Al-Kawakib
Volume 6 Number 1 2025, pp 1-23
ISSN: Online 2746-4997
DOI: https://doi.org/10.24036/kwkib.v6i1

Technopedagogy Approach in Classroom Management Strategy in *Fiqh* Learning at Madrasah Aliyah

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Abstract.
The advancement of digital technology in the Industrial 4.0 era has changed educational practices, including Islamic religious education, especially Fiqh learning. This study examines integrating digital technology in classroom management strategies in Fiqh learning at MAN 2 Parepare, Indonesia. Using a phenomenological qualitative approach, data were collected through observation, interviews, and documentation from teachers, students, and school leaders between February and April 2025. Findings show that tools such as Google Classroom, Quizizz, and interactive videos increase student engagement and create a dynamic learning environment. Adaptive classroom management strategies, including blended learning and positive reinforcement, support a structured and motivating atmosphere. However, challenges such as limited infrastructure, low digital literacy and digital distraction still exist, addressed through teacher training and access to flexible materials. This research confirms the potential of the technopedagogical approach to innovate Fiqh education, emphasizing the importance of a balanced integration of technology and pedagogy.

Keywords: *Technopedagogical approach, classroom management, Fiqh education, digital technology, Islamic education*

Received May 20th, 2025 RevisedJune 30th, 2025 Published June 30th, 2025

Introduction

The development of digital technology in the era of the Industrial Revolution 4.0 has brought significant changes in various fields, including the world of education. In the context of learning Islamic Religious Education (PAI), especially the subject of *Fiqh*, digital transformation demands an update in the learning approach. Teachers no longer only act as material deliverers, but are also required to be classroom managers who can create an active and participatory learning atmosphere. Digital devices such as computers, LCD projectors, and internet connections are essential instruments that support the creation of meaningful interactions in the classroom. This technology allows teachers to deliver material more interestingly and efficiently (Alfi et al., 2023). However, in reality, digital technology is still often limited to technical functions only. Technology has not been fully utilized as an integral part of a comprehensive and structured learning strategy (Ulya et al., 2021).

The main problem arising from this condition is the lack of integration between digital technology and practical classroom management strategies.

Teachers use technology only as a visual aid without maximizing its potential to build student interaction and engagement. As a result, learning becomes passive and does not encourage students to think critically or actively participate. This impacts low student involvement and less than optimal understanding of *Fiqh* material (Alfiah et al., 2025). In the context of 21st-century learning, this condition is undoubtedly a serious challenge that must be addressed immediately. A planned, adaptive, and digital-based classroom management strategy is needed to create a compelling and enjoyable learning atmosphere. Therefore, digital technology must be considered an integral part of the pedagogical approach, not just a tool (Syafia et al., 2024).

This study aims to describe the extent to which digital technology is used in the learning process of *Fiqh* at MAN 2 Parepare. The primary focus is to see how teachers integrate technology in terms of media, platforms, and learning methods used. In addition, this study also seeks to identify classroom management strategies implemented to support the optimal utilization of technology. These strategies include how teachers build a classroom atmosphere that is active, participatory and responsive to technological developments. This research also examines the obstacles teachers and students face in applying digital technology in the learning process. The obstacles include technical barriers, limited access, or a lack of competence in managing digital learning (Mufidah et al., 2024). Moreover, this research also explores practical solutions that are applied to overcome these problems.

Thus, the results of this study are expected to contribute to developing *Fiqh* learning practices that are more innovative and relevant to the demands of the times. This research can be a reference for increasing the capacity of teachers to be effective digital-based classroom managers. In addition, the results of this study can also strengthen the role of madrasah as an Islamic educational institution that is adaptive to technological advances. Teachers' experiences integrating technology and classroom management strategies will provide a real picture of the challenges and opportunities in the field. The findings from this study can also be used as a basis for formulating technology-based education policies. Therefore, it is essential to see the utilization of technology not only in terms of tools, but also in terms of the learning strategies and approaches accompanying it. This research is relevant to answering the needs for digital transformation in religious education.

Some previous studies have discussed similar topics, but are still limited to technology utilization in religious education. For example, research by Fitriani (2021) highlights online learning problems in MTs but has not specifically reviewed classroom management strategies. Another study by Destriani and Warsah (2022) focuses more on the social interaction model in

PAI, but does not reach the realm of *Fiqh* learning in depth. Meanwhile, Maulidiyah (2024) emphasizes using computers and the internet to improve the quality of education. Alfiah et al. (2025) focus more on the role of technology in fostering student independence. These references show that the strategic aspects of technology-based classroom management in *Fiqh* learning are rarely studied. Research by Alfiah et al. (2025) highlights the transformation of PAI through technology, but does not explicitly discuss *Fiqh*. Similarly, Syafia et al. (2024) research on modernization in pesantren shows the potential for digitalization, but focuses more on the managerial aspects of pesantren. This opens opportunities for more specific and in-depth research as offered in this study.

Therefore, this research offers novelty in the approach and scope of the study. Its primary focus on digital-based classroom management strategies in *Fiqh* learning is a significant contribution that has not been widely discussed. In addition, this research was conducted at the Madrasah Aliyah level, which empirically is still minimal as an object of study in a similar context. The uniqueness of this research also lies in the holistic attention to technical, pedagogical, and managerial aspects. The results of this study are expected to provide not only a theoretical understanding but also practical recommendations for teachers and education policymakers. The relevance of this research is even stronger because it answers concrete challenges in the world of religious education in the digital era. Thus, this study can be one of the essential references in developing adaptive, innovative, and competitive *Fiqh* learning.

