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## The Impact of Madrasah Digitalization Program on Strengthening Student Character: A Case Study at MA Ma'arif Al Muhtadi Lamongan

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### ABSTRACT

**Purpose:** This qualitative study describes the implementation of a madrasah digitalization program and analyzes its impact on student character at MA Ma'arif Al Muhtadi Lamongan.

**Methodology/approach:** Data were collected through observations, interviews, and documentation of e-learning, computer-based testing (CBT), electronic report cards, and digital attendance programs.

**Findings:** The findings indicate that digitalization strengthens students' discipline, academic responsibility, and digital literacy as learning activities become more transparent and measurable. However, increased screen-based activity also triggers digital individualism and weakens everyday expressions of empathy

**Practical implications:** Madrasahs must consciously integrate technology with Islamic moral values through value supervision, digital ethics guidance, and learning designs that intentionally cultivate empathy and social connectedness to balance digital competencies with students' affective development.

**Originality/value:** This study addresses a gap in the literature by examining digitalization as a structured institutional program within an Islamic senior high school (Madrasah Aliyah) context, specifically focusing on late adolescents



(11th-grade students), whereas previous studies predominantly focused on public schools.

**Keywords:** Character Education; Madrasah Aliyah; Madrasah Digitalization; Student Character Strengthening.

#### **ABSTRAK**

**Tujuan penelitian:** Penelitian ini mendeskripsikan pelaksanaan program digitalisasi madrasah dan menganalisis dampaknya terhadap karakter siswa di MA Ma'arif Al Muhtadi Lamongan.

**Metode/pendekatan:** Metode kualitatif digunakan melalui observasi, wawancara, dan studi dokumentasi terhadap program *e-learning*, ujian berbasis komputer (CBT), rapor elektronik, serta presensi digital.

**Hasil:** Hasil penelitian menunjukkan bahwa digitalisasi memperkuat kedisiplinan, tanggung jawab akademik, dan literasi digital siswa karena aktivitas belajar menjadi lebih terukur. Namun, tingginya aktivitas berbasis layar juga memicu individualisme digital dan melemahkan praktik empati sehari-hari.

**Implikasi praktik:** Institusi madrasah perlu secara sadar mengintegrasikan teknologi dengan nilai akhlak Islam melalui kontrol nilai, pembinaan etika digital, dan desain pembelajaran yang secara spesifik menumbuhkan kepedulian serta keterhubungan sosial guna menyeimbangkan kompetensi digital dengan nilai afektif siswa.

**Orisinalitas/kebaharuan:** Penelitian ini mengisi celah literatur dengan berfokus pada analisis implementasi digitalisasi sebagai program institusional yang terstruktur di lingkungan Madrasah Aliyah, khususnya pada kelompok remaja akhir (siswa kelas XI), di mana riset terdahulu mayoritas hanya berfokus pada sekolah umum.

**Kata kunci:** Digitalisasi Madrasah; Madrasah Aliyah; Pendidikan Karakter; Penguatan Karakter Siswa.

## INTRODUCTION

The advent of information and communication technology (ICT) has precipitated profound transformations across diverse sectors, including education. In the contemporary era of the Fourth Industrial Revolution and the advent of Society 5.0, digitization has become imperative, exerting its influence on the management of educational institutions, the pedagogy employed, and even the patterns of interaction among members of the school community. The digitization of madrasahs represents an adaptation to this reality, whereby the learning process and management of these institutions increasingly utilize digital technology, including e-learning, CBT, e-reports, and integrated administrative systems. The increased use of e-learning, CBT, and digital-based systems is part of the madrasah leadership's strategy to transform the learning system (Absuhalini, 2022). This transformation is believed to engender increased efficiency, transparency, and participation in the educational process. Nevertheless, this paradigm shift brings with it a series of novel challenges, most notably in the realm of character formation in students. The primary challenge confronting character education in the digital age does not originate from technological advancements per se, but rather from the question of how values and role models are integrated into the online learning process (Ulum, 2022).

