



Digital-Based Human Resource Management Strategy in Developing Teacher Competence Amidst Budgetary Constraints

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ABSTRACT

Teacher competency development is a crucial factor in improving educational quality; however, many Islamic educational institutions face budget constraints that limit the implementation of sustainable professional development programs. The rapid advancement of digital technology offers opportunities for educational institutions to optimize Human Resource Management (HRM) strategies through digital platforms and Artificial Intelligence (AI) as more effective and cost-efficient alternatives. This study aims to analyze digital-based HRM strategies in developing teacher competence amidst budgetary constraints at SMP Terpadu Bustanul Arifin. A qualitative research approach was employed using observations, semi-structured interviews, and documentation as data collection techniques. The data were analyzed using the interactive model of data reduction, data display, and conclusion drawing, while data credibility was ensured through source and method triangulation. The findings indicate that digital-based HRM strategies enhance teachers' pedagogical, professional, social, and personal competencies through online training, self-directed learning, digital collaboration platforms, and the utilization of AI in instructional planning. Nevertheless, several challenges remain, including limited digital infrastructure, varying levels of teachers' digital literacy, and resistance to technological change. This study concludes that digital-based HRM strategies provide an effective and sustainable solution for improving teacher competence despite financial limitations. The findings imply that educational institutions should strengthen digital transformation policies, enhance teachers' digital capacities, and improve technological infrastructure to support the sustainable improvement of educational quality in Islamic schools.

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INTRODUCTION

Human Resource Management (HRM) plays a crucial role in advancing organizational performance, particularly within Islamic educational institutions. In the educational context, teachers serve as the primary agents in

shaping students' quality, making teacher competence development a strategic priority (Mustofa et al., 2024). Teacher competence encompasses knowledge, skills, and professional attitudes that support effective learning processes. However, in the era of global disruption, relying solely on conventional management approaches is no longer sufficient to achieve optimal outcomes (Pitriani Muslimin et al., 2024). Educational institutions are required to adopt innovative paradigms that integrate technological advancements into professional development systems. Islamic schools, which emphasize both academic achievement and moral values, face additional challenges in balancing these dimensions. Limited financial resources often hinder access to high-quality training programs, creating disparities in teacher development (Fitri, Y., Pratama, A., & Wibowo, 2018). Therefore, a more adaptive and cost-efficient HRM strategy is necessary to ensure sustainable improvement in teacher competence.

Recent studies highlight that digital transformation has significantly reshaped HRM practices, particularly in education. The integration of digital platforms such as Massive Open Online Courses (MOOCs), webinars, and digital libraries enables continuous professional development without geographical and financial constraints (Nurmasyahyati and Maisyarah, 2026). Furthermore, the emergence of Artificial Intelligence (AI) has introduced new possibilities in personalized learning and instructional design. AI-powered tools can assist teachers in developing teaching materials, designing assessments, and analyzing student learning patterns more effectively (Najwa et al., 2026). Micro-learning approaches, which deliver content in short and flexible formats, have also proven effective in supporting teachers with limited time availability. Previous research indicates that digital-based HRM strategies not only reduce training costs but also enhance accessibility and learning efficiency (Sulthaan, 2025). In Islamic educational contexts, these innovations must be aligned with ethical and spiritual values, ensuring that technological adoption supports holistic educational goals (Ubaedullah et al., 2025).

Human Resource Management (HRM) in education refers to a systematic process that includes planning, organizing, implementing, and evaluating human resources to achieve institutional goals effectively. In the digital era, HRM has evolved from traditional administrative practices into digital-based management systems that emphasize efficiency, flexibility, and innovation (Nurmasyahyati and Maisyarah, 2026). In Islamic educational institutions, HRM is not only oriented toward performance outcomes but also toward the integration of moral and spiritual values. The adoption of digital technologies enables institutions to optimize teacher performance despite financial

limitations (Sirozi & Astuti, 2026). Digital-based HRM focuses on developing teachers' technological literacy and their ability to utilize Artificial Intelligence (AI) as part of professional growth (Fatmasari, 2026). This transformation is essential in ensuring that educators are capable of responding to global educational challenges while maintaining the ethical foundations of Islamic education.

