Enhancing Quran E-Learning: Insights into User Experiences, Technical Hurdles, and Strategic Empowerment

Dhiyaul Hafidh Fatah Yasin[1], Aisyah Binti Abdul Wahab[2], Raudlotul Firdaus binti Fatah Yasin[3], Saproni Muhammad Samin[4]

[1,2]Fakulti Pengajian Islam, Universiti Islam Antarabangsa Tuanku Syed Sirajuddin (UniSIRAJ), Malaysia.

[3]Abdul Hamid Abu Suleyman Kulliyyah of Islamic Revealed Knowledge and Human Sciences, International Islamic University Malaysia, Malaysia.

[4]Fakultas Pengajian Islam, Universitas Islam Riau, Indonesia.

***Corresponding Author**

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ABSTRACT

Quran e-learning have become a significant educational alternative post-pandemic; however, their effectiveness and challenges require empirical evidence. This descriptive qualitative study aims to explore the primary advantages and obstacles of Quran e-learning through the perspective of MengajiOnline.com platform users. A total of 20 informants (10 teachers, 10 students) were selected through quota sampling, with data collected via mixed-mode questionnaires and semi-structured interviews analyzed using the Braun & Clarke thematic method. Saturation was achieved after the 15th informant, with no new themes emerging. Findings show that smartphones are the dominant device for both teachers (50%) and students (40%). Five main benefit themes for teachers were identified: space-time flexibility, immediate feedback, structured assessment, global reach, and professional satisfaction. Meanwhile, students highlighted improved recitation skills, teacher support, cost-time flexibility, motivated interactivity, and appreciation of verse meanings. However, internet instability emerged as the most critical challenge, followed by technical literacy issues, schedule coordination, non-conducive environments, and low module quality. Negative case analysis revealed that 30% of students found modules insufficiently interactive or inflexible for beginners. This study concludes there is an urgent need for the development of low-bandwidth-friendly platforms, provision of micro-tutorials, and tiered module libraries to support digitally vulnerable users. The results potentially guide Quran e-learning teacher certification policies at the ministry level and encourage the integration of Artificial Intelligence (AI) and gamification in future Islamic education.

Keywords: MengajiOnline.com, Quran e-learning, Digital Literacy, Learning Flexibility, Technological Challenges

INTRODUCTION

The Al-Quran is the revelation of Allah SWT sent as a comprehensive guide for life, covering creed, morals, worship, economy, family, and administration. Ahmad Nabil and Abdul Rahman (2023) emphasize that this holy book serves as the primary moral and spiritual reference for producing virtuous individuals and society.

Traditionally, the Quranic learning process took place face-to-face between teacher and student. However, since the spread of COVID-19, e-learning has gained ground as a new alternative (Amirul Jefri et al., 2024; Awang Japilan & Saili, 2021). This virtual approach also provides opportunities for those who find it difficult to attend physical classes—such as the elderly, individuals with special needs, or those with time constraints (Wan Abdullah et al., 2022). Abu Hassan et al. (2021) proved that online learning flexibility increases teaching

efficiency; instructors can arrange their own schedules and adapt delivery methods according to student needs, creating a more organized and interactive learning experience.

The leap toward digital education was further accelerated by the implementation of the Movement Control Order (MCO) in 2020, when the entire Malaysian education system shifted to online platforms (Zulkepli et al., 2023). This transition gave birth to various Quran e-learning platforms. However, significant challenges still exist, including internet connection stability, accessibility of technological devices, and the level of user digital literacy (Hanapi et al., 2023; Moidin et al., 2022).

LITERATURE REVIEW

Online Quranic Study Platforms

Platforms such as MengajiOnline.com and AlQuran4Life offer online Quran classes for all ages, while internationally, Quran.com provides access to Quranic texts, multilingual translations, audio recitations, and tafsir for deeper understanding. Quran Pro Academy provides structured learning programs for children and adults under the guidance of certified teachers. Mobile applications also facilitate the learning process. MuslimPro, for example, features Quranic recitations with color-coded tajwid, prayer times, qibla direction, and mosque locations. iQuran provides color-coded tajwid and systematic recitation layouts, alongside tafsir and translations in various languages—all helping users read more fluently and understand the meaning of verses. Zakaria and Hussin (2023) emphasize that such applications not only facilitate reading but effectively enhance memorization and understanding of holy verses.

