

Digital-Based Madrasah Examination Management: A Case Study of MAN 3 Palembang, Indonesia

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Abstract: This study aims to examine how digital-based examination management is planned, implemented, and evaluated in an Islamic secondary education context by focusing on a case study at MAN 3 Palembang, Indonesia. Conceptualizing digital assessment as a managerial process, this research adopts a qualitative case study design. Data were collected through in-depth interviews, observations, and document analysis involving school leaders, examination committee members, teachers, and technical staff. The data were analyzed using thematic analysis to capture managerial patterns across planning, implementation, and evaluation stages. The findings reveal that digital-based examinations at MAN 3 Palembang are institutionally governed practices rather than isolated technological interventions. The planning stage demonstrates strategic integration of digital examinations into the madrasah's academic management framework through collaborative decision-making, leadership involvement, risk anticipation, and resource preparation. Implementation findings indicate that examination integrity, pedagogical alignment, and student adaptation are maintained through coordinated roles among teachers, examination committees, and technical personnel. The evaluation stage functions as a mechanism for continuous improvement, supporting data-informed decision-making, accountability, and organizational learning. The novelty of this study lies in its managerial focus on digital examination practices within a madrasah context, extending existing research that predominantly emphasizes technological effectiveness or student perceptions. Practically, the study highlights the importance of embedding digital examinations within governance structures, strengthening leadership coordination, and institutionalizing evaluation practices. The study contributing to literature on digital governance in faith-based educational institutions by providing context-sensitive insights into how digital examinations are sustainably managed in Islamic secondary education institutions.

Keywords: Digital Assessment, Digital Examination Management, Educational Governance, Madrasah Education, Qualitative Case Study

A. Introduction

The rapid advancement of digital technologies has profoundly transformed educational systems worldwide, particularly in the area of assessment and evaluation. Digital-based examinations, including online tests and computer-based tests (CBT), are increasingly adopted as alternatives to conventional paper-based examinations because they offer higher efficiency, scalability, and alignment with twenty-first-century learning competencies (Butler-henderson & Crawford, 2020). Digital assessment is also recognized as a key element of modern education systems that enables more flexible and data-driven evaluation practices (Egarter et al., 2020). At the global policy level, international organizations emphasize that digital assessment plays a strategic role in strengthening transparency, accountability, and institutional decision-making within digital education ecosystems (OECD, 2023).

Alongside these developments, educational governance has undergone significant transformation as digitalization reshapes how institutions are managed and led. Digital transformation is no longer understood merely as a technological upgrade but as a comprehensive managerial process that affects leadership practices, organizational culture, and policy implementation (Patil, 2024). In the school context, digital transformation requires governance structures that support coordination, sustainability, and innovation across institutional levels (Tømte & Smedsrud, 2023). Empirical evidence suggests that effective digital transformation depends on leadership capacity and strategic management that align technological initiatives with institutional goals (Sanginés & Ramírez, 2023). Furthermore, digital leadership has been shown to influence organizational performance by fostering innovation and adaptive work practices (Wang et al., 2025).

Within this broader transformation, examination management has emerged as a strategic domain where technology, governance, and educational leadership intersect. Research on digital examinations has expanded rapidly, addressing issues such as system effectiveness, assessment validity, and academic integrity. A systematic review of online examinations indicates that digital assessment systems can improve efficiency and accessibility, although they also raise concerns related to infrastructure readiness and security (Butler-henderson & Crawford, 2020). The implementation of digital proctoring further highlights managerial challenges associated with maintaining trust, fairness, and compliance in technology-mediated assessments (Han et al., 2025).

Beyond technical and managerial aspects, psychological factors play a crucial role in shaping the effectiveness of digital examinations. Studies demonstrate that students' experiences of electronic testing environments can influence their emotional engagement and learning outcomes (Lu et al., 2024). Research conducted in higher education contexts shows that familiarity with electronic examinations significantly affects students' test anxiety and academic performance (Al-Kaabi & Altae, 2024).

These findings reinforce the view that digital examinations should be understood as socio-technical systems that require careful management rather than as purely technological tools.

