



Digitalization Management in Schools : A Strategic Framework for Enhancing Academic Quality

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Abstract: This study aims to analyze the planning, organization, implementation, and evaluation of school digitalization to improve academic quality at SMAN 1 Karangrayung, Central Java. This study uses a qualitative approach using observation, interview and documentation methods for data collection. The informants selected with a total of 23 people consisting of the Principal, Vice Principal, Teachers and Students. The data analysis technique in this study uses qualitative descriptive. Based on the results of the study, the management of school digitalization at SMA Negeri 1 Karangrayung has been running well in improving academic quality, covering aspects of planning, organizing, implementing, and evaluating. In planning, the school has formulated digitalization objectives, identified problems, collected relevant data, determined implementation stages, and formulated problem solving, including in terms of infrastructure, teacher training, data security, and program sustainability. Organization is carried out with a clear division of labor, the formation of a digitalization team, and routine coordination through periodic meetings to ensure smooth implementation. At the implementation stage, the school sets an implementation schedule, provides examples of technology applications, motivates teachers, communicates tasks well, and carries out ongoing coaching so that the digitalization program runs optimally. Evaluation is carried out by determining supervision standards, measuring teacher performance, comparing implementation results with established standards, and making continuous improvements. Overall, a systematic approach to school digitalization management has supported the improvement of academic quality and learning effectiveness at SMA Negeri 1 Karangrayung.

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Introduction

The Industrial Revolution 4.0 has brought significant changes to the world of education, encouraging digitalization and innovation in technology-based learning. The government through the Ministry of Education and Culture initiated a school digitalization program to improve the quality of education and the readiness of students to face global challenges. Digitalization not only improves school administration, but also increases the flexibility and effectiveness of data-based learning (Dewanti, 2020).

Jamaluddin, J., & Sopiah (2018) explain that academic quality that occurs within schools includes all aspects of education implementation by utilizing various resources to achieve National Education Standards (SNP). The quality of education includes input, process, and output that must be in line with the established standards. SMA Negeri 1 Karangrayung as one of the state schools in Grobogan Regency, Central Java continues to strive to improve academic and non-academic achievements through various learning innovations and fulfillment of graduate competency standards. Data on the average value of



graduates shows an increasing trend, reflecting the school's efforts to maintain sustainable education quality.

The digitalization of education has become a key factor in increasing the effectiveness of learning and the efficiency of school management. Along with the development of technology, various schools have begun to adopt digital systems in the aspects of organizing, implementing, and evaluating education to improve students' academic quality. SMAN 1 Karangrayung is one of the schools that has implemented digitalization to support educational transformation, especially in reducing paper use (paperless), increasing learning interactivity, and optimizing integrated system-based administration. However, the effectiveness of digitalization in improving student academic achievement and gaps in teachers' digital skills and infrastructure are still challenges that need to be studied further.

Previous studies have shown that the implementation of digital strategies in educational institutions has not been fully effective due to the lack of commitment and vision in implementing digitalization (Bui, T. N., Nguyen, X. H., & Pham, 2023). In addition, there is no comprehensive framework for aligning digital devices with educational goals (Bui, T. N., Nguyen, X. H., & Pham, 2023). At the university level, a digital university management system (DCMS) has been developed to improve academic and administrative efficiency (Kumar et al., 2024), but the integration of a digital quality management system is still in its early stages (Budarina, A. O., Polupan, 2019). Other studies have also revealed that the method of assessing teachers' and students' digital literacy still needs to be strengthened to understand the level of digitalization in education (Belousova, O., Walsh, S., & Groen, 2021).

The novelty of this study lies in the in-depth analysis of the effectiveness of digitalization management at the secondary school level, especially at SMAN 1 Karangrayung, in improving students' academic quality. This study also explores how digitalization can overcome the constraints of teachers' digital skills and access and availability of infrastructure that are still obstacles in the implementation of school digitalization.

Based on this background, this study aims to examine the implementation of digitalization at SMAN 1 Karangrayung in terms of planning, organizing, implementing, and evaluating the quality of education. In addition, this study will analyze the extent to which digitalization has an impact on students' academic achievement and the factors that are challenges in its implementation. The results of this study are expected to provide recommendations for schools in optimizing digitalization management to improve the quality of education.