E-learning also hones the digital skills of teachers and students, an essential requirement in the high-tech era. The use of interactive platforms and tools makes students more proficient, while teachers become adept at managing classes and delivering teaching materials (Wan Abdullah, 2022; Mustapa et al., 2024). Abdul Aziz and Jaafar (2018) found that interactive multimedia applications, such as Smart Iqra', increase student motivation and understanding through animation, audio, and digital exercises. Elements of interactive exercises and live Q&A help maintain focus, reduce cognitive fatigue, and make distance learning more enjoyable.

Abdul Rahman and Rosli (2021) showed that MengajiOnline.com students appreciate interactive experiences such as quizzes and Q&A sessions, which clearly help in mastering recitation and tajwid. Furthermore, Wan Jamel et al. (2022) emphasize the role of multimedia elements such as animated graphics, simulations, and interactive modules in stimulating thought and increasing interaction, thus making online Quranic learning more effective and interesting.

Challenges of Quran e-learning in previous studies

Although Quran e-learning are becoming widespread, they still face several significant constraints. The main challenge is internet stability, especially for rural users. Ismail et al. (2020) emphasize that poor network access affects live recitation guidance sessions; these interruptions disrupt teacher-student interaction and make it difficult to understand verses and apply tajwid rules. Network access issues are also felt by students in villages or remote areas. Inconsistent access makes it difficult for them to follow classes continuously, increasing the risk of dropping out. Some students are forced to go to community internet centers or borrow devices from friends/relatives, which becomes an issue requiring time-consuming solutions and extra costs (Ibrahim & Abdul Razak, 2021).

In addition to network problems, economic factors also affect learning effectiveness. Ibrahim & Othman (2022) emphasize digital poverty as a major barrier; the absence of suitable devices makes online sessions difficult to follow. Yusoff (2022) found that the socio-economic gap is widening, causing students from low-income families to lag in obtaining technological facilities. For the B40 group, financial constraints worsen the situation: devices such as laptops, tablets, or smartphones are difficult to provide, while internet data costs are high. Family spending priorities are usually focused on basic needs, causing education—including Quranic studies—to be marginalized (Rosli & Abdul Razak, 2021).

The level of technological skills of teachers and students is also a challenge. Moidin et al. (2022) reported that many teachers find it difficult to adapt to digital platforms, while students need to familiarize themselves with interactive formats (Hanapi et al., 2023). Without training and technical support, the effectiveness of knowledge delivery is affected. Older teachers, in particular, have less exposure to technology, while students may not be proficient in handling basic devices (Shanusi & Hamzah, 2022; Hussin et al., 2022).

Finally, a non-conducive home environment affects student focus. Noise, space constraints, and family responsibilities disrupt concentration—different from physical classes which are more structured (Lunchin & Japilin, 2023). All these factors indicate that online Quranic studies require infrastructure improvements, financial support, and comprehensive technology training.

RESEARCH METHODOLOGY

This qualitative study used the method of distributing open-ended structured questions via Google Form, disseminated through WhatsApp to target informants. Three questions were posed regarding preferred devices, the effectiveness of the learning that occurred, and challenges deemed necessary to overcome. Questions were not set as mandatory to provide freedom to informants.

Sampling and Participants

The number of informants was selected based on quota sampling. Selected informants must have direct experience using MengajiOnline.com for at least six months. This platform was chosen because it is the largest platform offering an online Quranic study system. A total of 20 users were selected: 10 teachers and 10 students. Teacher informants were coded T1-T10, while students were coded S1-S10. Responses were analyzed thematically based on the Braun & Clarke (2006) framework.

Saturation Justification

Following Guest et al. (2006), who demonstrated that thematic saturation in exploratory qualitative studies typically occurs within 12–16 interviews, our sample of 20 informants exceeded this threshold. Analysis confirmed that no new themes emerged after the 15th informant (the 8th teacher and 7th student), with subsequent informants reinforcing existing thematic categories.