Despite the growing international literature, research on digital examination management remains unevenly distributed across educational contexts. Most existing studies focus on higher education or general schooling systems in Western or secular settings. Faith-based educational institutions, particularly Islamic secondary education such as madrasahs, remain underrepresented in empirical studies on digital assessment management. Madrasahs operate within distinctive organizational, cultural, and regulatory frameworks that may shape how digital innovations are planned, implemented, and evaluated. Recent studies on digital madrasahs primarily emphasize leadership strategies and institutional readiness in teaching and learning processes rather than in assessment management (As-shodiq et al., 2025). Similarly, research on digital madrasah implementation tends to address instructional transformation while giving limited attention to examination governance (Yamin & Sanuri, 2024).

In Indonesia, the urgency of digital transformation in assessment has intensified following national policy changes, including the abolition of the National Examination and the decentralization of evaluation authority to schools and madrasahs. This policy shift places greater responsibility on educational institutions to design and manage credible, transparent, and accountable examination systems. Digital-based examinations are increasingly viewed as a practical response to these demands, yet their success depends on effective management across planning, implementation, and evaluation stages.

From a managerial perspective, digital examination systems require coordination across multiple dimensions, including technological infrastructure, human resources, and organizational procedures. Research on data governance in education emphasizes that digital assessment systems must be supported by clear policies regarding data security, access, and accountability to ensure institutional trust and sustainability (Medeiros et al., 2025). In addition, studies on digitization in educational management suggest that digital transformation reshapes managerial roles by requiring leaders to engage in strategic planning, continuous monitoring, and adaptive decision-making (Pacheco et al., 2025).

However, much of the existing research treats digital examinations as isolated technological interventions rather than as managed organizational processes. Studies on technology acceptance and self-efficacy in digital examinations highlight individual-level factors influencing adoption but provide limited insight into institutional management mechanisms (Aris et al., 2025). Research on student perceptions of computer-based and online examinations similarly tends to emphasize user experiences, familiarity, and perceived outcomes, while giving limited attention

to how examination systems are systematically organized and governed at the institutional level (Domínguez-figaredo et al., 2025). This gap is particularly evident in madrasah contexts, where digital assessment initiatives often develop alongside broader digitalization agendas but lack systematic documentation.

MAN 3 Palembang represents a relevant case for examining digital-based examination management in Islamic secondary education. As a public madrasah that has adopted digital examination systems, MAN 3 Palembang provides an opportunity to explore how digital assessments are managed in practice, including decision-making processes, operational implementation, and evaluative mechanisms. Examining these processes is important because digital examinations reflect not only assessment practices but also institutional managerial capacity and readiness for digital transformation.

This study conceptualizes digital examination management as a managerial process rather than solely a technological implementation. Using a qualitative case study approach, the research examines digital-based examination management at MAN 3 Palembang through three interrelated dimensions: planning, implementation, and evaluation. This approach responds to calls for more context-sensitive and management-oriented analyses of digital assessment practices in educational institutions (Tømte & Smedsrud, 2023).

The novelty of this study lies in its focus on digital examination management within a madrasah context and its integration of educational management, digital governance, and assessment perspectives. Unlike prior studies that emphasize system effectiveness or user perceptions alone, this research provides an in-depth institutional analysis of how digital examinations are organized and evaluated. By situating the findings within broader discussions on educational governance and digital leadership, the study contributes to international scholarship on digital transformation in secondary education.

Accordingly, this study addresses the following research question: How is digital-based examination management planned, implemented, and evaluated in MAN 3 Palembang? The findings are expected to contribute theoretically to the literature on educational management and digital assessment while offering practical implications for policymakers, school leaders, and madrasah administrators seeking to implement sustainable and accountable digital examination systems.

B. Methods

Research Design

This study employed a qualitative research approach using a case study design to examine the management of digital-based examinations in a madrasah context.

Qualitative case studies are particularly appropriate for exploring complex managerial processes within real-life institutional settings, where boundaries between phenomena and context are not clearly evident (Taylor et al., 2024). This design enabled an in-depth understanding of how digital examination management is planned, implemented, and evaluated at the institutional level rather than measuring outcomes in a controlled environment. The case study approach was selected to capture the contextual specificity of MAN 3 Palembang as an Islamic secondary education institution implementing digital-based examinations. Case studies allow researchers to investigate organizational practices holistically and to generate rich, context-sensitive insights that may inform theory development in educational management (Xu & Zammit, 2020).

