Managing the Quality of Islamic Education in the Digital Era: Challenges and Strategic Framework in Batubara Regency, Indonesia

Irma Suryani[1]*, Mulkan Darajat Silaen[2], Muhammad Tafsir Tambunan[2]

[1]Sekolah Tinggi Ilmu Tarbiyah Batubara, Indonesia
[2]Universitas Al Washliyah Labuhanbatu, Indonesia
*Correspondence: ✉ suryaniir2@gmail.com
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ABSTRACT

Islamic education in Batubara Regency faces major challenges in integrating digital technology into the learning process, which impacts the quality of management and educational outcomes in the era of the industrial revolution 4.0. This article aims to describe research findings on quality management in Islamic education, with a focus on the impact of technological advancements and strategies that can be employed to address them. The research employs qualitative methods, elucidating findings through interviews and observations, and analyzing data to gain profound insights into the management of Islamic education in maintaining quality in the digital era. The research findings reveal that quality management in Islamic education commences with a transformation in teaching methods, integrating technological access while upholding religious principles and the development of virtuous individuals. It also involves the effective management of human resources to ensure the advancement and future of Islamic education, conscientious financial management of madrasah education, recognizing the enduring connection of Islamic principles to all financial activities within education, and the continuous improvement of facilities and resources that support educational quality. Additionally, in managing conflicts within Islamic educational institutions, a rapid response to external input and the willingness to accept suggestions are vital in achieving educational excellence. The strategies implemented align with the requirements and needs of Islamic educational institutions. Furthermore, they must continuously enhance their technological capabilities and secure the necessary funding to meet the demands of Islamic education.

ABSTRAK

Pendidikan Islam di Kabupaten Batubara menghadapi tantangan besar dalam mengintegrasikan teknologi digital ke dalam proses pembelajaran, yang berdampak pada kualitas pengelolaan dan hasil pendidikan di era revolusi industri 4.0. Artikel ini bertujuan untuk mendeskripsikan tentang pengelolaan kualitas dalam pendidikan Islam, dengan penekanan pada dampak perubahan teknologi dan strategi yang dapat diterapkan untuk mengatasinya. Penelitian ini menggunakan metode kualitatif dengan mendeskripsikan temuan penelitian melalui wawancara dan observasi, serta menganalisis data untuk memberikan pemahaman mendalam tentang manajemen pendidikan Islam dalam mengelola mutu pendidikan Islam di era digital. Hasil penelitian ini ditemukan pengelolaan kualitas pendidikan islam dimulai dari perubahan pembelajaran dengan menggunakan akses teknologi dan setiap aspek pembelajarannya tetap mengintegrasikan prinsip agama dengan konsep insan yang soleh, mengelola kualitas sumber daya manusia untuk kemajuan dan masa depan pendidikan islam, mengusahakan pendanaan pendidikan madrasah dengan baik serta tetap menyadari bahwa konsep islam tetap melekat dalam semua aktivitas keuangan pendidikan, dan berusaha melengkapi fasilitas dan sarana pendukung kualitas pendidikan, dalam mengelola konflik lembaga pendidikan islam merespon cepat masukan dan menerima masukan dari luar untuk mewujudkan kualitas pendidikan islam. Strategi yang dilakukan dan diterapkan sudah cocok dengan ketentuan dan kebutuhan lembaga pendidikan islam dan tantangannya harus terus

mengupgrade kemampuan dalam bidang teknologi dan harus mampu menyediakan dana yang dapat memenuhi kebutuhan pendidikan islam.

A. INTRODUCTION

The digital era certainly has an impact on all aspects of human life. In this generation, people live side by side with the digital world so they are very familiar with the use of advanced technologies such as tablets, laptops, and other devices. Information is very easy to use and can be obtained anywhere and anytime. Digitalization has a very broad impact on all aspects of human life, everything is digital due to the role of technological developments.[1] From a social perspective, humans are changing the way they interact socially and exchange cultures between nations from all over the world using social media. In the economic sector, *financial technology (fintech)* and *e-commerce* are changing the way people shop *online,* quickly and safely. Not only that, changes are also occurring in the field of education, making education 4.0, the starting point of which is the use of technology.[2]

Thus, the development of quality digital education in Indonesia was strongly encouraged by the Ministry of Education and Culture in early October 2019 by launching a school digitalization program with the aim of preparing human resources to face the industrial network revolution 4.0 by providing 37,300 servers for schools and 1.7 million computers and tablets for students containing e-books, learning materials and educational content for students in grades VI, VII and X, accessible online and offline. However, the quality of education in developing countries is still considered inadequate so that the education model seems less organized. Therefore, quality education is very important for the millennial generation to become a competitive resource, including the ability to communicate, collaborate, think critically and solve problems as well as express creativity and innovation. The high generation that has these skills must be prepared through the daily learning process at school.

