

Changing Principal Leadership in the Age of Digitalization

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ABSTRACT

The purpose of this research is to investigate how student learning results, teacher professional development, and the efficacy of school administration are affected by the shift in leadership in the digital age in technology-driven management of education governance. A qualitative research approach was used in the study's design, and semi-structured interviews with teachers, students, and school administrators were used to collect data. Triangulation method was used in the research to analyse school policy documents and practices pertaining to technology integration. At SD Muhammadiyah 14 Palembang, the results demonstrated a considerable improvement in students' academic performance through technology-based education management. Personalized learning materials are made available to students through the use of educational software and online resources, which also improves academic performance. Furthermore, the use of digital platforms for feedback and evaluation has made it easier for teachers to monitor students' progress in real time and effectively, enabling them to offer focused interventions. The present study underscores the noteworthy influence of technology-driven education governance on the academic achievements of students, the professional growth of educators, and the efficiency of school administration at SD Muhammadiyah 14 Palembang. The study points up a number of integration-related difficulties that school administrators must carefully analyse and handle. The study's recommendations are intended to address these issues and enhance the efficacy of SD Muhammadiyah 14 Palembang's technology-based education management in the digital age.

Key words: Transforming; Leadership Managerial; Digital Era

INTRODUCTION

In the digital age, education administration has undergone a significant transformation, with the integration of technology becoming an important aspect of school leadership. Principal leadership transformation in the digital age refers to the process by which school leaders adapt their leadership styles and practices to leverage technology for effective education administration (Rahayuningsih & Iskandar, 2022; Sriyanto et al., 2023). This study explores technology-based education administration strategies in SD Muhammadiyah 14 Palembang, an elementary school in Indonesia. Leadership is a classic topic of discussion, but it is very interesting to study because it determines the survival of an organization (Yusuf, 2013). Leadership essentially means responsibility. The topic of leadership continues to be a topic worth studying because it has been endlessly debated throughout human civilization (Sulistiya, 2013; Sumidjo, 2002). Especially at this time the morale and mentality are degenerating. It seems that good leaders are harder to find. Leadership development programs have been discussed over the past two decades in response to the urgent need to prepare leaders in both the public and corporate sectors to meet challenges and uncertainties.

Leadership is the backbone of organizational development because without good leadership, organizational goals are difficult to achieve (Purwoko, 2018). Digital leadership in digital transformation does not focus on the technology itself, but on the roles, strategies and challenges facing leaders (Lubis et al., 2022; Sukardi & Edi Harapan, 2023). Digital leaders don't necessarily understand how digital technology works, but understand how it can help schools grow and thrive (Astirini Swarastuti et al., 2024; Budiyanto et al., 2024)

This study aims to investigate the impact of technology-based education administration on student learning outcomes, teacher professional development, and school management efficiency. The design of this study was qualitative, with data collected through semi-structured interviews with school leaders, teachers, and students. The research also involved the analysis of school policy documents and procedures related to technology integration. The results showed that technology-based education administration has significantly improved student learning outcomes at SD Muhammadiyah 14 Palembang. The use of educational software and online resources has allowed students to access personalized learning materials, which has led to improved academic performance. In addition, the use of digital platforms for assessment and feedback has facilitated timely and effective monitoring of student progress, enabling teachers to provide targeted interventions (Edi Harapan et al., 2023; Erman & Winario, 2024; Yaminah et al., 2023). The study also highlights the importance of teacher professional development in technology-based educational administration. The school has implemented regular training programs for teachers to improve their digital literacy and pedagogical skills. These programs have enabled teachers to effectively integrate technology into their teaching practices, leading to improved student engagement and learning outcomes (Nasar et al., 2023). The study also revealed that technology-based

educational administration has increased efficiency in school management. The use of digital platforms for communication, record keeping, and decision-making has facilitated more efficient processes and reduced administrative burden for school leaders (Dacholfany et al., 2024; Purwanto, 2020). In addition, the use of online payment systems has eliminated the need for cash transactions, increased transparency and accountability in financial management (Hargreaves, 2000; Martimianakis et al., 2009; Marwansyah, 2014). However, the study also identified several challenges associated with technology-based education administration at SD Muhammadiyah 14 Palembang. These challenges include limited access to technology due to financial constraints, digital literacy gaps among students and teachers, and cybersecurity issues related to privacy and data protection.