Student character is a crucial issue in the context of national education in this era, as stipulated in the Minister of Education and Culture Regulation Number 20 of 2018 concerning Strengthening Character Education. In the digital context, several studies show that the wise use of technology can encourage the development of character traits such as responsibility, independence, and digital literacy (Ayunda et al., 2024). The potential of digital education to improve learning effectiveness is balanced by its profound implications for student character development (Ma'arif & Nursikin, 2024). However, other studies identify a decline in interpersonal communication, an increase in individualistic attitudes, and the potential for technology misuse (Masluhah, 2021). The Jakarta Center for Religious Research and Development also identifies a significant risk of exposure to negative content among madrasah students, despite their relatively high level of digital literacy (B. L. A. Jakarta, 2024). These findings show that digitization has ambivalent implications for student character building and emphasize the importance of targeted management.

The development of educational digitization should not occur in isolation from character building; rather, there is a need for deliberate management to ensure that technological innovation supports moral development rather than replacing it. A number of studies have discussed the relationship between digitization and student character (Masluhah, 2021; Ayunda et al., 2024; Ma'arif & Nursikin, 2024). However, the majority of these studies focus on the context of public schools, or discuss aspects of digital literacy and character in a partial manner.

Furthermore, these studies have not specifically analyzed the implementation of digitization as a structured institutional programmed in Islamic-based madrasah aliyah environments. Consequently, there remains a lacuna in the extant research concerning the concrete implementation of madrasah digitization policies and practices, and their impact on student character formation in the Islamic secondary education sector.

Empirical research investigating the impact of digitization on student character in madrasah aliyah, especially among upper-class students such as those in Grade 11, is still limited (A'yun et al., 2022). Indeed, late adolescence is a period of development characterized by intensive identity exploration, vulnerability to peer and digital media influences, and the formation of long-term moral orientations. Consequently, research in this context is imperative to ascertain whether digital initiatives fortify student character or introduce risks that necessitate more targeted pedagogical and institutional protective measures.

The novelty of this research lies in the following gaps in the existing literature: The implementation of madrasah digitization as an institutional programmed integrated into the learning system and educational management was analyzed. The focus of this analysis was on 11th grade madrasah aliyah students as a group of late adolescents. The use of digital character indicators aligned with Islamic education policies was also analyzed qualitatively through the perspectives of madrasah principals, teachers, and students. This study corroborates earlier findings and extends them through an institutional lens, focusing on madrasahs, and by means of a more comprehensive analytical approach.

The objective of this study is to provide a detailed account of the implementation of the madrasah digitization programmed at MA Ma'arif Al Muhtadi Sendangagung Paciran Lamongan and to undertake a comprehensive analysis of its impact on the character of 11th grade students. The objective of this study is to provide answers to two fundamental questions. The primary objective of this study is to identify the various forms of madrasah digitization implementation in the learning process and educational management. The secondary objective is to analyses its impact on student character aspects, with a specific focus on discipline, responsibility, and digital literacy. It is anticipated that this research will address the existing research gap concerning the relationship between the digitization of the education system and student characteristics in madrasahs, particularly within a local context that is grounded in Islamic values. As Sundari asserts, emphasized, character development in the context of digital learning must be achieved through the direct integration of Islamic Religious Education values into learning activities, rather than merely through the delivery of religious material online (Sundari et al. 2024).

## METHOD

The present study employs a descriptive qualitative approach with the objective of furnishing a comprehensive overview of the implementation of the madrasah digitization programmed and its impact on student character. The primary variables in this study encompass independent variables, namely the implementation of the madrasah digitization program, and dependent variables, namely student character. The character in question pertains to indicators of student digital character as delineated by the Ministry of Religious Affairs. These indicators encompass discipline, responsibility, digital literacy, independence, and media ethics (T. P. P. A. and K. Jakarta, 2019).