At the end of 2021, the Indonesian Minister of Religious Affairs initiated seven priority policies, one of which was digital transformation. According to him, this policy is mandatory in the era of the Industrial Revolution 4.0 because every aspect of life is inseparable from information technology. This digital transformation is expected to provide good services and present accurate data. Thus, the madrasah management system can be managed properly and easily,

In this era, Islamic education will face a dilemma between adapting technology and new formulas for Education 4.0, especially in remote villages. Improper use of these technologies risks eroding the traditional values of Islamic boarding schools (*pesantren*) and the Islamic principles underlying them, as well as the foundation of madrasahs (*pesantren*). Failure to

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[1] U Al Faruq, "Peluang Dan Tantangan Pendidikan Muhammadiyah Di Era 4.0. Jurnal Ilmiah Ar-Risalah: Media Keislaman," *Pendidikan Dan Hukum Islam* 18, no. 1 (2020): 013–030.

[2] A Halimurosid, "Strategi Pembelajaran Pendidikan Agama Islam Dalam Menghadapi Era Revolusi Industri 4.0," *Jurnal Pendidikan Dan Konseling (JPDK* 4, no. 4 (2022): 3642–3650.

adapt to these changes will only lead to a decline in education and graduates, both in terms of knowledge, insight, and quality.[3]

In the 4.0 era, the era of disruption demands that Islamic education be able to adapt to rapidly evolving changes. Therefore, educational management certainly requires a unique strategy to achieve productivity and quality results. Various concepts and ideas regarding educational management strategies are essential so that education in Indonesia, especially Islamic education, is not perceived as an educational institution unable to meet the community's belief and need for quality education. Islamic education currently faces new challenges, demands, and needs that have never existed before. Therefore, concrete efforts are needed to ensure Islamic education remains competitive in this era of disruption. The solution is to participate in self-definition through renewal and innovation of systems, administration, curriculum, human resource skills, facilities and infrastructure, culture, work ethic, teacher quality, teaching and learning processes, and management by developing new service systems, all based on digital technology. This will ensure that all members of Islamic educational institutions can easily access all their educational needs and administrative services. Otherwise, Islamic education will become increasingly backward, obsolete, and underdeveloped. Without abandoning its identity as an Islamic educational institution that has character and adheres to the principles of *al-muhafadhah, al-qadimash-shalih wal-ahdzu bi al-jadid al-ashlah,* especially the maintenance of safe Islamic religious traditions by preserving countless treasures and using methods, management and learning. [4]Therefore, educational management is a shared responsibility that must be carried out together to achieve educational goals effectively and efficiently, [5]playing an important role in shaping the personality, morality, and ethics, virtues and knowledge of the Muslim generation. Therefore, Islamic education must be of quality to maintain and sustain its existence. Therefore, quality is mandatory and must exist in the world of education, especially Islamic education. In order for the quality and quantity of education to be achieved optimally, educational institutions must be able to optimize the function and role of human resources as well as other facilities and infrastructure available to them.

Based on the description above, then according to the results of the researcher's observations, it is important to investigate how Islamic education management can adapt to this digital era by determining its quality so that good management is needed to face the challenges of the development of the times that exist in Islamic education in Batu Bara including rural areas that still experience difficulties in accessing and managing digitally educational infrastructure and facilities are still inadequate, do not have conducive classes, science laboratories, language laboratories and computer laboratories that are still incomplete and inadequate. the use of IT in madrasah teaching and learning activities is not optimal, human resources are limited both in quality and quantity who master Information and Communication Technology (ICT), madrasah managers are still very less accommodating to IT developments, especially in facing the digital era.

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[3] D Retnaningsih, "Tantangan Dan Strategi Guru Di Era Revolusi Industri 4.0 Dalam Meningkatkan Kualitas Pendidikan," *Prosiding Seminar Nasional: Kebijakan Dan Pengembangan Pendidikan Di Era Revolusi Industri* 1, no. September (2019): 23–30.

[4] S Budio, "Strategi Manajemen Sekolah," *Jurnal Menata* 2, no. 2 (2019): 64.

[5] Wina Sanjaya, *Strategi Pembelajaran Berorientsi Standar Proses Pendidikan* (Jakarta: Kencana Predana Media, 2006).