Teacher competence in Islamic educational institutions encompasses pedagogical, professional, social, and personal dimensions that must adapt to technological advancements. Pedagogical competence now includes the ability to design interactive learning using digital tools and AI-based platforms (Siregar, 2026). Professional competence is reflected in teachers' ability to continuously update subject knowledge through digital resources and self-regulated learning. Social competence extends to effective communication through digital platforms while maintaining ethical interaction based on Islamic values (Sugito, 2024). Meanwhile, personal competence involves integrity, discipline, and digital ethics in utilizing information responsibly. The integration of these competencies is crucial for ensuring that teachers can deliver meaningful and relevant learning experiences (Mahara & Hafidz, 2025). In resource-limited contexts, digital literacy becomes a key factor that enables teachers to remain competent without relying heavily on costly formal training programs.

Effective HRM significantly influences the development of teacher competence, particularly in the digital era. Strategic HRM practices, such as technology-oriented recruitment, allow institutions to select teachers with strong digital capabilities, reducing the need for extensive training (Mandalika et al., 2020). Furthermore, digital-based training programs, including webinars and online learning platforms, provide cost-efficient alternatives for professional development. HRM also plays a role in fostering a culture of continuous learning by encouraging teachers to utilize digital tools and AI as part of their daily teaching practices (Adigun, 2025). Performance evaluation systems have also shifted toward data-driven approaches, enabling institutions to monitor teacher progress more objectively and continuously. This approach allows for targeted interventions that address specific competency gaps while optimizing limited financial resources.

Various models of teacher competence development have emerged in response to digital transformation. One prominent model is digital self-development, which emphasizes independent learning through online platforms, digital modules, and virtual collaboration (Wulandari & Andris, 2026). This model allows teachers to access learning resources anytime and

anywhere, making it highly suitable for institutions with budget constraints. In addition, mentoring systems, both traditional and virtual, play an important role in facilitating knowledge sharing among teachers. The integration of AI further enhances this model by providing personalized learning experiences and assisting teachers in developing innovative instructional strategies (Xu et al., 2024). In Islamic educational contexts, these models must be aligned with religious values, ensuring that technological advancements support ethical teaching practices. As a result, digital-based development models offer a sustainable solution for improving teacher competence (Zuhriyeh et al., 2025).

The evaluation of teacher competence development is essential to measure the effectiveness of HRM strategies, particularly those based on digital innovation. Evaluation processes in the digital era utilize data-driven systems that enable continuous monitoring of teacher performance (Aisyah Yuspita Hamrul et al., 2025). Key indicators include the quality of teaching, the ability to integrate digital tools into learning, and adherence to ethical standards in using technology (Valverde-Berrocoso et al., 2021). In Islamic educational institutions, evaluation also considers the extent to which teachers incorporate moral and spiritual values into their teaching practices. The results of these evaluations serve as the basis for designing more effective and targeted development programs. By implementing systematic and continuous evaluation, institutions can ensure that digital-based HRM strategies contribute significantly to improving teacher competence while maintaining cost efficiency (Haikal et al., 2025).

Previous studies have emphasized the importance of HRM in enhancing teacher competence and institutional performance. Research highlights that structured HRM practices enable educational institutions to optimize teacher potential and achieve strategic goals (Of et al., 2024). Visionary leadership is also identified as a key factor in encouraging continuous professional development among teachers. Furthermore, continuous HR development contributes to improving institutional credibility and competitiveness (Qutni et al., 2021). Studies on Total Quality Management (TQM) demonstrate that integrating quality management with Islamic values creates a supportive environment for teacher innovation. Additionally, holistic development approaches that combine academic and spiritual aspects are essential in addressing modern educational challenges (Luthfiatul Udhma & Sri Minarti, 2025). These findings provide a strong theoretical foundation for this study, which examines how digital-based HRM strategies can effectively improve teacher competence in Islamic educational institutions with limited financial resources.

