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Digital Transformation in Primary Education

Octavia Nuril Kamila, Leonard Adrie Manafe, Shobikin

^{1,2,3}Management, Sekolah Tinggi Ilmu Ekonomi Mahardhika

¹octavianurilkamila@gmail.com*, ²leonard.adrie@stiemahardhika.ac.id, ³shobikin@stiemahardhika.ac.id *for corresponding author

Abstract

This study investigates the introduction of digital technology in primary school administration, specifically at SD Muhammadiyah 3 Ikrom Wage. The aim is to make education management more efficient and transparent, while improving service quality. The researcher collected data using traditional methods—observation, interviews, and document analysis—and analysed them using descriptive qualitative methods. Field findings indicate that digital systems do reduce time and improve communication, but they still face challenges such as infrastructure limitations, low digital literacy, and resistance from some teachers. On the positive side, transformational school principals provide regular training and invite parents and other stakeholders to participate. To accelerate the digitalisation process, schools need to improve internet connectivity, equip educators with adequate skills, and hope for continued policy support. A well-functioning digital administrative system, in turn, has the potential to boost overall educational performance and service quality.

Keywords: Digital technology, education administration, primary school, transformational leadership, digital competence.

1. Introduction

Education systems across the globe continue to face the challenge of keeping pace with an increasingly information and communication technology (ICT)-oriented society. In the sphere of education, the use of ICT has been found to improve the information and administrative functions of the institution, decrease human error, and refine the data handling tasks such as payment processing and parent communication channels which, in turn, enhances the overall quality of service provided in education [1]. Because of globalization, the world has become more interconnected, thus increasing the need for fulfilling educational frameworks like the European Higher Education Area which demands comparability of degrees and the academic mobility of students and staff [2]. It is important in the context globalization as it speeds up the socio-cultural processes and at the same time widens the gap between different social groups within the society, calling for the flexibility and inclusiveness of responsive systems [2]. The facets of the relationship that education has with globalization are multifaceted, and include both robust advantages and troubling downfalls.

Globalization encourages the sharing of resources and information, but centers unequal access to education and a need for a faster adaptation of technological systems as problems [3]. Despite the opportunities globalization creates for education systems to improve learning environments and outcomes, the world still faces disparities that require attention [4] [3]. Therefore, it is perceived that globalization in education means more than just the advancement of technologies; it requires a shift in the socio-economical, political, and cultural frameworks of the society as a whole [3].

Incorporating digital technologies into the management of schools, even at the primary level, poses distinct challenges alongside clear advantages. As with many sectors, the concern with 'educational administration' lies within its ability to optimize time, cost, transparency, and accuracy, clearly reflecting the managed value of information systems (MIS) and their accompanying success within the industry [5] [6]. As with any organization, systems such as Management Information Systems (MIS) ensure streamlined automation of administrative coursework and its management alongside aiding coherent decision making [7]. Nonetheless, the shift towards digital administration is sorted with obstacles.

Educator and staff digital competence, coupled with funding restrictions and infrastructural shortcomings, constitutes the primary challenges [8] [5]. Furthermore, the adoption of digital systems is hampered by change resistance and data protection concerns [5]. Integrated system development combined with ongoing training is

suggested to mitigate these barriers [8]. In addition, policy frameworks with appropriate infrastructure are critical to harness the full potential of digital technologies in addressing the management concerns of schools [9]. The experience of Yayasan Perintis Pendidik Nusa illustrates the efficacy of automated systems for enhancing the precision and reliability of student record-keeping and other administrative functions, emphasizing the need for educational management digitalization [6]. All in all, despite greater administrative efficiency provided by digital systems, balanced dependence on technological sophistication and human capital attuned to specific implementation processes is essential [7].

The use of information management systems which rely on technology within educational institutions improves the accessibility, precision, and operational efficiency of data, however, it is hindered by systemic inadequacies such as low digital literacy and information security. These issues are particularly acute in underserved regions with sparse infrastructural support, because these areas tend to lack adequate technological facilities [8] [5] [10]. To resolve these problems, it is vital to enhance the digital literacy competencies of teachers, school administrators, and other staff members.

Continuous training coupled with system integration development is essential to overcoming barriers related to a lack of technical expertise and change resistance [8] [9]. Alongside this, the application of information technology in the school management system not only streamlines operations but also improves management information systems, enhancing communication and decision-making during all levels of the admin hierarchy [10] [7]. Even though innovations in technology and education have the potential to increase performance, there are a number of prerequisites including infrastructure and policy frameworks as well as ongoing retraining programs to ensure maximum output [9]. Furthermore, robust data security and intricate mechanisms for protecting sensitive information are vital to maintaining data accuracy and privacy, which are central to digital systems management [7]. Educational institutions can shift from traditional systems and improve resource allocation and management, streamline inter-institutional communication, and enhance the overall quality of education by overcoming these hurdles [5] [7].

