment as a habit-forming socio-technical system; and institutions as spiritual governance that ensures consistency through culture, digital ethics policies, and parental partnerships. The novelty of this model lies in the relationship between ecological theory (ecosystem), character theory (internalization mechanism), technology integration theory (TPACK), online learning theory (CoI), and socio-technical theory (system design), into a digital madrasah framework that is centered on *ta'dib* and Qur'anic values so that character becomes not only a normative discourse, but a system of measurable, documented, and sustainable practices.

DISCUSSION

This discussion confirms that the conceptual model of Qur'anic character education in digital madrasas should not be understood simply as the transfer of habitual practices to online spaces, but rather as an ecosystem that integrates (1) the Qur'an as a source of values, (2) a reflective and projective internalization pedagogy, (3) a digital platform as a medium and reinforcement of practice, and (4) institutional governance that ensures consistency of values across learning experiences. Theoretically, this framework aligns with the character education approach that emphasizes the unity of moral knowledge, moral affection, and moral action (Lickona, 1991). In the context of Islamic education, empirical findings indicate that internalization of character derived from Qur'anic stories and role models can shape more consistent behavioral orientations when supported by school culture and teacher guidance (Tarik & Thobroni, 2024).

From a learning design perspective, integrating Qur'anic values into an LMS or madrasah application requires knowledge that integrates content, pedagogy, and technology. The TPACK framework emphasizes that technology use must be designed in alignment with value objectives and learning strategies, not simply the digitization of materials (Mishra & Koehler, 2006). In online learning, the Community of Inquiry (CoI) demonstrates the importance of teaching presence, social presence, and cognitive presence for effective discussion, reflection, and meaning-making (Garrison et al., 1999). Consequently, activities such as service learning projects, written reflections, digital ethics case-based discussions, and peer feedback can be designed to foster responsibility and trustworthiness in online environments.

At the assessment level, the most pressing need is a digital Quranic character measurement instrument that measures not only ritual adherence but also consistency of manners and integrity within the digital ecosystem. The use of learning analytics (e.g., discussion participation, quality of reflection, and assignment track record) can be considered as supporting data, but must be complemented by a rubric based on values and ethical principles to avoid falling into the trap of measuring superficial behavior (e.g., simply being "active" on the platform). Beyond schools, character formation in digital madrasas is heavily influenced by family and community. A study of Surah At-Tahrim, verse 6, emphasizes parents' responsibility for relevant care and supervision to strengthen children's self-control in the digital age (Elitaliya et al., 2025). From a developmental ecology perspective, home-school-community collaboration is a prerequisite for ensuring the values taught in madrasas are consistent with the students' social environment (Bronfenbrenner, 1979).

The institutional implications of these findings are the need for leadership capable of maintaining "value alignment" in the curriculum, culture, regulations, and platform governance. Spiritual leadership emphasizes congruence between vision and values (vision, hope/faith, and altruistic love), which influences the commitment and productivity of the school community (Fry, 2003). While transformative leadership strengthens role models, motivation, and a learning culture to ensure consistent digital policies (e.g., device ethics, data protection, and content moderation) at the classroom and institutional levels (Bass & Riggio, 2006). The limitations of this study lie in its reliance on available literature and the varying quality of study reporting. Therefore, further research is needed to empirically test the model in diverse digital madrasah contexts and develop validated measurement instruments. Strengthening the SLR methodology could also be achieved through more detailed reporting in accordance with PRISMA 2020 (Page et al., 2021) and transparent thematic synthesis (Braun & Clarke, 2006; Thomas & Harden, 2008).

Overall, this discussion broadens the understanding that effective digital madrasahs are those capable of integrating technology as a means of strengthening Qur'anic values and character, not merely as a means of administration and distribution of materials. The novelty of this model lies in the relationship between character theory (internalization mechanism), technology integration theory (TPACK), online learning theory (CoI), and socio-technical theory (system design), into a digital

madrasah framework that is centered on ta'dib and Qur'anic values so that character does not only become a normative discourse, but becomes a system of measurable, documented, and sustainable practices.

Furthermore, linking TPACK to the concept of adab is crucial so that digital literacy does not stop at technical aspects, but fosters an ethical orientation. Studies on Islamic education in the digital era emphasize that the primary crisis often involves the decline of adab values and the commodification of knowledge; therefore, ethical digital literacy, values-based teacher training, and curriculum design that affirms an Islamic worldview are necessary (Yunita et al., 2025). This perspective aligns with the concept of digital citizenship, which emphasizes norms, rights, obligations, and responsibilities in the digital space (Ribble, 2015). Thus, the indicators of Qur'anic character in digital madrasahs can be expanded into a set of online etiquette practices, such as commenting ethics, maintaining data trust, avoiding gossip/slander on social media, and the habit of tabayyun before sharing information, which are instilled through TPACK-based learning designs and strengthened by school culture and parental involvement.

