



MANAGEMENT OPTIMISATION OF DIGITAL-BASED LEARNING IN *MADRASAH*

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Abstract: This scientific article discusses *madrasah* management's responsiveness to globalisation through the implementation of digital-based learning at MTsN 1 Tulungagung. The purpose of this study is to analyse the planning, implementation, and evaluation processes in improving the quality of learning, especially digital-based learning. This study employs a qualitative approach, using data collection methods including interviews, observation, and documentation. The data were analysed through condensation, presentation, and verification. Data validity was ensured through tests of credibility, transferability, dependability, and confirmability. The results of the study show that planning includes alignment with the *madrasah*'s vision, mission, and objectives, supported by coordination meetings, the preparation of facilities and infrastructure, improvements in teacher competence, and socialisation with parents and prospective students. The implementation of digital learning was successful due to the synergy between available facilities and infrastructure and the presence of competent, well-qualified human resources. Evaluations were conducted incidentally and periodically at the end of the semester through reflection and *Computer-Assisted Test* (CAT)-based examinations. There were obstacles to implementing digital-based learning, namely, limited facilities and infrastructure, as well as misconceptions about it. The study concluded that strategic management can enhance the quality of digital learning, offering essential implications for educational institutions as they adapt to technological advances.

Keywords: Learning Quality, Digitalization, *Madrasah* Management

Abstrak: Artikel ilmiah ini membahas responsivitas manajemen madrasah terhadap globalisasi melalui penerapan pembelajaran berbasis digital di MTsN 1 Tulungagung. Tujuan penelitian ini untuk menganalisa proses perencanaan, pelaksanaan, dan evaluasi dalam meningkatkan kualitas pembelajaran terutama berbasis digital. Penelitian ini menggunakan pendekatan kualitatif dengan teknik pengumpulan data wawancara, observasi, dan dokumentasi, data dianalisis melalui kondensasi, penyajian, dan verifikasi. Keabsahan data dijamin melalui uji kredibilitas, transferabilitas, dependabilitas, dan konfirmabilitas. Hasil penelitian menunjukkan bahwa perencanaan meliputi penyelarasan dengan visi, misi, dan tujuan madrasah, didukung rapat koordinasi, persiapan sarana-prasarana, peningkatan kompetensi guru, serta sosialisasi kepada wali murid dan calon siswa. Pelaksanaan pembelajaran digital berhasil dengan sinergi dari ketersediaan sarana dan prasarana, kompetensi dan sumber daya manusia. Evaluasi dilakukan secara insidental dan berkala akhir semester melalui refleksi, dan ujian berbasis *Computer Assisted Test* (CAT). Terdapat kendala dalam pelaksanaan pembelajaran berbasis digital yaitu keterbatasan sarana-prasarana dan miskonsepsi terkait pembelajaran berbasis digital. Penelitian menyimpulkan bahwa manajemen yang strategis mampu meningkatkan kualitas pembelajaran digital, memberikan implikasi penting bagi lembaga pendidikan yang beradaptasi dengan kemajuan teknologi.

Kata Kunci: Kualitas Pembelajaran, Digitalisasi, Manajemen Madrasah

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INTRODUCTION

The development of the 4.0 industrial revolution and the phenomenon of disruption in the 21st Century have brought significant changes to various aspects of life, including education (Rahman et al., 2024). This disruption has not only transformed the old system into a new one but also altered human behavior, lifestyle, and social interaction. The COVID-19 pandemic has further accelerated digital transformation in education, driving the adoption of online learning to meet physical distancing requirements (Aliah & Warsah, 2021). This condition requires school or *madrasah* administrators to utilise technology to ensure effective, optimal distance learning. The initial implementation of technology-based learning faced various challenges, including limited facilities, inadequate digitalization capabilities, and uneven infrastructure across Indonesia (Sarnoto, 2023). Multiple efforts by the government and institutions, including the provision of online learning platforms and internet quotas, helped maintain education continuity during the pandemic.