The research instruments encompass observation guidelines, in-depth interview guidelines, and documentation guidelines. The development of these instruments was informed by two theoretical frameworks: the theory of education digitization and the theory of character education formulated by the Directorate of Religious Education of the Ministry of Religious Affairs (Najili et al., 2022). The instruments were systematically compiled with reference to the operational indicators of each variable in order to obtain relevant and targeted data.

The data sources employed in this study encompassed both primary and secondary data. Primary data were obtained through in-depth interviews with 11 key informants, consisting of 1 madrasah principal, 4 teachers, and 6 students. The selection of informants was conducted using purposive sampling, with the following criteria applied: The first component of the programmed is direct involvement in the implementation of the madrasah digitization programmed. The second component is active use of digital learning platforms in teaching and learning activities. The third component is willingness to provide information openly. The madrasah principal was selected as a key informant due to his role in formulating and overseeing digitization policies. The teachers interviewed were those who consistently utilized digital systems in learning, while the students were selected based on varying levels of participation and academic ability to obtain diverse perspectives.

The number of informants was determined based on the principle of data saturation. The interview process was conducted in stages, with the information obtained revealing a recurring pattern and the absence of any new significant themes. Indications of saturation began to appear in the ninth interview. Consequently, two additional interviews were conducted to ensure the consistency and stability of the findings.

Secondary data comprised official madrasah documents, including internal digitization policies, documentation of learning application usage, activity reports, and student character assessment archives relevant to digital character indicators.

The data collection phase was conducted from February to March 2025 using three main techniques: namely participatory observation, semi-structured interviews, and documentation studies. Observations were made to ascertain the implementation of digital-based learning and student interactions on the online platform. In-depth interviews were conducted using an open approach to explore the informants' experiences and perceptions regarding the use of digital systems in the context of learning and character building. Documentary studies were conducted to strengthen and verify the data obtained from observations and interviews.

The data analysis technique employed in this study is informed by Miles and Huberman's interactive analysis model, which comprises three distinct stages. (1) The data reduction process involves the selection, simplification and transformation of raw data; (2) The subsequent data presentation takes the form of descriptive narratives, the function of which is to describe patterns, trends and relationships between findings; and (3) conclusions and verification was carried out continuously during the research process (Sugiyono, 2020).

The validity of the data was ensured through a combination of source triangulation, technique triangulation, and member checking. Source triangulation was achieved through a comparative analysis of information from the principal, teachers, and students. Technique triangulation was carried out by integrating the results of observations, interviews, and documentation. Concurrently, member checking is conducted through the process of reconfirming the summary of the interview results with multiple informants, thereby ensuring the relevance and appropriateness of the interpretation. The entire research process is carried out in accordance with research ethics principles, including obtaining approval from the madrasah and ensuring the confidentiality of the respondents' identities.

## **RESULT AND DISCUSSION**

### **Result**

The present study has yielded descriptive data concerning the implementation of the madrasah digitization programmed and its impact on the character of 11th grade students at MA Ma'arif Al Muhtadi Sendangagung Paciran Lamongan. The data presented herein was obtained through a combination of methods, including observation, in-depth interviews, documentation of learning activities, and analysis of the madrasah's digital administration system.

- 9.1** A comprehensive case study of MA Ma'arif Al Muhtadi reveals the development of a madrasah information system. This system has been meticulously crafted to address the needs of madrasahs, as evidenced by observations and interviews with the head of the madrasah, ICT teachers, and school operators. The

digitization program that was implemented includes the use of e-learning, CBT-based exams, fingerprint attendance systems, e-libraries, and e-report card assessment systems. As posited by the head of the madrasah in interviews conducted for this study, the programme is envisaged as a component of an overarching institutional transformation strategy.

