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Empowering Islamic Senior High School through Educational Technology: A Case Study of MA Al Irtiqo' Malang

Diajeng Srikandi Kusumaning[1], Nyimas Dwi Anggun Lestari[2], Renni Hasibuan[3]
[1,2,3] Madrasah Aliyah Al Irtiqo Malang
Corresponding Email: rennihasibuan88@gmail.com

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ABSTRACT

The integration of technology in education is a critical step for madrasahs to remain relevant in the digital era. Madrasah Aliyah (MA) Al Irtiqo has undergone a digital transformation by utilizing various technological tools such as laptops, televisions, projectors, smartphones, and digital applications to support both academic and extracurricular activities. However, challenges such as limited device availability, uneven infrastructure distribution, and unstable internet connections still persist. This study aims to explore the implementation of educational technology at MA Al Irtiqo, the benefits and limitations experienced, and strategic recommendations for sustainable integration. The research method used is qualitative descriptive through observation and documentation analysis. The findings reveal that technology is effectively used in classrooms and extracurricular programs to enhance student creativity, digital literacy, and collaborative learning. Nevertheless, infrastructural constraints reflect the early-stage adaptation process common in madrasah environments. This study is relevant to the development of national education policy to ensure equitable technological advancement in religious-based schools. Future research is recommended to quantitatively evaluate the impact of technology on student outcomes and conduct comparative studies across madrasahs to identify best practices in digital learning implementation.

ABSTRAK

Integrasi teknologi dalam pendidikan merupakan langkah penting agar madrasah tetap relevan di era digital. Madrasah Aliyah (MA) Al Irtiqo telah mengalami transformasi digital melalui pemanfaatan berbagai perangkat teknologi seperti laptop, televisi, proyektor, smartphone, dan aplikasi digital untuk mendukung kegiatan akademik maupun ekstrakurikuler. Namun, tantangan seperti keterbatasan perangkat, distribusi infrastruktur yang belum merata, serta koneksi internet yang tidak stabil masih menjadi kendala. Penelitian ini bertujuan untuk mengkaji implementasi teknologi pendidikan di MA Al Irtiqo, manfaat dan hambatan yang dihadapi, serta strategi yang diperlukan untuk integrasi yang berkelanjutan. Metode penelitian yang digunakan adalah deskriptif kualitatif melalui observasi dan analisis dokumentasi. Hasil penelitian menunjukkan bahwa teknologi dimanfaatkan secara efektif dalam pembelajaran kelas dan kegiatan ekstrakurikuler untuk meningkatkan kreativitas, literasi digital, dan kolaborasi siswa. Meskipun demikian, keterbatasan infrastruktur mencerminkan tahap awal proses adaptasi yang umum terjadi di lingkungan madrasah. Penelitian ini relevan dalam konteks pengembangan kebijakan pendidikan nasional untuk memastikan kemajuan teknologi yang merata di sekolah berbasis keagamaan. Penelitian lanjutan disarankan untuk mengevaluasi dampak teknologi terhadap hasil belajar siswa secara kuantitatif serta melakukan studi komparatif antar madrasah untuk mengidentifikasi praktik terbaik dalam implementasi pembelajaran digital.

Introduction

The digital era has brought significant changes in various aspects of life, including in the field of education (Suryana & Antara, 2021). Information and communication technology (ICT) is now one of the main pillars in the development of modern learning systems (Alyssa R. Gonzalez-DeHass et al., 2022; Xiao-Jun Xu et al., 2023). At Madrasah Aliyah Al-Irtiqo, the use of technology in learning has begun to be implemented to support a more effective and efficient teaching and learning process. This is inseparable from the challenges of 21st century education that requires students to have digital literacy, critical thinking, collaboration, and creativity (Mudinillah et al., 2024; Sarif et al., 2024).

Technology utilization in learning can be defined as the use of digital tools, such as computers, the internet, and learning applications, to support the educational process (Amer Mutrik Sayaf et al., 2022). The integration of technology in learning not only facilitates access to information but also provides opportunities to create more interactive and immersive learning experiences (Yunisca Nurmalisa et al., 2023). The importance of technology in education is also emphasized by UNESCO, which states that technology can be a transformational tool to expand access to education, improve the quality of learning, and prepare students for global challenges (Sa'dullah Assa'aidi & Azzah Nor Laila, 2023).

