

Principal Management in Enhancing Digital Competencies of Qur'an-Hadith Teachers at MIN 6 Banda Aceh

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Abstract

The rapid advancement of digital technology has transformed education, including the teaching of Qur'an-Hadith in madrasahs. Teachers are expected to master both subject content and digital technologies that support effective learning. In this context, the principal plays a strategic role in strengthening teachers' digital competencies through effective educational management. This study aims to examine the principal's management in improving the digital-based competencies of Qur'an-Hadith teachers at MIN 6 Banda Aceh by exploring program planning, implementation, and outcomes. This study employed a qualitative descriptive approach. Data were collected through observations, interviews, and documentation involving the principal, Qur'an-Hadith teachers, and relevant stakeholders. Data analysis included data reduction, data display, and conclusion drawing, while source and technique triangulation ensured data credibility. The findings indicate that the principal successfully implemented key managerial functions to enhance teachers' digital competencies. During the planning stage, the principal identified teachers' professional development needs, designed competency improvement programs, and established clear objectives for technology integration in classroom instruction. The implementation phase included training, workshops, and mentoring on digital learning media, educational applications, digital teaching materials, and technology-supported classroom management. Continuous supervision and motivation encouraged teachers to apply newly acquired digital skills effectively. As a result, teachers demonstrated significant improvement in using digital platforms, creating interactive learning materials, and integrating technology into Qur'an-Hadith instruction. They became more creative, innovative, and capable of providing engaging learning experiences aligned with students' needs in the digital era. Overall, the principal's systematic management, supported by continuous training and mentoring, made a substantial contribution to improving the digital competencies of Qur'an-

1. Introduction

The rapid advancement of digital technology has fundamentally transformed educational systems worldwide, influencing not only teaching and learning processes but also educational leadership and institutional management [1]. Digital transformation has become an essential component of educational quality improvement, enabling schools to enhance instructional effectiveness, increase administrative efficiency, and foster innovation in learning environments [2]. Technologies such as Learning Management Systems (LMS), interactive digital media, cloud-based educational platforms, artificial intelligence (AI) [3], and online collaboration tools have expanded opportunities for creating more engaging, student-centered, and flexible learning experiences. Consequently, educational institutions are expected to develop comprehensive management strategies that support the integration of digital technology into both instructional practices and organizational governance.

Within the context of Islamic education, digital transformation presents unique opportunities and challenges [4]. The teaching of Qur'an-Hadith is not only intended to develop students' cognitive understanding of Islamic teachings but also to cultivate religious values, moral character, and spiritual awareness. Therefore, integrating digital technology into Qur'an-Hadith instruction requires careful management to ensure that technological innovation strengthens rather than diminishes the educational and spiritual objectives of the subject [5]. Teachers are expected to utilize digital resources effectively while maintaining the authenticity and integrity of Islamic values in the learning process.

The success of digital transformation in schools depends largely on the leadership and managerial competence of school principals. As educational leaders, principals play strategic roles in planning, organizing, implementing [6], supervising, and evaluating [7] school programs aimed at improving teachers' professional competencies. Effective school management encourages continuous professional development, facilitates access to technological resources, establishes supportive organizational cultures, and promotes innovation in classroom instruction. In this regard, principals function not merely as administrators but also as transformational leaders who guide schools in responding to technological and educational changes.

Teachers of Qur'an-Hadith face increasing demands to integrate digital technology into their instructional practices. They are expected to design interactive learning materials, utilize multimedia resources, implement digital assessment systems, employ online learning platforms [8], and facilitate collaborative learning experiences that correspond with the characteristics of digitally oriented students. Nevertheless, many teachers continue to encounter challenges, including limited digital literacy, insufficient professional development opportunities, inadequate technological infrastructure, and the absence of systematic managerial support for digital innovation. These challenges highlight the necessity of effective school management to facilitate teachers' digital competence development.

