AL-TANZIM Jurnal Manajemen Pendidikan Islam
e-ISSN : 2549-5720
p-ISSN : 2549-3663
Al-Tanzim: Jurnal Manajemen Pendidikan Islam
Vol. 10 No. 04 (2026) : 1386-1399
Available online at https://ejournal.unuja.ac.id/index.php/al-tanzim/index

Beyond Digital Adoption: Curriculum Management for Integrating Islamic Values, Science, and Technology in Madrasah Transformation

Agus Ali[1*], Ahmad Idhofi[2], Hasbiyallah[3], Siti Nurhidayah[4], Lia Safitri[5]
[1,2,4,5]Islamic Educational Management Department, Institut Ummul Quro Al Islami Bogor, West Java, Indonesia
[3]Islamic Educational Management Department, Universitas Islam Negeri Sunan Gunung Djati Bandung, West Java, Indonesia
Email: agus.ali@iuqibogor.ac.id[1], ahmad.idhofi@iuqibogor.ac.id[2], hasbiyallah@uinsgd.ac.id[3], Nurhidayahelzamzam@gmail.com[4], safitrilia950@gmail.com[5]

DOI: http://doi.org/10.33650/al-tanzim.v10i4.14794

Received: 12 March 2026	*Revised: 19 July 2026*	*Accepted: 01 August 2026*

Abstract:

This study examines how curriculum management can integrate Islamic values, science, and technology to strengthen educational competitiveness in a madrasah undergoing digital transformation. A descriptive qualitative design was employed. Data were collected through semi-structured interviews, classroom observations, and document analysis, involving 23 participants, including the principal, vice-principals, teachers, students, and madrasah committee members. Data were analyzed through data condensation, display, thematic coding, triangulation, and verification. The findings show that curriculum management operates through a cyclical process of needs analysis and planning, integrative implementation, evaluation, academic supervision, and teacher professional development. Islamic values are contextualized in religious and general subjects, while digital tools such as projectors, internet resources, Kahoot, and Quizizz support interactive learning. Smartphone use is regulated to balance digital innovation with character formation. The study indicates that leadership support, teacher development, and digital infrastructure enable integration, whereas uneven teacher digital competence and limited learning resources remain constraints. The study implies that educational competitiveness depends not only on technology adoption but on coherent curriculum governance that aligns technology, pedagogy, Islamic values, and continuous improvement.

Keywords: *Curriculum Management, Digital Transformation, Educational Competitiveness*

Abstrak:

Penelitian ini mengkaji bagaimana manajemen kurikulum dapat mengintegrasikan nilai-nilai Islam, ilmu pengetahuan, dan teknologi untuk memperkuat daya saing pendidikan di sebuah madrasah yang sedang mengalami transformasi digital. Penelitian ini menggunakan desain kualitatif deskriptif. Data dikumpulkan melalui wawancara semi-terstruktur, observasi kelas, dan analisis dokumen yang melibatkan 23 partisipan, termasuk kepala madrasah, wakil kepala madrasah, guru, siswa, dan anggota komite madrasah. Data dianalisis melalui tahapan kondensasi data, penyajian data, pengodean tematik, triangulasi, dan verifikasi. Hasil penelitian menunjukkan bahwa manajemen kurikulum berlangsung melalui proses siklus yang meliputi analisis kebutuhan dan perencanaan, pelaksanaan integratif, evaluasi, supervisi akademik, dan pengembangan profesional guru. Nilai-nilai Islam dikontekstualisasikan dalam mata pelajaran agama maupun umum, sementara perangkat digital seperti proyektor, sumber daya internet, Kahoot, dan Quizizz mendukung pembelajaran interaktif. Penggunaan telepon pintar

diatur untuk menyeimbangkan inovasi digital dengan pembentukan karakter. Penelitian ini menunjukkan bahwa dukungan kepemimpinan, pengembangan kompetensi guru, dan infrastruktur digital menjadi faktor pendukung integrasi, sedangkan ketimpangan kompetensi digital guru dan keterbatasan sumber belajar masih menjadi kendala. Implikasinya, daya saing pendidikan tidak hanya bergantung pada adopsi teknologi, tetapi juga pada tata kelola kurikulum yang koheren dan mampu menyelaraskan teknologi, pedagogi, nilai-nilai Islam, serta perbaikan berkelanjutan.
Kata Kunci: *Manajemen Kurikulum, Transformasi Digital, Daya Saing Pendidikan*

Please cite this article in APA style as:

Ali, A., Idhofi, A., Hasbiyallah, H., Nurhidayah, S., & Safitri, L. (2026). Beyond Digital Adoption: Curriculum Management for Integrating Islamic Values, Science, and Technology in Madrasah Transformation. *Al-Tanzim: Jurnal Manajemen Pendidikan Islam*, *10*(4), 1386-1399.