The madrasah principal stated:

*“The present digitization is not merely a response to prevailing trends; rather, it is an imperative for enhancing discipline, transparency, and the efficacy of learning. The integration of all systems enables parents to concurrently monitor their children’s progress.”* (Interview, 18 Februari 2025)

The digitization programmed that has been implemented includes the use of e-learning, CBT-based exams, a fingerprint attendance system, a digital library, and an integrated digital report card system.

The ICT teacher elucidated:

*“It has been established that the e-learning platform is already connected to the report card system. Consequently, the scores from the CBT are now entered directly into the system, thus eliminating the need for manual input. This approach serves to minimize input errors.”* (Interview, 18 Februari 2025)

As part of the research project, direct observation of the CBT dashboard used for mid-semester and end-of-semester assessments was also conducted by the researchers. The system in question displays examination results in real time and is linked to student accounts.

As indicated by the documentation provided by the operators of the Madrasah, the inception of the system was in 2021, and it has undergone continuous refinement through the medium of internal training. Since 2024, the institution has implemented a comprehensive integration of all classes, encompassing digital administrative and financial management systems.

The characteristics of Grade XI students in the context of digitalization

An investigation into the characteristics of Grade XI students in the context of digitalization reveals a divergence in student behavior, influenced by the utilization of technology. With regard to the matter of discipline, the homeroom teacher stated:

*“Following the implementation of the fingerprint and online assignment systems, there has been a notable decrease in the number of late students. They are aware that all interactions are systematically documented.”* (Interview, 18 Februari 2025)

With regard to the question of responsibility, one student offered the following statement:

*"The allocation of assignments in the context of e-learning is characterized by the presence of explicit temporal constraints, thereby facilitating the immediate identification of any individual who has not yet submitted their assignment. Consequently, tardiness is perceived as a social taboo, and the subject experiences feelings of embarrassment when they are late."* (Interview, 19 Februari 2025)

Nevertheless, there are still issues to be addressed. The Indonesian language instructor disclosed the following:

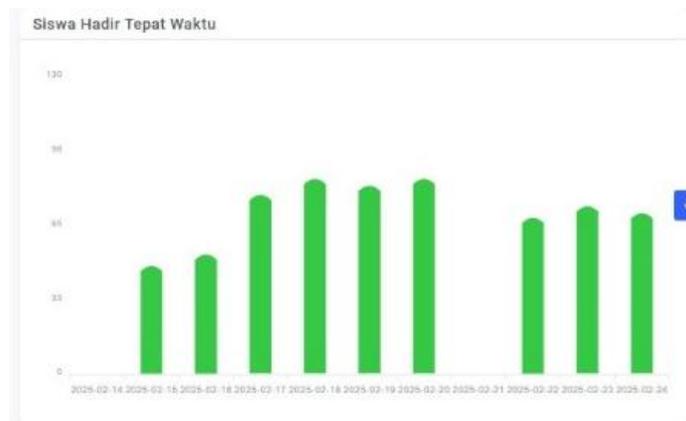
*"In some cases, students have been observed to engage in the practice of copying and pasting from internet sources. While the students possess digital literacy skills, there is a necessity to cultivate their academic ethics and responsibility."* ((Interview, 19 Februari 2025))

In relation to digital ethics, the guidance counsellor stated:

*"The crux of the issue lies not in the inherent shortcomings of the educational system itself, but rather in the utilization of electronic devices by students outside the confines of the classroom. Their social interactions are known to decrease on occasion. Nevertheless, the madrasah continues to integrate halaqah, kultum, and religious guidance activities in order to maintain a balance between technological advances and Islamic character values."* ((Interview, 19 Februari 2025))

#### Synthesis of Observation and Documentation Results

During the research period, the researcher undertook the documentation of student activities through the utilization of dashboard screenshots, digital class activity reports, and fingerprint system attendance graphs. The following graph presents the student attendance data, which has been collected using an anonymous fingerprint system. The graph shows the attendance trends for both odd and even semesters.