Method

This study adopts a qualitative approach with a phenomenological design to understand the experience and meaning of utilizing digital technology in classroom management strategies in *Fiqh* learning at MAN 2 Parepare. The phenomenological approach was chosen to explore the perceptions and practices of teachers and students in depth, revealing the hidden reality behind technology-based classroom interactions (Roulston & Halpin, 2022). The research was conducted at MAN 2 Parepare City, South Sulawesi, from February to April 2025, with a duration of three months for data collection, analysis, and reporting.

The research participants were selected purposively, consisting of the madrasah head, three *Fiqh* teachers who actively use digital technology, and 15 students from grades X-XII who take part in *Fiqh* learning. The *madrasah* head was chosen because of his role as a facilitator of technological facilities,

teachers as implementers of learning, and students as beneficiaries, providing a holistic perspective on the learning process (Yin, 2019). Primary data were collected through non-participatory observation, structured interviews, and documentation. Observation was used to observe classroom dynamics and the use of technology, such as projectors and online platforms. Structured interviews with consistent question guidelines explored participants' perceptions, constraints and solutions. Documentation, including lesson plans, digital modules and photos of activities, was used to validate the findings. Secondary data, such as journals, school reports and relevant literature, complemented the research context (Alfiah et al., 2025).

Data analysis followed the Miles and Huberman model, including data reduction, presentation, and conclusion drawing (Palazzolo, 2023). Data reduction was done by selecting relevant information from observations, interviews, and documents, focusing on technology and classroom management. Data were presented as narratives and tables to illustrate patterns and themes. Verification was carried out through source triangulation, comparing data from madrasah principals, teachers, students, documents and discussions with peers to ensure the accuracy of interpretations. Data validity was strengthened through credibility testing (extension of observation and persistence of observation) and transferability, by compiling a clear and structured report so that the findings can be understood and relevant to other contexts (Agostinho, 2005).

Research ethics were maintained by obtaining informed consent from participants, guaranteeing identity confidentiality, and using data for academic purposes only. The research instruments, such as interviews and observation guidelines, were validated by two Islamic education experts to ensure reliability.

Results and Discussion

Transforming Learning through Digital Technology

The use of digital technology at MAN 2 Parepare has changed the learning paradigm of *Fiqh*, shifting the traditional approach dominated by lectures and textbooks towards an interactive, visual, and learner-centered learning experience. Teachers utilize a variety of technological tools, including smart TVs, projectors, Google Classroom, Quizizz, Wordwall, Canva, CapCut, PowerPoint, ChatGPT, Meta, and learning videos, to enrich material delivery, increase learner engagement, and expand access to learning resources. Here in Table 1, researchers present data on the utilization of digital technology by teachers in the learning process.

Table 1. Initial Coding of Digital Technology Utilization

Indicator	Theme Code	Code Description	Data Snippets
Digital Presentation Media	TD1	Teachers use apps such as PowerPoint, Canva and CapCut to create visual learning materials.	"I use Canva to make infographics and CapCut to edit short videos so children are more interested."-Andi Annisa Nofianti.
E-Learning Platform	TD2	Teachers use Google Classroom to distribute materials and assignments.	"Google Classroom helps me share materials and assignments, and children can also access it anytime."-Nurhikmah Amrah.
Interactive Media	TD3	Teachers utilize Quizizz, Wordwall, and interactive videos for learning and evaluation.	"Quizizz makes children excited, they like it when there is a ranking and the score comes out immediately."-Afrianti..
Digital Literacy Improvement	TD4	Teachers improve students' digital literacy through technology-based assignments.	"I teach the children to look for sources on the internet, but they must be from valid sites."-Tasman Ramadhan.

Observations in classes X.1 and X.5 revealed that using interactive media, such as online quizzes through Quizizz, significantly increased learner participation compared to conventional methods. One learner, Assyifa Nurul Mukhlisa (X.1), stated, "Learning using videos and quizzes makes it easier to understand and not boring," reflecting the positive impact of technology on motivation and understanding.

In delivering the material, teachers use multimedia such as videos, animations and infographics to explain abstract or procedural concepts of *Fiqh*, such as ablution and prayer procedures. Learning videos allow learners to witness visual demonstrations, which are more effective than textual explanations in handbooks. For example, one teacher, Andi Annisa Nofianti, explains, "I use Canva to make infographics and CapCut to edit short videos so that children are more interested." These infographics and videos clarify ritual procedures and allow learners to visualize the context of *Fiqh*, such as the difference between *zakat fitrah* and *zakat mal*. Classroom documentation shows that the visual presentations increase interaction, with learners asking questions or discussing the material more often than when using a textbook.

Google Classroom became the leading platform for material distribution and assignment management, allowing flexible access outside class hours. Teachers such as Nurhikmah Amrah note, "Google Classroom helps me share materials and assignments, and the children can also access them at any

time." The platform supports independent learning, allowing learners to download e-books, articles or online Islamic references to deepen their understanding of *Fiqh*. In addition, interactive tools such as Quizizz and Wordwall facilitate formative evaluation, providing immediate feedback to teachers and learners. Afrianti added, "Quizizz excites children; they like it when there is a ranking and the score comes out immediately." Observation data confirms that interactive quizzes increase classroom engagement, with learners competing to answer questions quickly and accurately.