Previous studies have consistently demonstrated that school leadership significantly influences teacher performance, professional competence [9], instructional quality, and organizational effectiveness. However, existing research has predominantly focused on general instructional leadership, educational supervision, or teacher professional development [10]. Limited attention has been given to how school principals strategically manage the development of teachers' digital competencies within Islamic educational institutions, particularly in the teaching of Qur'an-Hadith. Furthermore, few studies have comprehensively examined the integration of managerial functions including planning, organizing, implementation, supervision, evaluation, and continuous professional development with digital [11] transformation initiatives in Islamic elementary schools. This gap indicates the need for further empirical investigation into principal management practices that support digital-based Qur'an-Hadith instruction [12].

MIN 6 Banda Aceh provides an appropriate context for investigating this issue. As one of the Islamic elementary schools committed to educational innovation, the institution has initiated various digital learning programs and encouraged teachers to integrate technology into classroom instruction. Despite these efforts, challenges remain regarding systematic planning, sustainable professional development, infrastructure optimization, instructional supervision, and the effective implementation of digital learning in Qur'an-Hadith education. These conditions make MIN 6 Banda Aceh a valuable case for examining how school management contributes to improving teachers' digital competencies.

The primary objective of this study is to analyze the management practices of the school principal in improving the digital competencies of Qur'an-Hadith teachers at MIN 6 Banda Aceh. Specifically, this research seeks to examine the principal's strategic planning for digital competency development, organizational management of digital learning programs, implementation of professional development activities, supervision and evaluation mechanisms, as well as the supporting and inhibiting factors influencing digital transformation within the school. The study also aims to identify effective managerial strategies that contribute to sustainable improvements in teachers' professional competence in digital-based Qur'an-Hadith instruction.

The motivation for conducting this research arises from the growing demand for effective educational leadership capable of responding to rapid technological changes in Islamic education. Educational institutions are increasingly expected to prepare teachers who possess not only pedagogical and professional competencies but also digital competencies that enable them to deliver meaningful, innovative, and technology-enhanced learning experiences. Understanding how school principals manage this transformation is essential for developing evidence-based leadership practices that support educational quality improvement and institutional sustainability.

This study employs a qualitative case study approach to obtain an in-depth understanding of principal management practices within their natural context. Data were collected through semi-structured interviews, participant observations, and document analysis involving the school principal, vice principals, Qur'an-Hadith teachers, and relevant institutional documents. The collected data were analyzed using an interactive qualitative analysis process consisting of data reduction, data display, conclusion drawing, and verification [13]. To ensure trustworthiness, triangulation, member checking, and peer debriefing techniques were applied throughout the research process [14].

The findings are expected to demonstrate that the successful improvement of teachers' digital competencies depends not only on individual teachers' [15] abilities but also on the effectiveness of school principal management in establishing strategic policies, promoting continuous professional development, providing adequate digital infrastructure, implementing technology-based instructional supervision, fostering an innovative organizational culture, and conducting systematic evaluations of digital learning practices [16]. The study is anticipated to contribute both theoretically and practically by enriching the literature on educational management and digital leadership in Islamic education while offering practical recommendations for school principals, teachers, policymakers, and educational stakeholders seeking to strengthen digital transformation in Qur'an-Hadith instruction.

Ultimately, this research proposes that effective principal management serves as a critical driving force in integrating educational leadership, digital transformation, and Islamic educational values. By strengthening managerial capacity and supporting teachers' digital competence, schools can improve the quality of Qur'an-Hadith education while preparing students with the knowledge, character, and digital literacy required in the twenty-first century.

1.1 School Principal Management in Improving the Competence of Qur'an-Hadith Teachers

The quality of education is largely determined by the effectiveness of school leadership and the professional competence of teachers. In educational institutions, particularly Islamic schools and madrasahs, the school principal plays a strategic role in ensuring [17] that educational objectives are achieved through effective planning, implementation, supervision, and continuous improvement [18]. As educational systems continue to

evolve in response to globalization, curriculum reform, and technological advancement, school principals are increasingly expected to adopt effective management practices that support teachers' professional growth and instructional quality.