Research Site and Participants

The research site was MAN 3 Palembang, a public madrasah that has implemented digital-based examination systems as part of its assessment practices. The selection of MAN 3 Palembang was based on its relevance to the research focus, institutional readiness for digital assessment, and accessibility for in-depth qualitative inquiry, consistent with context-sensitive case study research in educational settings (Taylor et al., 2024). Participants included key stakeholders such as the madrasah principal, vice principals, examination committee members, information technology staff, and subject teachers involved in administering digital examinations. Purposeful sampling was employed to ensure the inclusion of participants with direct involvement and substantial experience in digital examination management, enabling the collection of information-rich data relevant to the research objectives (Bouncken et al., 2025).

Data Collection Techniques

Data were collected through semi-structured interviews, document analysis, and limited observations related to the implementation of digital examinations. Semi-structured interviews were used to explore participants' perspectives on planning, implementation, and evaluation processes, while allowing flexibility to probe emerging themes during the interview process. Semi-structured interviews are widely used in qualitative educational research to capture participants' experiences and interpretations in depth (Taylor et al., 2024). Document analysis included examination guidelines, standard operating procedures, internal reports, and policy documents related to digital examinations at the madrasah. Document analysis provided complementary evidence to interview data and supported data triangulation by revealing formal managerial structures and procedures that guide examination practices (Elliott, 2018).

Data Analysis

Data analysis followed a thematic analysis approach, which involved systematically identifying, analyzing, and interpreting patterns within the qualitative data. Thematic analysis was selected due to its flexibility and suitability for examining organizational and managerial processes in educational settings (Naeem et al., 2024). Interview transcripts and documents were coded iteratively to capture recurring concepts related to planning, implementation, and evaluation of digital examinations. The coding process began with open coding to identify initial categories, followed by axial coding to establish relationships between themes. This process enabled the development of analytical themes that reflected institutional practices and managerial dynamics in digital examination management (Elliott, 2018). Thematic analysis allowed the study to move beyond descriptive accounts toward interpretive insights aligned with the research objectives (Xu & Zammit, 2020).

Trustworthiness of the Study

To ensure the trustworthiness of the findings, the study applied credibility, dependability, and confirmability strategies commonly used in qualitative research. Data triangulation was conducted by comparing interview data with documentary evidence to enhance credibility and reduce potential bias (Taylor et al., 2024). Prolonged engagement with the research site also supported a deeper understanding of institutional practices. Dependability was addressed by maintaining a clear audit trail of data collection and analysis procedures, allowing the research process to be traced and reviewed systematically. Confirmability was enhanced by grounding interpretations in empirical data and maintaining reflexivity throughout the research process to minimize researcher subjectivity (Naeem et al., 2024).

Ethical Considerations

Ethical considerations were carefully addressed throughout the research process. Informed consent was obtained from all participants prior to data collection, and participants were informed of the purpose of the study and their right to withdraw at any time. Anonymity and confidentiality were ensured by using pseudonyms and limiting access to research data to the researcher only. Ethical conduct in qualitative educational research is essential to protect participants and maintain research integrity (Taylor et al., 2024).

C. Results and Discussion

This section presents and discusses the findings of the study on digital-based examination management at MAN 3 Palembang. The results are organized according to three managerial dimensions: planning, implementation, and evaluation. These dimensions reflect the core functions of educational management and provide a

comprehensive understanding of how digital examinations are organized, coordinated, and governed at the institutional level. By integrating empirical findings with relevant literature, this section highlights how digital examination management operates as a structured managerial process rather than a purely technological intervention.

In addition, organizing the findings according to managerial dimensions allows the study to move beyond descriptive reporting toward analytical interpretation. By structuring the results around planning, implementation, and evaluation, the analysis reflects classical and contemporary management functions that remain relevant in digitally mediated educational environments. This structure also facilitates comparison with prior studies on digital transformation in education, which emphasize that managerial coherence across stages is essential for ensuring system reliability and institutional legitimacy (OECD, 2023). Consequently, the results presented here should be interpreted not as isolated practices but as interconnected managerial processes.

The findings demonstrate that digital examinations at MAN 3 Palembang are embedded within institutional governance mechanisms, involving leadership decision-making, organizational coordination, and reflective evaluation practices. This integrated approach supports the argument that digital transformation in education must be understood as an organizational and managerial process shaped by institutional context (Patil, 2024).

Digital-Based Examination Planning

The findings indicate that digital-based examination planning at MAN 3 Palembang is conducted through a structured and collaborative process involving school leadership, examination committees, and technical staff. Planning activities include the determination of examination schedules, selection of digital platforms, preparation of examination procedures, and allocation of human and technological resources. This planning process demonstrates that digital examinations are treated as an institutional program rather than a standalone technological tool, aligning with the view that digital transformation in education requires systematic managerial coordination (Patil, 2024).