Following the pandemic, although face-to-face learning has resumed, the use of digital technology continues to evolve as part of the digital transformation in education. Digital transformation is not merely the use of technology; it is also the changes that leverage technology to improve overall learning outcomes (McCarthy et al., 2023). In the context of *madrasahs*, which are educational institutions grounded in Islamic values, adaptation to the digital era must also maintain the integrity of religious values while optimizing learning quality through digital technology (Siswahyuningsih et al., 2024). MTsN 1 Tulungagung stands out as the first *madrasah tsanawiyah* to implement a digital *madrasah* program. This institution serves as a concrete example of efforts to transform the educational landscape through digital learning innovations.

This study explicitly aims to answer the question: How does *madrasah* management improve the quality of digital-based learning? The research focuses on three main aspects, namely planning, implementation, and evaluation of *madrasahs* in the context of digital-based learning at MTsN 1 Tulungagung. This question is vital for bridging the needs of modern education that is adaptive to technology while maintaining the quality of religion-based education. Islamic education management must be able to integrate human and non-human resources effectively and efficiently to achieve quality educational goals in line with current times (Qomar, 2022). In line with Boyle's view, educators are required to master a range of skills to teach effectively in a digital environment (Boyle, 1997; Schmidt & Tang, 2020). These skills include competence in planning and managing learning, skills in delivery and questioning, the ability to collaborate, in-depth mastery of the material, expertise in engaging students, and specific knowledge of digital learning.

This study makes a scholarly contribution through an in-depth qualitative analysis of the *madrasah* management process, encompassing strategies for planning, implementing, and evaluating digital learning at MTsN 1 Tulungagung. The findings are intended to provide a practical reference for *madrasah* administrators and to advance the theoretical framework of digital technology-based Islamic education management. By reinforcing scientific discourse in digital Islamic education management, this study expands both theoretical and practical understanding of how integrating technology and

managerial strategy can foster adaptive and competitive *madrasah* education within a global context.

This research draws upon the theoretical concepts posited by Terry and Franklin and further expanded by Mutohar, framing educational management as both a science and an art of resource management to facilitate an effective learning process (Terry & Rue, 2014; Mutohar, 2017). Digital-based learning is characterized as instruction that employs digital technologies to enhance learning quality through audiovisual media and expanded access (Effendi & Wahidy, 2019). Consequently, this study integrates management theory, educational technology, and Islamic education within a unified framework to address the complexities of 21st-century educational challenges.

LITERATURE REVIEW

The Concept of Digital-Based Learning Management

Madrasah management is a systematic and comprehensive process for effectively and efficiently managing human and non-human resources to achieve educational goals (Mutohar, 2017). In the context of digital *madrasahs*, management plays a crucial role in integrating information technology as the primary tool to support modern educational services that are adaptive to the era of Industrial Revolution 4.0. Management functions, such as planning, implementation, and evaluation, are key to the successful implementation of digital *madrasah* programmes (Terry & Rue, 2014; Mutohar, 2017). The concept of Islamic education management emphasizes that digital-based *madrasah* management must maintain religious values while responding to technological dynamics to improve the quality of learning and administration (Qomar, 2022). Learning management is an effort to manage and shape the interaction between teachers and students, influencing attitudes and knowledge acquisition (Kurniawan et al., 2021).

The digitisation of *madrasahs* is not merely a replacement of facilities and infrastructure, but also the development of management strategies that encourage organisational cultural adaptation and enhance the competencies of teachers and students (McCarthy et al., 2023). Implementing digital technology requires infrastructure readiness, competent human resources, and transformational Leadership that can drive cultural change while managing risks and obstacles (Pietsch & Mah, 2025). In addition, digitalisation programmes should be based on the understanding that technology supports the transformation of learning, management, and information services, thereby improving the accountability and transparency of institutions. Thus, digital-based learning can develop into an inclusive, innovative, and sustainable Islamic education ecosystem, where management plays a key role. This literature review provides a crucial foundation for research on how *madrasah* management impacts the quality of digital-based learning at MTsN 1 Tulungagung.

Quality of Digital-Based Learning

The quality of learning refers to the extent of success in achieving educational goals through effective interaction between educators and students, as measured by learning outcomes, skills, participation, and a conducive learning environment (Tanggulungan & Sihotang, 2023). In the context of digital-based learning, this quality is achieved through the use of information technology that supports creativity and innovation in learning,

provides wide access, and employs more interactive and personalised methods (Shatunova et al., 2021). Digital technology can enhance learning media, including audiovisuals, educational games, and LMS applications, thereby positively impacting student motivation and learning outcomes (Sanita & Maksum, 2021).