This study aims to analyze the implementation of digital-based Human Resource Management strategies in developing teacher competence at SMP Terpadu Bustanul Arifin. Specifically, it focuses on how digital technologies and AI-based tools are utilized as alternative solutions to overcome budget limitations in teacher professional development. The research also seeks to explore how school management facilitates independent learning among teachers through digital platforms, as well as how these strategies influence teachers' pedagogical and professional competencies. By examining these aspects, the study intends to provide a comprehensive understanding of how limited financial resources can be optimized through innovative and technology-driven HRM approaches in Islamic educational institutions.

This study argues that the integration of digital technology and Artificial Intelligence within HRM strategies can significantly enhance teacher competence despite financial constraints. It is hypothesized that schools implementing digital-based HRM approaches are more capable of creating flexible, efficient, and sustainable professional development systems. Furthermore, the use of AI and digital learning platforms is expected to foster independent learning, increase teacher engagement, and improve instructional quality. In the context of Islamic education, such strategies are also believed to support the development of technologically adaptive educators who maintain strong ethical and spiritual values. Therefore, digital transformation in HRM is not merely an alternative solution, but a strategic necessity for improving educational quality in resource-limited environments.

RESEARCH METHODE

This study was conducted at SMP Terpadu Bustanul Arifin, an Islamic junior secondary school in Indonesia, focusing on the implementation of digital-based Human Resource Management (HRM) strategies for developing teacher competence under conditions of limited financial resources. The study employed a qualitative case study approach to obtain an in-depth understanding of the strategies implemented by the school management and their influence on teachers' professional development. Qualitative research was considered appropriate because it enables researchers to explore participants' experiences, organizational practices, and contextual realities within their natural setting (Siti Maisyarah & Rahmat Asri Sufa, 2026). The study utilized primary data, obtained directly from field observations and interviews, as well as secondary data derived from institutional documents, teacher development reports, training records, school policies, and other relevant administrative documents. The combination of primary and secondary data provided a

comprehensive understanding of digital HRM implementation in the institution.

The participants consisted of the school principal, vice principal, and teachers who were directly involved in teacher competency development programs and digital learning initiatives (Sufa, Rahmat Asri & Maisyarah, 2026). Participants were selected purposively based on their roles, experiences, and involvement in human resource management activities. The research process began with preliminary observations to understand the institutional context, followed by semi-structured interviews to obtain detailed information regarding HRM policies, digital professional development practices, and challenges associated with budgetary limitations. Documentation analysis was subsequently conducted to verify and enrich the empirical findings obtained from interviews and observations. Data were analyzed using the interactive qualitative analysis model proposed by Miles, Huberman, and Saldaña, consisting of data collection, data reduction, data display, and conclusion drawing/verification. Throughout the analysis, coding techniques were employed to identify recurring themes and meaningful patterns, while source triangulation involving observations, interviews, and documentation was applied to enhance the credibility, validity, and trustworthiness of the research findings (Santos et al., 2020).

RESULT AND DISCUSSION

Result

The findings of this study indicate that digital-based Human Resource Management (HRM) strategies have been implemented as an alternative approach to overcome budget limitations in developing teacher competence. The institution has shifted from conventional training methods to more flexible and cost-efficient digital learning systems. Teachers are encouraged to access online platforms, webinars, and digital resources independently. This transition reflects an adaptive strategy that aligns with the demands of the digital era while maintaining institutional sustainability.

Observation results show that teachers have begun integrating digital tools into their teaching practices. Several teachers utilize presentation software, online videos, and simple educational applications to support classroom instruction. Although the level of mastery varies among teachers, the overall trend indicates a gradual improvement in digital literacy. This demonstrates that digital HRM strategies contribute to enhancing teachers' readiness to adopt technology in learning activities.

Interview findings reveal that school management plays a significant role in encouraging teachers to engage in self-directed digital learning. The leadership promotes a culture of continuous learning by providing access to internet facilities and recommending free online training platforms. Teachers perceive this approach as practical and beneficial, especially in situations where financial resources are limited.