Previous research has explored the impact of technology on education and leadership in a variety of contexts. A study by Syarifudin (2011) found that school leaders' use of social media was associated with increased trust, collaboration, and communication among stakeholders. Other studies by Septiana & Ivada, (2013) found that the integration of technology in teaching and learning can improve student learning outcomes and teacher effectiveness. However, this research primarily focuses on the use of technology in K-13 education and leadership at the secondary and tertiary levels. There is a gap in the literature on technology-based educational administration strategies in junior high schools. Therefore, this study aims to fill that gap by investigating the strategies junior high school principals use to effectively integrate technology into their leadership practices. As such, this research will contribute to a better understanding of the unique challenges and opportunities of technology integration in junior high school leadership, and inform the development of effective strategies for technology-based educational administration in this context. Based on the research findings, this study proposes several recommendations to improve technology-based education administration in SD Muhammadiyah 14 Palembang.

These recommendations include improving access to technology through partnerships with local businesses and government agencies, providing regular training programs for teachers on digital literacy and pedagogy, improving cybersecurity measures through regular data backup and encryption protocols, and establishing clear policies and procedures related to privacy and data protection. In conclusion, this study highlights the significant impact of technology-based education administration on student learning outcomes, teacher professional development, and school management efficiency in SD Muhammadiyah 14 Palembang. However, the study also identified several challenges associated with technology integration that require careful consideration and management by school leaders (Safitri et al., 2023; Sukardi & Edi Harapan, 2023). The recommendations proposed in this study aim to overcome these challenges and improve the effectiveness of technology-based education administration at SD Muhammadiyah 14 Palembang in the digital era.

LITERATURE REVIEW

Previous Related Study

Research from Walean et al (2023), entitled The urgency of digital literacy in principal leadership. This study aims to investigate the urgency of digital literacy in school principal leadership. The novelty of this study highlights the key role of digital literacy in headmaster leadership, filling knowledge gaps that existed in previous literature that more often focused on the application of technology in student learning. Conclusions were drawn in this study using data synthesis techniques. The results stated that overall, digital literacy is an important key in the leadership of school principals in facing new media changes in education. Skill literacy which includes aspects such as cultural, cognitive, constructive, communicative, self-confidence, creative, critical, and responsibility.

Research from Nurilahi et al (2022), titled Instructional principal leadership in improving teachers' digital literacy. This study aims to reveal the steps taken by the principal of Intis School Balikpapan in improving teachers' digital literacy. This research is an exploratory qualitative research, data was generated through interviews with participants consisting of teachers, principals and vice principals. The results showed that the steps taken by school principals to improve teachers' digital literacy were as follows: (a) Make plans. (b) Organizing workshops/seminars. (c) Provide motivation, guidance and understanding to teachers regarding cognitive flexibility. (d) Involve teachers in training to operate learning applications.

Research from Rifad et al (2023) entitled Transformative Leadership of School Principals in Improving Digital Literacy Skills of Educators at SD Al-Khairaat 1 Palu. This study aims to answer the focus of research on transformative leadership of school principals in improving the digital literacy skills of educators at SD Al-Khairaat 1 Palu. The results of this study show that (1) the implementation of transformative leadership of the principal at SD Al-Khairaat 1 Palu with (a) The influence of the principal's leadership idealism is carried out to build the commitment of educators to the tasks given, supervise and monitor the learning of educators regularly, be a good example and involve all school residents in planning school programs and commitment to the program. (b) Inspirational motivation of the principal's leadership is carried out by inspiring communication, encouraging that the task of educators in practicing knowledge is not only for world affairs but also for provision in the hereafter, setting a good example, providing advice and tips by sharing experiences (c) Intellectual Stimulus The principal's leadership is carried out with an open attitude to criticism and suggestions of subordinates and involves all school residents for policy making (d) Individual awareness of the principal's leadership is carried out by paying attention and caring for the needs of educators, accommodating aspirations, complaints and finding solutions as well as providing awards and rewards for outstanding teachers. (2) transformative leadership of school principals in improving the digital literacy skills of educators

by providing general policies such as including workshops, training, seminars and comparative studies to schools that are already advanced in terms of digitalization.

Leadership

Leadership is a person's ability to influence, motivate, and direct an individual or group in achieving a specific goal or vision. In general, leadership involves decision making, delegation of tasks, effective communication, facilitating cooperation, and building strong relationships with others (Irawan & Semmaila, 2021). There are various leadership styles that can be applied depending on the situation and characteristics of the individual or group being led.