Managing the quality of Islamic education in the digital era has been a primary focus of various studies, particularly regarding the challenges and strategies faced by educational institutions in facing technological transformation. Previous studies have highlighted the importance of strategic management in responding to digital change, such as integrating technology into online learning, developing digital-based curricula, and enhancing teacher capacity through educational technology training. Key challenges identified include limited infrastructure, disparities in technology access, and low digital literacy among educators, necessitating adaptive leadership and policies that support digital transformation.[6] Furthermore, the research also emphasizes the importance of upholding Islamic values in the digitalization process to maintain the identity and morality of education.[7] Proposed strategies include intensive training for educators, developing a curriculum responsive to technological developments, and collaborating with various parties to address resource limitations.[8]

The novelty offered by this article lies in its specific local contextual focus, namely an in-depth examination of the management of the quality of Islamic education in Batubara Regency. This research fills a gap in the literature, which has so far focused more on the national context or large institutions, rather than the district level with its unique social, cultural, and infrastructure characteristics.[9] Furthermore, this article offers a description of challenges and strategies that are truly relevant to the local conditions of Batubara, and integrates quality management and digitalization approaches based on Islamic values and local wisdom. The resulting recommendations are practical and can be immediately implemented by education stakeholders in the region, thus providing a real contribution that differs from previous studies that tend to be conceptual or macro in nature.[10]

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[6] Anik Indra Mustika et al., "The Role of Strategic Management in Improving the Quality of Islamic Education in the Digital Era," *Journal of Practice Learning and Educational Development* 5, no. 1 (2025): 28–31, https://doi.org/10.58737/jpled.v5i1.318; Qur Rohman, Agus Fawait, and Ahmadi Pramuja, "Islamic Education Management In The Society 5 . 0 Era : Building A Educational System That Is Responsive To Technological And Social Changes," *Journal of International Multidisciplinary Research* 3, no. 1 (2025): 107–11; Holilah and Wafi Ali Hajjaj, "Transformation Of Islamic Education Management In The Digital Era : Trends And Implications For Learning Quality," *Journal of International Multidisciplinary Research* 2, no. 3 (2024): 82–87.

[7] Febrianty Eka Putri et al., "At Turots : Jurnal Pendidikan Islam Innovative Strategies in Islamic Education Management Facing the Era of Global Disruption," *At Turots: Jurnal Pendidikan Islam* 7, no. 1 (2025): 506–17, https://doi.org/10.51468/jpi.v3i1.56; Baso Syafaruddin, "Conceptual Framework Of Islamic Education In The Digital Era : Challenges , Opportunities And," *Indonesian Journal of Research and Educational Review Volume* 3, no. 4 (2024): 56–64, https://doi.org/https://doi.org/10.51574/ijrer.v3i4.2186.

[8] Naf Tarihoran and Enung Nugraha, "Technology Adaptation Strategy In Islamic Boarding School Quality Management: Systematic Literature," *Vol. 2 No. 3 Edisi Juli 2025 Multidisciplinary Indonesian Center Journal (MICJO)* 2, no. 3 (2025): 2407–25, https://doi.org/https://doi.org/10.62567/micjo.v2i3.738 Submitted:; Durotun Nisa and Siti Aimah, "Strategic Adaptation in Islamic Education Quality Management : Navigating Social Developments for Sustainable Educational Outcomes," *Journal of Educational Management Research* 03, no. 02 (2024): 154–67; Ahmad Tantowi, Muhammad Ali Gunawan, and Abdullah Ibrahim, "Optimizing Islamic Boarding School Management in the Digital Era : Analysis of Technology Effectiveness in Administration and Operations," *Munaddhomah: Jurnal Manajemen Pendidikan Islam* 6, no. 2 (2025): 295–309, https://doi.org/https://doi.org/10.31538/munaddhomah.v6i2.1738.

[9] Mohamad Sodikin, Parmujianto, and Khoirul Anwar, "Enhancing Education Quality In Islamic Institutions Through Management Approaches," *Evaluasi: Jurnal Manajemen Pendidikan Islam ISSN* 8, no. 1 (2024): 70–81, https://doi.org/http://doi.org/10.32478/evaluasi. v8i1. cwxxya26 Article.

[10] Hasyim Haddade et al., "Quality Assurance Strategies of Higher Education in Digital Era: An Anthropology of Education Study in Islamic Higher Education Institution," *Quality Assurance in Education* 32, no. 1 (2023), https://doi.org/https://doi.org/10.1108/qae-05-2023-0084.

This study aims to determine the strategies in managing quality Islamic educational institutions and to see the challenges in the 4.0 era for Islamic education for students with the Generation Z group, namely those aged 8-23 years, children who were born and grew up in this era and are very close to the digital world and virtual reality.

B. METHODS

This research uses a qualitative descriptive approach with the aim of gaining a deeper understanding of the challenges and strategies for managing the quality of Islamic education in the digital era. The research was conducted in five madrasahs (Islamic schools) in Batubara Regency, selected based on the criteria of representing various levels of technology implementation in the learning process.[11] The primary data sources consisted of madrasah principals, teachers, and educational staff directly involved in the teaching and educational management process at each madrasah.

Data were collected through in-depth interviews with madrasah principals, teachers, and support staff, as well as direct observation of the learning process and administrative management at the madrasahs. The interviews were semi-structured, allowing for further exploration as the conversations progressed. Observations focused on the use of technology in learning, administrative management, and interactions between teachers, students, and madrasah management.