In Islamic education, the Qur'an-Hadith subject occupies a central position because it serves as the foundation for developing students' religious knowledge, moral values [19], spiritual awareness, and Islamic character. The effectiveness of Qur'an-Hadith instruction depends not only on teachers' mastery of subject matter but also on their pedagogical competence, professional commitment, instructional creativity, and ability to respond to educational changes. Consequently, improving the competence of Qur'an-Hadith teachers has become an important responsibility of school leadership.

1.2 School Principal Management

School principal management refers to a systematic process of planning, organizing, leading, coordinating, supervising, and evaluating all educational resources to achieve institutional goals effectively and efficiently. Effective management enables schools to develop a professional learning environment that continuously improves teacher performance and student achievement [20].

School principals perform multiple leadership functions. They act as educators by facilitating teachers' professional development through training, mentoring, and academic guidance. As managers, they formulate strategic plans, allocate resources, establish institutional policies, and coordinate educational programs. As administrators, they ensure that school operations comply with educational regulations and quality standards. As instructional supervisors, they monitor classroom practices, provide constructive feedback, and encourage continuous instructional improvement. Furthermore, as leaders, innovators, and motivators, principals cultivate a collaborative organizational culture that promotes innovation, accountability, and lifelong learning among teachers [4].

Effective school management requires visionary leadership, strategic decision-making, effective communication, participatory governance, and evidence-based policy implementation. Through these managerial functions, school principals create conditions that enable teachers to improve their professional competence and instructional effectiveness.

1.3 Competence of Qur'an-Hadith Teachers

Teacher competence is a critical determinant of educational quality. Qur'an-Hadith teachers are responsible not only for delivering religious knowledge but also for nurturing students' spiritual development, ethical values, and Islamic character. Therefore, they are expected to possess comprehensive competencies encompassing pedagogical, professional, personal, and social dimensions [11].

Pedagogical competence includes the ability to design effective lesson plans, implement student-centered learning strategies, conduct classroom assessment, and accommodate diverse learning needs. Professional competence involves mastery of Qur'anic studies, Hadith sciences, Islamic theology, interpretation, and contemporary educational approaches relevant to Islamic education [21].

Personal competence reflects integrity, moral responsibility, discipline, sincerity, and exemplary behavior consistent with Islamic values. Social competence includes effective communication with students, colleagues, parents, and the broader community while fostering collaborative relationships within the school environment.

Beyond these four competencies, contemporary educational demands require Qur'an-Hadith teachers to engage in continuous professional development, educational research, curriculum innovation, reflective teaching practices, and the integration of technology into learning activities.

1.4 Principal Management Strategies for Improving Teacher Competence

Improving teacher competence requires systematic and sustainable management strategies. The first stage involves strategic planning [9] based on a comprehensive assessment of teachers' professional needs. School principals should identify teachers' strengths, weaknesses [22], opportunities, and developmental priorities to design appropriate professional development programs [23].

The second stage focuses on organizing educational resources. Principals establish professional learning communities, teacher working groups, mentoring systems, and collaborative academic teams that encourage knowledge sharing and continuous learning among teachers. Such collaborative structures strengthen teachers' capacity to exchange experiences, solve instructional challenges, and develop innovative teaching practices [8].

Implementation includes various professional development activities such as workshops, seminars, in-service training, peer coaching, mentoring, lesson study, classroom action research, curriculum development programs, and academic discussions. These activities enhance teachers' instructional competence while encouraging lifelong professional learning.

Instructional supervision represents another essential managerial strategy. Rather than functioning merely as an evaluation mechanism, supervision serves as professional guidance that assists teachers in improving instructional planning, classroom management, assessment practices, and reflective teaching. Constructive feedback enables teachers to identify instructional challenges and continuously refine their teaching practices.

Evaluation constitutes the final stage of the management cycle. Principals assess the effectiveness of professional development initiatives by examining improvements in teacher competence, instructional quality, student learning outcomes, and overall school performance. Evaluation findings become the basis for future planning and continuous quality improvement.