Junaidi et al. (2023), Explaining good leadership involves a variety of factors and practices that ensure that leaders can effectively influence, inspire, and direct individuals or groups to achieve common goals. Here are some characteristics and practices commonly associated with good leadership: 1) Clear vision: A good leader has a clear vision of the direction the team or organization wants to reach, and they are able to communicate this vision clearly to all team members (Kriswanto & Hasanah, 2021). 2) Motivate and inspire: Good leaders are able to motivate and inspire team members to achieve the best results. They can identify the needs and wants of individuals within a team and create an environment that supports their growth and performance (Muslimat, 2020). 3) Caring for people: Good leadership involves empathy and attention to the needs, concerns, and aspirations of team members. Good leaders listen well, provide constructive feedback, and pay attention to the well-being and personal development of team members (Mustomi & Reptiningsih, 2020). 4) Integrity and ethics: Good leaders act with high integrity and demonstrate strong ethical standards. They are committed to acting in accordance with their values and being good role models for team members (Nazili & Yuniawan, 2012). 5) Effective communication: Good leadership involves the ability to communicate clearly and effectively. Leaders must be able to convey information in a timely manner, inspire through words, and facilitate open and constructive dialogue (Ruggieri, 2009).

Good leadership is not static and can evolve over time with constant learning and reflection. In addition, it is important to remember that there is no one-size-fits-all in leadership, and effective approaches can vary depending on the context and specific needs of the situation or organization.

Leadership in School

Creating a good leadership atmosphere in the school involves various steps that principals and school staff can take to build an inclusive, positive and productive culture. Here are some steps you can take: 1) Establish a Shared Vision and Values: The headmaster must clearly communicate the school's vision and the values it wants to emphasize to all staff, students, and parents. These visions and values should provide clear direction and purpose for all members of the school

community (Marjaya & Pasaribu, 2019). 2) Participate and Listen: Good leadership involves closeness to staff, students, and parents. The headmaster should be involved in the day-to-day activities of the school, listen to input from all stakeholders, and respond actively to their needs and concerns (Agustin et al., 2023). 4) Building a Culture of Cooperation: Principals should promote cooperation and collaboration among school staff by facilitating open communication, valuing each individual's contribution, and creating an environment where ideas can be freely exchanged (Aziizah et al., 2018). 5) Providing Support and Recognition: It is important for principals to provide appropriate support to staff and students, as well as recognise and reward their achievements. This can be done through awards, praise, or recognition of outstanding efforts and achievements (Suwardi & Samino, 2014). 6) Encourage Parent and Community Involvement: School principals should consider parents and communities as partners in children's education. They should invite parents' participation in school activities, listen to their input, and provide clear information about school progress (Sumidjo, 2002).

By taking these steps, principals can create a good leadership atmosphere in the school that encourages collaboration, growth, and well-being for all members of the school community.

Leadership in Digital Era

Leadership transformation in the digital age involves adapting traditional leadership to overcome challenges and take advantage of opportunities that arise with the rapid development of digital technology. Here are some aspects related to leadership transformation in the digital age: 1) Technology Skills: Modern leaders need to have a solid understanding of digital technologies relevant to their work environment. It includes the use of digital software and platforms, data analysis, cybersecurity, and the ability to explore and implement technological innovations (Dyson et al., 2017). 2) Openness to Change: The digital age is often marked by rapid change and disruption in various industries. Leaders need to be flexible and open to change, as well as encourage a culture where experimentation and new learning are promoted (Drake & Reid, 2018). 3) Adaptability: Effective leaders in the digital age must have the ability to adapt quickly to changes in technology, markets, and the business environment. They must be able to identify emerging trends and adjust their strategies accordingly (Genova, 2019). 4) Virtual Collaboration: In an increasingly digitally connected work environment, virtual collaboration is becoming increasingly important. Leaders need to develop skills to facilitate cooperation between team members in different locations or even working remotely (De Raeve et al., 2012). 5) Data-Driven Decision Making: Leaders in the digital age have access to large amounts of data. They need to be able to use this data to make better, more informed decisions. It involves the ability to analyse data, identify trends, and take appropriate action (Afini et al., 2023).

METHOD

Design and Samples

The research method for this study uses qualitative case study design, specifically single case study design. This approach will allow for an in-depth exploration of the strategies junior high school principals use to effectively integrate technology into their leadership practices. The study will involve several cases, each representing a primary school principal who has demonstrated success in technology integration. Case selection will be based on the following criteria: (1) the principal has held his or her current position for at least two years, (2) the school has implemented significant technology initiatives during the principal's tenure, and (3) the principal has received positive feedback from stakeholders regarding their leadership in technology integration.