Adequate digital facilities and infrastructure, along with a supportive classroom environment, are crucial factors that influence the quality of digital learning. Teachers' competence as facilitators of digital learning is vital, so there is a need for continuous training and professional development to optimise the use of technology. Teachers' pedagogical abilities encompass not only understanding learning materials but also delivering them through meaningful learning and the effective use of information and communication technology to achieve learning objectives (Fitriani et al., 2025). Teachers' digitalisation skills will be beneficial in the process of innovating and developing learning media that are both interesting and more effective in learning activities (Syamsu, 2024). Previous research in *madrasahs* and schools has demonstrated that integrating information technology with the appropriate pedagogical approach can enhance the effectiveness and efficiency of the learning process while fostering the development of 21st-century competencies, such as critical thinking and collaboration (Kurniasih et al., 2022).

However, digital learning also faces challenges, such as students' loss of focus due to technological distractions, infrastructure limitations, and misconceptions about technology that prioritize media replacement over optimal utilization. Therefore, the development of digital-based learning strategies must be balanced, with a strong digitalisation mindset and classroom management that are adaptive to the dynamics of technology use. This study emphasises the importance of integrated management and pedagogical strategies to comprehensively improve the quality of digital-based learning in *madrasahs*.

Related Studies on Digital *Madrasah* Management

Research by Kurniasih and Majid reveals that digital-based learning utilizes digital technologies such as computers, LCD projectors, specific platforms, social media, and smartphones. The implementation of digital-based learning is accompanied by equipping teachers with digitalisation skills through training (Kurniasih et al., 2022; Majid, 2022). Azah's research shows that digital-based learning makes learning active and interactive for students (Azah, 2024). Semerikov's research also shows that technology can enhance classroom learning by making it more varied and interactive. Technology can present audiovisual interpretations of a theory, allowing students to understand it more easily and access the material without being limited by space or time (Semerikov, 2021). Based on previous studies, no research has been found that comprehensively examines *madrasah* management, covering planning, implementation, and evaluation. The relevance of this research lies in filling a research gap that has so far focused more on digital facilities and infrastructure, but has not extensively examined *madrasah* management as a key factor in improving the quality of digital-based learning.

The contribution of this research lies in its holistic understanding of *madrasah* management, which empirically improves the quality of digital-based learning, particularly in the context of *madrasah tsanawiyah*, the precursor to digital *madrasahs* in

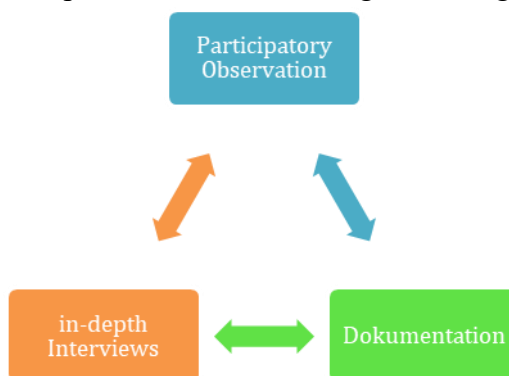
the Tulungagung region. This research is relevant to closing a gap in studies, as most previous work has focused more on infrastructure development than on the in-depth explanation of management as the driving force behind the digital transformation of Islamic education. Thus, the results of this study are expected to serve as a practical and academic reference for the development of effective and sustainable digital *madrasah* management.

RESEARCH METHODOLOGY

This study employs a qualitative case study design to describe *madrasah* management, aiming to enhance the quality of digital-based learning at MTsN 1 Tulungagung. This study employs a qualitative approach, which enables researchers to gain an in-depth understanding of the planning, implementation, and evaluation processes of digital *madrasah* programs in a natural, contextual manner. The research subjects included the *madrasah* principal, vice principal for curriculum, vice principal for facilities and infrastructure, teachers, and students in the digital class, with selection criteria based on their direct involvement in the management and implementation of digital learning at the *madrasah*, ensuring they could provide relevant and comprehensive information.