Research Method

The research approach used in the study is qualitative descriptive because this study produces conclusions in the form of data that describes in detail, not data in the form of numbers. In this study, the researcher uses qualitative research to be able to understand phenomena in a natural social context that describes the problems of school digitalization management to improve academic quality in schools. The place where this research was carried out was at SMA Negeri 1 Karangrayung, Grobogan Regency, Central Java. According to Miles, (2020), qualitative data analysis is interactive, where data collection, reduction, presentation, and drawing conclusions are carried out repeatedly and simultaneously until a clear conclusion is obtained. This technique allows researchers to continuously improve the focus of the research based on the data found during the process. In collecting data in this

study, researchers used observation, interview and documentation methods. To obtain complete data and information in accordance with the focus of the research,

In order to test the validity or truth of the data from interviews, observations and documentation, triangulation was used. The data triangulation technique in this study uses checking through other sources. Triangulation with sources means comparing and checking back the degree of trustworthiness of information obtained through different times and tools in qualitative research (Patton in Moleong LJ., 2016: 330). The reason for using triangulation is because the data collected from various sources from informants totaling 8 teachers, 2 vice principals, a principal, 12 students using observation data and documentation data. This triangulation is used to eliminate differences in the construction of reality that exist in the context of the research when collecting data. In this study, the conclusion will be related to how the management of school digitalization to improve academic quality in SMA Negeri 1 Karangrayung. This conclusion must be re-verified through the revision and re-checking process to be more.

Results and Discussion

School digitalization management is a strategic initiative aimed at improving the efficiency and effectiveness of both learning and administration through the use of digital technology. At SMA Negeri 1 Karangrayung, the digitalization process is implemented to enhance education quality by integrating various technological innovations. This transformation involves a systematic approach consisting of planning, organizing, implementation, and evaluation. By following these structured steps, the school ensures that digitalization runs smoothly and benefits all stakeholders, including teachers, students, and administrators.

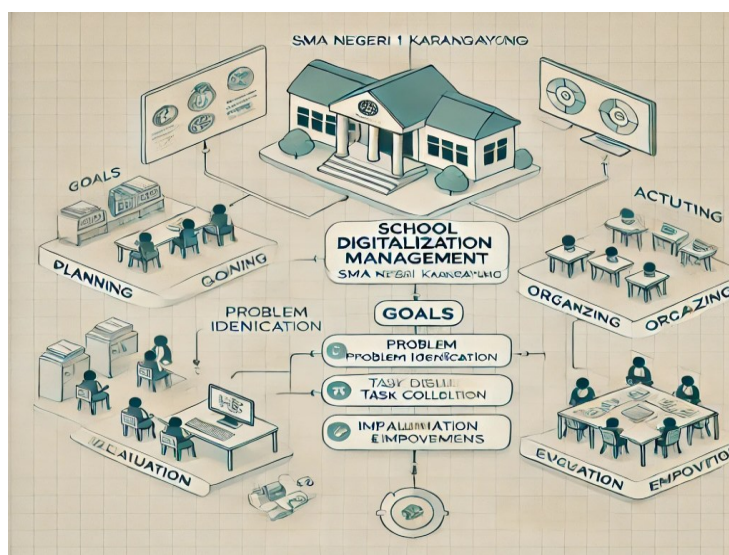


Figure 1. School digitalization management at SMA Negeri 1 Karangrayung

The first stage of digitalization is planning, where the school identifies the technological needs and sets strategic goals for implementation. This includes determining the necessary tools, software, and internet infrastructure to support digital learning and administration. Proper planning is essential to prevent obstacles such as a lack of adequate resources or limited digital literacy among educators. Additionally, the school allocates financial and human resources to ensure that the digitalization process is feasible and sustainable in the long term.



Once planning is completed, the school proceeds to the organizing phase. In this stage, a dedicated team is formed to oversee the digitalization efforts, ensuring that every aspect is properly managed. The school also sets clear roles and responsibilities for teachers, IT staff, and students in the use of digital tools. During this stage, necessary devices and digital platforms, such as Learning Management Systems (LMS) and school administration software, are procured and introduced to ensure seamless integration within the learning environment.

The next phase is implementation, where digital technologies are actively applied in the school system. Teachers integrate digital tools into their lesson plans, using interactive media, online assessments, and virtual collaboration platforms. Meanwhile, school administration processes, including student attendance, grading, and communication, are also transitioned into digital formats. To ensure successful implementation, training sessions are provided for both teachers and students, helping them adapt to the new systems and maximize their benefits.

Following the implementation, the school conducts an evaluation to assess the effectiveness of digitalization. This process involves gathering feedback from teachers, students, and administrators to identify strengths and areas for improvement. The evaluation considers various factors such as the usability of digital platforms, the impact on student engagement, and the overall effectiveness of digital learning. If necessary, adjustments are made to optimize the system and ensure that it meets the evolving needs of the school community.