The collected data were analyzed using thematic analysis, where interview transcripts and observation notes were grouped into themes related to the challenges and strategies for managing Islamic education in the digital era. Validation of the analysis results was carried out through data triangulation, which included checking the conformity between the results of interviews, observations, and related documents, as well as providing opportunities for members of each madrasah to provide feedback on the initial research findings to ensure the accuracy and credibility of the data obtained.[12]

Hamalik argues that management is a social process that involves collective human efforts with the help of others, using effective and efficient methods to achieve predetermined goals.[13] To achieve an effective and efficient goal, a management function is needed in Islamic education.[14] Diding Nurdin stated that there are two scopes of madrasah management in general, namely: (1) physical madrasah management[15] and 2) non-physical madrasah management.[16]

As for the physical management of the madrasah, especially the management of buildings, teachers' rooms and classrooms, [17] library space, management of former land, management of teacher and student desks and chairs, blackboards for teaching and school activities, number of students, number of teachers, [18] administrative staff, school security, toilets, laboratories,

[11] Mamik, *Metodologi Kualitatif* (Sidoarjo: Zifatama, 2015).

[12] W V Nurfajriani et al., "Triangulasi Data Dalam Analisis Data Kualitatif," *Jurnal Ilmiah Wahana Pendidikan* 10, no. 17 (2024): 826–833, https://doi.org/10.5281/zenodo.13929272.

[13] D Mustofa Abi Hamid, *Pengelolaan Pendidikan* (Medan: Yayasan Kita Menulis, 2021).

[14] Utomo, *Buku Ajar Pengelolaan Pendidikan* (Sukabumi: Nusaputra Press, 2021).

[15] M Qomar, *Manajemen Pendidikan Islam (Strategi Baru Pengelolaan Lembaga Pendidikan Islam* (Jakarta: Erlangga, 2007).

[16] I S Diding Nurdin, *Pengelolaan Pendidikan (Dari Teori Menuju Implementasi)* (Jakarta: PT Rajagrafindo Persada, 2015).

[17] Budio, "Strategi Manajemen Sekolah."

[18] Hidayat and Machali.

science laboratory equipment, language laboratory equipment, ventilation, teaching materials, teacher guidebooks, shelves, amount of funds and their allocation, number of vehicles, number of IT equipment, layout of the school yard, OSIS room, UKS room, number of sports equipment. [19]

Furthermore, non-material madrasa management, specifically includes curriculum, course schedule, learning outcomes, education schedule, program, learning implementation plan, learning assessment, madrasa program work plan, [20] learning outcome assessment, teaching and learning process, training to improve teacher quality, training to improve madrasa principal management skills, relations with stakeholders, training administrative staff, evaluating teacher performance, evaluating madrasa principals, compiling materials for teacher members, [21] madrasa principals and administrative staff.

In contrast to Diding's explanation, Ara Hidayat outlined several aspects of madrasah management, including curriculum management, student management,[22] educator and staff management, financial management, and facilities and infrastructure management. Hasbiyallah also outlined the management of Islamic educational institutions, which includes curriculum management, student management, [23] financial management, [24] and human resource management.[25]

C.   RESULTS AND DISCUSSION

1.   Strategies and Challenges for Managing the Quality of Islamic Education in Batubara in the Digital Era

In this digital era, managing the quality of Islamic education in Batubara Regency has faced various challenges and efforts to adapt to technological developments. Although most madrasas have begun integrating technology into the learning process, this implementation is still limited by limited infrastructure. E-learning platforms and other learning applications have been introduced to support teaching and learning activities, but the main obstacle faced is unstable internet access. The principal of Madrasah A stated, "We have started using several applications to facilitate the learning process, but the main obstacle remains the internet speed, which often cuts out."

Furthermore, information and communication technology (ICT) training for teachers is a key priority in managing Islamic education in Batubara. Although a number of teachers have participated in training, they still face difficulties in maximizing the use of digital devices. As one teacher stated, *"Although I know using digital applications is important, I find it difficult to fully utilize them in teaching."* This indicates the need for ongoing support in the form of regular training to improve teachers' skills in utilizing technology.

Meanwhile, human resource management in madrasas is focused on developing pedagogical skills that are in line with current needs. Teachers are encouraged to be more

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[19] Hidayat and Machali, *Pengelolaan Pendidikan (Konsep, Prinsip, Dan Aplikasi Dalam Mengelola Sekolah Dan Madrasah*.

[20] Diding Nurdin, *Pengelolaan Pendidikan (Dari Teori Menuju Implementasi)*.

[21] A Hidayat and I Machali, *Pengelolaan Pendidikan (Konsep, Prinsip, Dan Aplikasi Dalam Mengelola Sekolah Dan Madrasah* (Bandung: Universitas Pendidikan Indonesia, 2012).