In terms of pedagogical competence, teachers reported improvements in designing learning materials. The use of digital tools enables them to create more interactive and engaging lesson plans. For instance, teachers utilize videos and visual content to explain abstract concepts, making lessons easier for students to understand. This indicates that digital strategies positively influence teaching effectiveness.

Professional competence is also enhanced through digital learning practices. Teachers independently access educational resources, including e-books, online journals, and instructional videos. This self-regulated learning approach allows teachers to continuously update their knowledge without relying on formal training programs. As a result, teachers become more adaptive and responsive to curriculum changes.

Social competence among teachers has improved through the use of digital communication platforms. Teachers actively participate in online discussion groups and professional communities, where they exchange ideas, teaching strategies, and educational resources. This collaborative environment fosters knowledge sharing and strengthens professional relationships among educators.

From a personal competence perspective, teachers demonstrate increased responsibility and discipline in utilizing digital tools. They show awareness of ethical considerations in using online information and artificial intelligence. This reflects the integration of professional values and Islamic principles in digital practices.

Despite the positive outcomes, several challenges were identified. Technical issues such as limited internet connectivity, lack of adequate devices, and insufficient digital skills among some teachers hinder the effectiveness of implementation. Additionally, some teachers still rely on traditional teaching methods due to resistance to change.

The following table summarizes the main findings related to teacher competence development:

Table 1.
Summary of Teacher Competence Development

Competence Aspect	Findings
Pedagogical	Improved through use of digital media and interactive content
Professional	Enhanced via self-directed online learning
Social	Strengthened through digital collaboration and communication
Personal	Increased awareness of digital ethics and responsibility
Challenges	Technical limitations and varying digital literacy levels

Discussion

The findings indicate that digital-based Human Resource Management (HRM) strategies have significantly contributed to the development of teacher competence despite financial limitations. This finding suggests that budget constraints do not necessarily hinder professional development when educational institutions adopt flexible digital learning strategies. From the perspective of Strategic Human Resource Management, organizational success depends not only on financial resources but also on the institution’s ability to optimize available human capital through innovation and technology. These findings are consistent with (Astagini et al., 2022). who argued that effective HRM enables educational institutions to maximize teacher potential through systematic planning and development. Likewise, (Mengembangkan & Pesantren, 2024) emphasized that visionary leadership plays an essential role in encouraging continuous professional growth. However, unlike previous studies that mainly focused on conventional HRM practices, this study demonstrates that digital technology and Artificial Intelligence can become strategic alternatives for teacher development in institutions facing severe budgetary constraints. This distinction represents the primary contribution of the present study.

The improvement of teachers’ pedagogical competence demonstrates that digital platforms and AI-based applications provide practical opportunities for continuous professional learning. Teachers reported that online courses, webinars, and AI-assisted instructional planning enabled them to improve lesson preparation, classroom management, and learning innovation without attending expensive face-to-face training programs. This finding supports Mayer’s Cognitive Theory of Multimedia Learning, which explains that meaningful learning occurs when verbal and visual information are processed simultaneously through dual cognitive channels. The results also correspond

with the findings of (Fatmawati, 2025), who concluded that continuous competency development is essential for improving teacher professionalism. Nevertheless, this study extends previous research by highlighting that AI applications, including ChatGPT and other intelligent digital tools, function not merely as learning resources but also as personal professional assistants that facilitate independent competency development.

Professional competence was also strengthened through teachers' self-directed learning behavior. Rather than depending exclusively on formal institutional training, teachers actively explored digital resources, participated in webinars, and utilized open-access educational materials to improve subject mastery and instructional quality. This finding reflects the principles of lifelong learning, which emphasize continuous knowledge acquisition throughout professional careers. However, unlike previous studies that primarily discussed structured professional development programs, the present study reveals that independent digital learning supported by AI technologies enables teachers to continuously upgrade their competencies even when institutional financial support is limited. Consequently, digital literacy becomes an important determinant of sustainable professional development within Islamic educational institutions.