Building upon these perspectives, the effective implementation of technology in education requires not only the availability of digital infrastructure but also the readiness of educators and students to adapt to technological change (Abdul Halik Nasaruddin et al., 2023). Teachers must possess adequate digital literacy to design and deliver meaningful learning experiences, while students need to develop critical thinking and problem-solving skills through technology-enhanced activities (Zaharo et al., 2024). Furthermore, institutional support such as training programs, clear policies, and continuous evaluation is essential to ensure that technology integration truly contributes to improving educational outcomes rather than becoming a mere trend or superficial addition to the learning process.

The author sees that the use of technology in Madrasah Aliyah Al-Irtiqo is not only a necessity, but a must that must be optimized. As an Islamic educational institution, madrasah has a great opportunity to integrate Islamic values with the development of modern technology (Koderi et al., 2023). However, the implementation must remain within the corridor of Islamic ethics and values, so that technology becomes a tool that supports educational goals without losing the identity of the madrasah.

Initial observations show that Madrasah Aliyah Al-Irtiqo has used various technologies in learning, such as online learning applications, the use of projectors in class, and the development of digital content. However, this implementation still faces a number of challenges, such as lack of training for teachers, limited student access to technological devices, and other technical barriers. Therefore, this

study aims to analyze the us of technology utilization in this madrasah and provide recommendations for further development.

Recent research highlights the significant potential of technology in revitalizing and innovating education in madrasahs. Studies show that integrating educational technology can enhance student engagement, deepen understanding, and promote interactive learning (Sungkowo et al., 2024). The implementation of e-learning platforms, digital collaboration tools, and learning management systems has proven effective in improving pedagogical skills and student motivation (Abdul Halik Nasaruddin et al., 2023). Successful strategies include using tablets for employing language learning applications like Alef, and implementing digital academic services (Aditya Purnama et al., 2023). However, challenges such as limited infrastructure, inadequate teacher training, and resistance to change persist (Aditya Pratama et al., 2024). To overcome these obstacles, joint efforts between educational institutions, governments, and communities are necessary to improve facilities and conduct comprehensive teacher training programs (Siti Swasti Eka et al., 2023). With proper support and planning, technology can be a powerful tool in transforming religious education in madrasah.

As a continuation of the previous research, this study will highlight how Madrasah Aliyah Al Irtiqo implements technology in its learning process. This madrasah has taken various strategic steps, such as the integration of e-learning platforms, the use of digital-based language learning applications, and the implementation of a learning management system (LMS) to facilitate teacher and student interactions online and offline. These efforts are also supported by intensive training programs for educators to improve their digital literacy and pedagogical skills in the context of technology. Although challenges such as limited facilities and resistance to change are still encountered, Al Irtiqo continues to strive to build an innovative and adaptive learning ecosystem, so as to optimize the potential of technology in improving the quality of education in madrasah.

Method

This research uses a qualitative approach with descriptive method to explore the utilization of technology in learning at Madrasah Aliyah Al-Irtiqo. Data were collected through direct observation, in-depth interviews with teachers and students, as well as document analysis such as syllabus, learning tools and technology usage reports. This approach allowed the researcher to gain an in-depth understanding of how technology is applied in the learning process and its impact on student learning outcomes.

The research subjects included teachers, students and the head of the madrasah who were selected using purposive sampling technique. The data obtained were analyzed qualitatively with the steps of

data reduction, data presentation, and conclusion drawing. Data validity was maintained through triangulation of methods and sources, so that the results of this study can provide a comprehensive picture of the challenges and opportunities in the use of technology at Madrasah Aliyah Al-Irtiqo. This research also aims to provide strategic recommendations for the development of technology-based learning in the madrasah.

Results and Discussions

Digital Transformation and Technology Utilization in MA Al Irtiqo

Madrasah Aliyah (MA) Al Irtiqo has undergone a significant transformation in the utilization of technology to enhance the learning process. Based on observations and documentation, the school has integrated various digital tools such as laptops, televisions, projectors, Wi-Fi networks, and digital applications to enrich students' learning experiences. In classroom settings, laptops are used by students to explore conceptual materials, while teachers use televisions to visually present historical content and introduce lesser-known national songs. Smartphones are also widely used, especially for online-based school examinations and the creation of educational video content by students.

Technology integration extends beyond academic activities into extracurricular domains. MA Al Irtiqo offers nine extracurricular activities, including journalism, graphic design, literacy and publication, and scouting. In these programs, laptops are used to write news articles, design posters, compose books, and draft proposals. This demonstrates that technology not only strengthens academic capabilities but also fosters students' creativity and non-academic skills. School programs such as P5P2RA, ANBK (National Assessment), and academic competitions also involve the use of technology. Students utilize applications like Canva to create visual projects and Google Drive to store and share documents.