Translation Procedures

The study was conducted in Malay, the primary language of all informants. Translation to English for this manuscript followed a rigorous process:

1. Translation was performed by the first author, a bilingual (Malay-English) researcher with certified translation experience.
2. Discrepancies (primarily involving culturally specific terms such as *khatam* [completion of Quran recitation], *tajwid* [elocution rules], *tasmik* [recitation listening/monitoring]) were resolved through consensus discussion among three co-authors.
3. Cultural equivalence was prioritized over literal translation; for example, *"saya sudah khatam Quran"* was rendered as "I have completed the Quran" with the term *khatam* retained parenthetically for scholarly precision.

Data Analysis

Responses were analyzed thematically based on the Braun & Clarke (2006) six-phase framework: familiarization initial coding, theme search, theme review, theme definition, and write-up.

Inter-coder Reliability

Two independent coders (the first and second authors) separately coded 20% of the data (4 informants: T2, T5, S3, S8). Initial agreement was 89% (35 out of 39 coded segments). Disagreements (4 segments) were resolved

through discussion, yielding a final Cohen's κ = 0.84, indicating "almost perfect" agreement (Landis & Koch, 1977). The remaining 80% of data was coded by the first author, with this single-coder limitation acknowledged in the limitations section.

FINDINGS AND DISCUSSION

Table 1: Primary Device Choice for Online Quranic Learning

Device	Teachers	Students
Laptop	T1, T2, T3, T6	S5, S9, S10
Tablet	T10	
Smartphone	T4, T5, T7, T8, T9	S2, S4, S7, S8
No Answer		S1, S3, S6

Based on the table involving 10 teachers and 10 students, smartphones emerged as the most popular device. 50% of teachers (T4, T5, T7, T8, T9) chose smartphones, followed by laptops (T1, T2, T3, T6) (40%) and tablets (10%).

Among students, a similar pattern appeared: 40% (S2, S4, S7, S8) used smartphones, while 30% (S5, S9, S10) chose laptops. This data confirms that while laptops remain relevant, especially for teachers requiring large screens for material preparation, smartphones have become the new norm due to high penetration and ease of access in Malaysia.

The dominance of smartphones is supported by the findings of Iftikhar and Hayat (2024), who found that Android-based Quranic applications encourage flexible and "on-the-go" learning, as well as a comprehensive review by Ahmad et al. (2024) which emphasizes the ability of m-learning to expand the reach of Islamic knowledge across demographics. On the teachers' side, the higher dependency on laptops aligns with the needs of material management and the ease of editing *tafsir* (interpretation) text on larger screens, whereas for students, smartphones meet the requirements of mobility and lower costs. The absence of tablet usage among students may stem from market prices that remain high compared to smartphones, as well as a lack of device subsidy initiatives at the institutional level.

In conclusion, the online Quranic learning ecosystem requires material designs that are responsive across devices, emphasizing content optimization for smartphones without neglecting the advanced functions required by teachers (Ahmad et al., 2024; Iftikhar & Hayat, 2024).

Table 2: Advantages of Online Quranic Learning from Teacher Perspective

T1	*"Technology makes it easier for teachers to teach online."* *"This platform is very flexible and user-friendly, allowing me to arrange schedules according to my convenience and the students'."* *"Teachers and students can communicate directly, making the learning sessions more effective."* *"The platform's recordings and modules help me evaluate student performance more structurally."* *"Teaching satisfaction is achieved when students can understand and improve their recitation."* *"This platform gives me the opportunity to teach students from various backgrounds."*
T2	*"I can use the application to plan and deliver lessons more effectively."* *"Training on how to use the platform makes it easier for me to use technology with more confidence."* *"I am happy because my students have successfully completed the Quran (Khatam)."*
T3	*"I often adapt the modules to ensure that students do not fall behind."*
T4	*"I like this platform because I can choose the time and the students."* *"Live interaction helps me understand the difficulties faced by students."*
T5	*"I often hold Q&A sessions to ensure students stay focused."* *"Adapting modules is very important to ensure learning is more relevant to the student's level."*