The study further reveals that digital HRM strategies positively influence teachers' social competence by encouraging collaborative learning and knowledge sharing through online communication platforms. Teachers frequently exchanged teaching experiences, learning materials, and classroom solutions using digital communication media, thereby strengthening professional collaboration beyond conventional face-to-face meetings. This finding aligns with the concept of Professional Learning Communities (PLCs), which emphasize collaborative learning as a mechanism for improving educational quality. Similar conclusions were reported by Hijrawan (2019), who found that collaborative organizational cultures significantly contribute to teacher performance improvement. Nevertheless, the current study introduces an important perspective by demonstrating that digital collaboration substantially reduces operational costs while maintaining effective communication among teachers. Therefore, technology serves not only as an instructional medium but also as an organizational communication strategy that strengthens institutional learning capacity.

Despite these positive outcomes, several challenges continue to affect the effectiveness of digital HRM implementation. Limited technological infrastructure, unstable internet connectivity, varying levels of teachers' digital literacy, and resistance to organizational change remain significant barriers.

These findings reinforce the Technology Acceptance Model (TAM), which argues that technology adoption is influenced by perceived usefulness and perceived ease of use. Teachers who perceived digital technology as beneficial tended to adopt it more readily, whereas those with limited technological confidence experienced greater resistance. Previous studies generally acknowledged infrastructure limitations as obstacles to educational digitalization; however, the present research further identifies organizational leadership and institutional support as equally important determinants of successful digital transformation. Therefore, technological investment alone cannot guarantee effective HRM implementation without accompanying managerial commitment and continuous mentoring.

Overall, this study proposes that digital-based HRM represents a sustainable strategic model for improving teacher competence in Islamic educational institutions experiencing financial limitations. The findings suggest that successful competency development depends on integrating technological innovation, visionary leadership, continuous learning culture, and ethical values rather than relying solely on financial investment. While previous studies primarily examined HRM effectiveness, leadership, or competency development independently, this research integrates these dimensions within a comprehensive digital HRM framework specifically designed for resource-constrained educational institutions. Consequently, this study contributes both theoretically and practically by offering a contextual HRM model that combines digital transformation, Artificial Intelligence utilization, and Islamic educational values as complementary strategies for sustainable teacher professional development. This integrated perspective constitutes the principal novelty of the research and provides practical guidance for educational institutions facing similar financial challenges.

CONCLUSION

This study demonstrates that digital-based Human Resource Management (HRM) has become a strategic approach for developing teacher competence in Islamic educational institutions operating under financial constraints. The most significant finding is that digital technologies and Artificial Intelligence (AI) enable teachers to enhance their pedagogical, professional, social, and personal competencies through continuous self-directed learning, online collaboration, and technology-supported instructional practices. Rather than relying solely on conventional training programs, institutions can optimize freely accessible digital resources to maintain sustainable professional development while minimizing operational costs. These findings confirm that effective HRM in the

digital era is determined not only by financial capacity but also by institutional readiness to foster innovation, digital literacy, and adaptive leadership.

The principal contribution of this study lies in proposing an integrated digital-based HRM framework that combines strategic human resource management, digital transformation, and AI-assisted professional learning within the context of Islamic education. Unlike previous studies that primarily examined teacher competency development or HRM practices separately, this research demonstrates how digital HRM functions as a comprehensive strategy for addressing budget limitations while maintaining educational quality. Consequently, the study enriches the literature on educational management by providing both a conceptual perspective and practical recommendations for educational institutions seeking sustainable teacher development through technology-driven initiatives.

Despite these contributions, this research has several limitations. The study was conducted in a single Islamic junior secondary school using a qualitative approach, which may limit the generalizability of the findings to different educational settings. Furthermore, the study focused primarily on exploring participants' experiences rather than quantitatively measuring the effectiveness of digital HRM implementation. Future research is therefore recommended to involve multiple educational institutions, employ mixed-method or quantitative approaches, and examine the long-term impact of digital HRM strategies on teacher performance, instructional quality, and student learning outcomes. Such studies would provide stronger empirical evidence regarding the sustainability and scalability of digital HRM practices across diverse educational contexts.

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