From a managerial perspective, planning functions as a **strategic stage** where institutional priorities, risk mitigation, and operational feasibility are negotiated. Unlike ad hoc technology adoption, the planning process at MAN 3 Palembang reflects deliberate managerial control aimed at ensuring examination credibility and continuity. This supports broader arguments in educational governance literature that effective digital initiatives are characterized by early-stage coordination and institutional ownership (Wang et al., 2025).

A key aspect of the planning stage is leadership involvement. The madrasah principal and vice principals play a central role in setting policy directions and ensuring alignment between digital examination practices and institutional goals. This finding supports research emphasizing that leadership commitment is critical for the successful governance of digital initiatives in educational institutions (Tømte & Smedsrud, 2023). At MAN 3 Palembang, leadership engagement is reflected in formal meetings, the issuance of internal guidelines, and continuous supervision of examination preparations.

Leadership involvement also contributes to legitimizing digital examinations among teachers and staff. When digital assessment is framed as a leadership-driven institutional agenda rather than a technical experiment, stakeholders are more likely to perceive it as a credible and sustainable practice. This finding resonates with studies highlighting that leadership plays a symbolic and practical role in shaping organizational readiness for digital transformation (Wang et al., 2025).

Infrastructure readiness also emerges as a major consideration in the planning process. The examination committee assesses the availability of computer devices, network stability, and backup systems prior to implementation. This cautious approach reflects awareness of technical risks commonly associated with digital examinations, such as system failure or connectivity disruptions, which have been widely documented in the literature (Butler-henderson & Crawford, 2020). By anticipating these challenges, the madrasah attempts to minimize operational risks during examination periods. This emphasis on infrastructure readiness illustrates a shift from reactive to preventive management, where potential failures are addressed at the planning stage. Such an approach aligns with international findings that infrastructure preparedness is a key determinant of digital examination success, particularly in contexts with uneven technological resources (Butler-henderson & Crawford, 2020).

Human resource preparation constitutes another critical planning component. Teachers and technical staff receive orientation on examination procedures and system operation, ensuring that all stakeholders understand their roles and responsibilities. This finding resonates with studies highlighting that user readiness and institutional capacity are decisive factors in the adoption of technology-based examinations (Egarter et al., 2020). Planning at MAN 3 Palembang thus extends beyond technical preparation to include organizational readiness.

From a management perspective, the planning practices observed indicate a shift toward strategic digital assessment management. Rather than merely adopting technology, the madrasah integrates digital examinations into its broader academic management framework. This supports the argument that digital assessment planning must be embedded within institutional governance structures to achieve sustainability and accountability (Patil, 2024). Another important aspect emerging

from the planning phase is the role of collective decision-making. Planning activities at MAN 3 Palembang are not concentrated in a single administrative unit but distributed across leadership, examination committees, and technical staff. This distributed approach reflects principles of participatory governance, which are increasingly recognized as necessary for managing complex digital initiatives. By involving multiple stakeholders, participatory planning helps integrate diverse perspectives, reduce organizational resistance, and strengthen shared ownership of digital examination programs (Tømte & Smedsrud, 2023).

The planning process also reveals how institutional experience shapes digital assessment strategies. Participants indicated that planning decisions were informed by reflections on previous examination cycles, including both technical challenges and procedural successes. This experiential learning dimension supports arguments that digital transformation is cumulative rather than linear, requiring institutions to continuously adapt strategies based on contextual feedback (Tømte & Smedsrud, 2023).

From a risk management perspective, planning at MAN 3 Palembang demonstrates anticipatory governance. By identifying potential technical and organizational risks early, the institution reduces uncertainty during high-stakes examination periods. This finding aligns with studies emphasizing that risk anticipation and contingency planning are core components of effective digital governance in education (Patil, 2024). Planning thus functions not only as preparation but as institutional risk mitigation. Moreover, planning practices reflect an awareness of accountability demands. Digital examinations generate data trails that increase institutional visibility and scrutiny. By formalizing procedures and documentation at the planning stage, the madrasah strengthens its accountability mechanisms, ensuring that examination processes can be justified to internal and external stakeholders. This observation resonates with international discussions on transparency and accountability in digital education ecosystems (Medeiros et al., 2025).