Improving digital literacy is also a focus, with teachers training learners to find valid references online. Tasman Ramadhan explains, "I teach the children to look for sources on the internet, but it must be from valid sites." This approach expands access to information and equips learners with essential digital skills. However, an internal school survey revealed that only 50% of teachers are comfortable using digital technology, suggesting a competency gap that affects the consistency of technology utilization across classrooms. Some teachers use basic tools such as PowerPoint without utilizing interactive features, as seen in the documentation of class X.5.

These findings are visualized in Figure 1, a mind map that categorizes the use of digital technology into four main themes: digital presentation media, e-learning platforms, interactive media, and enhancing digital literacy. This mindmap clarifies the diversity of technological tools and their functions, ranging from visual material delivery to interactive evaluation, and highlights the role of technology in transforming *Fiqh* learning to be more dynamic and inclusive.

Figure 1. Mind Map Data Visualization of Digital Technology Utilization

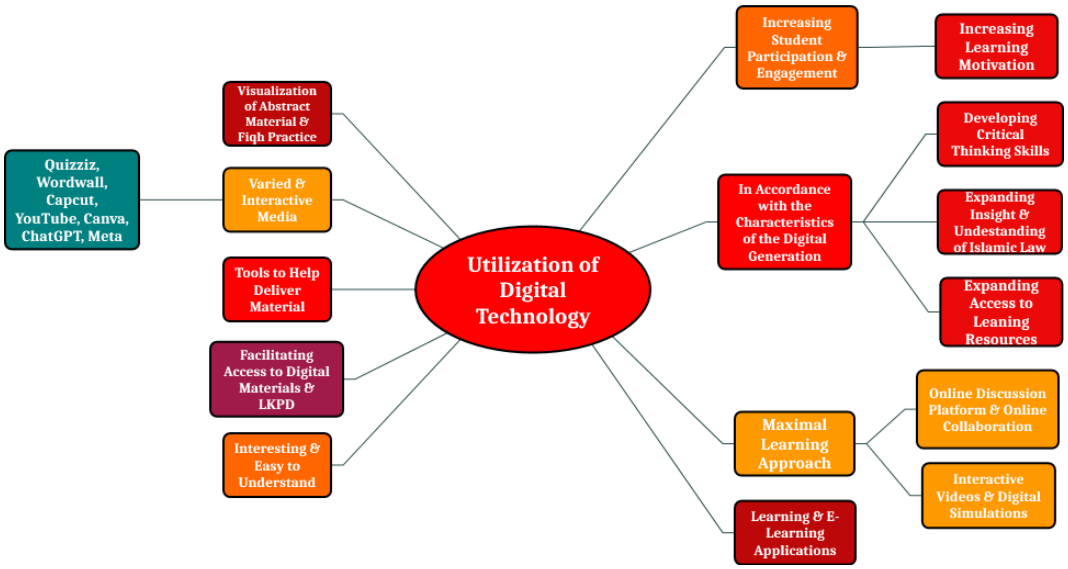

Figure 1, generated using NVivo 15 software, is a mind map that maps the utilization of digital technology in *Fiqh* learning. The center of the mindmap is titled "Utilization of Digital Technology", with four main branches: (1) Digital Presentation Media, including PowerPoint, Canva, and CapCut for infographics and videos; (2) E-Learning Platform, focusing on Google Classroom for material distribution; (3) Interactive Media, including Quizizz, Wordwall, and videos for quizzes and evaluations; and (4) Digital Literacy Enhancement, emphasizing online reference search training. Each branch has sub-branches detailing specific applications, such as "infographics" for Canva or "interactive quizzes" for Quizizz. This mind map illustrates the diversity of technology and its role in improving material delivery, learner engagement, and information access, supporting the narrative of transforming *Fiqh* learning.

The use of digital technology in *Fiqh* learning at MAN 2 Parepare aligns with Vygotsky's social constructivism theory, which emphasizes the role of tools as mediators in the learning process (Amahorseya & Mardliyah, 2023). Platforms such as Google Classroom and Quizizz serve as zones of proximal development, facilitating interaction between learners, teachers and learning content. Videos and infographics, as visual tools, support understanding abstract concepts by providing concrete representations, allowing learners to construct knowledge actively. Piaget's cognitive development theory is also relevant, as multimedia stimuli such as animations and interactive quizzes adjust to learners' cognitive developmental stages (Marinda, 2020), especially in processing procedural and conceptual information in *Fiqh*.

However, the gap in teacher competence, with only 50% feeling comfortable using technology, points to challenges in full implementation.

This reflects the need for a structured pedagogical approach, as advocated by (Laurillard et al.,2013), which emphasizes that technology must be integrated with clear learning patterns to achieve maximum effectiveness. Using basic tools such as PowerPoint by some teachers, without utilizing interactive features, suggests technology adoption at the substitution level in the SAMR model (Substitution, Augmentation, Modification, Redefinition), rather than the more transformative modification or redefinition. Nevertheless, the diversity of technologies visualized in Figure 1 shows the potential to reach higher levels, primarily through training and institutional support.