The effectiveness of principal management is influenced by numerous internal and external factors. Supporting factors include visionary leadership, teachers' commitment to professional growth, collaborative organizational culture, adequate educational facilities, supportive educational policies, parental involvement, and sufficient financial resources for professional development.

Conversely, several barriers may hinder teacher competence development. These include limited budgets, inadequate technological infrastructure, excessive administrative workloads, insufficient professional training opportunities, resistance to organizational change, and disparities in teachers' educational backgrounds and professional experience. Addressing these challenges requires strategic planning, effective resource management, and strong institutional commitment.

Impact of Principal Management on Educational Quality

Effective principal management contributes significantly to enhancing teachers' professional competence and improving educational quality. Teachers become more confident in implementing innovative instructional strategies, managing classrooms effectively, designing meaningful learning experiences, and conducting authentic assessments. As teachers' competence improves, classroom instruction becomes more engaging, interactive, and student-centered.

Improved instructional quality positively influences students' academic achievement, religious understanding, critical thinking, and moral development. In the context of Qur'an-Hadith education, effective school management also strengthens students' appreciation of Islamic values and encourages the practical application of Qur'anic teachings and Prophetic traditions in their daily lives.

Furthermore, effective principal leadership promotes a positive school climate characterized by collaboration, professional responsibility, innovation, and continuous improvement. Such an environment supports institutional excellence and contributes to the long-term sustainability of educational quality.

2. Research Methods

This study employed a qualitative case study design to explore how the school principal manages the improvement of the professional competence of Qur'an-Hadith teachers through school management practices. A qualitative approach was selected because it enables researchers to obtain an in-depth understanding of participants' experiences, managerial practices, institutional culture, and contextual factors influencing teacher competence development. The case study design was considered appropriate because the research focused intensively on a single educational institution, allowing a comprehensive examination of leadership practices within their natural setting.

The research followed [14] four sequential stages: (1) preliminary observation and identification of research problems; (2) preparation of research instruments and participant selection; (3) field data collection through interviews, observations, and document analysis; and (4) data analysis, verification, interpretation, and reporting of findings.

2.1 Research Site

The research was conducted at MIN 6 Banda Aceh, an Islamic public elementary school under the Ministry of Religious Affairs of Indonesia. The school was purposively selected because it has implemented various initiatives aimed at improving teacher professionalism and integrating digital technology into instructional practices, particularly in the teaching of Qur'an-Hadith. The school also demonstrates active leadership in educational innovation and continuous professional development, making it an appropriate setting for investigating principal management practices.

2.2 Participants

Participants were selected using purposive sampling, whereby individuals were chosen based on their direct involvement in school management and the implementation of Qur'an-Hadith instruction. This sampling technique ensured that participants possessed sufficient knowledge and experience to provide relevant information regarding the research objectives [24].

The participants consisted of:

1. One school principal;
2. One vice principal responsible for curriculum and academic affairs;
3. Qur'an-Hadith teachers actively involved in classroom instruction;
4. Senior teachers with experience in teacher professional development;
5. Administrative staff responsible for academic documentation.

Participant selection continued until data saturation was achieved, meaning that additional interviews no longer generated substantially new information relevant to the research questions.

Characteristics of Participants. The participants represented various professional backgrounds and educational experiences within the school. The school principal possessed extensive experience in educational leadership and school management. The participating Qur'an-Hadith teachers held undergraduate or postgraduate qualifications in Islamic Education and had varying lengths of teaching experience, ranging from novice to senior educators. This diversity enabled the researchers to obtain comprehensive perspectives regarding principal management strategies and teacher competence development.

Data Collection. Data were collected over several weeks using multiple qualitative techniques to obtain rich and comprehensive information.

Semi-Structured Interviews. Semi-structured interviews were conducted with the school principal, vice principal, and Qur'an-Hadith teachers. Interview questions focused on leadership strategies, management functions, teacher professional development programs, instructional supervision, institutional policies, and challenges encountered in improving teacher competence. Interviews were audio-recorded with participants' consent and subsequently transcribed verbatim for analysis.