Implementation of Digital-Based Examinations

The implementation stage reveals how planned strategies are translated into operational practices during examination periods. At MAN 3 Palembang, digital examinations are administered using computer-based systems under supervised conditions. Examination committees coordinate room arrangements, system access, and technical support to ensure smooth execution. This structured implementation reflects an effort to balance technological efficiency with procedural control.

One notable finding is the emphasis on maintaining examination integrity. Proctoring mechanisms, including supervision by teachers and monitoring of system activity, are implemented to reduce academic misconduct. This practice aligns with research on digital proctoring, which emphasizes the importance of combining technological

controls with human oversight to maintain trust in digital assessment systems (Han et al., 2025). The madrasah's approach suggests an understanding that technology alone cannot fully guarantee examination integrity.

The presence of teachers as supervisors also reinforces the pedagogical legitimacy of digital examinations. Rather than delegating assessment entirely to technology, the madrasah maintains human involvement to uphold academic norms and ethical standards. This finding supports literature arguing that trust in digital assessment systems depends on visible institutional responsibility (Domínguez-figaredo et al., 2025). Technical support plays a crucial role during implementation. IT staff are present throughout examination sessions to address potential system issues promptly. This readiness reflects lessons from previous studies indicating that technical disruptions are among the most significant barriers to effective digital examinations (Butler-henderson & Crawford, 2020). By ensuring immediate technical assistance, MAN 3 Palembang enhances system reliability and user confidence. Teacher involvement during implementation extends beyond supervision. Teachers are responsible for ensuring that examination content aligns with curriculum standards and learning objectives. This finding highlights that digital examinations remain pedagogical instruments, not merely administrative processes. Such integration of pedagogy and technology supports the argument that effective digital assessment requires alignment between instructional design and assessment practices (Correia et al., 2025).

Student responses to digital examinations, as reported by participants, are generally positive, particularly regarding efficiency and clarity of procedures. However, some students experience initial anxiety related to unfamiliarity with the digital format. This observation is consistent with studies showing that test anxiety in digital environments is influenced by students' prior experience and familiarity with electronic testing systems (Al-Kaabi & Altae, 2024).

The madrasah addresses this issue by conducting trial examinations prior to high-stakes assessments. These simulations function as adaptive mechanisms that help students develop confidence and technical familiarity. This practice reflects a learner-centered management approach and supports findings that preparatory exposure can mitigate anxiety in digital assessment contexts (Lu et al., 2024). Overall, the implementation findings demonstrate that digital examinations at MAN 3 Palembang are managed as coordinated institutional activities. This supports the view that successful digital assessment implementation depends on the interaction between technological systems, human actors, and organizational procedures (Domínguez-figaredo et al., 2025).

Implementation practices at MAN 3 Palembang also reveal the importance of coordination across functional roles. Examination committees, teachers, and IT staff operate interdependently, requiring clear communication and role delineation. This

coordination supports the view that digital examinations are socio-technical systems in which technical performance depends heavily on human and organizational interaction (Domínguez-figaredo et al., 2025). The findings further indicate that implementation success is shaped by institutional routines. Standard operating procedures guide examination supervision, system access, and contingency responses. These routines reduce ambiguity and enhance consistency across examination sessions, contributing to procedural fairness. Such routinization is consistent with research suggesting that institutionalized procedures are essential for sustaining digital assessment practices beyond pilot stages (Han et al., 2025).

Importantly, implementation practices demonstrate sensitivity to student experience. Although digital examinations are institutionally managed, attention is given to students' emotional responses and adaptability. By incorporating trial examinations and gradual exposure, the madrasah mitigates anxiety while maintaining assessment standards. This balance reflects a managerial approach that integrates efficiency with student well-being, echoing findings on emotional engagement in digital assessment environments (Lu et al., 2024). Implementation also functions as a site of organizational learning. Technical issues encountered during examinations are immediately documented and discussed among staff. This real-time problem-solving fosters adaptive capacity and supports the argument that digital transformation requires ongoing managerial learning rather than one-time implementation (Wang et al., 2025).

Evaluation of Digital-Based Examination Management

Evaluation constitutes the final managerial dimension examined in this study. At MAN 3 Palembang, evaluation of digital examinations is conducted through formal meetings, technical reports, and reflective discussions among stakeholders. Evaluation focuses on system performance, procedural effectiveness, and stakeholder feedback. This practice reflects an understanding of evaluation as a tool for continuous improvement rather than mere compliance.