These findings are consistent with research (Laurillard et al., 2013), which found that digital media increased learner engagement in higher education through interactivity and immediate feedback. The use of Quizizz at MAN 2 Parepare reflected similar effects, with learners showing greater enthusiasm than traditional methods. However, in contrast to higher education contexts in developed countries, madrasahs face infrastructure challenges, such as limited internet access, which limits the scalability of the technology. This research also extends the findings of (Selwyn, 2021) on technology integration in education, highlighting the importance of contextual factors. At MAN 2 Parepare, local adaptation through tools such as Canva and Google Classroom shows how technology can be adapted to the needs of the madrasah, despite limited resources. In addition, the focus on digital literacy is resonant with (Christanti et al., 2024), which emphasizes the importance of digital skills to address the information access gap, although this study adds a unique perspective on Islamic religious education.

Adaptive Classroom Management through Digital Technology

Classroom management strategies at MAN 2 Parepare demonstrate an adaptive approach that utilizes digital technology to create a structured, interactive, and motivating learning environment in *Fiqh* learning. Teachers integrate various technology platforms and tools, such as Google Classroom, Quizizz, Wordwall, and interactive videos, to manage classroom activities, facilitate evaluation, and encourage learners' active participation. The researcher presents the initial coding data of classroom management strategies.

Table 2: Initial Coding of Classroom Management Strategies

Indicator	Theme Code	Code Description	Data Snippets
Interactive Media	PK1	Utilization of apps like Quizizz and Wordwall for active learning.	"We use Quizizz for quizzes, the children are more active in answering the questions."-Nurhikmah Amrah.
Online Learning Platform	PK2	Use of Google Classroom for material distribution and evaluation.	"Google Classroom makes it easy for me to monitor assignments and give feedback."-Andi Annisa Nofiant.
Teacher Digital Competency	PK3	Teachers improve digital competencies through training and workshops.	"I participated in the Google Workspace training, so I understand better how to create interactive materials."-Tasman Ramadhan.
Motivation and Discipline	PK4	The teacher gives simple rewards and maintains discipline through technology.	"If the children are active, I praise or applaud, they get excited."-Afrianti.

Observations in classes X.1 and X.5 revealed that using interactive quizzes through Quizizz increased learner engagement, with many students competing to answer questions and achieve the highest score. Afriantia, *Fiqh* teacher, noted, "Quizizz makes children excited, they like it when there is a ranking and the score comes out immediately." This statement reflects how technology supports classroom management and increases learners' intrinsic motivation.

Google Classroom is the backbone of digital classroom management, used to distribute materials, organize assignment schedules, and provide feedback. Andi Annisa Nofianti, explains, "Google Classroom makes it easy for me to monitor assignments and give feedback; the children also know when to submit." The platform allows teachers to set clear guidelines, such as assignment submission deadlines and material access, which reduces confusion and ensures equitable access for all learners. Classroom documentation shows that the structured schedule in Google Classroom helps maintain discipline, with learners consistently accessing materials and completing assignments on time. In addition, the platform enables two-way communication, where learners can ask questions or request clarification directly.

Teachers use interactive media such as Quizizz and Wordwall to increase engagement for formative evaluation and collaborative activities. Nurhikmah

Amrah, states, "We use Quizizz for quizzes, and children are more active in answering questions." These interactive quizzes provide real-time feedback, allowing teachers to customize instruction based on learners' level of understanding. For example, when the quiz shows common mistakes in *zakat*, teachers can immediately provide additional explanations or supporting videos. Interactive videos are also used to initiate class discussions, such as a video on the *Hajj* procedure that triggers questions and dialogue among learners. Observations confirm that this approach creates a more lively classroom dynamic than the static presentation method.

Teachers' digital competence is a key factor in the success of this strategy. Teachers attended training, such as Google Workspace workshops and mock studies at other schools, to improve their skills in designing interactive content and managing digital platforms. Tasman Ramadhan noted, "I attended the Google Workspace training, so I understand better how to create interactive materials." This training enables teachers to use tools such as Canva for infographics and CapCut for videos, which enhance the visual appeal of learning. However, the data shows variations in technology adoption, with some teachers still relying on PowerPoint without interactive features, as seen in X.5's class documentation. This suggests that while training is available, its implementation has not been evenly spread across the teaching staff.

Learner motivation and discipline are also the focus of classroom management strategies. Teachers apply positive reinforcement techniques, such as verbal praise and applause, to encourage participation. Afrianti adds, "If the children are active, I praise or applaud them, and they get excited." In addition, teachers vary teaching methods, incorporating quizzes, videos and group discussions, to prevent boredom and keep learners' attention. This approach proved effective, with observations showing that learners remained engaged during learning sessions that used interactive technology. These findings are visualized in Figure 2, a mind map that categorizes classroom management strategies into four themes: interactive media, online learning platforms, teacher digital competencies, and motivation and discipline. This mind map clarifies how these strategies support each other to create an organized and dynamic learning environment.