SD Muhammadiyah 3 Ikrom is one example which illustrates the application of technological innovation in educational administration. The school's adaptive integration of technology into its management processes has streamlined and sped up the various administrative functions with greater clarity in data handling. This particular case study exemplifies how primary schools can leverage technology much beyond its basic version to enhance efficiency and ease in administrative management. The SD Muhammadiyah 3 Ikrom's experiences can be valuable assets of information for other schools aspiring for a comprehensive digital overhaul in administrative management.

Although numerous studies have explored integrating technology in education, there remains a gap in literature concerning the use of digital management systems at the primary school level. The existing body of research tends to concentrate on more advanced educational institutions and overlooks the myriad difficulties primary schools encounter when attempting to integrate technology. This study seeks to address this problem by investigating how the digitalisation of administration processes at SD Muhammadiyah 3 Ikrom can enhance efficiency, transparency, and quality in managing educational data. It also aims to analyze problems related to the adoption of digital-based administration systems and recommend appropriate measures to resolve those problems.

The problem formulation in this research focuses on two primary issues: First, how does the implementation of digital innovation in the administration at SD Muhammadiyah 3 Ikrom enhancement efficiency and transparency in managing education data? Second, what problems arise in the applying of administrative system digitalisation, and what methods are used to solve these problems? This sought these questions in order to elicit primary school case studies on administrative digitalisation for the rest of the educational institutions.

Therefore, besides enriching the literature on the legislation of education administration in the point of view of informatics technology, this research is also directed toward policies that respond radically to the development of educational technology and serves as a guide in resolving the challenges of digitalisation in primary education.

2. Research Methods

For understanding the use of technology in the administration processes at SD Muhammadiyah 3 Ikrom, a case study method with a descriptive qualitative approach fits best. This method fits the requirement to understand the participants' viewpoints as it offers a grasp of social phenomena relevant to the situation, supporting the interpretivist paradigm that views reality as a social construction [11]. Descriptive research methods provide a basis for observation and description of phenomena using documents, interviews, and other relevant qualitative tools, which gather data to be analyzed qualitatively [12]. A multi-method strategy enabling detailed studies of

particular instances while placing them in broader contexts; this is important for probing the details underlying the processes of digital innovation in the field of educational administration [13]. In addition, method and methodology choice directly determines the quality and relevance of outcomes, emphasizing systematic design steps to ensure relevance in the outcomes of the research [14]. With a case study approach, researchers have access to numerous data collection methodologies, such as direct observation and interviews, which, combined, allow for an in-depth understanding of the implementation process and its effects on administrative services and their delivery [11].

3. Results and Discussions

As multiple studies have shown, the use of digital technology in managing a school's activities and programs brings significant value to education. The adoption of integrated information systems and online learning tools fosters improved operational efficiency, acceleration in school decision-making activities, and improvement in the quality of learning [9] [5]. Notably, there exists a myriad of issues such as internet access, low levels of digital literacy training targeted towards educators, and limited funding all in a single space [9] [15] [16]. While achieving digital transformation goals, SD Muhammadiyah 3 Ikrom Wage and Muhammadiyah Al-Kautsar junior high school still face problems with internet connectivity and infrastructure readiness [16]. Effective school policies allow educators to foster their technological prowess which ensures that support mechanisms, infrastructural frameworks, and appropriate professional development are in place to guarantee the school does achieve the aforementioned digital transformation [9] [17]. Further, stress that resource sustainability and comprehensive digitization across all systems from student and staff data management to curriculum and communications management requires strategy focused on resource allocation [15] [5]. From an educational standpoint, the issue of data accuracy and learning experience fosters new avenues for improvement thus change on a global scale is vital to realize.

Recent research has shown that SD Muhammadiyah 3 Ikrom Wage's use of educational technology for school administration has been integrated into a wider system of pedagogy and management within the contemporary educational landscape. The administrative digitization as an integral operational function of the school's management enhances both efficiency and the quality of education services offered [9]. The introduction of smart multifunctional cards, digital payments systems, and the S3 performance evaluation app are pivots in administration automation and seamless collaboration among the educators, learners, and guardians [9] [16]. Other institutions, like SMP Negeri 3 Bangli, utilize google classroom and other social media for teaching and showcasing school activities, which provides evidence for the efficacy of these digital platforms [18]. However, uncovering still-contained potential as expounded literature reveals lacks, enduring infrastructural frameworks, evolving skillset enhancement registries of course [8]. The advancement of SMP Muhammadiyah Palangka Raya's digital admin applications boosts school management, shows us the further importance of technology in educational organizational effectiveness [19]. As far as the reality of SD Muhammadiyah 3 Ikrom Wage's ambition for digital transformation in age-shifting education innovation goes-committed furthering tech-based infrastructure expansion and educator continual training needed.