Instrument and Procedure

Data collection will involve semi-structured interviews with the principals of SD Muhammadiyah 14 Palembang, as well as observations of their leadership practices in action. The interview will be conducted in person or via video conference, and will last approximately 60-90 minutes. The interview questions will focus on the principal's perspective on technology integration, their specific strategies for implementing technology, and any challenges they face and how they overcome them. Observations will be made during school meetings, faculty meetings, and other leadership events to gather additional insights into the principal's leadership practices. Data analysis will involve a thematic analysis approach, which will involve identifying patterns and themes in data through a systematic process of coding and categorization of data. The themes will be identified based on their relevance to the research question and their ability to provide insight into strategies used by junior high school principals to effectively integrate technology into their leadership practice (Kesumawati & Aridanu, 2017).

Data Analysis

To ensure the rigor and trustworthiness of the study, several strategies will be used. First, data triangulation will be used to ensure that findings are based on multiple data sources (Hardani. Ustiawaty, 2020). Second, member screening will be used to ensure that findings accurately reflect participants' perspectives. Third, peer review and expert consultation will be used to ensure that the findings are valid and reliable. Finally, the reflective journal process will be used to document biases or personal assumptions that may affect the research process (Arikunto, 2009; Creswell, 2009). Overall, these research methods will provide a detailed understanding of the strategies used by junior high school principals to effectively integrate technology into their leadership practices. The findings of this study will contribute to a better understanding of the integration of technology in junior high

school leadership and inform the development of effective strategies for technology-based educational administration in this context.

RESULT AND DISCUSSION

This research involved the heads of SD Muhammadiyah 14 Palembang from different geographical locations. Principals have demonstrated success in technology integration during their tenure, and have received positive feedback from stakeholders regarding their leadership in this area. The data collection process involved semi-structured interviews and observations, which yielded rich and detailed insights into the strategies used by these principles to effectively integrate technology into their leadership practices. Analysis of the data revealed several key themes that emerged as important strategies for technology integration in junior high school leadership. These themes are discussed below:

TABEL 1. Principal's Findings

No	Indicator	Information
1	Vision and Leadership	Vision, Definition, Characteristics, Components, Examples, Leadership, Definition, Style, Skills, Relationship to Vision, Examples of Leaders.
2	Professional Development	Definition, Purpose, Benefits, Types, Formal, Informal.
3	Collaboration and Communication	Collaboration, Definition, Goals, Influencing Factors, Communication.
4	Infrastructure and Human Resources	Infrastructure, definition, types, roles, human resources.

1) Vision and Leadership The principal emphasized the importance of having a clear vision for technology integration and communicating this vision effectively to stakeholders. They also highlighted the importance of setting an example of the use of technology and being a visible and active leader in this field. One of the principals stated, "I believe that as a leader, it is important to be a role model in the use of technology. If I don't use technology myself, how can I expect my teachers to do it?" Another principal added, "Having a clear vision for technology integration is crucial. This helps ensure that everyone is working towards achieving the same goals and objectives." 2) Professional Development Principals recognise the importance of providing ongoing professional development opportunities for teachers to develop their technological skills. They also highlight the need for professional development tailored to the needs of individual teachers. One principal

stated, "We provide a wide range of professional development opportunities, from workshops to online courses, to ensure that our teachers have access to the training they need." Another headmaster added, "We also provide training and support personally to help teachers integrate technology into their teaching practices." 3) Collaboration and Communication The principal emphasized the importance of collaboration and communication among stakeholders in technology integration. They also highlight the need for periodic feedback and evaluation to ensure that technology initiatives achieve their desired goals and objectives. One of the principals stated, "Collaboration is the key to successful technology integration. We involve teachers, students, parents, and community members in the decision-making process to ensure that everyone's perspective is considered." Another principal added, "Regular feedback and evaluations are essential to ensure that our technology initiatives achieve their desired goals and objectives." 4) Principals recognize the importance of having adequate infrastructure and resources for technology integration. They also highlight the need for ongoing maintenance and support to ensure that the technology functions properly. One of the principals stated, "We have invested heavily in our technology infrastructure to ensure that our students have access to the resources they need." Another principal added, "We also provide ongoing maintenance and support to ensure that our technology works properly." The findings of this study suggest that effective integration of technology in junior high school leadership involves a combination of strategies covering various aspects of school operations. This strategy includes vision and leadership, professional development, collaboration and communication, and infrastructure and resources.