The data collection techniques used were in-depth interviews, participatory observation, and documentation. Interviews were conducted to gather key information from informants in line with the research focus, while observations were used to obtain a direct picture of digital-based learning activities. Documentation included the collection of archives and recordings relevant to digital *madrasah* management, ensuring that the data obtained was rich and diverse (Tanzeh, 2011; Moleong, 2018). The presence of researchers in the field, as the primary instrument, was reinforced through orientation activities and comprehensive data collection, ensuring that the information could be trusted and validated in accordance with the principles of qualitative data validity.

Data analysis was conducted using the Miles and Huberman model, which comprises three main stages: data condensation, data presentation, and conclusion drawing/verification (Miles et al., 2014). This process aims to filter, organise, and interpret data to produce comprehensive and meaningful findings.



Source: (Moleong, 2018)

Image1. Triangulation of data collection techniques

Data validity checks are conducted through extended observation, triangulation of sources and techniques, persistent observation, and cross-checking to ensure that the research results are credible, transferable, dependable, and confirmable in accordance with qualitative research standards (Moleong, 2018). Using this method, the study provides a concrete picture of digital-based learning management, along with its supporting factors and constraints, at MTsN 1 Tulungagung.

FINDINGS AND DISCUSSION

Findings

This study found that *madrasah* management at MTsN 1 Tulungagung plays a crucial role in improving learning quality through three main areas: planning, implementation, and evaluation. *Madrasah* management is carried out systematically and in a structured manner, involving various parties to contribute to the success of efforts to improve the quality of digital-based learning.

Digital-Based Learning Planning

At the planning stage, the *madrasah* developed a digital learning program aligned with its vision, mission, and objectives, which were in line with the digital *madrasah* guidelines. This process aimed to minimize future risks and problems and, of course, to increase the chances of achieving the predetermined objectives. The programme is implemented in stages with limited digital classes as a pilot project. The Leadership of MTsN 1 Tulungagung coordinated the formation of an IT team, a learning team, and a resource and facility team, which would later develop digital classes. The head of the *madrasah* provided the following explanation during the researcher's interview session:

"In response to developments in education driving digitalisation, we, as leaders, have coordinated with the *madrasah's* head. As a result of this coordination, an agreement was reached to implement a digital *madrasah* programme. We then socialised this plan to the teachers' council through coordination meetings and official meetings. We formed an IT team, a learning team, and an infrastructure team, which will later collaborate to develop this digital-based learning programme. We also provided information and coordinated with prospective students and their guardians regarding this programme," KM01.

Intensive coordination between *madrasah* leaders, teachers, the *madrasah* committee, and the teams formed at the beginning became the basis for careful planning, followed by the preparation of facilities and infrastructure (digital classrooms, tablet devices, Wi-Fi networks) and the improvement of teacher competence through workshops and socialisation with parents and prospective students. The planning of digital-based learning at MTsN 1 Tulungagung covers two main aspects: the preparation of infrastructure and the development of human resources (HR).

Digital-based learning is not only a change in the use of digital technology but also involves the comprehensive use of technology, which certainly requires digitalization skills. To enhance HR readiness, the *madrasah* prioritizes developing teachers' digital skills through targeted workshops. In addition, as an acceleration strategy, MTsN 1 Tulungagung also empowers young teachers who are considered more proficient in digital technology.



Source: Research Results

Image 2. Digital-based learning planning mechanism

Based on field research findings, the quality of the digital-based learning programme at MTsN 1 Tulungagung can be improved through careful planning and a solid team. Digital-based learning planning that aligns the *madrasah's* vision, mission, and objectives with the guidelines for implementing a digital *madrasah* provides a strategic foundation for achieving goals in a systematic, structured, and focused manner. The coordination of various elements and preparations, including facilities and infrastructure, human resource competency development, and subsequent program socialization, constitutes effective communication by educational institutions in demonstrating their commitment to developing programs that can improve the quality of learning and student achievement.

Implementation of Digital-Based Learning

During the implementation phase, researchers observed digital-based learning in digital classrooms, each equipped with a smart TV, an audio system, and personal tablets, with teaching materials accessible online via the *madrasah* website. This learning method was considered more interesting and compelling because it used audiovisual media that supported various student learning styles. The following explanation from the curriculum coordinator reinforced the results of these observations:

"Our school's digital classrooms use tablets for teachers and students, with smart TVs as the primary presentation media in each classroom. Teachers can explain the material directly on the smart TV or connect their tablets, while students access it through the website. For flexibility, especially in subjects such as mathematics, manual whiteboards are still used" WK02.