As indicated by the training received by educators and staff at SD Muhammadiyah 3 Ikrom Wage, human resources at the institution have digital skills which are indicators of successful adoption of digital innovations. This is in line with the results of many studies conducted in educational institutions. For example, at SD Mathla'ul Anwar, technology integration has improved human resource functions such as recruitment, communication, and even training, although there are still some challenges related to technical training [20]. Likewise, Muhammadiyah educational institutions are facing technological challenges by incorporating technology into teaching as well as administration, which improves educational services and highlights the need for continuous support to overcome the digital divide [21]. The creation of a concept model for HRM in educational organisations further demonstrates the need to strategically focus on leveraging digital technologies to build a more active, interactive and collaborative framework [22]. In addition, a strategic discussion on digital technology competencies at the higher education level revealed that it optimises processes and encourages new ideas that support the need for training specifically designed for meaningful digital change [23]. Their findings confirmed the importance of specialised teaching aimed at developing digital skills for school management as well as improving the proper working of management functions.

As evidenced by the head of SD Muhammadiyah 3 Ikrom Wage, the role of school principals - especially those who apply transformational leadership - is crucial in driving digital innovation in schools. Transformational leadership, as defined by Bernard M. Bass, centres on driving change through motivating and empowering educators to stimulate innovation and creativity [24] [25]. Present at SD Muhammadiyah 3 Ikrom Wage, the principals provide technology and infrastructure training and coaching, helping with the human resource issues of

modern education [24] [26]. It not only helps in solving the problems of modern education, but also actively motivates faculty innovation and advances collaborative communities to strengthen educational development [25] [27]. Principals collaborating with the public and private sectors greatly contribute to overcoming budget and resource constraints in infrastructure [26]. Community-aligned instruments such as questionnaires provide regular evaluation through 21st century school services, ensuring modern innovations in education remain relevant and useful (Iskandar, 2023). The impact of this form of leadership is significant in faculty motivation, improvement, and effective implementation of innovations in education [27] [28].

The active participation and support from all stakeholders, especially from students' guardians, greatly enhances the successful implementation of digital innovation at SD Muhammadiyah 3 Ikrom Wage. The community's active participation is not only helpful in motivating the school to innovate, but also helps improve the quality of education and administrative services [29]. The collaborative strategy underscores the importance of constant feedback and evaluation, which can assist in improving the school's services in relation to the vision and mission of the school [21] [29]. With the help of digital innovations like e-learning and management systems, communication among the school administration, teachers, students, and parents has improved, leading to better educational performance [9] [30]. However, there are still challenges that need to be addressed like gaps in technological infrastructure and support frameworks with ongoing training programmes for educators - support and adaptation are still required [9] [19]. The integration of digital technologies creates an environment that is educationally transparent and inclusive to all actors, thus promoting collaboration [30]. This comprehensive plan aims to ensure that SD Muhammadiyah 3 Ikrom Wage succeeds in the digital world, thus enhancing the educational and satisfaction levels of all stakeholders [21] [30].

4. Conclusion

This research highlights the importance of digital technology integration in the education administration system, focusing on SD Muhammadiyah 3 Ikrom Wage as a case study, where the implementation of information and communication technology (ICT) can improve the efficiency, transparency and quality of education services. However, the adoption of digital systems at the primary school level faces various challenges, such as limited infrastructure, low digital literacy and resistance to change, which require the development of digital competencies for educators and administrative staff, as well as appropriate policy support to optimise the potential of technology in education. The research also emphasises the important role of transformational leadership in driving digital innovation in schools, where principals who are committed to providing training and technical support to staff and forging links with the community and public sector can accelerate the implementation of technology in school management. In addition, active support from all stakeholders, especially parents, strengthens the success of digitalisation of school administration. Although SD Muhammadiyah 3 Ikrom Wage has successfully implemented technology in their administration system, there are still challenges such as infrastructure gaps and the need for continuous training, but with the right strategy and strong support, digitalisation of education administration can improve school performance and advance the overall quality of education. Based on the findings of this study, to improve the implementation of digital innovations in education administration in primary schools, it is important for schools to improve technological infrastructure, such as stable internet access and adequate devices, with support from the government and relevant institutions. In addition, the development of digital competencies for educators and administrative staff through regular training tailored to their skill levels is necessary, followed by policies that support the digitalisation of administration, including sufficient budgets and continuous training, as well as solutions to challenges such as the digital divide and data security. Active support from stakeholders, especially parents, is also crucial to the success of this change, so schools need to strengthen communication with them through digital platforms. Regular refinement and evaluation of digital systems and strengthening of data security mechanisms will ensure that technology is used effectively, efficiently and transparently, which in turn improves the overall quality of education services.

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