Classroom and School Observations. Non-participant observations were carried out to examine classroom instruction, teacher-student interaction, instructional supervision, professional development activities, and school management practices. Observation notes documented participants' behaviors, learning environments, leadership activities, and the implementation of school programs related to teacher competence development.

Relevant institutional documents were reviewed to complement interview and observation data. These documents included annual school plans, teacher development programs, supervision reports, meeting minutes, professional training records, curriculum documents, lesson plans, and official school policies related to teacher competence improvement. The use of multiple data sources enabled methodological triangulation and enhanced the credibility of the findings.

Data Validity and Trustworthiness. To ensure the rigor and trustworthiness of the study, several validation techniques were employed.

Credibility. Credibility was enhanced through prolonged engagement in the research setting, triangulation of data sources, triangulation of data collection methods, and member checking. After transcription and preliminary analysis, interview summaries were returned to participants for confirmation to ensure that the interpretations accurately reflected their intended meanings.

Transferability. Transferability was supported by providing detailed descriptions of the research context, participant characteristics, school environment, and management practices. These rich contextual descriptions enable readers to determine the applicability of the findings to similar educational settings.

Dependability. Dependability was maintained through an audit trail documenting every stage of the research process, including participant recruitment, interview procedures, coding decisions, analytical processes, and interpretation of findings. Research procedures were implemented consistently throughout the study.

Confirmability. Confirmability was ensured through researcher reflexivity, documentation of analytical decisions, peer debriefing with educational management scholars, and systematic comparison of evidence across multiple data sources. These procedures minimized researcher bias and strengthened the objectivity of the findings.

Data Analysis. Data analysis followed the interactive qualitative analysis model proposed by Miles, Huberman, and Saldaña. The analysis consisted of four interconnected stages: Data collection, involving the organization of interview transcripts, observation notes, and documentary evidence. Data condensation, whereby relevant information was coded, categorized, and organized into meaningful themes related to principal management and teacher competence. Data display, involving the presentation of organized findings through thematic matrices and descriptive narratives to facilitate interpretation. Conclusion drawing and verification, during which emerging themes were continuously compared with empirical evidence and validated through triangulation and participant confirmation. The analytical process was iterative, allowing new insights to emerge as additional data were collected and analyzed.

Prior to data collection, permission to conduct the study was obtained from the school administration. All participants voluntarily agreed to participate after receiving information regarding the objectives and procedures of the study. Informed consent was obtained from each participant before interviews and observations were conducted. Participant anonymity and confidentiality were maintained by removing identifying information from transcripts and research reports. All collected data were used exclusively for academic purposes and stored securely throughout the research process.

The detailed description of the research design, participant selection, data collection procedures, validation strategies, and analytical techniques provides sufficient methodological transparency to enable future researchers to replicate this study in similar Islamic educational institutions. Replication across different schools or educational contexts may contribute to a broader understanding of principal management practices in improving teacher competence and strengthening educational quality

3. Result and Discussion

This study investigated how principal management contributes to improving the digital competencies of Qur'an-Hadith teachers at MIN 6 Banda Aceh. Data obtained from semi-structured interviews, classroom observations, and document analysis revealed five major themes: (1) strategic planning for digital teacher competency development, (2) organization of school resources, (3) implementation of digital-based academic supervision, (4) supporting and inhibiting factors, and (5) the impact of principal management on teachers' professional competence.

3.1 Strategic Planning for Digital Competency Development

The findings indicate that the school principal systematically planned teacher professional development through a needs-based management approach. Planning began with a comprehensive assessment of teachers' digital competencies, analysis of previous academic supervision reports, and evaluation of curriculum requirements related to digital learning. Based on these assessments, annual professional development programs were designed to strengthen teachers' capacity to integrate digital technologies into Qur'an-Hadith instruction.