In conclusion, school digitalization management at SMA Negeri 1 Karangrayung is a continuous process aimed at enhancing education through technology. By systematically implementing planning, organizing, implementation, and evaluation, the school ensures a smooth transition into digital learning and administration. Identifying challenges and making necessary improvements are key to sustaining digitalization efforts, ultimately leading to a more efficient, interactive, and innovative educational environment.

The digitalization management planning of schools at SMA Negeri 1 Karangrayung aims to improve academic quality by implementing four main management functions according to Terry (2016), namely planning, organizing, implementing, and supervising.

Digitalization Management Planning of Schools to Improve Academic Quality

In the planning stage, the initial step taken is to set digitalization goals, including the management planning function is one of the four main management functions, along with organizing, directing, and controlling. According to Fayol (2017), planning provides direction, coordination, and control based on predetermined plans. However, management planning does not always have to be strictly followed, as it may change according to the existing situation. Nevertheless, planning remains essential, as it helps structure activities systematically, ensuring that every step taken aligns with organizational goals. Good planning also helps formulate strategies to address uncertainties in the future. There are five key dimensions in the school digitalization management planning process: (1) Setting digitalization management objectives, (2) Identifying problems and tasks for digitalization, (3) Collecting necessary data and information, (4) Defining digitalization management stages, and (5) Formulating problem-solving strategies.

In the context of school digitalization, planning involves setting objectives and strategies to achieve them efficiently. Effective planning ensures that all team members work toward a common goal, minimizes uncertainty, optimizes resources, improves operational efficiency, reduces overlapping activities, promotes innovation, and facilitates decision-



making. The research findings at SMA Negeri 1 Karangrayung indicate that the initial steps in digitalization management planning include defining goals, identifying potential challenges, and formulating solutions to ensure a smooth transition toward digital-based education. According to Silmi (2024), planning in management is a decision-making process that involves selecting objectives and developing strategies to achieve them, ranging from strategic to operational planning.

The school's digitalization planning program at SMA Negeri 1 Karangrayung has been implemented effectively. The planning includes resource analysis to improve academic quality through needs analysis, defining vision and mission, selecting technology, implementation planning, training and development, evaluation and adjustments, data security, and sustainability strategies. The identification of problems and tasks in school digitalization management includes budget limitations, resistance to change, lack of infrastructure, training needs for teachers and staff, data security and privacy concerns, technical support, regulatory compliance, and ongoing evaluation. These challenges must be addressed through well-structured management strategies.

To enhance academic quality through digitalization, the necessary data and information include student records, teacher and staff data, administrative records, learning materials, communication records, and security-related data. A structured digitalization process includes (1) initial assessment of technological needs, (2) strategic planning with clear vision and measurable goals, (3) forming a digitalization team, (4) budgeting and resource allocation, (5) selecting suitable technology, (6) training and development programs, (7) implementation and integration, (8) continuous monitoring and evaluation, (9) maintenance and technical support, and (10) long-term sustainability. These steps ensure that digitalization is not only implemented but also sustained effectively over time.

The problem-solving approach in school digitalization management includes identifying key challenges, analyzing root causes, developing appropriate solutions, implementing technology, enhancing human resource capacity, evaluating progress, and prioritizing data security. According to research findings, well-structured digitalization management planning at SMA Negeri 1 Karangrayung aligns with educational management principles and supports improved academic quality. Arikunto and Yuliana (2018) state that planning is a preparatory effort for achieving future goals through the optimal use of resources. Similarly, Parida et al. (2024) emphasize that digitalization planning should be based on educational report cards, mapping priorities, assessing capabilities, engaging stakeholders, conducting training, and collaborating with quality assurance institutions.

School digitalization is a necessary adaptation to technological advancements. The government has introduced digitalization policies to support digital learning, including providing online educational resources for teachers, students, schools, and communities. These policies are based on Ministerial Regulation No. 31 of 2019. According to Iqbal (2023), digitalization enhances efficiency, broadens access to education, and fosters collaboration between teachers and students. Schools must plan, implement, and evaluate digitalization policies effectively, addressing challenges such as inefficient administrative processes and infrastructure limitations. The implementation at SMA Negeri 1 Karangrayung aligns with Tjokroamidjojo's (2021) theory, which states that planning is a systematic process to achieve specific objectives efficiently. Effective digitalization planning ensures that schools can adapt to technological changes while maintaining high academic standards.



Organization of School Digitalization Management to Improve Academic Quality

The organization of digitalization management at SMA Negeri 1 Karangrayung follows a structured approach, ensuring effective implementation. It consists of three main components: (a) effective division and placement of work, (b) the formation of a school digitalization management team, and (c) regular coordination meetings. These components help streamline the digitalization process, ensuring that responsibilities are clearly defined and efficiently executed.