Figure 2: Mind Map Data Visualization of Classroom Management Strategies

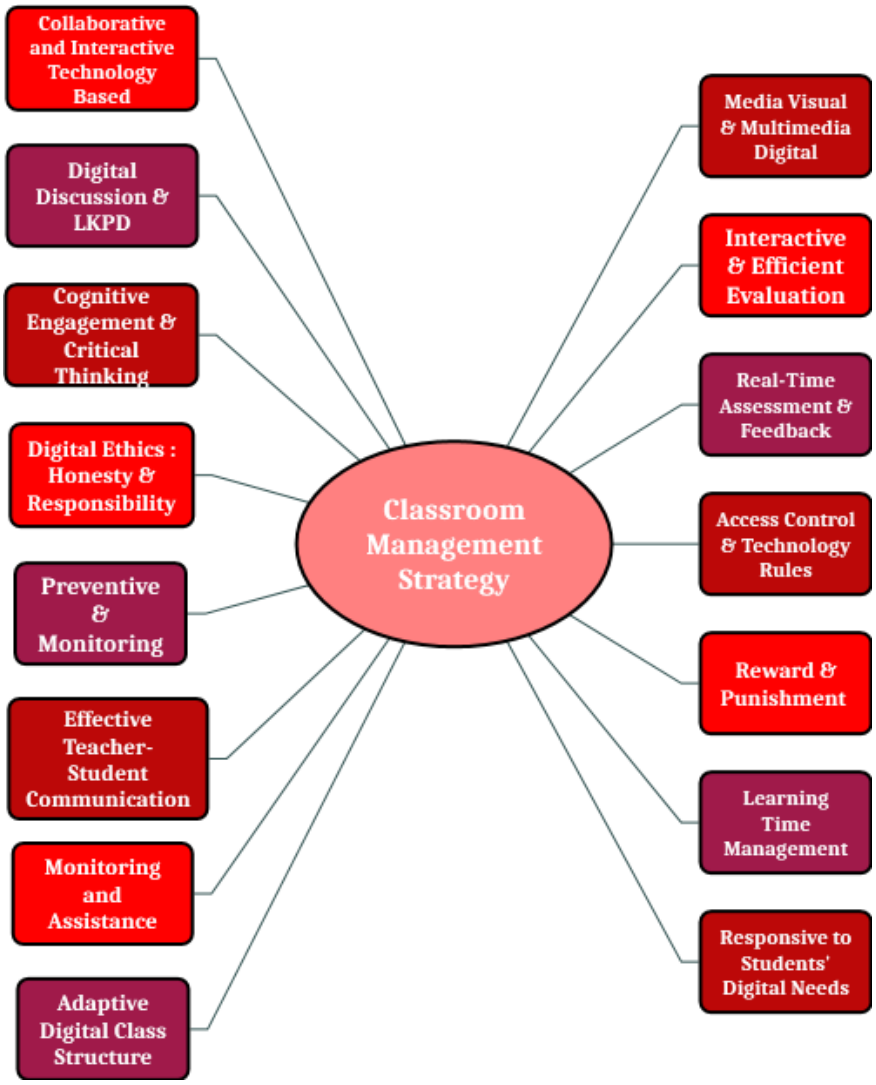

Figure 2, generated using NVivo 15, is a mind map that maps the classroom management strategies in digital technology-based *Fiqh* learning. The center of the mind map reads "Classroom Management Strategies", with four main branches: (1) Interactive Media, covering Quizizz, Wordwall, and interactive videos for quizzes and discussions; (2) Online Learning Platform, focusing on Google Classroom for distribution of materials and assignments; (3) Teachers' Digital Competence, covering training and workshops for digital skills; and (4) Motivation and Discipline, covering verbal praise, applause, and variety of teaching methods. Each branch has sub-branches detailing specific applications, such as "interactive quizzes" for Quizizz or "structured schedules" for Google Classroom. This mind map illustrates a multifaceted approach to classroom management, supporting how technology facilitates an organized and motivating learning environment.

The classroom management strategies at MAN 2 Parepare reflect B.F. In Skinner's behaviorism approach, positive reinforcement, such as verbal praise

and interactive quiz feedback, encourages desired learning behaviors (Syarifah et al., 2023). Giving praise after answering questions in Quizizz, for example, reinforces active participation, while structured schedules in Google Classroom instill discipline. Mayer's principles of multimedia learning are also relevant, as the combination of visual (videos, infographics) and auditory (discussion, verbal feedback) input improves information retention and learner cognitive engagement (Agung Budi Santoso, 2021). The SAMR (Substitution, Augmentation, Modification, Redefinition) model (Niswatin & Zainiyati, 2021) provides a framework for understanding these strategies, with the use of Quizizz and Google Classroom reflecting the level of modification, where technology transforms the learning experience to be more collaborative and interactive. However, some teachers' reliance on PowerPoint without interactive features suggests that some strategies are still at the substitution level, replacing traditional tools without significant transformation.

Despite training, teachers' digital competency gaps point to challenges in achieving consistent technology adoption. This aligns with the views of (Niswatin & Zainiyati, 2021), who assert that successful technology integration requires ongoing professional development to avoid superficial use. Training such as Google Workspace workshops has been helpful, but uneven implementation suggests the need for more targeted approaches, such as inter-teacher mentoring or individual needs-based training. In addition, the focus on motivation through positive reinforcement resonates with Maslow's humanistic theory, which emphasizes the importance of meeting learners' psychological needs (Rachmahana, 2008), such as recognition and a sense of accomplishment, to support learning.

These findings support research (Blundell et al., 2020), highlighting the importance of professional development to ensure technology is used transformatively in classroom management. The use of Quizizz and Google Classroom at MAN 2 Parepare reflects pedagogical modifications, consistent with findings Bond&Bedenlier (2019) that interactive technologies enhance learner engagement through immediate feedback. However, in contrast to research in urban education contexts with abundant resources, madrasahs face constraints such as limited internet access, which makes strategies such as structured schedules in Google Classroom key to maintaining consistency. This research also enriches Kounin's concept of seamless transition in classroom management, showing how digital technology allows teachers to maintain a smooth learning flow through tools such as interactive quizzes and online platforms (Hunaepi, 2023). In addition, the focus on motivation through praise extends Maslow's findings, showing that technology can fulfill psychological needs in religious education (Rachmahana, 2008).