INTRODUCTION

Digital transformation, artificial intelligence, and the expansion of digitally mediated learning are reshaping what educational institutions are expected to provide (Hosna et al., 2025; Putri et al., 2026; Wahyani et al., 2025). Recent studies show that technology integration is most effective when it is connected to pedagogy, curricular purposes, teacher competence, and the learning context, rather than being treated as an isolated technical intervention (Consoli et al., 2023; Nagel et al., 2023; Fawaid et al., 2025; Najiburrahman et al., 2025). This shift requires curriculum management to become adaptive and to coordinate technological innovation with learning quality, ethical responsibility, and the development of students' broader competencies.

In Indonesia, these changes are particularly important for madrasahs because they combine national educational requirements with a distinctive Islamic mission. Recent scholarship on Islamic education curriculum reform indicates that curriculum development must respond to technological and social change while maintaining religious identity, character formation, and contextual relevance (Putri & Hamami, 2023; Rohman, 2024). Consequently, curriculum management in madrasahs cannot be reduced to adopting digital tools; it must also address how knowledge, values, teaching practices, assessment, and teacher development are coordinated.

Technology integration also depends strongly on teachers and organizational conditions. Research in international education journals indicates that teachers' digital competence, professional learning, collegial interaction, and institutional support influence the meaningful integration of technology into learning (Huang et al., 2022; Tzafilkou et al., 2023). Studies further show that school leadership and an innovative organizational climate can shape the conditions for technology integration, while unclear curriculum guidance, limited resources, and differences in teacher readiness may constrain implementation (Ninković et al., 2023; Stupurienė et al., 2024). These findings suggest that curriculum management should address both pedagogical practice and the organizational infrastructure that sustains it.

Within Islamic education, integrating religious values with science and technology presents an additional challenge. The curriculum must enable students to develop scientific and digital competencies without separating these competencies from ethical and spiritual formation. Recent studies of Islamic

education curriculum development in Indonesia emphasize the need to align curriculum content, learning processes, and institutional goals with changing social and technological conditions (Rohman, 2024; Sirojuddin et al., 2025). An integrative approach is therefore relevant when it encourages dialogue between Islamic values, scientific inquiry, and technological literacy rather than simply adding religious references to conventional subjects.

The empirical context of this study is important because curriculum integration is often discussed at the policy or classroom-practice levels. In contrast, less attention is given to the managerial process that connects planning, implementation, evaluation, supervision, and teacher development. Recent research on digitalized education likewise calls for context-sensitive analysis of how institutions organize technology adoption and sustain educational quality (Okoye et al., 2024). At the same time, research on teachers' technology integration shows that access to tools alone does not guarantee meaningful pedagogical change (Abedi, 2024; Consoli et al., 2023). This creates a research gap regarding how an Islamic secondary school integrates Islam, science, and technology into a coherent curriculum.

Against this background, the study focuses on the curriculum management practices implemented at MAN 2 Bogor. The study examines five interconnected dimensions: the current condition of curriculum management; the integration of Islamic values, science, and technology in learning; supporting and inhibiting factors; the integrative curriculum management process; and its contribution to educational competitiveness. The study is guided by the view that competitiveness in madrasahs should be understood broadly to encompass academic quality, character formation, digital competence, institutional adaptability, and public trust.

The study contributes empirically by presenting a context-based curriculum management framework for an Islamic secondary school undergoing digital transformation. Rather than proposing technology as an end in itself, the study demonstrates how curriculum planning, integrative instruction, evaluation, supervision, teacher development, and technology governance can be coordinated to support a madrasah's educational mission. The findings are expected to inform madrasah leaders and curriculum teams seeking to strengthen educational quality while preserving Islamic identity in a rapidly changing technological environment.