The learning strategy includes the use of educational games and discussions, as well as the provision of additional material such as graphic design and computer networking to improve students' digitalisation skills. Students appear active and highly enthusiastic about the digital-based learning process, especially when using games and quizzes. However, in other circumstances, some students are distracted by game features unrelated to learning. In such circumstances, it is challenging for teachers to help students refocus on learning activities. This situation was described in an interview session by a teacher as follows:

" We remind distracted students. The strategy is to incorporate games into the learning process and make the learning materials more engaging, for example, by using Canva. We also often discuss ideas with fellow teachers. Digital learning has its advantages and disadvantages. The advantage is that when teachers and students use technology effectively, the learning process can be both fast and effective. Nevertheless, if they lack focus and become bored, they are easily distracted by other features on the tablet" GR03.

In the context of digital-based learning, educators have greater flexibility to innovate. Teachers can integrate a variety of simple applications that significantly support the creation of a more meaningful learning experience. The essence of digitising education is not merely to shift conventional learning media to digital form, but to explore how educators can leverage technology's potential to create a substantive and practical learning process. Therefore, teachers' ability to utilise various digital tools is a crucial factor in achieving this goal.

Digital class students, as well as those enrolled in additional graphic design and computer networking material programs, are considered very effective in improving their knowledge and skills. This initiative is crucial in equipping students with essential digital skills in the era of the 4.0 revolution. This programme not only enriches their knowledge, but also encourages students to use digital facilities more productively, rather than just for entertainment. Familiarity and digital exploration skills, both on the part of teachers and students, are key factors in the overall success of digital-based learning.



Source: Research Results

Image 3. Factors for the Success of Digital-Based Learning Implementation

Based on the research results, the success of digital learning implementation is highly dependent on the collaboration of various elements, including the availability of facilities and infrastructure, competence, and human resources. Teachers' and students' awareness of the need to continue learning throughout their lives, as well as their ability to adapt to innovation, are crucial factors in this fast-paced era. Without the willingness to learn, sophisticated facilities will not provide optimal benefits. In other words, technological advances must be supported by human readiness to use them productively.

Digital-Based Learning Evaluation

The research findings were collected incidentally during the evaluation stage, and a comprehensive evaluation was conducted at the end of each semester. Learning evaluation utilized the *Computer-Assisted Test* (CAT) method to facilitate student assessment and online reflection on the learning process. The test results were one of the evaluation media to determine whether digital-based learning had been implemented

effectively. Teachers can evaluate daily learning through student reflections provided on the E-Learning Platform. The main obstacles identified are related to internet network disruptions and misconceptions about digital learning that focus solely on media transition without optimizing technology use. Continuous efforts are made through workshops and motivational initiatives to enhance the comprehensive use of technology.

"Based on an evaluation meeting involving the Leadership, curriculum team, and digital classroom teachers, learning with digital technology has shown positive results. We regularly monitor and evaluate its implementation. As the semester progresses, we continue to identify weaknesses and make immediate improvements. Thankfully, digital-based learning in *madrasahs* has now reached our planned targets. Even so, we are committed to gradually improving it so that the results are more optimal and always relevant to the times" WK02.

The evaluation instrument for this programme is the plan set at the beginning of the new academic year. The parties involved in the evaluation stage are the same as those in the planning stage. The evaluation results show that digital technology facilities and infrastructure are available, teachers have competent digitalisation skills, students' digitalisation and academic skills have improved, and discipline in the digital-based learning process has increased. The obstacle encountered in implementing digital-based learning was an unstable Wi-Fi network, which has been resolved through collaboration with professional partners in the Wi-Fi field.

The study found that the implementation of digital-based learning has various significant implications for students, teachers, and educational institutions as a whole. For MTsN 1 Tulungagung, this programme has become a distinguishing factor that can enhance its public image. It is because the *madrasah* has an excellent programme that has not been implemented evenly in other educational institutions. On the other hand, teachers and students also feel the positive impact. This programme directly broadens their horizons, providing knowledge that is more relevant to the times. Therefore, adopting this technology is not only an internal matter but also a strategy to increase the institution's competitiveness. As a result, both teachers and students have become more adaptive to the dynamics of the digital environment. Thus, this initiative consistently contributes to better, more sustainable educational quality.