Navigating Technology Constraints in *Fiqh* Learning

Although digital technology significantly benefits *Fiqh* learning at MAN 2 Parepare City, its implementation faces several complex obstacles, ranging from infrastructure to digital literacy. However, the solutions demonstrate resilience and innovative local adaptation, enabling continued learning despite limited conditions. The main constraints identified include restricted access to technology, technical issues, low digital literacy, digital distraction, low discipline, and limited resources, as summarized in Table 3 and categorized in Table 4. The solutions implemented, including teacher training, blended learning and distraction management, are outlined in Tables 5 and 6. The thematic visualizations in Figures 3 and 4 clarify the relationship between constraints and solutions, providing a structured picture of the dynamics of technology implementation.

1. Obstacles in Utilizing Digital Technology

Limited access to technology is a significant obstacle, with an unstable internet network, limited school Wi-Fi, and a shortage of learners' devices. Ibnu Fatur Rahman (X.1) reported, "The network often breaks when opening the material; sometimes you have to use your quota." Observation of class X.5 confirmed that signal interference often disrupts access to Google Classroom or online quizzes. Technical issues, such as application errors, slow devices, smart TV malfunctions, and power outages, hinder the smooth learning process. Nurul Syauqiah Hamsah (XI.A.1) stated, "Smart TV or Wi-Fi errors, the electricity also likes to go out, so it's difficult to follow the lesson." Documentation data shows that these disruptions cause delays in class activities until the problems are resolved.

Learners' low digital literacy complicates the use of technology. Many learners have difficulty accessing links or understanding application interfaces, as Assyifa Nurul Mukhlisa (X.1) noted: "Sometimes it's difficult to enter links, I ask the teacher." Teachers also face similar challenges, with an internal survey revealing that only 50% of teachers feel confident using technology, indicating a competency gap. Digital distractions, such as notifications from social media or other apps, take away learners' focus. Syarifah Najwa Husain (X.1) admitted, "I get distracted when there are other notifications, sometimes I open other apps." In addition, online evaluation raises concerns about academic honesty, with Nurhikmah Amrah, S.Pd, noting, "It is difficult to make sure children are honest during online evaluation."

Then, the researcher will code the data against the main obstacles identified, including limited access to technology, technical problems, low digital literacy, digital distraction, low discipline, and limited resources, as

summarized in Table 3. and categorized in Table 4, with the following explanations

Table 3. Initial Coding of Obstacles in Utilizing Digital Technology

Indicator	Theme Code	Code Description	Data Snippets
Limited Access to Technology	K1	Limited devices, unstable signal, weak Wi-Fi.	"The network often breaks when opening the material."-Ibnu Fatur Rahman, X.1
Technical Issues	K2	Application errors, slow devices, and power outages.	"Smart TV or Wi-Fi errors, the electricity also goes out."-Nurul Syauqiah Hamsah, XI.A.1
Learner Digital Competency	K3	Difficulty accessing links or apps.	"It was difficult to enter the link, I asked the teacher."-Assyifa Nurul Mukhlisa, X.1
Psychological and Disciplinary Factors	K4	Lack of motivation, academic dishonesty.	"Online evaluation is difficult to ensure honesty."-Nurhikmah Amrah.
Limited Resources	K5	Strategy is not optimal, and funds are limited.	"Funding is gradual, there is still a lot that needs to be improved."-Hj. Darna Daming
Digital Distraction	K6	Notifications interrupt concentration.	"Distracted if there are other notifications."-Syarifah Najwa Husain, X.1

Table 4. Categorization of Obstacle Themes

No.	Main Theme	Subtheme
1.	Limited Access to Technology	Limited personal devices, limited quota, weak signal, limited school Wi-Fi
2.	Technical and Non-Technical Constraints	App error, slow device, smart TV/Wi-Fi/electricity malfunction
3.	Platform Adaptation Difficulties	Lack of familiarity with the application, difficulty opening links, and a complex interface
4.	Low Literacy and Discipline	Low motivation, poor time management, and academic dishonesty
5.	Lack of Environmental Support	Digital strategy not yet optimized, limited funds
6.	Digital Distraction	Notifications, opening other apps

Limited resources and environment are also significant constraints. Limited school funding has hampered infrastructure improvements, as the Head of Madrasah, Darna Daming, explained: "Funding is gradual, there is still a lot that needs to be fixed." Learners' home environments, such as a noisy ambience or lack of study space, exacerbate access challenges. Table 3 summarizes the initial coding of constraints, while Table 4 categorizes constraints into six themes: technology access, technical issues, platform adaptation, literacy and discipline, resources, and distraction. The researcher then presents Figure 3 to visualize this categorization, providing a clear structure of the complexity of the challenges.