From an infrastructure standpoint, MA Al Irtiqo has provided several essential technological facilities to support digital learning. These include 20 laptops, 2 projectors, 6 television units, HDMI cables in every classroom, and Wi-Fi vouchers distributed to students for internet access. The following diagram illustrates the distribution of technological facilities available.

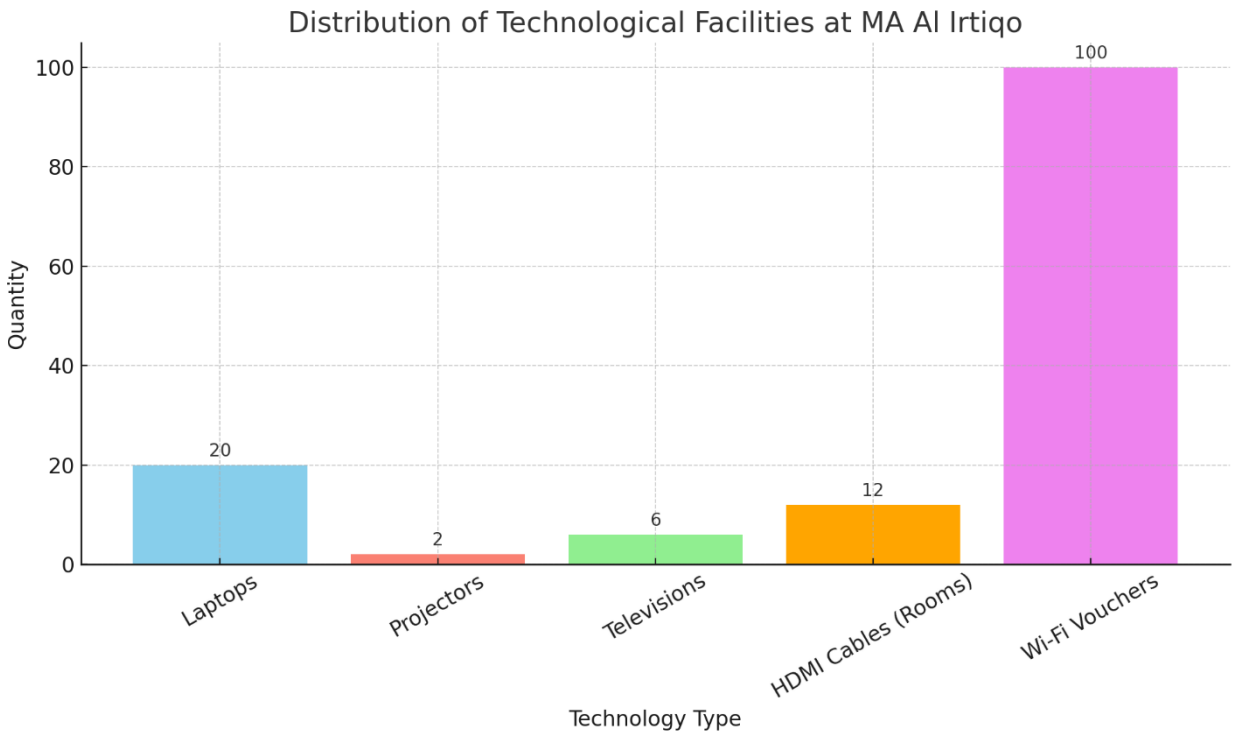

Figure 1. Distribution of Technological Facilities at MA Al Irtiqo

As illustrated, although the school has made commendable efforts to provide technological resources, distribution remains limited relative to the number of students and classrooms, especially in the case of projectors and laptops. This shortage presents a key challenge in the implementation of effective digital learning. Not all students own personal devices, and some classes must rely on smartphones to conduct examinations. Additionally, unstable internet connections occasionally hinder the smooth running of online learning sessions.

The findings indicate that although the school has made notable progress in integrating technological tools into the learning environment, significant challenges remain in ensuring equitable access and consistent implementation. The limited availability of essential devices such as projectors and laptops relative to the number of students and classrooms hinders the widespread adoption of effective digital learning strategies. This resource gap often forces some classes to rely on smartphones, particularly for assessments, which may not provide the most conducive platform for academic integrity or optimal learning experiences (Amer Mutrik Sayaf et al., 2022). Moreover, the reality that not all students own personal digital devices points to a deeper issue of digital inequality that affects student engagement and performance (Abdul Halik Nasaruddin et al., 2023; Darman Manda et al., 2024). The situation is further exacerbated by frequent internet instability, which disrupts the flow of online sessions, reduces instructional time, and undermines the reliability of virtual learning platforms. These combined factors suggest that without targeted improvements such as expanding access to

technological equipment, offering support for device ownership, and enhancing internet infrastructure the school's digital learning initiatives may fall short of their intended impact (Prisca Rodríguez et al., 2012). Addressing these barriers is critical to fostering a more inclusive, accessible, and effective digital education system.