[22] I Widiastuti, *Strategi Pengentasan Kemiskinan Melalui Kemandirian Pangan Dalam Perspektif Kebijakan Publik* (Sumatera Barat: Insan Cendekia Mandiri, 2021).

[23] Hasbiyallah; George R Terry, *Dasar-Dasar Manajemen* (Malang: Intelegensia Media, 2013).

[24] Hidayat and Machali.

[25] N S Hasbiyallah, *Pengelolaan Pendidikan Islam Teori Dan Praktik* (Bandung: Remaja Rosdakarya, 2019).

adaptive in using technology to create more flexible learning. As expressed by several Madrasah Principals, *"We are trying to update teachers' skills, but sometimes the biggest challenge is a lack of understanding of technology among some teachers."*

In addition to skills development, some madrasahs have also begun improving digital facilities by providing computers in every classroom and increasing internet network capacity. However, not all madrasahs have the necessary facilities. One teacher stated, *"We only have a few computers in our classrooms, and other digital infrastructure is still very limited."* These efforts reflect the schools' commitment to strengthening digital infrastructure to support the quality of education. Finally, financial management is also a significant challenge, given that most madrasahs rely on limited School Operational Assistance (BOS) funds. This impacts their ability to access the latest technology and upgrade existing infrastructure. Therefore, madrasahs have begun seeking additional funding sources through collaborations with other institutions or special assistance to strengthen digital facilities. However, BOS funds remain the primary source of funding.

This research reveals that the challenges faced by madrasahs in Batubara relate to limited technological infrastructure, teacher acceptance of technology, and the financing of technology-based education. These findings were obtained through interviews with madrasah principals, teachers, and support staff, as well as field observations. Madrasah principals revealed that most madrasahs face challenges related to inadequate internet access and digital facilities. Furthermore, while teachers have high levels of technology acceptance, their implementation in learning remains limited by technical skills and a lack of ongoing training. Overall, the management of Islamic education quality in Batubara demonstrates ongoing efforts to adapt technology, but numerous challenges remain, particularly in infrastructure, training, and funding.

2. Learning Management

In managing learning, the head of the Islamic education madrasah in Batubara conveyed that learning activities utilize developing technology. The education curriculum has also undergone changes from the 2013 curriculum and has now begun to shift to the independent curriculum, but this curriculum update still adapts and pays attention to its preparation with potential and accommodates local culture as well. So the curriculum is divided into two curriculum groups, namely following the central curriculum and the curriculum according to each region that does not eliminate the concept of insan poleh as a manifestation of akhlakul karimah attitudes in the goals of Islamic education that must be mastered by teachers, education personnel, and also students.[26]

The concept of Islamic education must remain within the goals and ideals of education, guided by the Quran and Hadith, and must be based on the principle of maintaining and adopting new, better innovations that benefit the development of Islamic education. Therefore, Fauziah, an Islamic education teacher, stated that learning methods in Islamic education are undergoing significant changes. Therefore, whether we like it or not, and whether we are ready or not, it is imperative to participate in digital platforms such as *e-learning* so that Islamic education remains relevant to society and keeps pace with other forms of general education.

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[26] Mustofa Abi Hamid, *Pengelolaan Pendidikan*.

According to Erwansyah, a teacher in Islamic education, digital media-supported learning activities include the use of e-learning platforms, instructional videos, and mobile applications to facilitate the learning process, creating effective digital learning. [27]With these methods, students will more quickly find motivation and context for their learning. It is important to implement methods that provide information to students so they can respond to student engagement in this digital era. However, not all teachers are able to properly access these applications due to a lack of understanding of technology and the limited facilities needed to manage madrasas in this area of learning.

Researchers' observations indicate that madrasah computer laboratories, which serve as learning resources, still lack a few computers. Digital facilities are not yet available in all classrooms, and internet access remains limited. However, challenges remain in ensuring equitable accessibility for all students, especially those from difficult economic circumstances.

3. Data and Information Management

In this digital era, the head of the Islamic educational institution in Batubara realized that he had followed the digital education process because this development would greatly facilitate the management of the madrasa using the official application from the Ministry of Religion of the Republic of Indonesia (Kemenag) which was continued by Solihin as an educational staff in Batu Bara such as, Application for data collection of educators/teachers and madrasa directors, management of data/information related to quality classroom action research (PTK), professional development, teacher expertise allowances, and teacher performance evaluation in the Educator and Education Personnel Information System (Simpatika), there is also the Education Management Information System "EMIS"; used to collect integrated data of institutions, teachers, students, and guardians of students which will be integrated into the Madrasah Digital Report (RDM) for student assessment data which will be integrated directly with the Regional Office and Head Office of the Ministry of Religion and other applications including e-RKAM, this application helps monitor the development of madrasas by the Madrasah Supervisory Team (TPM) of the Ministry of Religion at the district level, regional office and head office of the Ministry of Religion then there is Verval PD Confirmation, an application for checking and validating the National Student Number (NISN) including final year students connected to Simpatika, BOS, AKSI and Siaga.