The division of labor is carried out transparently, with the principal overseeing the overall implementation of digitalization, the IT coordinator managing technology infrastructure, and specific roles assigned to teachers, administrators, and security personnel. Each team member is assigned responsibilities based on their expertise to enhance efficiency. Teachers integrate technology into their lessons, while administrators manage school information systems and ensure data security.

To further strengthen digitalization efforts, the school has established a digitalization management team consisting of school leaders, teachers, administrative staff, student representatives, parents, and external stakeholders. This team works collaboratively to support the integration of technology in education. Their involvement helps in aligning the digitalization strategy with the school's vision and mission, ensuring sustainability.

Regular meetings play a crucial role in maintaining the effectiveness of digitalization management. These include initial meetings to strategize and identify needs, periodic meetings (weekly or monthly) to discuss progress and challenges, annual evaluations to assess success and obstacles, and ad-hoc meetings for urgent matters. Additionally, workshops and training sessions are organized to enhance staff competency in using digital tools. The organizational structure at SMA Negeri 1 Karangrayung aligns with various management theories. Hasibuan (2020) states that organizing involves determining and grouping activities to achieve goals, placing individuals in the right roles, and delegating authority. Similarly, Griffin (2020) emphasizes that structuring tasks and resources effectively enhances organizational competitiveness. The school's digitalization efforts reflect these principles by ensuring a well-coordinated and systematic approach.

By implementing a structured organizational framework, the school optimizes digitalization management for better academic quality. The emphasis on structured role assignments, specialized training, and centralized decision-making enhances efficiency and effectiveness. This well-planned approach ensures that technology is seamlessly integrated into educational processes, ultimately improving teaching and learning outcomes.

Implementation of School Digitalization Management to Improve Academic Quality

Actuating is a crucial management function aimed at realizing the results of planning and organizing. It involves directing and motivating employees while utilizing available resources to work collaboratively. In an organization, actuating is defined as the overall process of encouraging subordinates to work earnestly toward achieving organizational goals (Faiz et al., 2024). Leadership, motivation, and communication are essential aspects of actuating, ensuring that all team members contribute effectively to the organization's success.

In the context of SMA Negeri 1 Karangrayung, the implementation of digitalization management follows a structured process. It begins with defining the execution of digitalization plans, setting an example for implementation, motivating teachers to fulfill their responsibilities, and maintaining continuous communication. The execution involves six key stages: initial assessment, strategic planning, infrastructure preparation, training and



development, implementation and integration, and monitoring and evaluation. Each stage is essential in ensuring the seamless adoption of digital tools in the school's academic system.

Various stakeholders play a role in implementing digitalization management, including IT coordinators, experienced teachers, education consultants, technology providers, and government institutions. These individuals provide guidance, training, and support to ensure a smooth transition to digital learning. The motivation of teachers is crucial for the success of digitalization efforts, as it fosters adaptation, skill enhancement, work efficiency, collaboration, and a positive learning environment.

Communication plays a key role in actuating, with structured meetings such as initial planning sessions, routine coordination meetings, workshops, and evaluation gatherings. These meetings ensure alignment among all stakeholders, helping to address challenges and enhance digitalization efforts. Additionally, ongoing training and professional development ensure that teachers and staff are equipped with the necessary skills to integrate digital tools effectively into their teaching methods.

The concept of actuating aligns with management theories emphasizing leadership and motivation. Actuating involves guiding individuals to work cohesively towards organizational objectives. Effective implementation requires treating employees with fairness, recognizing achievements, providing growth opportunities, and fostering collaboration (Putri et al., 2024). Studies have shown that digitalization in schools enhances interactive and efficient learning, with leaders playing a vital role in inspiring and guiding teachers (Mardhiah et al., 2024).

In conclusion, actuating is an essential function in digital school management, ensuring that planned strategies are effectively executed. It involves structured leadership, motivation, and communication strategies to optimize digital integration. Through careful implementation, continuous support, and evaluation, SMA Negeri 1 Karangrayung successfully enhances its academic quality by leveraging digitalization in education.

Evaluation of School Digitalization Management to Improve Academic Quality

Evaluation is the process of monitoring and assessing operational activities and outcomes by comparing them to predetermined standards. Effective evaluation in management requires steps such as setting quality standards, measuring activities against these standards, and making necessary improvements. In school management, evaluation ensures that all activities align with policies, strategies, and objectives. Monitoring and assessment in digital school management help identify gaps and implement corrective actions to enhance academic quality.