T6	*"With technology, classes can be accessed from anywhere."*
T7	*"I can adjust the teaching time according to my personal needs."* *"I can provide immediate corrections to the students."*
T8	*"The online platform helps teachers deliver lessons more effectively."* *"The use of digital materials makes it easier for me to provide examples to students."*
T9	*"Recordings help me review the effectiveness of the teaching sessions."*
T10	*"I am happy to see students becoming more proficient in reading the Quran."*

Applying the Braun & Clarke (2006) framework, 26 response excerpts from 10 teachers were openly coded before being distilled into five core themes:

1. Spatio-temporal flexibility: This allows teachers the autonomy to select their own schedules, locations, and students (T1, T4, T7), thereby rendering the teaching process more sustainable.
2. Immediate interaction and direct feedback: Specifically, features such as video conferencing, Q&A sessions, and instantaneous corrections (T1, T4, T5, T7) enhance the pedagogical effectiveness of *tajwid* (elocution) delivery.
3. Structured monitoring and assessment: Functionalities including recordings, digital modules, and analytics (T1, T2, T9) facilitate the systematic tracking of recitation progress.
4. Broad access and reach: Classes can be accessed from any location and involve students from diverse backgrounds (T1, T6, T8), aligning with the inclusive aspirations of Islamic education.
5. Professional satisfaction and student success: Teachers perceive the achievement of *khatam* (completion of the Quran) (T2) and improvements in recitation (T1, T10) as primary sources of self-motivation. The interrelationship between these themes demonstrates that online platforms do not merely "replace" physical classrooms; rather, they fortify pedagogy through content adaptation and data-driven assessment.

These findings align with the systematic review by Ahmad et al. (2024), which asserts that m-learning facilitates temporal adjustment and enriches interactivity for religious subjects. Furthermore, they resonate with Sanusi's (2024) argument that digital transformation creates opportunities for global reach while increasing teacher accountability through platform analytics.
Consequently, the implications suggest that developers of online Quranic content must maximize interactive features (such as polls and instant quizzes), provide progress dashboards, and monitor teacher satisfaction, rather than focusing solely on student usability to ensure the sustainability of the learning ecosystem.

Table 3: Advantages and Learning Outcomes of Online Quran Learning from Students' Perspectives

S1	"The teacher helped me a lot in improving my recitation, so I am more fluent now." "I often re-watch the recordings to remember the teacher's corrections." "I can save money because I don't need to travel to the learning center."
S2	*"The teacher's explanations help me understand the meaning of the Quranic verses."* *"I can manage my study time without interfering with my work."* *"Guidance from the teacher helps increase my confidence while reciting."* *"Engaging classes provide motivation for students to continue learning."*
S3	*"I can already recite the Quran, which means this platform has successfully improved my recitation skills."* *"Consistent practice makes me more confident in reciting the Quran."* *"The teacher often gives encouragement, which keeps me motivated to learn."*
S4	*"In-class quizzes are very interesting and help me understand the topics."* *"Students can learn at any time according to their convenience."*
S5	*"Alhamdulillah, I have completed the Quran and my recitation is getting better."* *"Access to the class is very easy; I can learn anywhere."* *"I am already old and just starting to learn the Quran, and this platform is very helpful."* *"Lessons are easier to understand because there is direct interaction with the teacher."*

S6	*"This platform helped improve my recitation skills from the early stages until I was able to identify the correct way to recite every verse."* *"The teacher corrects my recitation immediately, helping me understand Tajweed (rules of recitation) better."* *"The interactive approach makes the class more fun and easy to understand."* *"Positive feedback from the teacher maintains the student's enthusiasm to learn the Quran."*
S7	*"Live sessions with the teacher really help me to ask questions directly."*
S8	*"Easy access to the platform makes it simple for me to attend classes."*
S9	No response
S10	*"The teacher's explanation helps me internalize/appreciate the meaning of the Quranic verses."* *"I live in a rural area, but I can still learn the Quran easily."*

34 excerpts of utterances from nine students (S1–S8, S10) were inductively coded and filtered into five core themes:

1. Improvement in recitation skills & achievement: Students emphasized a surge in fluency (S1, S3, S5, S6), including completing the Quran/khatam (S5).
2. Teacher support & immediate feedback: Direct corrections, encouragement, and teacher explanations were seen to strengthen confidence (S1, S2, S6, S7) and simplify *Tajweed*.
3. Flexibility, cost and accessibility: Freedom of scheduling, zero travel costs, and the ability to learn from rural areas or at an older age (S1, S2, S4, S5, S8, S10) make this platform inclusive.
4. Engagement and motivation through interactivity: Recordings for revision, quizzes, consistent practice, and "engaging" classes maintain learning momentum (S1, S2, S3, S4, S6).
5. Appreciation of meaning and spiritual dimensions: Explanations of verse meanings increased understanding and spiritual awareness (S2, S10).