The digital transformation undertaken by the Ministry of Religious Affairs is a government oversight measure for madrasas or schools under the jurisdiction of the Ministry of Religious Affairs, and this system applies not only to Islamic education but also to Christian, Catholic, Hindu, and Buddhist education, as well as Confucian religious education.[28]

In this regard, Islamic education in Batubara already has a well-organized digital information management mechanism, although not all teachers are proficient in using this technology, and this is handled by educational staff. However, using these applications requires a strong internet connection. This is also a challenge at the madrasah, as it's not located in the city center and the network is less reliable.

Data and information management are becoming increasingly important in managing

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[27] A Rahman and Z Nuryana, "Pendidikan Islam Di Era Revolusi Industri 4.0," 2019.

[28] D Mariana and A M Helmi, "Madrasah Sebagai Lembaga Pendidikan Di Indonesia," *Jurnal Pendidikan Tambusai* 6, no. 1 (2022): 1907–1919; S Anwar, "Revolusi Industri 4.0 Islam Dalam Merespon Tantangan Teknologi Digitalisasi," *Jurnal Studi KeIslaman* 8, no. 2 (2019).

Islamic education. Educational administration needs to effectively manage student, teacher, and financial data. Therefore, a robust management system can manage existing resources and administration, from providing information and a student registration system, to teaching and learning activities. Students who have completed their studies can have accurate records through a technology-based management system. Data protection and privacy are also important issues that require attention. However, in reality, many still lack the infrastructure to support the management of such information and data.

Therefore, to maintain good quality, it must be improved immediately, both through material and immaterial means, optimizing creativity and the courage to utilize technology more effectively and efficiently. Islamic education in Batubara has activated social networks as a means of communication. with the wider community, both to obtain information as a form of promotion of the madrasah and madrasah activities as well as to receive criticism and suggestions about the madrasah from the community, as emphasized by the head of the madrasah.

4. Human Resource Management

According to Sya'i, the head of the madrasah, some teachers are still not technologically proficient, which is a barrier to conducting digital learning activities, such as creating teaching materials and scientific references online. In managing the quality of Islamic education, teacher quality remains a key factor, playing a vital role, as students' learning activities are determined by teachers in carrying out their roles. Teachers must be able to adapt to current digital developments, possessing the necessary qualities, linked to both technical and non-technical skills.[29]

The madrasah principal continued, stating that it is necessary to ensure that teachers have a deep understanding of religion and effective teaching methods. Continuous training and professional development are necessary to keep teachers abreast of developments in education and technology.

Furthermore, educating students during this revolutionary era certainly requires different approaches. It cannot rely solely on conventional learning models. Therefore, a combination of conventional media and advanced digital technology is essential to achieve optimal results. Therefore, teachers must be able to utilize and leverage digital media to maximize learning activities. Teachers must be able to face the reality that students, as the digital generation, cannot be separated from smartphones, gadgets, or other technological devices in their daily lives. Teachers must also be able to integrate and exemplify the effective and positive use of digital media to guide students toward quality learning and the goals of Islamic education.

The madrasah principal emphasized that teachers, educational staff, and the principal, as leaders, need to be trained to effectively meet the requirements and challenges of this revolutionary era and continuously update their skills. To achieve this, the internal management of Islamic education in Batubara holds monthly IT training to enable teachers to independently use applications required by the government for integrated management within the Ministry of Religious Affairs.

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[29] A Noor, "Problematika Pembelajaran Pendidikan Agama Islam Di Era Digital," *Prosiding Seminar Nasional Prodi PAI UM*, 2019.

Externally, madrasah teachers and operators participate in training provided by the government or the Batubara Ministry of Religion, especially in the field of digital technology. In addition, socialization and awareness raising are also held regarding the importance of using learning media with technology creatively and innovatively, because the biggest challenge faced by Islamic educational institutions in this digital era is the technological stuttering of teachers.

