Digitization-Based Education Management: Case Study of MAS Tarbiyah Islamiyah, Hamparan Perak, Deli Serdang

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Abstract

Digitalization-based education management is a new paradigm in school management, especially in the era of the Industrial Revolution 4.0 which demands digital transformation in various aspects of education. This study aims to analyze the implementation of digitization-based education management at MAS Tarbiyah Islamiyah, Hamparan Perak, Deli Serdang. The research method used is a case study with a qualitative approach. Data were collected through observation, in-depth interviews, and document analysis related to digitalization policies and practices at the school. The results showed that MAS Tarbiyah Islamiyah has adopted various technologies in education management, such as the use of Learning Management System (LMS), digitalization of academic administration, and the use of digital media in the learning process. This implementation has a positive impact on the effectiveness and efficiency of madrasah management, increasing information accessibility for students and teachers, and encouraging improved learning quality. However, this study also found several challenges in the implementation of digitalization, such as limited technological infrastructure, human resource readiness, and internet access constraints in some classes. Therefore, a comprehensive strategy is needed to overcome these obstacles, including training for educators, improving technology facilities, and stronger policy support from the head of the madrasah. This research contributes to the development of a digitalization-based education management model that can be implemented in MAS Tarbiyah Islamiyah, Hamparan Perak, Deli Serdang and in other Islamic-based schools. Thus, digitization of education can be a solution in improving the quality of education in a sustainable manner in the modern era.

Keywords: *Education Management, Digitalization, Learning Effectiveness*

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Introduction

Education management is the process of planning, organizing, directing, and supervising in managing educational resources to achieve effective and efficient educational goals. Education management is a process that needs to be applied in the world of education so that the goals of education can be achieved. Management is a process of planning, organizing, and controlling resources to produce something effective. If it is associated in the world of education, then the ultimate goal is on the education. management will shape the education to be more directed so that the results will be better. Saebani and Koko, 2016 in Sherly, et al., state that education management functions as a benchmark in developing the performance of all elements of educational institutions to create quality, moral and good character graduates. Principals as managers in schools must understand the application of education management, especially in terms of leadership to influence all elements of educators and education personnel in the school environment to work according to their competence. The functions of education management include: (1). Planning, namely efforts to plan educational activities in the form of work programs that will be implemented to achieve educational goals; (2). Organizing, which is the activity of managing educators and education personnel through the establishment of a structure to determine the division of tasks and responsibilities of each element in the school; (3).Staffing, which is the activity of placing educators and education personnel in accordance with their respective expertise competencies ranging from recruitment, placement, training, education and development of expertise competencies of educators and education personnel who are the main assets in educational institutions; (4). Directing, which is the activity of providing instructions, guidance, direction, motivation and examples from the principal as a school manager to educators and education personnel so that educational goals can be achieved; (5).Coordinating, which is the activity of coordinating so that there is a balance of delegation of tasks and responsibilities to each element in the educational institution; (6).Controlling, which is the activity of evaluating the overall educational activities that have been carried out to be used as corrections for the implementation of future educational activities Sherly et al., 2020).

Thus, in addition to the functions of education management related to education management, the principal as a leader has the power to carry out an effective education process. This means that the effectiveness of school/madrasah principal management in carrying out its role and responsibilities as a leader, namely: (1) Educator; (2) Manager; (3) Administrator; (4) Supervisor, (5) Leader; (6) Innovator, (7) Motivator, and (8) Evaluator).

In the National Education System Law Number 20 of 2003, it is stated that national education functions to develop the ability and shape the character and civilization of a dignified nation in order to educate the nation's life, aims to develop the potential of students to become human beings who are faithful and devoted to God Almighty, noble, healthy, knowledgeable, capable, creative, independent, and become democratic and responsible citizens. Seeing the purpose of national education, it is important to realize an ethical educational institution by having superior quality human resources (Ministry of Education, 2003).

MAS Tarbiyah Islamiyah, located in Hamparan Perak District, Deli Serdang Regency, North Sumatra, has a strong commitment to improving the quality of its education. In this digital era, utilizing digital technology in education management is key to improving effectiveness and efficiency, as well as providing a more optimal learning experience for students. There are several main factors behind digitization-based education management: Case Study of MAS Tarbiyah Islamiyah, among others: (1).The desire to improve the quality of education: In this case, MAS Tarbiyah Islamiyah Hamparan Perak wants to provide high-quality education to its students, in line with the times and needs in the digital era. Digitization-based education management offers various tools and platforms that can help improve the quality of learning, such as e-learning, interactive multimedia, and online assessment systems;