RESEARCH METHODS

This study employs a qualitative approach (Miles et al., 2020; Oranga & Matere, 2023) with a descriptive-analytical design to gain an in-depth understanding of the integrative curriculum management practices of Islam, science, and technology at MAN 2 Bogor. The qualitative approach was selected because it enables researchers to examine phenomena holistically, interpret meanings, and explore the dynamics of curriculum implementation in real contexts (Creswell & Creswell, 2018). The research was conducted at MAN 2 Bogor, which was purposively selected because it has actively developed an integrative curriculum that combines Islamic values, science, and technology in

response to the demands of twenty-first-century education. The selection was also based on the institution's readiness in educational policy, qualified human resources, digital infrastructure, and alignment with the university's research roadmap for knowledge integration and innovation in Islamic education. The participants were purposively selected for their direct involvement in curriculum management and implementation. They consisted of one principal, two vice principals responsible for curriculum and student affairs, eight teachers representing Islamic Religious Education, science, and technology-related subjects, ten students, and two school committee members, resulting in a total of 23 participants. These stakeholder groups were chosen to provide comprehensive perspectives on curriculum planning, implementation, evaluation, and the integration of Islamic values, science, and technology within the context of digital education transformation.

The research subjects included the principal, vice principal for curriculum, Islamic Education (PAI) teachers, science and technology teachers, digital infrastructure managers, students, and the madrasah committee as representatives of the community. The involvement of these stakeholders aimed to obtain a comprehensive understanding of the planning, implementation, and evaluation of the integrative curriculum. Data were collected through in-depth interviews, participatory observation, and documentation studies to explore curriculum management practices and verify the consistency between policy and implementation in the field (Creswell & Creswell, 2018). Data analysis followed the interactive model of Miles, Huberman, and Saldaña, consisting of four interconnected stages: data collection, data condensation, data display, and conclusion drawing and verification (Miles et al., 2014; Salmona & Kaczynski, 2024). The analytical process began concurrently with data collection through repeated readings of interview transcripts, field observation notes, and institutional documents to obtain a comprehensive understanding of the data. In the first stage, open coding was conducted by identifying meaningful units related to curriculum planning, implementation, evaluation, digital learning practices, and the integration of Islamic values, science, and technology. Similar codes were then grouped into broader analytical categories through axial coding, enabling the identification of relationships among curriculum management components. These categories included curriculum planning, curriculum implementation, curriculum evaluation, digital learning integration, stakeholder collaboration, and educational competitiveness.

The categorized data were subsequently synthesized through selective coding to generate overarching themes that reflected the integrative curriculum management practices implemented at MAN 2 Bogor. The final themes included: (1) strategic curriculum planning based on the integration of Islamic values, science, and technology; (2) implementation of digital learning within the framework of Islamic educational values; (3) collaborative curriculum evaluation and continuous improvement; and (4) institutional strategies for strengthening educational competitiveness in the context of digital transformation. The themes were continuously compared across multiple data sources using data triangulation, including interviews, classroom observations, and document analysis, to ensure consistency and credibility. Interpretations were developed

inductively by relating the empirical findings to relevant theoretical frameworks, including curriculum management theory, integrative curriculum concepts, and the Technological Pedagogical Content Knowledge (TPACK) framework. Throughout the analysis, conclusions were refined through an iterative verification process in which emerging interpretations were repeatedly compared with the original data until coherent and trustworthy findings were achieved. This systematic analytical procedure enhanced the transparency, dependability, and credibility of the qualitative findings by providing a clear audit trail from raw data to categories, themes, and final interpretations. To ensure trustworthiness, this study applied methodological and source triangulation, member checking, audit trail procedures, and peer debriefing to guarantee credible, objective, and academically accountable findings (Lincoln, 1990).

Credibility was strengthened through source and methodological triangulation, member checking, peer debriefing, and an audit trail. Interview statements were compared with observations and documents before being incorporated into the final themes. This procedure is particularly important because participants' perceptions of innovation can otherwise dominate qualitative findings about technology integration. The study therefore distinguishes between what participants reported, what researchers observed, and what institutional documents demonstrated. The resulting framework should be understood as an empirically grounded description of curriculum management in one madrasah, not as a statistically generalizable model.

Methodologically, the study used purposive participant selection to capture perspectives from different roles in curriculum management and implementation. The 23 participants comprised one principal, two vice principals, eight teachers from Islamic education, science, and technology-related subjects, ten students, and two madrasah committee members. Data were collected through interviews, participatory observation, and document analysis, allowing the researchers to compare reported practices with observed classroom activities and institutional records. The analytical process moved from open coding to category development and thematic synthesis, with attention to curriculum planning, implementation, evaluation, digital learning, stakeholder collaboration, and educational competitiveness.