To measure the readiness of Islamic education in Batubara in managing integrated information and communication technology education, the following are the levels based on the 2005 UNESCO framework depicted in the pictures of Indrajit and Nurhabibah.[30]
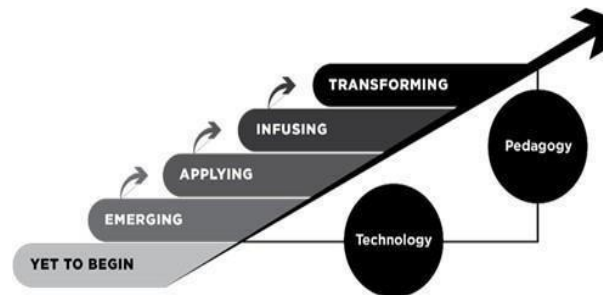
Figure 1. Strategy for the stages of information and communication technology transition in education

Based on the levels mentioned above, Islamic education in Batu Bara is still in its early stages. This is the emerging phase, meaning that madrasah management has begun to implement digital applications. To manage the madrasah, teachers are starting to use digital applications to prepare spreadsheets, process class lists, search for information online, and communicate and coordinate via email. Although the learning process remains traditional, teachers are beginning to recognize the importance of utilizing information and communication technology to support madrasah activities.

5. Financial Management

The principal of the madrasah revealed that funding for Islamic education in Batubara comes solely from the School Operational Assistance (BOS) fund. To meet the needs of the digital era, where needs are increasing daily, the madrasah management is very careful in managing the inflow and outflow of madrasah funds. In terms of financial recording, the madrasah has implemented a digital accounting system, as it is considered more efficient and easier to report. However, the financial management strategy is still far from optimal, and budget preparation is still haphazard.

Wise financial management is crucial to maintaining the sustainability of Islamic education in Batu Bara. Therefore, the provision of educational funds is not only an individual responsibility but a shared responsibility, this statement is in accordance with what Martin stated, educational costs are all expenditures, both monetary and non-monetary, which demonstrate the sense of responsibility of all parties (society, parents and government)

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[30] R E Indrajit, *Guru Sebagai Fasilitator & Coach Dalam Proses Belajar Mengajar Masa Kini* (Yogyakarta: Andi, 2021).

towards educational development to achieve the desired educational goals effectively and efficiently, this must be continuously reviewed from various perspectives, resources, maintained, collected and managed administratively so that they can be used effectively and efficiently.[31]

Thus, it is necessary to have budget planning, supervision, and increase accountability and transparency in the management of education funds which are key factors in the success of the madrasah. The Head of the Madrasah also emphasized that in this financial management it is necessary to instill an honest attitude for the treasurer as the holder of madrasah finances, because in Islamic education there are always Islamic elements attached to all activities in the madrasah including in the form of finance, for example when conducting an evaluation, Islam teaches that when there is financial misappropriation carried out by one of the staff then he must know that outside of the legal sanctions that we give there are also abstract parts such as angels who always control our activities.[32]

Madrasahs sometimes face financial difficulties in education funding, hindering educational programs that support digital media from carrying out well-planned learning activities. This obstacle to implementing these activities is the madrasah's finances. To effectively achieve Islamic education goals, stakeholders must be able to source funding from various sources and manage the treasurer based on their financial management capabilities.

6. Conflict Management

From The principal recognizes that managing a madrasah will inevitably encounter problems that can lead to conflict. Conflict is an unavoidable reality in everyday life, but it can be avoided and appropriate solutions sought. Conflict in Islamic education also needs to be managed wisely. Effective school leadership and communication can help resolve conflict and create a harmonious environment.

Hendra explained that when problems arise in a madrasah, the principal usually calls the affected parties to reach a compromise to resolve the issue. The way to resolve conflict is through reconciliation. The disputing parties must increase their awareness and understanding of each other. Both parties must be aware of their obligations and interests, including clearly understanding the boundaries of their respective authorities and responsibilities. [33]Therefore, compromise is suitable for resolving problems involving parties with different goals but equal capabilities. This compromise is a give-and-take approach from the parties involved.

The results of this study were analyzed using Islamic educational management theories proposed by experts in relevant literature, particularly in the context of adapting technology in the digital age. These management theories were used to explore how Islamic education management can be more optimal in facing the challenges of digitalization. One such theory is curriculum management and educational technology. According to Hasbiyallah, curriculum management in Islamic education must be able to adapt to technological developments to

[31] Martin, *Manajemen Pembiayaan Pendidikan* (Jakarta: Raja Grafindo Persada, 2014).

[32] N Fattah, *Ekonomi & Pembiayaan Pendidikan* (Bandung: Remaja Rosdakarya, 2012); S Asiah, *Manajemen Pendidikan Islam* (Yogyakarta: Pustaka Cendekia, 2018).

[33] M R Alhaddad, "Manajemen Lembaga Pendidikan Islam Dan Politik. Raudhah Proud To Be Professionals," *Jurnal Tarbiyah Islamiyah* 4, no. 2 (2019): 55–68, https://doi.org/10.48094/raudhah.v4i2.48.

create a more effective learning process.[34] The findings of this study align with this opinion, stating that although the curriculum in madrasas has begun to adopt digital elements, its implementation is still limited by existing infrastructure and the skills of educators. Curriculum management strategies that adapt to digital technology, such as the use of e-learning and other digital learning media, need to be implemented more widely, as explained by Hidayat, who emphasized the importance of technology integration in every aspect of education to enhance learning effectiveness.[35]

Furthermore, regarding human resource management in the digital age, Nurdin stated that human resource management in Islamic education must involve ongoing training and professional development.[36] The results of this study indicate that despite awareness of the importance of training for teachers in the use of technology, access and opportunities for such training remain limited. Therefore, madrasas need to be more proactive in providing technology-based training accessible to all teachers, both internally and through partnerships with educational institutions or the government.