At SMA Negeri 1 Karangrayung, evaluation in digital school management follows structured steps: defining evaluation standards, measuring teacher performance, comparing outcomes with set benchmarks, and implementing improvements. Key evaluation criteria include teaching performance, student achievement, and participation in digitalization initiatives. Performance indicators such as attendance tracking (fingerprint and facial recognition), lesson planning, and student learning progress are used to assess effectiveness.

The school employs several methods to evaluate teacher performance, including classroom observations, portfolio assessments, surveys, student performance data analysis, interviews, and continuous feedback mechanisms. Evaluations also cover the effectiveness of digital tools and their impact on student learning outcomes, teacher efficiency, and stakeholder satisfaction. These assessments ensure that the digital transformation efforts in the school are on track and contributing positively to academic performance.



To improve digital school management, SMA Negeri 1 Karangrayung implements measures such as evaluating performance gaps, conducting training workshops for teachers, upgrading digital infrastructure, collaborating with stakeholders, and continuously monitoring progress. Additionally, adjustments in policies and procedures are made to optimize the use of digital platforms in teaching and school administration. Regular assessment and corrective actions contribute to sustained improvements in digital learning and school management.

Research highlights the importance of digital school management oversight. Studies indicate that school monitoring includes financial reporting, digital resource management, and compliance with government policies. Regular audits and supervision by the principal and education authorities ensure that digitalization efforts align with educational goals and financial accountability. The integration of digital platforms, such as online learning tools and e-performance tracking, enhances administrative efficiency and academic outcomes.

Overall, evaluation in digital school management is crucial for maintaining quality education. By continuously monitoring performance, identifying areas for improvement, and adapting to technological advancements, schools can enhance learning experiences and organizational efficiency. Effective digital school management requires structured planning, regular assessment, and proactive interventions to ensure long-term success.

The findings of this study have significant conceptual implications for school digitalization management, particularly in improving academic quality. Conceptually, this study reinforces the theory that digitalization in education management enhances efficiency and effectiveness in both learning and school administration. The systematic evaluation demonstrates that technology-based approaches not only improve access to information but also enhance supervision and accountability in teacher performance and student achievement. Additionally, these findings support the idea that supervision in education management must be dynamic and data-driven to respond effectively to rapid changes in the digital education environment.

Practically, this research provides insights for schools in developing more optimal digitalization implementation strategies. The evaluation results indicate that the use of technology, such as digital attendance systems, online learning platforms, and teacher performance monitoring systems, can improve teaching effectiveness and student engagement in the learning process. Another practical implication is the need for continuous teacher training to maximize the use of technology, as well as the enhancement of digital infrastructure to ensure smooth implementation of school digitalization. Furthermore, this study highlights the importance of collaboration between schools, government bodies, and other stakeholders to ensure the sustainability and continuous improvement of digital school management in achieving better educational outcomes.

Conclusion

The management of school digitalization at SMA Negeri 1 Karangrayung has been running well in improving academic quality, covering aspects of planning, organizing, implementing, and evaluating. In planning, the school has formulated digitalization objectives, identified problems, collected relevant data, determined implementation stages, and formulated problem solving, including in terms of infrastructure, teacher training, data security, and program sustainability. Organization is carried out with a clear division of labor, the formation of a digitalization team, and routine coordination through periodic meetings to ensure smooth implementation. At the implementation stage, the school sets an implementation schedule, provides examples of technology applications, motivates teachers,



communicates tasks well, and carries out ongoing coaching so that the digitalization program runs optimally. Evaluation is carried out by determining supervision standards, measuring teacher performance, comparing implementation results with established standards, and making continuous improvements. Overall, a systematic approach to school digitalization management has supported the improvement of academic quality and learning effectiveness at SMA Negeri 1 Karangrayung.

Recommendation

The Education Office needs to collaborate with elementary schools in Grobogan Regency to foster digitalization management to improve academic quality, considering the constraints in human resources and budget. In addition, the office can facilitate digitalization according to school needs by identifying internal and external resources.

For schools, digitalization management that has been running well needs to be maintained and improved through educational innovation and strengthening of technological infrastructure, including internet networks and more modern devices. In addition, the formation of a digitalization management team involving IT experts is needed to strengthen program implementation.

Meanwhile, teachers are expected to be active in digitalization by participating in educational technology training, utilizing online learning platforms, and using school management applications. Teachers also need to be committed to implementing the digitalization program and contributing to the learning community by providing feedback to the principal so that appropriate improvements can be made in digitalization management to improve academic quality.

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