RESULTS AND DISCUSSION

Results

The Current Condition of Curriculum Management

Based on interviews with the principal and teachers, as well as observations and document studies conducted at MAN 2 Bogor, it was found that curriculum management is implemented in reference to the madrasah's vision, namely "excellence in achievement and noble character." This vision serves as the foundation for developing learning programs and various educational activities within the madrasah. Observation results indicate that the learning process has utilized digital technology as part of the modernization of education. Teachers employ various learning media, such as PowerPoint presentations, projectors, and internet-based resources, during classroom instruction. The use of digital media also helps overcome the limited availability of textbooks in the madrasah.

At the curriculum planning stage, the madrasah conducts a needs analysis of students by considering the availability of facilities and infrastructure. The number of study groups (classes) becomes the basis for determining the quota for new student admissions each academic year. In the process of new student admissions, the madrasah forms an admission committee (PPDB) that manages the selection process through achievement-based, affirmative, and regular admission pathways. Based on interviews with the admission committee, both the achievement and affirmative pathways each have a quota of approximately 15% of the total student admissions. In addition, the madrasah conducts curriculum evaluations periodically every six months. The results of these evaluations are reported to the government as part of the supervision mechanism for implementing educational policies in the madrasah.

Table 1. Stages of Curriculum Management at MAN 2 Bogor

Management Stage	Main Activities	Data Source
Planning	Student needs analysis and determination of study groups	Interview with the principal
Implementation	Learning using digital media and interactive methods	Classroom observation
Evaluation	Curriculum evaluation every 6 months	Madrasah documentation
Supervision	Academic supervision and Teacher Performance Assessment (PKG)	Teacher interviews

In addition to curriculum evaluation, the madrasah also conducts academic supervision annually. The supervision is carried out by the principal together with senior teachers through several stages, namely preparation, classroom learning observation, and evaluation. The results of supervision and teacher performance assessments are then used as the basis for designing teacher professional development programs, such as training in digital learning, information technology training, and other competency development activities.

Integration of Islamic Values, Science, and Technology in Learning

Based on interviews with teachers and the principal as well as classroom observations, the findings indicate that Islamic values have been integrated into various subjects, both religious and general subjects. In religious subjects such as Fiqh, Islamic Cultural History (SKI), Qur'an-Hadith, and Aqidah Akhlak, Islamic values constitute the main component of the learning materials. Meanwhile, in general subjects such as mathematics and science, teachers relate the material to Islamic concepts. For example, in mathematics learning, teachers connect calculation concepts with inheritance law (mawaris) in Islam. In science lessons, teachers also relate natural phenomena to verses of the Qur'an. In addition to the integration of Islamic values, learning activities are also supported by digital technologies such as projectors, internet access, and interactive learning applications such as Kahoot and Quizizz.

Table 2. Forms of Integration of Islamic Values, Science, and Technology

Integration Aspect	Implementation in the Madrasah	Data Source
Integration of Islamic values	Linking lesson materials with Islamic values	Teacher interviews
Integration of science	Relating natural phenomena to Qur'anic verses	Classroom observation
Integration of technology	Use of projectors, internet, Kahoot, and Quizizz	Classroom observation

However, the use of smartphones by students is still restricted by madrasah policies. Smartphones are only allowed to be used during learning activities under teacher supervision.

Supporting and Inhibiting Factors in the Implementation of the Integrative Curriculum

Based on interviews with the principal and teachers, as well as observations in the madrasah environment, several factors were identified that both support and hinder the implementation of an integrative curriculum grounded in Islam, science, and technology.

Table 3. Supporting and Inhibiting Factors in the Implementation of the Integrative Curriculum

Factor	Description	Data Source
Leadership support	The principal supports the integration of Islamic values in learning	Interview
Teacher development	Workshops and periodic teacher training	Documentation
Technological facilities	Projectors in classrooms and internet access	Observation
Limited references	Library book collections still need updating	Observation
Digital competence	Some senior teachers still face difficulties using technology	Interview

The results of the study also indicate that approximately 90% of teachers have utilized technology in learning, although some teachers still require improvement in digital competence.

Integrative Curriculum Management Model

Based on interviews with the principal, the vice principal for curriculum, and teachers, the findings reveal that the curriculum management model at MAN 2 Bogor integrates the national curriculum with local needs and student characteristics. Curriculum development is carried out through work meetings and curriculum discussion forums involving teachers and madrasah leaders. In these forums, adjustments are made to learning materials so that they are more relevant to students' needs and developments in science and technology. Furthermore, in the learning process, teachers use a contextual approach, relating lesson materials to the social and cultural conditions of the surrounding community.