The professional development program included workshops on interactive digital media, Learning Management Systems (LMS), digital Qur'an applications, technology-based assessment, online collaborative learning, and instructional video production. These activities were implemented continuously throughout the academic year rather than as isolated training events.

As presented in Table 1, the professional development initiatives were integrated into the school's annual strategic planning. This systematic approach ensured that teacher competency development became a continuous institutional process rather than a series of disconnected training activities.

3.2 Organization of School Resources

The study found that the principal established a collaborative organizational structure to support teacher competency development. A school development team consisting of the vice principal for curriculum, information technology coordinator, senior teachers, and Qur'an-Hadith teachers was responsible for planning, implementing, monitoring, and evaluating professional development activities.

In addition, the school established a Professional Learning Community (PLC) that encouraged teachers to exchange teaching experiences, develop digital instructional materials collaboratively, discuss classroom challenges, and share innovative teaching practices. This collaborative environment fostered continuous learning among teachers and strengthened peer support.

3.3 Implementation of Digital-Based Academic Supervision

Academic supervision emerged as one of the most influential management strategies implemented by the principal. Unlike traditional supervision that primarily emphasizes administrative compliance, supervision at MIN 6 Banda Aceh focused on improving instructional quality and digital pedagogical competence.

The supervision process consisted of classroom observation, evaluation of digital lesson plans, reflective discussions, constructive feedback, coaching, mentoring, and follow-up evaluation. Teachers reported that

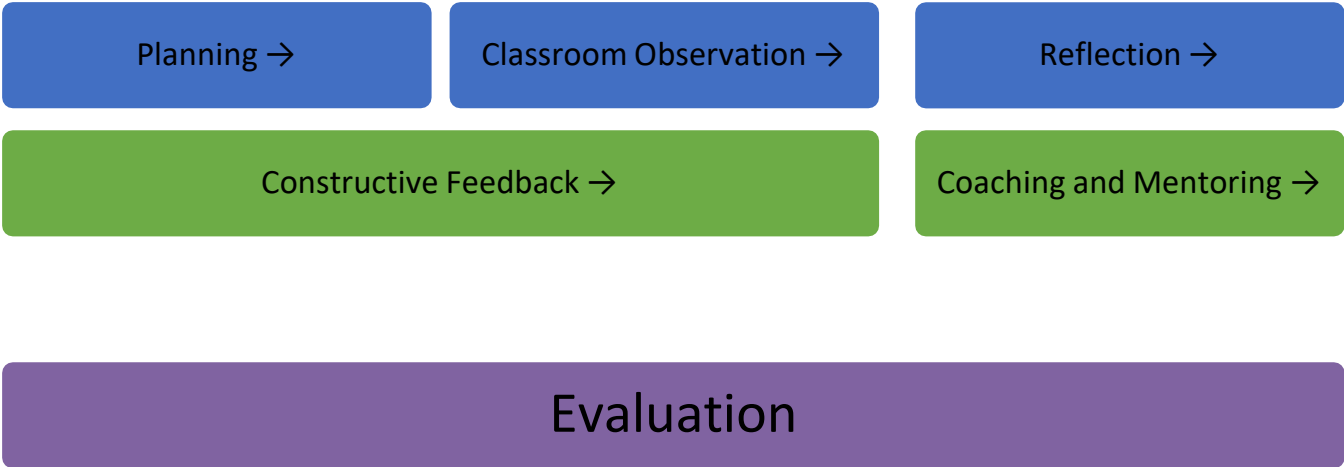
supervision was perceived as professional guidance rather than formal inspection, enabling them to improve instructional practices with confidence.

As illustrated in Figure 1, digital academic supervision followed a cyclical process that promoted continuous professional improvement. Reflection and mentoring became essential components of the supervision cycle, enabling teachers to refine their instructional practices systematically.