(2) Improve Efficiency and Effectiveness of Education Management: By utilizing digital technology, MAS Tarbiyah Islamiyah Hamparan Perak can automate manual tasks such as in the learning process, administration, attendance, and assessment. This allows teachers and staff to focus on more important tasks, namely teaching and guiding students; (3) Improving Access and Quality of Learning: Digitization-based education management allows students to access a variety of quality learning resources, whenever and wherever they are. This can help increase student motivation and engagement in learning; (4) Preparing Students for the Future: In the digital era, the ability to use digital technology is one of the important skills needed by students. Implementing digitization-based education management can help students develop these skills and prepare them for the future;(5) Adapting to the Needs and Times: The world of education continues to evolve rapidly, and MAS Tarbiyah Islamiyah Hamparan Perak wants to keep up. Digitalization-based education management allows MAS Tarbiyah Islamiyah Hamparan Perak to adapt to the needs and developments of the times, and provide education that is relevant to the needs of its students. The need for science and technology innovation that can provide opportunities to improve students' academic and non-academic competencies that can be integrated into all subjects. Meanwhile Tumiran, et al, revealed that the innovation of science and technology and imtaq: Integrated science and technology and imtaq are harmoniously implemented by including in learning in Islamic religious subjects in particular, and in general in all subjects (Tumiran et al., 2022).

MAS Tarbiyah Islamiyah, led by the Head of Madrasah M. Rozali, M.Pd, has high hopes that it can carry out digitalization-based education management well which can increase competence for students, both academically and non-academically. Although digitalization-based education management offers many benefits, MAS Tarbiyah Islamiyah also faces several challenges, including: (1) Limited Access to Technology: Not all students have access to adequate technology and internet devices; (2) Lack of Digital Literacy: There are still many teachers and students who do not have sufficient digital literacy to effectively use digital technology in education; (3) Implementation Costs: Implementing digitization-based education management requires a lot of money for infrastructure, software and training; (4) Mindset and Culture Change: The implementation of digitization-based education management requires changes in mindset and culture in schools.

Various efforts to overcome weaknesses and shortcomings as a challenge can be done by MAS Tarbiyah Islamiyah Hamparan Perak, namely: (1) Conduct Socialization and Education: Providing socialization and education to students, teachers, and parents about the benefits and ways of using digital technology in education; (2) Building ICT Infrastructure: Building adequate ICT infrastructure in schools, such as internet networks and computer equipment; (3) Improving Digital Literacy: Conduct training and workshops to improve digital literacy for teachers and students; (4) Seeking Funds and Sponsors: Seeking funds and sponsors to finance the implementation of digitization-based education management; (5) Developing Curriculum: Develop a curriculum that adapts to digital technology and prepares students for the future.

Meanwhile, Danny Abrianto, et al. revealed that one of the efforts in optimizing the use of learning media that can be done as a solution to these problems is to socialize and train students based on information technology and computers (Abrianto et al., 2023).

Banyu Hikmah, et al, stated that; Analysis shows that the National Digital Literacy Movement (GNLD) has succeeded in increasing digital awareness and skills at various levels of society, especially in urban areas. This program also contributes to the 2030 Sustainable Development Goals (SDGs), namely, no poverty, quality education, gender equality, justice, and reduced inequality. Program improvement and evaluation efforts are needed to ensure that the benefits can be felt evenly across all levels of society (Banyu et al., 2024),

Education management with the utilization of digital technology is the key to improving effectiveness and efficiency, as well as providing a more optimal learning experience for students. Teachers full of high dedication can actualize in the process of education and teaching in everyday both intracurricular and extracurricular fields. Digitalization-based education management has contributed with various benefits, namely (1).The desire to improve the quality of education, where teachers can apply digitalization with various tools and platforms that can help improve the quality of learning, such as e-learning, interactive multimedia, and online assessment systems; (2) Improve the efficiency and effectiveness of education management by automating manual tasks such as in the learning process, administration, attendance, and assessment; (3) Improving access and quality of learning, where teachers always help increase students' motivation and engagement in learning; (4) Preparing students for the future, by using digital technology to become one of the important skills needed by students; (5) Adjusting to the needs and development of the times, with digitalization-based education management makes it possible to adapt to the needs and development of the times, and provide education that is relevant to the needs of student.

Theoretical Studies
1. **Definition of Education Management**

Education management focuses not only on administration and operations, but also on developing the quality of the teaching and learning process and increasing the competence of human resources in education. It means that education management is the process of planning, organizing, directing, and supervising various educational resources to achieve effective and efficient educational goals.