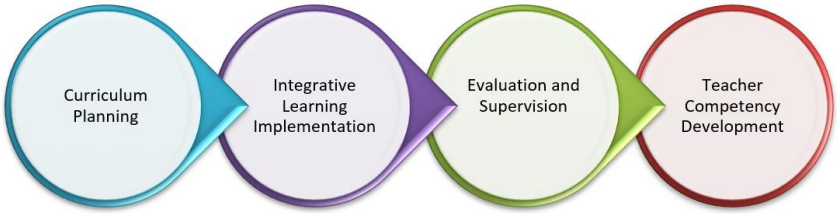

Figure 1. Integrative Curriculum Management Model at MAN 2 Bogor

Contribution of the Integrative Curriculum to Madrasah Competitiveness

Based on the research findings, the implementation of the integrative curriculum contributes to improving educational quality in three main aspects: academic achievement, character formation, and technological mastery.

Table 4. Contribution of the Integrative Curriculum to Madrasah Competitiveness

Aspect	Impact
Academic	Improves students' understanding of the interconnection between various fields of knowledge
Character	Strengthens students' moral and religious values
Technology	Enhances students' digital literacy

The research findings also indicate that the successful implementation of the integrative curriculum has increased public trust in the madrasah. This can be seen from the growing interest of the community in enrolling their children at the madrasah.

Discussion

The Current Condition of Curriculum Management

The findings show that curriculum management is organized as a continuous cycle of planning, implementation, evaluation, supervision, and professional development. Planning begins with student needs and institutional capacity and is translated into curriculum and learning programs through collaborative meetings. This pattern is consistent with recent evidence that digital transformation requires organizational coordination rather than isolated technology adoption (Okoye et al., 2024). Digital media are used to address instructional needs and expand access to learning resources, while evaluation and supervision provide feedback for subsequent improvement

The use of projectors, internet resources, Kahoot!, and Quizizz demonstrates that digital tools have become part of everyday instructional practice. However, the findings also show that technology is governed through rules for smartphone use. This is important because meaningful technology integration depends on pedagogical purpose, teacher competence, and institutional conditions rather than access alone (Consoli et al., 2023; Abedi, 2024). The madrasah's approach, therefore, combines technological opportunity with ethical regulation, positioning digital transformation as part of curriculum governance rather than simply the provision of equipment.

Integration of Islamic Values, Science, and Technology

The integration of Islamic values occurs in both religious and general subjects. Teachers connect mathematics with Islamic inheritance calculation and relate scientific phenomena to Qur'anic perspectives, while digital resources

support interactive learning. Recent studies of Islamic education curriculum reform emphasize the importance of aligning curriculum change with religious identity, contextual learning, and contemporary competencies (Putri & Hamami, 2023; Rohman, 2024). The present findings extend this discussion by showing that integration is operationalized through lesson content, teaching strategies, curriculum planning, and technology use.

Epistemic Balance

At the same time, integration should not reduce science to confirmation of religious texts. A stronger curriculum position is to allow dialogue between Islamic values and empirical inquiry so that students develop both ethical awareness and scientific reasoning. This interpretation is consistent with recent scholarship that frames curriculum reform as a process of balancing tradition with new educational demands (Rohman, 2024; Sirojuddin et al., 2025). Thus, the distinctive contribution of the madrasah lies not simply in adding Islamic references to science lessons, but in creating a coherent learning environment in which knowledge, values, and digital competencies interact.

Supporting and Inhibiting Factors

Leadership support, teacher workshops, digital infrastructure, and collaborative curriculum discussions are the principal enabling conditions identified in the study. These findings correspond with international evidence that teacher learning, professional agency, and organizational support are important for sustained technology integration (Huang et al., 2022; Nagel et al., 2023). Conversely, uneven teacher digital competence and limited learning resources remain constraints. Recent research also identifies teacher competence, resources, curriculum guidance, and institutional support as recurring conditions shaping technology integration (Tzafilkou et al., 2023; Stupurienė et al., 2024).

Integrative Curriculum Management Framework

The empirical model identified in this study can be represented as a cycle:

Figure 2. Integrative Curriculum Management Framework

The cycle links national curriculum requirements with student characteristics, local context, Islamic values, science, and technology. Its significance is managerial because integration is coordinated across several functions rather than assigned solely to individual teachers. The model also reflects evidence that digital transformation becomes more sustainable when curriculum guidance, professional learning, resources, and organizational processes reinforce one another (Ninković et al., 2023; Abedi, 2024).