**Figure 1. Graph Illustrating Student Attendance Data**

**Figure 2.** Student Activity Dashboard

The Student Activity Dashboard, which is displayed on the e-learning platform, is a tool that provides a comprehensive overview of the number of logins, the progress of tasks, and the results of the CBT. The data obtained from this dashboard demonstrate a high degree of consistency in the implementation of the digital system throughout the semester. Student participation is reflected in the intensity of logins, discussion forum activity, and the timeliness of completing online exams.

The digital characteristics of students are evident in their responses to assignments, which show an increase in independent learning and academic responsibility. Nevertheless, challenges persist in terms of the ethics of technology use and the reinforcement of social values.

The research findings indicate that madrasahs have effectively incorporated digitalization programmed into their learning and administrative systems. The most significant positive impact is observed in the domains of discipline and digital literacy. Concomitantly, there is a necessity to fortify digital ethics and social equilibrium through the implementation of a sustainable pedagogical and religious approach.

## Discussion

The findings of the study suggest that the implementation of the madrasah digitization program at MA Ma'arif Al Muhtadi Sendangagung Paciran Lamongan exerts a substantial influence on the character development of 11th grade students. With regard to the cultivation of discipline, responsibility, and digital literacy, students undergo character development through the implementation of integrated digital systems, including fingerprint attendance, e-learning, and CBT. Fauziah posits that the implementation of a transparent and integrated online assessment system serves to foster a sense of responsibility and

discipline among students (Ma'sum et al., 2025). The present findings corroborate the conclusions of Ayunda et al., who asserted that the integration of technology in learning, in conjunction with supervision, can serve as an effective instrument for enhancing students' cognitive and conative attributes, particularly with regard to responsibility and independent learning (Ayunda et al., 2024). Anwar underscored the pivotal role of human resources, encompassing teachers and educational staff, in the successful execution of the digitization program in madrasahs (Alfiyaturohmaniyyah, 2024).

It is imperative to note that these findings underscore the pivotal role of technology integration in not only enhancing learning efficiency but also in the management of student behavior. Rosyidah underscored the necessity of integrating ICT in PAI learning, stating that this integration must be meticulously designed to not only facilitate mastery of the material but also to address the affective and spiritual domains of students (Nursobah et al., 2022). Teachers find it easier to monitor learning activities, while students feel motivated to be more disciplined due to the transparent and real-time documented system. These findings are consistent with the research conducted by Asyhari, which demonstrates that digital technology can systematically influence students' cognitive processes and learning behaviors when utilized effectively and in a structured manner (Asyhari, 2025).

However, these findings also highlight problematic areas in the use of technology, namely a decline in interpersonal communication and a tendency toward individualistic attitudes. Nurhayati posited that excessive reliance on gadgets and digital platforms has the potential to adversely impact students' interpersonal communication skills (Ayub & Sulaeman, 2022). These findings are consistent with the research conducted by Shura Melelo, which demonstrates that the absence of a balanced integration of digitization with character building can, in fact, foster individualistic attitudes and a decline in social interaction among students (Melelo & Shutura, 2023). A number of educators have attested to a decline in students' social interaction and empathy levels as a consequence of increased engagement with digital devices. This phenomenon aligns with a report by the Jakarta Religious Research and Development Center, which observes that madrasah students who are habituated to utilizing digital platforms tend to demonstrate heightened vulnerability to social isolation and a deterioration in verbal communication skills (B. L. A. Jakarta, 2024). Consequently, a character education strategy is required that can balance cognitive-digital aspects with affective and socio-religious values.