The next implication is strengthening digital madrasah governance to align with TPACK requirements. Digital transformation is not just about adopting devices, but also about changing work processes, organizational culture, and data-driven decisions. Studies of educational institutions undergoing digital transformation have shown contributions to administrative efficiency and accelerated decision-making, but have also identified obstacles such as resistance to change, infrastructure limitations, and staff training needs (Lazwardi & Kurniawan, 2025). In the madrasah context, these findings are relevant to emphasize the importance of device and network policies, student data security/privacy standards, and responsive technical support so that teachers can consistently practice TPACK without being burdened by recurring technical issues.

In the context of Qur'anic character education, TPACK encourages the design of learning experiences that link character goals with measurable digital activities. For example, the values of trustworthiness and discipline can be reinforced through learning contracts and task tracking in the LMS; the value of tabayyun (religious trust) is practiced through information curation and source verification tasks; and the value of brotherhood (ukhuwwah) is strengthened through cross-class collaborative projects using shared workspaces. Empirical evidence in Islamic education shows that TPACK-based digital literacy integration can improve students' communication, ethics, and cooperation skills, although it still faces challenges in access, technical support, and resistance to change among teachers (Afnan & Maksum, 2025). At the professional development level, a meta-analysis shows that teacher education interventions significantly improve TPACK, especially when the training is sufficiently long and provides space for practice in a blended/online environment (Ning et al., 2022). This strengthens the argument that character internalization through digital madrasahs needs to be accompanied by a sustainable teacher competency strengthening program, not just short-term application training.

More operationally, the conceptual framework resulting from this SLR can be mapped into TPACK components as a "competency map" for digital madrasah teachers. The values and teachings of the Qur'an that form the basis of character serve as **content knowledge** (CK), while internalization strategies (exemplary behavior, habituation, reflection, project-based learning, and strengthening school culture) constitute **pedagogical knowledge** (PK). Platforms, applications, digital learning resources, and learning monitoring and analytics features constitute **technological knowledge** (TK). The integration of the three is evident in the design of moral/character materials (PCK), the selection of appropriate technology for character goals (TCK), and the management of meaningful online learning activities (TPK), which ultimately culminates in TPACK as the ability to design integrated learning experiences in offline and online spaces contextually (Mishra & Koehler, 2006; Koehler & Mishra, 2009).

Another important dimension is leadership. Bass's transformational leadership theory emphasizes four main elements: idealized influence, inspirational motivation, intellectual stimulation, and individualized consideration. Madrasah principals and teachers who practice spiritual transformational leadership act not only as administrative managers but also as moral role models and agents of change who integrate the Qur'anic vision with digital innovation. The concept of Total Moral Quality, developed by Baharun (2023) and critically developed in the context of Islamic boarding schools, shows that the character of students is formed through a multidisciplinary approach that integrates curriculum, institutional culture, regulations, and the exemplary behavior of the *kiai*/teacher. Therefore, the conceptual model of Qur'anic character education in digital madrasahs should not be understood simply as transferring habitual practices to online spaces, but as an ecosystem that integrates (1) the Qur'an as a source of values, (2) reflective and projective internalization pedagogy, (3) digital platforms as a medium and reinforcement of practice, and (4) institutional governance that ensures consistency of values across learning experiences, as well as spiritual leadership

CONCLUSION

Based on a systematic literature review of national and international literature, this article concludes that there is no Qur'an-based character education model explicitly integrated with the digital madrasah ecosystem, even though the conceptual foundation of Qur'anic character education and various digital madrasah initiatives have developed. Thematic synthesis shows that Qur'anic character education has tended to be strong in the cognitive and memorization domains, but less than optimal in the internalization of digital ethical values and practices, while the transformation of digital madrasahs has focused more on technical and managerial aspects. This article offers a model of the Qur'anic character education ecosystem in digital madrasahs that integrates four components: sources of Qur'anic values, Qur'anic digital pedagogy, the madrasah technological environment, and spiritual governance and leadership. Theoretically, this model enriches the treasury of Islamic education by extending the concept of Qur'anic *tarbiyah* to the digital space; practically, it provides an operational framework for madrasahs to design curricula, LMS features, and Qur'an-based character policies that are relevant to the profile of Muslim students in the era of the Industrial Revolution 4.0 and Society 5.0. The main limitation of this study is its conceptual nature and its predominant Indonesian literature. Therefore, further research is needed to empirically test the model in various digital madrasah contexts and develop a more comprehensive digital Qur'anic character measurement instrument.

The theoretical implication of this study is the need for further development of the concept of digital ecosystem-based Qur'anic character education. Future researchers can develop a digital Qur'anic character measurement instrument, examine the relationship between the intensity of Qur'anic LMS use and value internalization, and model the link between spiritual leadership, madrasah digital culture, and student character outcomes. Practical implications for madrasahs include the importance of designing a digital madrasah blueprint that explicitly incorporates a Qur'anic character vision, reviewing the design of the LMS and digital media to align with character indicators, and developing teacher training programs on digital Qur'anic pedagogy and Islamic digital ethics. Based on the study's findings, it is recommended that digital madrasahs begin auditing their curriculum, systems, and institutional culture to ensure the explicit integration of Qur'anic values into each component, while simultaneously developing digital features that support character building, such as character dashboards, prayer reminders, and moral e-portfolios. Educational practitioners and madrasah information system developers need to collaborate with Islamic education academics to translate this conceptual model into a contextual operational design

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