Contribution to Educational Competitiveness

The findings suggest that the integrative curriculum contributes to competitiveness through three mutually reinforcing outcomes: stronger connections among fields of knowledge, reinforcement of Islamic character, and improved digital literacy. The increased public interest in the madrasah, as reported by participants, further suggests that institutional reputation may be strengthened when academic quality and distinctive values are evident in students' learning experiences. However, these contributions should be interpreted as qualitative indications rather than as measured causal effects, as the study did not employ standardized outcome indicators.

Overall, the study indicates that educational competitiveness in a digital era is better understood as an institutional capacity to adapt while preserving educational identity. The MAN 2 Bogor case demonstrates that technology can support this capacity when it is embedded in curriculum planning, teacher development, instructional practice, evaluation, and ethical governance. The findings therefore support a shift from a technology-centered perspective toward a curriculum-management perspective in which digital innovation, Islamic values, pedagogy, and continuous improvement are treated as interdependent components.

Taken together, the findings position curriculum management as the bridge between policy, institutional identity, and classroom practice. National curriculum requirements provide the formal structure, while local student needs and Islamic educational values provide contextual direction. Digital technology expands instructional possibilities, but teacher competence, leadership, supervision, and ethical governance determine how those possibilities are realized. This integrated perspective is consistent with recent research showing that digital transformation requires alignment among curriculum guidance, teacher knowledge, organizational support, and actual classroom practice (Abedi, 2024; Stupurienė et al., 2024). The model developed from the case therefore has practical relevance for other madrasahs facing similar pressures to modernize without losing their educational identity.

From an educational competitiveness perspective, the model's strongest contribution is its ability to differentiate the madrasah through a combination of academic learning, Islamic character, and digital competence. Public trust reported by participants should nevertheless be treated as an emerging qualitative indicator rather than a measured outcome. Competitiveness would be stronger if future evaluations included indicators such as student achievement, digital literacy, graduate progression, participation in innovation activities, and stakeholder satisfaction. The present study therefore provides an institutional framework and empirical explanation, while quantitative evidence of competitive advantage remains a direction for further research.

The integration of Islamic values with science and technology is also strengthened when teachers use contextual examples rather than treating religious knowledge and scientific knowledge as separate domains. The examples identified in the study, including the connection between mathematics and Islamic inheritance calculation and the interpretation of natural phenomena in relation to

Qur'anic verses, illustrate an effort to make learning meaningful within students' cultural and religious context. Recent studies of Islamic curriculum transformation similarly emphasize contextual adaptation and alignment between curriculum objectives, institutional identity, and contemporary educational demands (Putri & Hamami, 2023; Rohman, 2024). The managerial challenge is to ensure that such integration remains academically rigorous and does not replace scientific explanation with symbolic association.

The regulation of smartphone use provides a distinctive example of technology governance within an Islamic educational setting. The madrasah does not reject digital devices; instead, their use is permitted when connected to learning activities and supervised by teachers. This approach responds to the tension between the educational benefits of digital access and the need to maintain attention, discipline, and character development. Recent research on digital education emphasizes that sustainable digital transformation includes pedagogical, technological, infrastructural, and ethical dimensions (Okoye et al., 2024). The finding therefore suggests that digital policies in madrasahs should define not only what technologies are available but also when, why, and under what ethical conditions they are used.

Teacher competence remains a central issue in this transition. Some senior teachers reportedly have difficulty using technology, while other teachers independently develop their skills and resources. This variation is consistent with research showing that digital competence includes teaching preparation, delivery, assessment, professional development, school development, and educational innovation (Tzafilkou et al., 2023). It also supports findings that teachers' attitudes, self-efficacy, digital competence, and access to digital tools interact in shaping technology integration (Peng et al., 2023). The implication for curriculum management is that professional development should be differentiated according to teachers' actual competence and instructional needs.

The reported use of technology by approximately 90% of teachers indicates substantial institutional adoption, but the finding should not be interpreted as evidence that all technology use is pedagogically transformative. International research distinguishes between the presence of technology and the quality of its integration, particularly regarding cognitive engagement, collaboration, and student-centered learning (Consoli et al., 2023). The MAN 2 Bogor findings similarly show a mixture of presentation tools, online resources, and interactive applications. The next stage of development, therefore, lies in improving the pedagogical quality of technology use, not merely in increasing the number of teachers who use digital tools.

The evaluation cycle provides another important managerial mechanism. Curriculum evaluation is conducted every six months, while academic supervision and Teacher Performance Assessment are used to identify areas for teacher improvement. The findings indicate that professional development activities, including digital learning and information technology training, follow supervision. Such a cycle is consistent with recent evidence that professional learning and teacher agency are essential to sustained digital competence (Huang et al., 2022; Nagel et al., 2023). In this case, evaluation serves not only as a means

of accountability but also as a feedback mechanism for curriculum improvement and teacher capacity building.