Figure 3. Mind Map Data Visualization of Technology Utilization Constraints

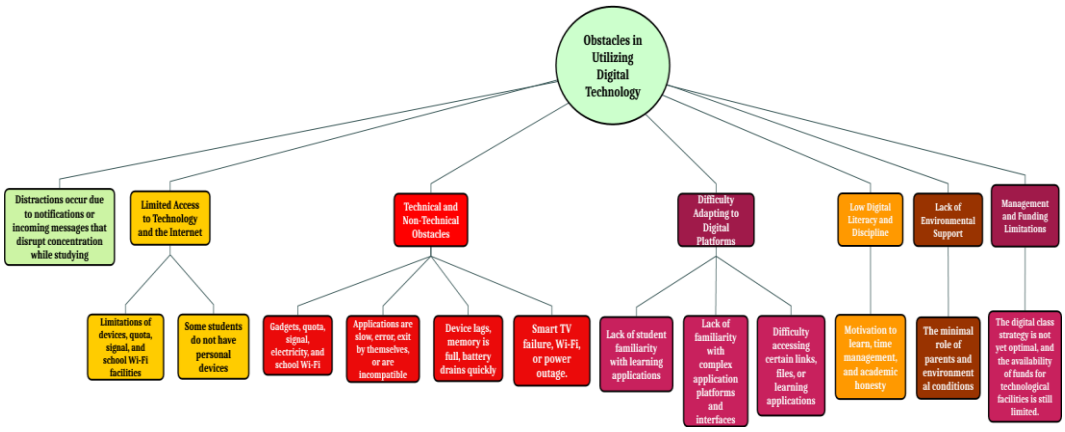

Figure 3, generated using NVivo 15, is a mind map with a center titled "Constraints to Digital Technology Utilization". The six main branches include: (1) Limited Access to Technology (limited devices, weak signals); (2) Technical and Non-Technical Constraints (application errors, power outages); (3) Platform Adaptation Difficulties (complex interfaces); (4) Low Literacy and Discipline (low motivation, dishonesty); (5) Lack of Environmental Support (limited funds); and (6) Digital Distractions (notifications). Sub-branches such as "limited Wi-Fi" or "poor time management" detail each theme, illustrating the complexity of the challenges in digital technology implementation.

2. Solution to Overcome Obstacles

To navigate the obstacles, MAN 2 Parepare implemented diverse and proactive solutions, such as teacher training, blended learning approaches and digital distraction management. Teacher training through Google Workspace workshops and mock studies at other schools improved digital competencies, addressing the gaps identified in the survey. Darna Daming, Head of Madrasah, stated, "Teachers participated in Google Workspace training and mock studies to understand technology." The blended learning approach, which combines digital and traditional methods, ensures continuity of learning when technical disruptions occur. Andi Annisa Nofianti explains, "We use blended learning, videos and Quizizz for variety, but also prepare offline methods."

Offline materials like PDF files and flexible assignment schedules overcome connectivity limitations. Tasman Ramadhan notes, "I prepare PDFs and set flexible assignment schedules so children can still learn." Teachers provide app tutorials and technical assistance to help learners who struggle with the interface, as Afrianti explains: "I explain how to use the app

and give praise for motivation." Motivational strategies, such as praise and rewards, increase learner engagement, while online evaluation monitoring and digital ethics education minimize dishonesty. Nurhikmah Amrah adds, "We supervise online evaluations and teach digital ethics so children are honest."

Infrastructure support, such as school Wi-Fi and technician coordination, reduces technical glitches. Daming emphasized, "There is madrasah Wi-Fi and technicians help if there are problems." Adaptive management through WhatsApp groups facilitates communication and monitoring of learners' engagement, with Andi Annisa Nofianti noting, "I created a WhatsApp group for discussion and monitoring engagement." To overcome distractions, learners are encouraged to turn off notifications or use "do not disturb" mode during learning, as Syarifah Najwa Husain (X.1) explained: "I turn off notifications while studying and follow the teacher's guidance." Below, in Table 5 we summarize the coding of the solutions, while Table 6 categorizes the solutions into eight themes.

Table 5. Initial Coding of Digital Technology Utilization Solutions

Indicator	Theme Code	Code Description	Data Snippet
Teacher Competency Improvement	S1	Continuous training, workshops, mock studies.	"Teachers participated in Google Workspace training and a mock study."-Darna Daming
Strengthening Digital Learning Methods	S2	Blended learning, interactive media, and a variety of strategies.	"We use blended learning, videos, and Quizizz for variety."-Andi Annisa Nofianti.
Flexibility of Access and Materials	S3	Offline materials, flexible schedule.	"I prepare PDFs and organize flexible duty schedules."-Tasman Ramadhan
Learner Mentoring & Education	S4	App tutorials, motivation, and rewards.	"I explain how to use the app and give praise."-Afrianti
Collaboration and Environmental Support	S5	School Wi-Fi, technician coordination, and parent cooperation.	"There is a madrasah Wi-Fi, and technicians help if there are problems."-Hj. Darna Daming
Digital Surveillance and Ethics	S6	Evaluation supervision, digital ethics education.	"We monitor evaluation and teach digital ethics."-Nurhikmah Amrah.
Digital Classroom Management Development	S7	Adaptive strategies, such as WhatsApp groups.	"I created a WhatsApp group for discussion and monitoring."-Andi Annisa Nofianti.
Strategies for Overcoming Distraction	S8	Disable notifications, standalone tutorial.	"I turn off notifications while studying."-Syarifah Najwa Husain.

Table 6: Solution Theme Categorization

No.	Main Theme	Subtheme
1.	Teacher Competency Improvement	Continuous training, workshops, mock studies, and digital platform understanding
2.	Strengthening Digital Learning Methods	Blended learning, interactive media, and content variety
3.	Flexibility of Access and Materials	Offline alternative, light material, regular access schedule
4.	Mentoring & Education for Students	Application explanation, technical assistance, motivation, and reward
5.	Collaboration and Environmental Support	School Wi-Fi, technician communication, and parent cooperation
6.	Digital Surveillance and Ethics	Evaluation supervision, digital character building
7.	Digital Classroom Management Development	Technology-based adaptive strategies
8.	Strategies for Overcoming Distraction	Disable notifications, self-tutorial, "do not disturb" mode.