Meanwhile Andang in Sharly, et al, stated that education management is a systematic, systemic and comprehensive work process to develop education and achieve educational goals through the implementation of management functions. The definition of education management can be understood that the process of education management is a work process that has power as a whole to achieve a goal in management functions (Sherly et al., 2020).

While Tumiran's view, education management is to obtain the best ways, techniques, methods to do, so that resources, such as energy, funds, facilities, personal, material, and spiritual are needed to achieve educational goals efficiently and productively (Tumiran, 2017).

In managing schools with solid and professional education management by madrasah principals will make a very meaningful contribution to all stake holders, teachers, and students intended to improve the quality of education holistically, effectively, efficiently, productively and effectively. Professional madrasah principals will show their performance which can have an impact on solving the problems faced in the education management function from the planning, organizing, implementing and supervising processes.

Hasan Basri, et al, state that management is a series of processes that include planning, organizing, implementing, supervising, evaluating and controlling activities in order to empower all organizational / company resources, both human resources (*human resource capital*), capital (*financial capital*), material (*land, natural resources or raw*) (Hasan et al., 2023). In this sense, education management is a process of planning, organizing, implementing and supervising in managing resources which can be in the form of man, money, materials, methods, machines, markets, and all things to achieve effective and efficient educational goals.

In another opinion expressed by Muhammad Rohman and Sofan Amri, (2012: 7), in Tumiran, that education management is an activity or a series of activities in the form of a process of managing the cooperative efforts of a group of people who are members of an educational organization, to achieve educational goals that have been previously set, to be effective and efficient (Tumiran, 2017).

Another opinion can be expressed education management is a process of managing educational resources through planning, organizing, directing, supervising, and evaluating to achieve educational goals that have been set through the use of human and material resources. This can be described in relation to the aspects of education management as follows: (1) Planning: Planning in education management involves setting educational goals and objectives, as well as determining the steps and strategies to achieve them. This includes planning the curriculum, budget, teaching staff needs, facilities, and other educational programs; (2) Organizing: Organizing involves arranging and structuring available resources, including human, financial, and material resources, so that they can be used optimally. It includes the division of tasks and responsibilities, as well as the establishment of an effective organizational structure to support the implementation of educational programs; (3) Directing: Directing in education management involves leading, motivating and guiding education personnel and learners to work in accordance with the established plan. It includes aspects of leadership, communication and decision-making; (4) Supervision: Supervision aims to ensure that the implementation of the education program is in accordance with the plans and standards that have been set. It involves monitoring, evaluating and controlling educational performance and processes, so that deviations or problems can be identified and corrected immediately; (5) Evaluation: Evaluation in education management is the process of assessing the effectiveness and efficiency of all aspects involved in the education process. It involves measuring learning outcomes, the performance of education personnel, and the efficient use of resources. The results of the evaluation are used to improve and develop future education programs.

From the description above, it is reinforced by Ricky W. Griffin in Tumiran that management is nothing but "a process of *planning* (*planning*), *organizing (organizing*), implementing (*actuating*), *coordinating* (*coordinating*), and *controlling* (*controlling*) resources to achieve *goals (goal's*) effectively and efficiently". Effective means that goals can be achieved in accordance with the plan that has been set, while efficient means that the tasks at hand are carried out correctly, well organized, and according to the planned schedule (Tumiran, 2018).

2. Functions of Education Management

The functions of education management include planning, organizing, directing, controlling, and supervising. The following can be described about the functions of education management: (1) *Planning*: Planning is the first step in educational management which involves determining the goals and objectives of education, as well as the ways to achieve them; (2) *Organizing*: Organizing involves setting up an organizational structure that enables efficient implementation of the plan; (3) *Directing*: Directing is the process of motivating and guiding staff to achieve organizational goals; (4) *Controlling*: Controlling is the process of monitoring and evaluating organizational performance to ensure that goals are achieved; (5). *Supervising*: Supervision is an important aspect of ensuring that all activities are carried out in accordance with established plans and policies; (6) *Evaluating*: Evaluation is the process of assessing the final results of a program or activity to determine the extent to which objectives have been achieved.

3. Principles of Education Management

The principles of education management is a statement or fundamental truth that guides to complete the task of guiding efforts to achieve the best balance in the process of managing the education system effectively and efficiently. Douglas (1963: 13-17) in Muhammad Kristiawan, et al formulated the principles of education management as follows: (1) prioritize goals over personal interests and the interests of the work mechanism; (2) coordinate authority and responsibility; (3) give responsibility to school personnel should be in accordance with the

properties and abilities; (4) well acquainted with human psychological factors; and (5) the relativity of values (Kristiawan et al., 2017, p. 12).