Table 1. Digital Professional Development Programs for Qur'an-Hadith Teachers

Program	Objective	Frequency
Interactive Digital Media Workshop	Improve teachers' ability to design digital learning media	Twice a year
Learning Management System Training	Strengthen online learning implementation	Twice a year
Digital Academic Supervision	Improve instructional quality	Once each semester
Professional Learning Community	Share best teaching practices	Monthly
Individual Coaching and Mentoring	Provide personalized professional assistance	As needed

Figure 1. Digital Academic Supervision Cycle



3.4 Supporting and Inhibiting Factors

The findings identified several factors that facilitated the successful implementation of digital teacher

competency development. The supporting factors included:

1. strong leadership commitment from the school principal;
2. teachers' willingness to engage in professional development;
3. adequate internet connectivity;
4. institutional support from the Ministry of Religious Affairs;
5. collaborative school culture.

Conversely, several challenges were identified, including:

1. varying levels of teachers' digital literacy;
2. limited availability of digital devices;
3. increasing administrative workload;
4. limited time for professional training;
5. rapid technological changes requiring continuous adaptation.

To address these challenges, the principal implemented individualized mentoring, peer coaching, and continuous in-house professional development programs that accommodated teachers with different levels of digital competence.

3.5 Impact of Principal Management on Teacher Competence

Participants consistently reported significant improvements in their professional competence following the implementation of the school's management strategies.

The most notable improvements included:

1. greater confidence in using digital learning technologies;
2. improved ability to design interactive instructional materials;
3. increased integration of digital Qur'an applications into classroom instruction;
4. stronger collaboration among teachers;
5. enhanced student engagement during Qur'an-Hadith lessons.

Classroom observations further demonstrated that teachers increasingly utilized multimedia presentations, educational videos, online quizzes, digital Qur'an platforms, and interactive learning applications to facilitate student-centered learning.

Discussion

The findings demonstrate that improving teachers' digital competence is not solely an individual responsibility but is strongly influenced by the effectiveness of school principal management. The results support Fayol's classical management theory, which emphasizes planning, organizing, directing, coordinating, and controlling as fundamental management functions for achieving organizational objectives. At MIN 6 Banda Aceh, these management functions were integrated into a comprehensive strategy for teacher professional development, enabling continuous improvement in digital instructional competence.

The findings also reinforce the concept of ****Instructional Leadership****, which argues that principals play a central role in improving teaching quality by providing academic guidance and creating supportive learning environments for teachers. Rather than functioning merely as administrative supervisors, the principal assumed the role of instructional leader by facilitating professional learning, mentoring teachers, encouraging reflective practice, and promoting collaborative problem-solving. This leadership approach contributed significantly to teachers' willingness to adopt digital innovations in Qur'an-Hadith instruction.

Compared with previous studies, which generally focused on the relationship between school leadership and teacher performance in a broader educational context, this study specifically highlights how principal management supports digital transformation within Islamic education. Earlier research primarily emphasized teachers' digital competence as an individual characteristic developed through external training. In contrast,

the present study demonstrates that sustainable digital competence development requires an integrated management system involving strategic planning, institutional support, collaborative professional learning, technology-based supervision, and continuous evaluation.

The principal novelty of this study lies in the development of an integrated principal management framework that combines the five managerial functions planning, organizing, implementation, supervision, and evaluation with systematic digital competency development for Qur'an-Hadith teachers. This integrated perspective extends previous research by demonstrating that successful digital transformation depends not only on technological infrastructure or teacher motivation but also on the principal's managerial capacity to establish a supportive organizational ecosystem.

Another important contribution concerns the role of Professional Learning Communities and digital academic supervision. The findings suggest that sustainable professional development is more effectively achieved through collaborative learning cultures and continuous mentoring rather than through one-time training programs. These findings provide practical implications for Islamic educational institutions seeking to strengthen teacher professionalism while adapting to digital transformation.

From a theoretical perspective, this study contributes to the growing literature on educational leadership by integrating instructional leadership, professional development, and digital transformation within the context of Islamic elementary education. From a practical perspective, the findings provide evidence-based recommendations for school principals, educational policymakers, and teacher development institutions regarding effective strategies for enhancing teachers' digital competencies.