After the researcher summarized the coding of the solutions and categorized the solutions into eight themes, the researcher visualized these solutions, showing the resulting integrated approach with NVivo 15 in the following figure.

Figure. 4. *Mindmap* Data Visualization of Digital Technology Utilization Solutions

Figure 4, generated with NVivo 15, is a mind map with a center titled "Digital Technology Utilization Solutions". The eight main branches include: (1) Improvement of Teacher Competence (training, workshops); (2) Strengthening Digital Learning Methods (blended learning); (3) Flexibility of Access and Materials (offline materials); (4) Learner Mentoring & Education (tutorials, motivation); (5) Collaboration and Environmental Support (Wi-Fi,

technicians); (6) Digital Supervision and Ethics (evaluation supervision); (7) Development of Digital Classroom Management (WhatsApp groups); and (8) Strategies to Overcome Distractions (turn off notifications). Sub-branches such as "flexible schedule" or "ethics education" detail each solution, illustrating a multifaceted approach to overcoming obstacles.

The barriers identified reflect common challenges in digital education, particularly in resource-limited contexts. Infrastructure limitations, such as weak signals and limited funding, align with the digital divide proposed by Warschauer & Matuchniak (2010) where unequal access to technology affects learning effectiveness. Low digital literacy and distraction reflect teachers' and learners' need for more intensive digital skills education. The solutions implemented, such as blended learning and offline materials, demonstrate a collaborative problem-solving approach that resonates with Dreikurs' theory emphasizing cooperation to overcome classroom challenges (Nirvana, 2024). Praise and rewards to increase motivation align with Maslow's humanistic theory, prioritizing psychological needs such as recognition to support learning (Rachmahana, 2008).

Strategies like WhatsApp groups and online evaluation supervision reflect innovative local adaptations, enabling communication and academic integrity under limited conditions. Blended learning, as the leading solution, supports Kounin's concept of seamless transition, where combining digital and traditional methods ensures smooth learning despite technical disruptions (Ummah, 2019). Figures 3 and 4 clarify the relationship between constraints and solutions, with teacher training (S1) addressing low digital literacy (K3) and offline materials (S3) addressing limited access (K1). This approach shows that the success of technology depends on addressing technical and human factors simultaneously.

This finding supports Selwyn (2021) argument that technology integration requires addressing both technical (infrastructure) and human factors (literacy, motivation), as seen in the blended learning solution and teacher training at MAN 2 Parepare. Warschauer & Matuchniak (2010) highlight inequality of access as a significant barrier to digital education, consistent with the limitations of Wi-Fi and devices in madrasahs. However, solutions such as offline materials and WhatsApp groups showed unique adaptations to the madrasah context, extending their findings with a religious education perspective. The research is also resonant with that on seamless transitions, with technology facilitating flexible classroom management (Ummah, 2019). In contrast to studying in developed contexts, madrasahs face significant funding constraints, making low-resource-based solutions, such as PDFs and WhatsApp, relevant. A motivational approach through rewards enriches

Maslow's theory, suggesting that technology can support psychological needs in Fikih learning (Rachmahana, 2008).

Conclusion

This study shows that integrating digital technology in *Fiqh* learning at MAN 2 Parepare City has transformed the teaching approach through tools such as Google Classroom, Quizizz, and interactive videos, as discussed in formulating the first problem. Adaptive classroom management strategies, such as online platforms and motivational techniques, ensure a structured and dynamic learning environment, as outlined in the second problem statement. However, constraints such as limited infrastructure, low digital literacy and digital distraction, as analyzed in the third problem statement, highlight the complexity of technology implementation. Solutions such as blended learning, teacher training and adaptive management demonstrate local resilience, enabling madrasahs to overcome challenges with limited resources.

The tables presented summarize specific data, ranging from technology utilization to constraints and solutions, while the Figures presented visualize thematic relationships, strengthening the narrative about the transformation of *Fiqh* learning. Theoretically, this study extends Vygotsky's social constructivism through technology as a mediator of learning, Skinner's behaviorism through positive reinforcement in classroom management, and Maslow's humanistic theory through a focus on motivation. Compared to previous research, this study offers unique insights into religious education in resource-limited contexts, highlighting local adaptations such as offline materials and WhatsApp groups uncommon in developed educational contexts.

This study has several limitations that need to be considered. First, the focus on one madrasah (MAN 2 Parepare) limits the generalizability of the findings to other contexts, such as madrasahs in urban areas or schools with better infrastructure. Second, the absence of quantitative data, such as learning outcome scores or technology success rates, limits the ability to measure technology's impact objectively. Third, the reliance on interviews and observations is prone to subjectivity bias, although source triangulation has reduced this risk. Fourth, limited access to information on school budgets or details of teacher training limits in-depth analysis of systemic factors.

Acknowledge

I sincerely thank all parties for their invaluable support during this research. I am very grateful for the guidance, resources, and encouragement provided by the lecturers, which have been essential factors in completing this research. This research did not receive any funding or special grants from funding agencies. The authors independently funded all research and writing processes.

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