Impacts, Challenges, and Recommendations for Sustainable EdTech Integration

To overcome these issues, strategic efforts are necessary to strengthen the implementation of educational technology. Continuous digital literacy training for teachers is essential to build their confidence and competence in using educational technology (Zhaoxi Wei, 2023). Moreover, acquiring additional devices and improving internet quality are crucial steps to ensure equitable access. The curriculum must also be regularly updated so that technology integration becomes a core component of the learning process, rather than a supplementary feature (Hasanah et al., 2021; Hasibuan et al., 2023). With these strategies, MA Al Irtiqo can better position itself as a technologically adaptive institution, capable of producing graduates who are competitive in the digital age.

The use of television to deliver historical content and introduce national songs, as well as students' use of applications like Canva and Google Drive, supports the literature asserting that technology enhances visual understanding and promotes digital collaboration (Neeraj Yadav, 2024). These findings align with expectations that technology can improve student engagement and facilitate active learning. For instance, the use of laptops in journalism and literacy activities illustrates that technology also contributes to the development of digital literacy and creative writing skills.

This study's findings are consistent with previous research by (Tuma, 2021) and (Sungkowo et al., 2024), which found that technology integration in secondary schools expands access to learning resources and enhances students' digital competencies. Similar patterns are also reflected in other Indonesian madrasahs that have adopted digital tools for instruction and collaborative projects.

In particular, the integration of technology in extracurricular activities highlights a unique strength of MA Al Irtiqo. The ability of students to independently produce digital content ranging from video presentations to book manuscripts demonstrates a level of digital fluency that extends beyond the classroom. This points to an emerging culture of innovation and collaboration among students, suggesting that when given the tools and guidance, students are capable of becoming not just consumers, but also creators of digital knowledge. Furthermore, the creative use of widely accessible applications such as Canva and Google Drive indicates the school's strategic focus on low-cost, high-impact solutions that are scalable and replicable in other madrasah contexts.

However, despite the increased adoption of technology, limitations in device availability may also be attributed to economic constraints and institutional priority policies. These limitations should not be viewed as a failure of technological implementation but rather as an indication of an early-stage adaptation process and budget limitations often faced by madrasah-based educational institutions.

In the educational context, these findings are highly relevant as they demonstrate that madrasahs are capable of adapting to digital transformation demands. This has significant implications for national education policy development, particularly in ensuring that madrasahs are not left behind technologically compared to general schools. The case of MA Al Irtiqo proves that with targeted efforts and community support, madrasahs can innovate and transform themselves into 21st-century learning institutions. Nevertheless, the study has some limitations. It does not include a quantitative evaluation of how technology use affects students' academic performance. Furthermore, there is no systematic measurement of the improvement in teachers' digital competencies. Another limitation is the absence of comparative analysis with other madrasahs to provide a broader context.

Future research is recommended to conduct longitudinal evaluations of the impact of technology on student learning outcomes. Comparative studies between madrasahs are also necessary to identify best practices in technology integration. Moreover, further assessment of the effectiveness of digital literacy training for both teachers and students is essential to maximize the sustainable use of educational technology.

Conclusion

The This study concludes that the implementation of career development and university preparation programs in *Madrasah Aliyah* significantly enhances students' readiness for both higher education and future employment. The findings clearly indicate that structured guidance, competitive exposure, and skill-building initiatives are critical in shaping student aspirations and trajectories. The importance of this study lies in its focus on a population often underrepresented in discussions of career planning Islamic school students highlighting the need for inclusive educational strategies across diverse schooling systems. By addressing this gap, the research provides timely insights for policymakers and educators.

Compared to previous research, which mostly centers on general high school settings, this study offers a unique contribution by contextualizing the programs within the *madrasah* framework. It underscores the necessity of tailored approaches that respect both religious identity and academic advancement, thus making the findings both novel and impactful. While aligned with prior work on career readiness, the originality of this study lies in its exploration of how Islamic education institutions

can effectively implement such programs without compromising their core values. The results offer a practical model for integration and may serve as a reference for similar educational institutions seeking holistic student development.

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