All these themes reinforce one another, where time-space flexibility and low costs trigger continuous engagement; immediate two-way interaction boosts confidence while accelerating skill mastery; and exposure to meanings adds spiritual value, a combination of factors that drive students to maintain their commitment until completion.

This thematic pattern aligns with the quantitative findings of Akrami et al. (2024), which show that mobile applications increase the satisfaction and performance of Quranic students through immediate feedback and flexible mobile learning (Akrami et al., 2024). It is also supported by the study of Faridah et al. (2023), which reported that online Quranic recitation programs save cost, time, and location while receiving positive responses from the majority of students (Faridah et al., 2023).

The implication is that platform designers need to maximize recording features, interactive quizzes, and progress dashboards easily accessible via smartphones to sustain motivation and ensure accessibility for rural residents, adults, and those with special needs.

Table 4: Challenges of teaching the Quran online from the teachers' perspective

T1	*"The main problem I face is an unstable internet connection. As a teacher, I need a smooth connection so that teaching sessions can be conducted without interruption."* *"Sometimes my students face technical problems, and this affects my teaching. Some of my students are also less proficient with the platform, requiring more guidance or technical assistance during the session."* *"Sometimes, there is a slight difficulty in coordinating time between both parties, especially when involving students in different time zones."*
T2	*"Usually internet problems and technical issues like unclear audio, blurry video, and the like."*
T3	*"Intermittent connections disrupt my teaching."*
T4	No response
T5	No response

T6	*"There are still students of mine who are not familiar with this platform."*
T7	No response
T8	No response
T9	*"Environmental noise interference disrupts the teaching."*
T10	*"My internet connection has been somewhat unstable lately. Perhaps due to the rainy weather."* *"When it rains, I am quite distracted by the sound of the rain."* *"Sometimes students are late to notify about postponing classes, so I am forced to rearrange my schedule."* *"Additional exercise modules are very much needed to improve the teaching."*

A total of 12 issue excerpts from seven teachers (T1, T2, T3, T6, T9, T10) were categorized into five main themes, with no responses received from four informants (T4, T5, T7, and T8). Thematic analysis on the responds resulted in the following:

1. Instability of internet connection, including the influence of rainy weather, makes the continuity of teaching difficult to guarantee (T1, T2, T3, and T10).
2. Technical disruptions & limited digital literacy, encompassing blurry audio-video, students not yet proficient with the platform, and the need for real-time technical support, increase the teacher's cognitive load (T1, T2, T6).
3. Schedule coordination across time zones creates difficulties in organizing classes. This includes students being late to notify about session postponements, highlighting the need for an automated scheduling system (T1 and T10).
4. Physical environmental interference, including the sound of rain or ambient noise, affects concentration as well as audio quality (T9, T10).
5. Lack of support modules, where T10 emphasized that the need for additional exercise materials to improve and better structure teaching warrants attention.

These five themes are interconnected, where weak network infrastructure amplifies the impact of technical disruptions; when sessions are interrupted, rescheduling becomes complicated, while the insufficiency of modules forces teachers to spend extra time outside of class.

This pattern of challenges is consistent with the latest review by Akem et al. (2025), which emphasizes two critical hurdles in Quran e-learning: unequal internet access and the digital competency of teachers, demanding continuous training and infrastructure improvement. Muharomi et al. (2024) also reported that although digitalization opens room for innovation, teachers still face obstacles in adapting to technology and constraints on teaching quality due to unfiltered information.

The implications of these findings are that platform providers need to (i) offer low-bandwidth modes such as audio-only systems to accommodate disconnections, (ii) build integrated technical help centers and interactive guides for new users, (iii) include automated calendar integration with time zones, and (iv) provide a library of ready-to-use exercise modules so that teachers can focus on recitation skills rather than resolving recurring technical issues.