The planning process also shows that curriculum management is connected to the madrasah's organizational capacity. Student admissions are determined in part by the availability of study groups and facilities, while a designated committee manages admission pathways. Although these procedures are administrative, they influence curriculum implementation because class size, infrastructure, and student characteristics determine the conditions under which learning can be organized. This finding reinforces the view that curriculum management should be understood as an institutional process that links resource planning, student needs, and instructional design, rather than as the preparation of curriculum documents alone.

CONCLUSION

This study demonstrates that integrative curriculum management can strengthen educational competitiveness when Islamic values, science, and technology are coordinated through a continuous cycle of planning, implementation, evaluation, supervision, and teacher development. At the madrasah, Islamic values are contextualized across religious and general subjects, while digital tools support interactive learning and are governed through policies that balance innovation with character formation. Leadership support, professional development, and digital infrastructure enable implementation, whereas uneven teacher digital competence and limited learning resources remain constraints. The main implication is that digital transformation in Islamic education should be managed as a coherent curriculum process rather than as technology adoption alone, aligning pedagogical innovation, Islamic identity, teacher capacity, ethical governance, and continuous improvement.

ACKNOWLEDGMENT

The authors would like to express their sincere appreciation and gratitude to the Rector and faculty members of Institut Ummul Quro Al Islami Bogor for their institutional support, facilitation, and cooperation throughout the implementation of this research. The authors also extend their thanks to all stakeholders who participated in and contributed to the smooth conduct of the study, particularly during data collection and the provision of relevant information.

REFERENCES

Abedi, E. A. (2024). Tensions Between Technology Integration Practices of Teachers and ICT in Education Policy Expectations: Implications for Change in Teacher Knowledge, Beliefs and Teaching Practices. *Journal of Computers in Education, 11*, 1215–1234. https://doi.org/10.1007/s40692-023-00296-6

Area-Moreira, M., Rodríguez-Rodríguez, J., Peirats-Chacón, J., & Santana-Bonilla, P. (2023). The Digital Transformation of Instructional Materials: Views and Practices of Teachers, Families and Editors. *Technology, Knowledge and Learning, 28*, 1661–1685. https://doi.org/10.1007/s10758-023-09664-8

Consoli, T., Désiron, J. C., & Cattaneo, A. A. P. (2023). What Is "Technology Integration" and How Is It Measured in K-12 Education? A Systematic Review of Survey Instruments from 2010 to 2021. *Computers & Education, 197*, 104742. https://doi.org/10.1016/j.compedu.2023.104742

Creswell, J. W., & Creswell, J. D. (2018). *Research Design: Qualitative, Quantitative, and Mixed Methods Approaches* (5th ed.). SAGE.

Fawaid, A., Hamzah, M., Rohimah, Munawwaroh, I., & Putri, D. F. (2025). AI-Based Career Management to Improve the Quality of Decision Making in Higher Education. *2025 15th IEEE Integrated STEM Education Conference (ISEC 2025)*, 1–8. https://doi.org/10.1109/ISEC64801.2025.11147274

Hosna, R., Qusyairi, L. A. H., Mualimin, M., Fauzi, A., & Putri, D. F. (2025). Utilization of Digital Advertising Strategy in Marketing Educational Programs. *2025 11th International Conference on Education and Technology (ICET)*, 34–39. https://doi.org/10.1109/ICET67257.2025.11290729

Huang, X., Lai, C., Sun, M., & Sun, C. (2022). Associations of Different Types of Informal Teacher Learning with Teachers' Technology Integration Intention. *Computers & Education, 190*, 104604. https://doi.org/10.1016/j.compedu.2022.104604

Lincoln, Y. S., & Guba, E. G. (1990). *Naturalistic Inquiry*. SAGE.

Liu, X., & Zhong, B. (2024). A Systematic Review on How Educators Teach AI in K-12 Education. *Educational Research Review, 45*, 100642. https://doi.org/10.1016/j.edurev.2024.100642

Miles, M. B., Huberman, A. M., & Saldaña, J. (2014). *Qualitative Data Analysis: A Methods Sourcebook* (3rd ed.). SAGE.

Miles, M., Huberman, M., & Saldaña, J. (2020). *Qualitative Data Analysis: A Methods Sourcebook* (4th ed.). Sage Publications, Inc.