DISCUSSION

The learning planning carried out by MTsN 1 Tulungagung demonstrates readiness, vision, and a high level of commitment in efforts to improve the quality of digital-based learning because the coordination involves various parties and aspects. The findings of this study reinforce the argument of educational management theory that systematic planning, involving all stakeholders, as well as the readiness of infrastructure and human resources, are crucial prerequisites for achieving quality learning (Mutohar, 2017). Coordination and socialization, as integral parts of planning, reinforce Robbins' view of the importance of communication in educational organizations (Robbins et al., 2017). Mature and comprehensive planning indicates that the organisation's strategic readiness is the key to the success of digital transformation in *madrasahs*.

The implementation of digital learning at MTsN 1 Tulungagung confirms the effectiveness of audiovisual and interactive learning media in increasing student motivation and learning outcomes (Robbins et al., 2017; Pradilasari et al., 2020). The addition of graphic design and digital networking materials also encourages the development of students' 21st-century competencies, aligning with the discourse on digital transformation in education (McCarthy et al., 2023). The implementation of technological devices and innovative methods demonstrates a paradigm shift in learning, oriented towards student engagement and active understanding. Continuous and adaptive evaluation signifies a management cycle that is responsive to learning dynamics and operational issues.

The wise and comprehensive use of digital technologies, such as computers, LCD projectors, digital platforms, social media, and smartphones, has been proven to transform the learning process into a more active and interactive one for students (Azah, 2024). The use of technology enables teachers to present material in an audiovisual format, helping students understand theoretical concepts more easily. Additionally, technology provides students with the freedom to access materials without being limited by space and time (Semerikov, 2021). Thus, the results of this study emphasise that the success of digital-based learning does not lie solely in the availability of technology, but also in its effective integration to create a more dynamic and accessible learning experience.

Evaluation using CAT shows that integrating technology into learning measurement supports the efficiency and effectiveness of assessment (Astino & Sabandar, 2023). Technical barriers and digital misconceptions reflect common challenges in implementing educational digitalization that require continuous coaching (Munir, 2017). Misconceptions about digitalisation as merely a replacement of media highlight the need for a systematic improvement of digital awareness and competence, which, if successful, can optimise the transformative effects of technology in Islamic education while preserving the local values of *madrasahs* (Qomar, 2022). Along with the important role of teachers as facilitators, curriculum changes oriented towards character building, contemporary competencies, and digital technology require them to continuously upgrade their skills (Akhyar et al., 2024). Therefore, the development of an effective training programme must begin with a needs analysis and the formulation of clear objectives.

Systematic, structured, and visionary management of digital-based learning programs plays a crucial role in enhancing the quality of digital-based learning, providing students with meaningful learning experiences. The improvement in the quality of digital-based learning is evidenced by the availability of digital technology facilities and infrastructure, the increase in digitalisation competencies for teachers and students, and their academic competencies, as measured through CAT-based learning evaluations, student work, and achievements. The integration of technology and the improvement of human resource competencies are necessary to address the advances of the digital era through education management that focuses on transformation and innovation to achieve educational goals (Basri et al., 2024). Digital-based learning has become a flagship programme, enhancing MTsN 1 Tulungagung's competitive edge. It is not only due to the

use of technology but also because the programme demonstrates that the institution's administrators are high-calibre human resources ready to face the challenges of the times and maintain educational quality.

CONCLUSION

Based on the research results, it can be concluded that the management of MTsN 1 Tulungagung has successfully improved the quality of digital-based learning through strategic planning that involves a clear vision and mission, team coordination, preparation of digital infrastructure, enhancement of teacher competence, and socialization of prospective students. The implementation of digital learning is highly dependent on the alliance of various elements, including the availability of facilities and infrastructure, competence, and human resources. Incidentals and end-of-semester evaluations, learning evaluations using the *Computer Assisted Test* (CAT) method, and reflections are conducted to address obstacles. The theoretical implications of this study reinforce the educational management framework that integrates digital technology as a crucial element in enhancing the quality of learning. The practical consequences offer a model for implementing digital *madrasah* management and serve as a reference for similar educational institutions. This conclusion provides a crucial scientific foundation for advancing digital learning management in contemporary Islamic education.

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