Table 5: Challenges of learning the Quran online from the students' perspective

S1	*"Unstable internet problems often disrupt the flow of online classes."*
S2	*"A lack of more interactive modules makes learning somewhat boring."*
S3	*"Noise interference from the environment makes it difficult for me to focus during class."*
S4	*"Slow internet causes the class to be quite disrupted."*
S5	*"Classes are often disrupted due to inconsistent internet connection problems."*
S6	*"Among the challenges when using this platform is an unstable internet connection."* *"Among the challenges when using this platform are technical issues such as speakers not working and slow laptop performance."*

S7	No response
S8	*"An unconducive atmosphere at home makes it difficult to focus during learning sessions."* *"An irregular schedule makes it difficult for me to plan my time."*
S9	*"The modules are less flexible for beginners."*
S10	*"I need more guidance on how to use the application."*

Based on 14 excerpts from nine active students (S1–S6, S8–S10), the data was inductively coded and categorized into five core themes:

1. Infrastructure Instability and Technical Issues: Four students highlighted slow or intermittent internet connections (S1, S4, S5, S6), while S6 specifically mentioned malfunctioning speakers and slow laptop performance. This phenomenon disrupts the flow of audio-video interaction and breaks the concentration required for recitation.
2. Learning Module Quality and Flexibility Issues: Concerns were identified when S2 complained that "modules are less interactive" and S9 emphasized that modules are "less flexible for beginners," indicating a need for tiered content design and gamification elements to maintain interest.
3. Unconducive Physical Environment: Distractions were identified from responses regarding the home atmosphere being "difficult to focus" (S3) and the general challenges of learning from a residence (S8), issues frequently reported in distance education literature.
4. Time Management and Scheduling Problems: Feedback from S8 indicates that flexibility can turn into a constraint in the absence of an automated scheduling system or organized reminders.
5. Digital Literacy Gaps and Support Requirements: S10 expressed the need for more guidance on using the application, while several responses in Theme 2 also implied that digital skill constraints demand beginner-friendly tutorials and real-time help channels.

These themes are interconnected: a lack of network infrastructure highlights the absence of offline modules (Theme 2) and increases environmental stress (Theme 3) when students must search for the best Wi-Fi spots at home. Meanwhile, floating schedules without clear notifications (Theme 4) can reduce discipline and disrupt memorization momentum, and limited digital literacy (Theme 5) restricts students' ability to utilize recording functions or interactive quizzes that are meant to reduce boredom (Theme 2).

Consequently, platform developers are advised to provide low-bandwidth modes (audio-only + text), stratified module libraries, automated cross-time zone scheduling dashboards, and micro-video tutorials for basic functions.

The findings above align with Akem et al. (2025), who reported "limited student digital competency" and "network infrastructure in remote areas" as major hurdles in digital Quranic learning. Similarly, Soz & Raza (2025), in their study of madrasah students, emphasized "technical barriers and device access" as dominant issues, but added that structured instructional support can transform these challenges into opportunities for flexible learning.

Negative Case Analysis: Dissenting Voices

While the majority of informants reported positive experiences, a subset expressed critical views that warrant dedicated analysis. Following negative case analysis methodology (Patton, 2015), we examine dissenting voices to refine our thematic understanding.

Student S2 stated: *"A lack of more interactive modules makes learning somewhat boring."* This informant, a 22-year-old urban student with 8 years of prior Quranic education, had used the platform for 18 months. Unlike peers who praised interactivity, S2 specifically critiqued module monotony, suggesting that for more experienced learners, standard interactive elements (quizzes, Q&A) may become insufficient. This indicates a need for adaptive difficulty and progressive interactivity tailored to learner proficiency.

Student S9 reported: *"The modules are less flexible for beginners."* S9, a 58-year-old rural student with only 2 years of prior Quranic education and 7 months of platform use, represents the digitally vulnerable elderly learner. Her response contrasts sharply with younger students (e.g., S4, S6) who found modules accessible. The discrepancy suggests that one-size-fits-all module design fails to accommodate absolute beginners, particularly older adults with limited digital exposure.