Nagel, I., Guðmundsdóttir, G. B., & Afdal, H. W. (2023). Teacher Educators' Professional Agency in Facilitating Professional Digital Competence. *Teaching and Teacher Education, 132*, 104238. https://doi.org/10.1016/j.tate.2023.104238

Najiburrahman, N., Zamroni, Z., Novita, L., Nuryani, L. K., & Qushwa, F. G. (2025). Local Values as a Catalyst for Technology Integration in Quality Assurance. *2025 15th IEEE Integrated STEM Education Conference (ISEC 2025)*, 1–8. https://doi.org/10.1109/ISEC64801.2025.11147290

Ninković, S., Knežević Florić, O., & Momčilović, M. (2023). Multilevel Analysis of the Effects of Principal Support and Innovative School Climate on the Integration of Technology in Learning Activities. *Computers & Education, 202*, 104833. https://doi.org/10.1016/j.compedu.2023.104833

Okoye, K., & Hosseini, S. (2024). Analyzing the Impact of Digitized-Education Toward the Future of Education: A Comparative Study Based on Students' Evaluation of Teaching Data. *Studies in Educational Evaluation, 82*, 101359. https://doi.org/10.1016/j.stueduc.2024.101359

Oranga, J., & Matere, A. (2023). Qualitative Research: Essence, Types and Advantages. *Open Access Library Journal, 10*(12), 1–9. https://doi.org/10.4236/oalib.1111001

Peng, R., Abdul Razak, R., & Hajar Halili, S. (2023). Factors Influencing In-Service Teachers' Technology Integration Model: Innovative Strategies for Educational Technology. *PLOS ONE, 18*(8), e0286112. https://doi.org/10.1371/journal.pone.0286112

Putri, D. F., Jali, H. Bin, & Maulidy, A. (2026). Generative AI Policy-Oriented Framework for Risk-Aware Technology Management in Higher Education E-Platforms. *2026 International Conference on Enterprise and Industrial System (ICOEINS)*, 1–7. https://doi.org/10.1109/ICOEINS69996.2026.11605438

Putri, L. A., & Hamami, T. (2023). The Islamic Religious Education Curriculum Towards Globalization of Education: A Study on the Dynamics and Implications of Curriculum Changes. *Muslim Education Review, 2*(2), 249–274. https://doi.org/10.56529/mer.v2i2.199

Rohman, A. (2024). Challenges in Islamic Education Curriculum Development: A Comparative Study of Indonesia, Pakistan, and India. *International Journal of Learning, Teaching and Educational Research, 23*(6), 504–523. https://doi.org/10.26803/ijlter.23.6.23

Salmona, M., & Kaczynski, D. (2024). Qualitative Data Analysis Strategies. In *How to Conduct Qualitative Research in Finance* (pp. 80–96). Edward Elgar Publishing. https://doi.org/10.4337/9781803927008.00012

Sirojuddin, A., Maskuri, Ghoni, J., & Hosna, R. (2025). Integration of Islamic Boarding School and Higher Education Curriculum from a Multicultural Islamic Education Perspective. *Al-Tadzkiyyah: Jurnal Pendidikan Islam, 16*(1), 107–128. https://doi.org/10.24042/002025162646300

Stupurienė, G., Lucas, M., & Bem-Haja, P. (2024). Teachers' Perceptions of the Barriers and Drivers for the Integration of Informatics in Primary Education. *Computers & Education, 208*, 104939. https://doi.org/10.1016/j.compedu.2023.104939

Tzafilkou, K., Perifanou, M., & Economides, A. A. (2023). Assessing Teachers' Digital Competence in Primary and Secondary Education: Applying a New Instrument to Integrate Pedagogical and Professional Elements for Digital Education. *Education and Information Technologies, 28*, 16017–16040. https://doi.org/10.1007/s10639-023-11848-9

Wahyani, W., Ilyasin, M., Jumatriadi, J., & Hasanah, R. (2025). Enhancing Lecturers' Career Adaptability Through AI-Driven Quality Control Systems: A Human-Tech Synergy Perspective. *2025 11th International Conference on Education and Technology (ICET)*, 417–421. https://doi.org/10.1109/ICET67257.2025.11290724

Yani, Y. I., Nasution, W. N., & Halimah, S. (2025). Implementation of the Merdeka Curriculum in Islamic Religious Education and Character Education: A Multisite Study at SMA Negeri 1 and 2 Sibolga. *Jurnal Pendidikan Islam, 14*(1), 35–49. https://doi.org/10.14421/jpi.2025.141.35-49