Overall, the study concludes that principal management serves as a strategic driver of digital transformation in Islamic schools. Effective planning, collaborative organizational structures, constructive academic supervision, continuous professional development, and systematic evaluation collectively contribute to improving the professional competence of Qur'an-Hadith teachers and strengthening the quality of digital-based Islamic education.

4. Conclusions

This study concludes that principal management plays a decisive role in enhancing the digital competencies of Qur'an-Hadith teachers at MIN 6 Banda Aceh. The findings demonstrate that the improvement of teachers' digital capabilities is not achieved solely through individual initiatives or occasional training activities but through a comprehensive and systematic management process implemented by the school principal. The principal successfully integrated the core managerial functions of planning, organizing, implementation, academic supervision, and evaluation into a sustainable professional development system that supports teachers in adapting to the demands of digital transformation. This integrated management approach enabled Qur'an-Hadith teachers to improve their ability to design digital learning materials, utilize educational technologies, implement technology-supported assessment, and create more interactive and student-centered learning experiences while preserving the fundamental values of Islamic education.

The study further reveals that strategic planning based on teachers' professional needs, collaborative organizational structures, continuous academic supervision, and the establishment of professional learning communities constitute the primary mechanisms through which teacher competencies are strengthened. Academic supervision was found to function not merely as an administrative monitoring process but as a developmental strategy involving mentoring, coaching, reflective dialogue, and constructive feedback. This approach fostered a positive professional culture in which teachers became more confident in adopting digital innovations and more willing to engage in continuous learning. Nevertheless, the study also identified several challenges, including disparities in teachers' digital literacy, limited technological resources, administrative workloads, and the rapid evolution of educational technology. These constraints highlight the necessity of sustained institutional support, continuous capacity building, and adaptive leadership to ensure the long-term success of digital transformation initiatives.

From a theoretical perspective, this research contributes to the literature on educational management by

proposing an integrated framework that connects instructional leadership, school management, teacher professional development, and digital transformation within the context of Islamic elementary education. Unlike previous studies that primarily examined digital competence as an individual teacher attribute, this study demonstrates that digital competency development is fundamentally an organizational process shaped by the principal's managerial capacity to establish supportive policies, collaborative learning environments, and systematic professional development programs. Consequently, the findings enrich existing theories of educational leadership by emphasizing that effective digital transformation requires not only technological readiness but also strategic and sustainable school management.

The practical implications of this study are equally significant. School principals may use the findings as a reference for designing evidence-based professional development programs that integrate digital literacy into instructional improvement initiatives. Educational authorities and policymakers, particularly within Islamic education, may also utilize these findings to formulate policies that strengthen principals' leadership capacities, expand access to digital infrastructure, and promote continuous teacher professional development. Furthermore, teacher education institutions may incorporate these managerial strategies into leadership training and professional preparation programs to better equip future educational leaders for managing digital transformation.

Despite these contributions, this study was conducted within a single case study at MIN 6 Banda Aceh; therefore, the transferability of its findings to other educational contexts should be considered with caution. Future research is encouraged to examine principal management practices across multiple madrasahs or different educational levels using comparative case studies or mixed methods approaches. Further investigations may also explore the long-term impact of digital leadership on teacher performance, students' learning outcomes, organizational innovation, and the integration of emerging technologies such as artificial intelligence, adaptive learning systems, and learning analytics into Islamic education. Such studies would provide broader empirical evidence for developing comprehensive models of digital educational leadership capable of responding to the evolving challenges of twenty-first-century education.

Overall, this study demonstrates that effective principal management is a strategic driver of sustainable digital transformation in Islamic schools. By integrating visionary leadership, systematic management practices, collaborative professional learning, and continuous academic supervision, school principals can significantly strengthen the digital competencies of Qur'an-Hadith teachers while improving the overall quality of teaching, learning, and educational management. These findings reinforce the importance of leadership as the cornerstone of educational innovation and provide valuable insights for advancing both theory and practice in educational management within the rapidly evolving digital era.

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