One significant finding is the use of evaluation results to inform future planning. Identified issues, such as minor technical disruptions or procedural inefficiencies, are documented and addressed in subsequent examination cycles. This feedback loop aligns with principles of data-driven decision-making emphasized in digital education governance literature (OECD, 2023). Through systematic evaluation, the madrasah enhances its capacity to refine digital examination practices over time.

Data management and security are also considered during evaluation. Examination data are reviewed to ensure accuracy, confidentiality, and appropriate access. This attention to data governance supports findings from studies emphasizing that digital assessment systems require clear policies on data protection and accountability to maintain institutional trust (Medeiros et al., 2025). The madrasah's evaluation

practices thus extend beyond technical performance to include ethical and governance considerations.

Evaluation findings also inform professional development initiatives. Teachers and staff receive feedback on their roles during examination implementation, which contributes to organizational learning. This aligns with research suggesting that digital transformation reshapes managerial roles and requires continuous capacity building among educational personnel (Pacheco et al., 2025). Evaluation at MAN 3 Palembang therefore functions as a mechanism for institutional learning. Despite these strengths, the evaluation process remains primarily internal. External benchmarking or comparative evaluation with other institutions is limited. This finding suggests an area for further development, as comparative evaluation can enhance institutional learning and innovation in digital assessment management (Sanginés & Ramírez, 2023). Nevertheless, the existing evaluation practices demonstrate a commitment to reflective management.

Evaluation practices at MAN 3 Palembang further illustrate the role of reflection in sustaining digital examination management. Evaluation meetings provide a structured space for stakeholders to critically assess both technical and procedural dimensions. This reflective practice aligns with perspectives that view evaluation as a formative managerial tool rather than a summative administrative requirement (Sanginés & Ramírez, 2023). Another dimension of evaluation concerns institutional memory. Documentation of evaluation outcomes enables the madrasah to build a repository of organizational knowledge related to digital examinations. This institutional memory supports continuity, particularly in contexts where staff rotation or policy changes may occur. Such documentation practices are consistent with studies highlighting the importance of knowledge management in digital governance (Medeiros et al., 2025).

Evaluation also reinforces accountability relationships. By reviewing examination outcomes and processes, leadership can assess whether digital assessments align with institutional standards and ethical expectations. This reinforces trust among stakeholders and legitimizes digital examination practices within the madrasah community. Trust, as emphasized in governance literature, is a critical factor in the sustainability of digital initiatives (Patil, 2024). Furthermore, the evaluation phase highlights limitations that open avenues for improvement. The limited use of external benchmarking suggests that digital examination management remains internally focused. While internal evaluation strengthens institutional coherence, comparative insights could enhance innovation and responsiveness. This finding supports arguments that external collaboration and benchmarking can accelerate learning in digital education systems (Sanginés & Ramírez, 2023).

Taken together, the findings illustrate that digital-based examination management at MAN 3 Palembang operates as an integrated managerial process encompassing

planning, implementation, and evaluation. This integration supports arguments in the literature that digital transformation in education is fundamentally an organizational and governance issue rather than solely a technological one (Patil, 2024). Compared with previous studies that focus primarily on student perceptions or system effectiveness, this study highlights the importance of managerial coordination and institutional governance in digital assessment. While studies on technology acceptance emphasize individual user readiness, the findings here demonstrate that institutional structures and leadership play a decisive role in shaping digital examination practices (Wang et al., 2025).

The madrasah context adds further significance to these findings. Islamic secondary education institutions operate within unique cultural and regulatory frameworks, which influence how digital innovations are adopted and managed. This study complements existing research on digital madrasahs by extending the focus from instructional practices to assessment management, addressing a gap identified in prior literature (As-shodiq et al., 2025). Moreover, the findings support the view that digital examinations should be conceptualized as socio-technical systems. Technical infrastructure, human resources, and organizational policies interact dynamically, shaping examination outcomes and institutional capacity. This perspective aligns with broader discussions on digital governance and sustainable innovation in education (Tømte & Smedsrud, 2023).

When situated within the broader literature, the findings underscore the distinctive contribution of this study. Many prior studies emphasize technological acceptance or student satisfaction, often treating management implicitly. In contrast, this study foregrounds management as the central analytical lens, demonstrating how leadership, coordination, and evaluation shape digital examination outcomes. This perspective complements and extends existing research on digital leadership and institutional innovation (Wang et al., 2025).