The impact of digitization on students' character is influenced by several factors, including institutional readiness, the quality of digital content, and the roles of teachers and parents. Teachers function as digital role models, as asserted by Maslulah, who contends that teachers who are technologically proficient and

possess integrity will be capable of guiding students in the ethical and productive use of technology (Maslulah, 2021). Arifin underscored the pivotal function of educators as pivotal agents in shaping students' digital literacy and character in the contemporary age (Agustina, 2024). Sari underscored the profound ethical responsibility that accompanies the presence of educators in the digital realm (Situmorang & Naibaho, 2025). In the context of MA Ma'arif Al Muhtadi, teachers function not only as facilitators but also as character mentors, particularly through the integration of digital religious activities such as online religious lectures, virtual *halaqah*, and app-based worship reminders. Digitalization in education is insufficient in addressing solely technical aspects; it must be complemented by the cultivation of character values to ensure that students maintain a balanced utilization of technology (Ma'rufah, 2022).

Additionally, the digital learner's identity is not solely influenced by their exposure to technology; their critical literacy regarding digital content is also a significant factor. Islamic digital literacy emerges as a pivotal factor in differentiating students who demonstrate proficiency in filtering information effectively from those who are susceptible to the influence of negative content. As articulated by Qurrotul A'yun and Ghofur, the digitalization of education that is not accompanied by robust digital literacy training has the potential to result in a generation that is technically proficient but ethically deficient (A'yun et al., 2022). Researchers also noted that students who participated in digital-based religious programs exhibited superior character development compared to students who engaged with technical systems without guidance on values. Maulana posited that the digital transformation of madrasahs ought not to be confined merely to the implementation of administrative and learning technologies; rather, it should be situated within the overarching framework of Islamic values (Ghufron et al., 2023). Hidayat underscored the significance of Islamic digital literacy, defined as the capacity to not only access and comprehend digital information, but also to discern, sift, and respond to it in accordance with Islamic values (Ma'sum et al., 2025). Rahmatullah underscored the significance of incorporating Islamic digital literacy into the madrasah curriculum. In the absence of robust ethical literacy, students risk becoming mere technology users devoid of any guiding principles. The curriculum must integrate digital competencies with spirituality (Karaman et al., 2020).

Therefore, the impact of digitization on student character is contextual and contingent upon the manner in which it is implemented. The implementation of planned and value-based digitization, as evidenced at MA Ma'arif Al Muhtadi, has been demonstrated to promote positive character development. However, in the absence of a concomitant emphasis on fortifying spiritual and social values, the digital transformation may, in fact, serve to erode the affective dimension of students.

Consequently, this study lends further support to the extant literature on the subject, which posits that digital transformation in education is not merely a matter of technology, but also a means to shape the holistic development of the individual. Digital education must remain grounded in a humanistic and spiritualistic approach, as emphasized by Najili et al., that technology-based character education needs to embrace the integration of science and technology and IMTAQ as the foundation of 21st century education (Najili et al., 2022).

## CONCLUSION

A comprehensive review of the extant research findings, in conjunction with the ensuing discourse, suggests that the implementation of the madrasah digitization program at MA Ma'arif Al Muhtadi Sendangagung Paciran Lamongan has been executed in an optimal manner. The program has been seamlessly integrated into the institution's learning system, administrative structure, and academic evaluation framework. The advent of digital technologies has had a profound impact on the academic environment, fostering discipline, cultivating academic responsibility, and fortifying digital literacy among 11th-grade students. The e-learning system, CBT, fingerprint recognition, and e-report card systems employed have had a direct impact on the regularity of the learning process and students' active engagement in online learning. However, it should be noted that these positive impacts are not entirely free from challenges. The study also identified indications of a decline in the quality of interpersonal communication and a tendency toward individualism. Educational institutions must be cognizant of these tendencies and take proactive measures to address them. Therefore, the success of digitalization in character building is contingent not only on technological sophistication, but also on the values internalized through the system.

To further refine the research, it is recommended that quantitative studies be conducted using psychometric scales to measure student character more accurately. Additionally, the scope of research should be expanded to include madrasahs with varying levels of digitization. The necessity of longitudinal studies is underscored in order to monitor the long-term effects of digitization, particularly in relation to the formation of Islamic character and the integration of spiritual values into the digital ecosystem of madrasahs.

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