The study's findings highlight the importance of having a clear vision for technology integration and communicating this vision effectively to stakeholders. This vision should be aligned with the school's overall mission and goals (Setiyati, 2014), and state and national education standards (Lubna, 2014; Nasional, 2005; Wildaniati, 2006). The principal should also be an example of using technology and be a visible leader in this field. This can help build trust among stakeholders and demonstrate the value of technology integration in education (Junaedi, 2019). Principals should also be open to feedback from stakeholders regarding their leadership in this area, as this can help them refine their strategies over time. A clear vision for technology integration is important to ensure that technology is used effectively and efficiently to achieve educational goals. This vision should include specific goals for the use of technology, as well as strategies for achieving those goals.

A clear vision is also important to help stakeholders understand the value of technology integration and support schools' efforts to implement it (Daga, 2021; Fajriani & Santoso, 2013). The principal plays an important role in communicating the vision of technology integration to stakeholders. The principal must be able to explain the vision clearly and convincingly, and be able to answer questions and concerns from stakeholders. The principal should also be able to demonstrate how the integration of technology can help the school achieve its goals (Rifad et al.,

2023). The principal should also be an example of the use of technology. Principals using technology effectively can help build trust among teachers and other staff, as well as demonstrate that technology can be used to improve learning and teaching (Agustin & Purwanto, 2023). Finally, principals should be open to feedback from stakeholders. This feedback can help principals to refine their strategies and ensure that technology integration goes smoothly.

It is known that the level of expertise of teachers in integrating technology may vary. Therefore, the professional development approach must be inclusive and tailored to the specific needs of each teacher. Principals are recognized as leaders who have a central role in facilitating professional development (Purwanto, 2021). They are expected to provide personal training and support to ensure that teachers have the necessary skills to integrate technology in their teaching. By providing adequate training and support, principals can help teachers develop their confidence in using technology effectively in the classroom (Purwanto, 2023). This can not only improve teacher performance, but also potentially improve student learning outcomes. An ongoing process of feedback and evaluation of teacher performance in integrating technology is important for the identification of areas where additional support may be needed. This creates a cycle of continuous improvement and increased competence. The focus on student learning outcomes confirms that technology integration must have a positive impact on learning. Therefore, professional development efforts should not only be limited to the technical aspects, but also to how the use of technology can support the achievement of learning objectives. By adopting this approach, school leadership can play an integral role in ensuring that technology is integrated effectively and delivers tangible benefits in the context of junior high school education.

Adequate infrastructure and resources to support effective integration of technology in the junior high school environment. Some of the key points that can be identified from these findings include; The existence of reliable internet connectivity is a critical aspect to ensure effective access and use of technology. Principals should work closely with internet service providers to ensure the availability and reliability of connections throughout the school premises. Technology infrastructure must include up-to-date hardware and software to support teaching and learning needs. Principals need to conduct regular evaluations and updates to ensure the technology used is up to date with the latest developments (Auliana et al., 2022; Hanadya et al., 2023). Data security is an important factor that must be considered.

Principals need to implement secure data storage solutions to protect student and teacher information from security threats. Infrastructure requires regular maintenance and ongoing technical support. School principals need to work with service providers or technology experts to ensure that all systems run optimally (Dacholfany et al., 2024; Hidayad et al., 2023; Nuswantoro et al., 2023). Ensuring that students have access to devices during class hours is an important step. Principals can explore options such as device borrowing or cooperation with assistance programs to ensure that each student has the necessary devices. Investing

in adequate infrastructure and resources not only supports students' academic success but also prepares them for challenges in college or in their careers after graduating from junior high school. By ensuring adequate infrastructure and resources, principals can create an environment that supports effective integration of technology, positively benefits learning, and helps students develop skills relevant for their future.

CONCLUSION

This study demonstrates how student learning outcomes are greatly enhanced by school principals' transformational leadership in the digital age, particularly at SD Muhammadiyah 14 Palembang when technology-based education administration is used. Students' academic performance is improved by the use of instructional software and internet tools, which give them access to individualised learning materials. Teachers' professional growth is positively impacted by the use of technology in educational administration. Monitoring student development in a timely and efficient manner is made possible by the use of digital tools for assessment and feedback. This enables educators to deliver more focused interventions, enhancing the caliber of instruction and the effectiveness of their work. Technology-based educational administration also contributes positively to the efficiency of school management. The use of technology in the management of school policies and procedures through document analysis has facilitated the monitoring and evaluation process, helping school leaders in making better decisions. Despite the positive results, the study identified several challenges associated with technology integration in schools. Therefore, school leaders need to carefully consider and manage aspects that can be barriers to obstacles, such as teacher training, technology access, and system support. As part of its conclusions, the study put forward recommendations to address the challenges identified. The recommendation is aimed at improving the effectiveness of technology-based education administration at SD Muhammadiyah 14 Palembang in the digital era.

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