The madrasah context further enriches this contribution. As Islamic educational institutions navigate both national education policies and religious-cultural expectations, management decisions regarding digital assessment carry additional layers of complexity. The findings suggest that digital transformation in madrasahs is mediated by institutional values and governance traditions, reinforcing the need for contextually grounded research (As-shodiq et al., 2025).

In summary, the results demonstrate that MAN 3 Palembang has developed a structured approach to managing digital-based examinations through careful planning, coordinated implementation, and reflective evaluation. These practices contribute to examination credibility, operational efficiency, and institutional learning. The discussion situates these findings within international literature, highlighting the role of management and governance in digital assessment. By doing so, this study advances understanding of digital examination management in

madrasah contexts and contributes to broader debates on educational management in the digital era.

D. Conclusions

This study examined digital-based examination management at MAN 3 Palembang by conceptualizing digital assessment as a managerial process encompassing planning, implementation, and evaluation. The findings demonstrate that digital examinations are not merely technological interventions but institutionally governed practices shaped by leadership commitment, organizational coordination, and reflective evaluation. In the planning stage, digital examinations were strategically integrated into the madrasah's academic management framework through collaborative decision-making, anticipatory risk management, infrastructure readiness, and systematic preparation of human resources. The implementation stage revealed that examination integrity, pedagogical alignment, and student adaptation were sustained through coordinated roles among school leaders, teachers, examination committees, and technical staff, highlighting the importance of balancing technological efficiency with educational values and human oversight. Furthermore, the evaluation stage functioned as a critical mechanism for continuous improvement, enabling data-informed decision-making, accountability, and organizational learning through reflective review of both technical and procedural aspects. Collectively, these findings underscore that the effectiveness and sustainability of digital examinations depend primarily on managerial coherence, governance capacity, and institutional learning processes rather than on technological sophistication alone.

From a practical perspective, this study offers important implications for madrasah leaders, school administrators, and policymakers. Digital examination initiatives should be embedded within institutional governance structures, supported by clear standard operating procedures, strong leadership involvement, participatory coordination, and systematic evaluation practices. Capacity building for teachers and technical staff, the use of trial examinations to reduce student anxiety, and the development of internal documentation and feedback systems are essential for strengthening institutional readiness and stakeholder trust in digital assessments. At the policy level, increased autonomy in school-based assessment management should be accompanied by guidance on governance frameworks, data management, and accountability mechanisms to ensure quality, transparency, and equity across institutions. Future research is recommended to extend this analysis through comparative studies across different madrasahs, regions, or educational levels to explore how contextual and organizational factors shape digital examination management. Longitudinal research could further examine how managerial practices evolve over time as digital assessment systems mature. Additionally, incorporating perspectives from students, parents, and external stakeholders may provide a more comprehensive understanding of trust, acceptance, and legitimacy in digital-based examination systems.

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References

- Al-Kaabi, A., & Altae, M. (2024). Electronic test and its relationship with test ' s anxiety and academic achievement : Experiment at Qatar University. *PETIER (Psychology, Evaluation, and Technology in Educational Research)*, 6(2), 151–167. <https://doi.org/10.33292/petier.v6i2.218> This
- Aris, N. A., Ahmad, A. E., Hambali, S. S., & Jalaludin, A. A. (2025). Technology Acceptance and Self-Efficacy in Digital Examinations : Insights from Accounting Students. *International Journal of Research and Innovation in Social Science (IJRISS)*, IX(2454), 5106–5115. <https://doi.org/10.47772/IJRISS>
- As-shodiq, M. J., Sukur, M., Syamsuddin, H., & Huggins, B. A. (2025). Madrasah Digitalization: Madrasah Head's Strategy in Realizing Digital-Based Quality Of Academic Service. *Journal of Islamic Education Management (JoIEM)*, 6(2). <https://doi.org/10.30762/joiem.v6i2.6578>
- Bouncken, R. B., Czakon, W., & Schmitt, F. (2025). Purposeful sampling and saturation in qualitative research. *Review of Managerial Science*. <https://doi.org/10.1007/s11846-025-00881-2>
- Butler-henderson, K., & Crawford, J. (2020). Computers & Education A systematic review of online examinations: A pedagogical innovation for scalable authentication and integrity. *Computers & Education*, 159(September), 104024. <https://doi.org/10.1016/j.compedu.2020.104024>
- Correia, N., Almeida, T., Friães, R., & Cardoso, A. (2025). Bridging Pedagogy, Curriculum , and Assessment in Digital Education : Ensuring a Constructive Alignment. *Social Inclusion*, 13, 1–22. <https://doi.org/10.17645/si.i472>
- Domínguez-figaredo, D., Gil-jaurena, I., & Domínguez-figaredo, D. (2025). Effects of familiarity with digital assessment in online education education. *Distance Education*, 46(2), 301–317. <https://doi.org/10.1080/01587919.2024.2372260>
- Egarter, S., Mutschler, A., Tekian, A., Norcini, J., & Brass, K. (2020). Medical assessment in the age of digitalisation. *BMC Medical Education*, 1–8. <https://doi.org/10.1186/s12909-020-02014-7>
- Elliott, V. (2018). Thinking about the Coding Process in Qualitative Data Analysis. *The Qualitative Report*, 23(11), 2850–2861. <https://doi.org/10.46743/2160-3715/2018.3560>
- Han, S., Nikou, S., & Ayele, W. Y. (2025). Digital proctoring in higher education : a systematic literature review. *International Journal of Educational Management*, 38(1),