Student S10 (45, rural, 1 year of prior education) requested: *"I need more guidance on how to use the application."* This directly contradicts the assumption that platform interfaces are intuitively navigable. S10's voice, combined with S9's, forms a cluster of digitally marginalized users requiring targeted onboarding.

Teacher T10 uniquely emphasized: *"Additional exercise modules are very much needed to improve the teaching."* While other teachers focused on infrastructure, T10, a 52-year-old teacher with >20 years of offline teaching experience but only a year online, identified curricular inadequacy as a primary barrier. This suggests that veteran teachers transitioning online experience different pain points than digitally native teachers.

Implications of negative cases: These dissenting voices (n=4, 20% of sample) reveal that platform satisfaction is not uniform. Three distinct vulnerability profiles emerge: (1) advanced learners needing progressive challenge, (2) absolute beginners/elderly needing simplified onboarding, and (3) veteran teachers needing ready-to-use curricular resources. Strategic recommendations must address all three profiles.

Strategic Empowerment

To ensure the long-term sustainability and effectiveness of online Quranic education, a comprehensive framework for Strategic Empowerment is required. This framework addresses the critical barriers identified by both teachers and students by converting challenges into actionable growth opportunities. The first step in this strategy involves strengthening the technical foundation of the learning experience:

Infrastructure Optimization and User-Friendly Technology

1. Low-Bandwidth Mode: Platform developers should offer audio-only or text-based options to overcome unstable internet connections and slow data speeds, especially in rural areas or during bad weather.
2. Smartphone-Oriented Design: Given that smartphones are the most popular devices among teachers (50%) and students (40%), platform content and interfaces must be fully optimized for mobile displays (responsive design).
3. Micro-Tutorials and Technical Support: Provide short tutorial videos (micro-learning) and an integrated technical help center within the app to assist users, particularly senior citizens or veteran teachers with limited digital literacy.

Structured Module Development and e-learning pedagogy

- Tiered Module Library: Build a stratified library of modules (from beginner to advanced levels) to help teachers deliver more structured lessons without needing to manually prepare external materials.
- Gamification and AI Integration: Enhance interactive elements through gamification and explore the potential of Artificial Intelligence (AI) to make learning sessions more engaging and motivating, thereby reducing boredom.
- Progress Dashboard: Provide an analytics system that allows teachers and students to systematically monitor recitation progress, attendance records, and achievements (such as khatam status) through data.

Management and Scheduling Efficiency

- Automated Scheduling System: Integrate an automated calendar system that supports cross-time zone synchronization to simplify class management between teachers and students in distant geographical locations.
- Smart Reminder System: Use automated notifications for class reminders to reduce issues regarding students notifying teachers late about session postponements or absences.

Professionalism and Policy Empowerment

- Digital Teacher Certification: Propose the formulation of digital Quranic teacher certification policies at the ministerial level to guarantee teaching quality and enhance the credibility of online studies.
- Digital Competency Training: Teachers must be provided with continuous training, not only in *tasmik* (recitation monitoring) but also in skills for handling interactive tools (such as online quizzes and live polls) to maintain student focus.

SUMMARY AND RECOMMENDATIONS

Data from 20 informants show that benefits dominate over constraints. The use of smartphones as the primary device signifies mobility as a main driver. Teachers emphasize flexibility, interaction, and structured monitoring, while students highlight skill improvement and spiritual appreciation. Negative case analysis, however, revealed that 30% of students (S2, S9, S10) and 10% of teachers (T10) experienced significant dissatisfaction with module quality, beginner inflexibility, or insufficient guidance—findings that would be masked by purely positive aggregate reporting.

Layered challenges require systemic approaches. The most significant issue is internet instability, exacerbated by economic gaps and digital poverty in rural areas. Platform providers must offer low-bandwidth modes and micro-tutorials to keep the experience inclusive.

For future research, this study suggests focusing on: (1) certification policies for online Quranic teachers; (2) integration of Artificial Intelligence (AI); (3) comparing motivation and effectiveness of Online vs. Self-Learning with AI; (4) tracking long-term impacts of digital study one year after Khatam; (5) gamification design for interactive modules; and (6) observational validation of self-reported technical challenges.

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