Regarding financial management for digital education, this study shows that although madrasas have received funding through the School Operational Assistance Program (BOS), allocations for technological equipment procurement remain limited. As stated by Fattah, financial management in education must allocate resources wisely to meet the needs of efficient educational management, including technology procurement. Therefore, it is crucial for madrasas to strengthen their budget management capabilities and seek additional funding sources, both from the government and the community, to strengthen their digital infrastructure.[37]

Finally, regarding conflict management and effective communication, Qomar stated that conflict management in Islamic education is crucial for creating a conducive learning environment.[38] This study found that conflicts that arise in madrasas often relate to differences of opinion between teachers regarding teaching methods, particularly regarding technology adoption. Therefore, it is crucial for madrasah management to develop more effective communication strategies and facilitate open discussions between teachers regarding the benefits and challenges of using technology in teaching. Overall, despite the various challenges faced by madrasas in Batubara Regency in managing technology-based education, there is significant potential to improve the quality of Islamic education through the implementation of appropriate managerial strategies. Therefore, the role of madrasah administrators, teachers, and related parties is crucial in creating a more adaptive and sustainable education system in the digital age.

This research makes a significant contribution to the development of the quality of Islamic education, both theoretically and practically. Theoretically, this study enriches the understanding of Islamic education management in the digital era, emphasizing the importance of adapting technology to educational management. The findings suggest a paradigm shift in learning, where technology is no longer merely a tool but also an integral

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[34] Hasbiyallah, *Pengelolaan Pendidikan Islam Teori Dan Praktik*.

[35] Ara Hidayat and Iman Machali, *Pengelolaan Pendidikan (Konsep, Prinsip, Dan Aplikasi Dalam Mengelola Sekolah Dan Madrasah)*, *Universitas Pendidikan Indonesia* (Bandung: Universitas Pendidikan Indonesia, 2012).

[36] Diding Nurdin, *Pengelolaan Pendidikan (Dari Teori Menuju Implementasi)*.

[37] Fattah, *Ekonomi & Pembiayaan Pendidikan*.

[38] Qomar, *Manajemen Pendidikan Islam (Strategi Baru Pengelolaan Lembaga Pendidikan Islam*.

part of the educational process that must be aligned with Islamic principles. This research provides a new perspective on the integration of Islamic values with technological advances, which can serve as a reference for further research on digital-based educational management.

Practically, this research provides guidance for madrasah (Islamic school) managers and Islamic educational institutions in facing the challenges of digitalization. The results indicate that despite challenges related to infrastructure and technological understanding among educators, appropriate strategies for using technology can improve the efficiency and quality of educational management. The practical implications of these findings are the importance of increasing training and professional development for teachers and enhancing digital facilities in madrasahs to support better learning processes. This research also provides recommendations for government policy and educational institutions to strengthen support for the development of technology-based educational infrastructure and management, particularly in areas with limited access to technology. Thus, this research not only contributes to the development of theory in Islamic education management, but also offers practical solutions that are relevant to the current condition of Islamic education in the digital era.

D. CONCLUSION

The Islamic education in Batubara in this digital era offers significant opportunities, but also presents significant challenges. Effective management of Islamic education in Batubara requires adaptation to technological changes and appropriate strategies. Significant changes have occurred in data collection and school operational administration, shifting from manual to digital, requiring schools to prepare qualified and IT-savvy human resources, as well as significant costs and supporting facilities. However, this madrasah has achieved the government's desired success, although there is still much room for improvement to achieve even better results. It is crucial for madrasahs to continuously strive to improve the quality of education and ensure equitable accessibility for all students, while upholding strong religious and moral values. With sound management, Islamic education can continue to be a crucial pillar in developing a quality generation of Muslims. This study has several limitations, including the limited number of respondents, which included only five madrasahs in Batubara Regency, and the limited technological infrastructure in rural areas, which hampers the optimal implementation of digital learning. Furthermore, this study did not fully explore the long-term impact of digital technology use on Islamic education in remote areas. Suggestions for future research include expanding the scope of the study to include more madrasahs in other regions with varying levels of technology access, and conducting more in-depth research on the long-term impact of technology on student learning outcomes and teacher teaching quality. The study could also consider external factors such as government policies and community support for managing digital-based education. With broader and more in-depth research, it is hoped that a more comprehensive picture of managing the quality of Islamic education in this digital era can be obtained.

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