- 265–285. <https://doi.org/10.1108/IJEM-12-2022-0522>
- Lu, K., Zhu, J., Pang, F. and, & Liu, Z. (2024). Understanding college students' test anxiety in asynchronous online courses: the mediating role of emotional engagement. *International Journal of Educational Technology in Higher Education*, 1, 1–21. <https://doi.org/10.1186/s41239-024-00482-1>
- Medeiros, T., Ara'ujo, A., Silva, J., & Silva, A. (2025). Data Governance in Education : Addressing Challenges and Unlocking Opportunities for Effective Data Management. In *Proceedings of the 27th International Conference on Enterprise Information Systems (ICEIS 2025)*, 1(Iceis), 367–374. <https://doi.org/10.5220/0013468300003929>
- Naeem, M., Ozuem, W., Howell, K., & Ranfagni, S. (2024). A Step-by-Step Process of Thematic Analysis to Develop a Conceptual Model in Qualitative Research. *Journal SAGE*, 22(October), 1–18. <https://doi.org/10.1177/16094069231205789>
- OECD. (2023). *Towards an Effective Digital Education Ecosystem*. OECD Publishing.
- Pacheco, A., Yupanqui, R., Mogrovejo, D., & Garay, J. (2025). Computers in Human Behavior Reports Impact of digitization on educational management : Results of the introduction of a learning management system in a traditional school context. *Elsivier*, 17(August 2024). <https://doi.org/10.1016/j.chbr.2025.100592>
- Patil, L. (2024). Education governance and digitization: Inherent conflicts and potential safeguards for a new social contract. *PROSPECTS*, 54(2), 323–329. <https://doi.org/10.1007/s11125-023-09668-3>
- Sanginés, C. P., & Ramírez, M. J. (2023). education policy analysis archives Digital Leap in the New Mexican School since the Pandemic Lockdown : Challenges for Governance and Pedagogical Processes. *Education Policy Analysis Archives*, 31, 136. <https://doi.org/10.14507/epaa.31.7912>
- Taylor, M., Garner, P., Oliver, S., & Desmond, N. (2024). Use of qualitative research in World Health Organisation guidelines: a document analysis. *Health Research Policy and Systems*, 22, 1–17. <https://doi.org/10.1186/s12961-024-01120-y>
- Tømte, C. E., & Smedsrud, J. H. (2023). Governance and digital transformation in schools with 1: 1 tablet coverage. *Frontiers in Education*, October. <https://doi.org/10.3389/feduc.2023.1164856>
- Wang, Y., Prak, J., & Gao, Q. (2025). Digital leadership and employee innovative performance : the role of job crafting and person – job fit. *Frotiers in Psychology*, April, 1–16. <https://doi.org/10.3389/fpsyg.2025.1492264>
- Xu, W., & Zammit, K. (2020). Applying Thematic Analysis to Education : A Hybrid Approach to Interpreting Data in Practitioner Research. *International Journal of Qualitative Methods*, 19, 1–9. <https://doi.org/10.1177/1609406920918810>
- Yamin, M., & Sanuri, D. (2024). Implementations of The Digital Madrasah : Case Study on MTSN 1 Makassar. *Jurnal Sustainable*, 7(1), 126–130. <https://doi.org/10.32923/kjmp.v7i1.3746> Implementations