The statement above can be interpreted that the principles of education management have the essence of having to pay attention to the goals, resources, tasks, and values that become the reference of school organizations can be described in the form of vision, mission, and goals.

According to Aziz, M. F. A. (2020) in Alzet Rama, et al, the principles of education management are as follows: (1) Prioritize goals over personal interests and colleagues; (2) Coordinate competencies and responsibilities; (3) Delegation of responsibilities to school personnel must be in accordance with their nature and competence; (4) Familiarity with human psychological factors; (5) Relativity of values (Alzet et al., 2022).

Drucker (1995) through MBO (*Management by Objective*) in Alzet Rama, et al, provides the idea of management by objectives as an approach to planning. The seven steps of MBO include 1) determine what final results the school wants to achieve; 2) analyze whether the results are related to the school's goals; 3) confer to determine the goals needed; 4) determine what activities are appropriate to achieve the goals; 5) arrange tasks to facilitate achieving the goals; 6) determine the limits of work and the type of direction that will be used by superiors; 7) do monitoring and make reports (Kristiawan et al., 2017, p. 12).

4. Digitalization-based Education in Madrasahs
a. Definition of Digitalization

Digitization is the process of converting information or data from an analog form into a digital format, which can be processed, stored, and transmitted by computers. This process involves using digital technology to convert different types of information such as text, images, sound, and video into a format that can be accessed and processed electronically.

Sukmana, in Irma Rahayua, et al, stated that digitization is the process of converting media from printed, audio, and video forms into digital forms. Digitization is carried out to create digital form document archives, for the photo copy function, and to create digital archival collections. Digitization requires equipment such as computers, scanners, source media operators and supporting software (Rahayua et al., 2021). This means that digitization in madrasah education units is a process of documents both academic and non-academic being archived in digital form. While Brennan & Kreiss (2016), stated that digitization is the integration of digital technology into everyday life through digitizing everything that can be converted into digital data. This includes the conversion of processes and information from analog to digital formats.

Meanwhile, according to Lasa in Irma Rahayua, et al. provides an understanding of digitization, namely digitization is the process of managing printed documents into electronic documents. Digitization is the process of transferring media from printed form to electronic form (Rahayua et al., 2021).

Digital literacy is the ability to collect, sort, process, present and use digital data. This competency includes the ability to communicate, critical thinking, collaboration and creativity.

b. Digitization Planning

Careful planning is key to the successful implementation of digitalization in madrasah or schools. Planning for digitalization in madrasah is (1) needs analysis, this identifies the technology, infrastructure, and training needs required; (2) Goal Setting: Setting short-term and long-term goals for digitization, such as improving the quality of learning, administrative efficiency, or parental involvement; (3) Strategic Plan: at this stage, a strategic plan is developed that includes the stages of implementation, budget, and resources.

Kristanto, stated that digital madrasah uses madrasah management and information systems which are a combination of people, hardware, software, communications networks and dataresourses that are collected, transformed and streamed in an organization (Kristanto, 2003) (Ministry of Religious Affairs, 2019).

In accordance with the UNESCO ICT Competency Framework for Teachers, the digital competence of educators that must be mastered consists of six components, namely: 1) understanding ICT in education, 2) curriculum and assessment, 3) pedagogy, 4) application of digital skills, 5) organization and administration, 6) teacher professional learning. The six components must be developed at three levels: knowledge acquisition, knowledge deepening, and knowledge creation (Ministry of Religious Affairs, 2019).

c. Technology Infrastructure Development

The development of adequate infrastructure is the foundation of digitizing education. Hardware and Software by providing computers, tablets, projectors, as well as educational and administrative software. Yudi Mulyanto and Kudratullah presented several expert opinions on technology infrastructure development, namely (Mulyanto & Kudratullah, 2019):

1. In the opinion of Sujadi (2002) explains that research and development is a process or step to develop a new product, to improve existing products, which can be accounted for.
2. According to Kodoatie (2005) infrastructure in a system is parts in the form of facilities and infrastructure (networks) that are inseparable from one another. Infrastructure itself in a system supports the social system and economic system as well as being a link with the environmental system.
3. According to Kriston (2003), it can be interpreted as a collection of a number of communication terminals consisting of two or more computers that are connected to each other. The purpose of building a computer network is so that the information or data carried by the sender (transmitter) can arrive to the receiver (receiver) precisely and accurately. Computer networks allow users to communicate with each other easily.

d. Use of Digital Learning Platforms

Education platforms are software ecosystems with tools that give learners, teachers, parents, and principals/madrasas access to communication tools, information, and common resources both inside and outside of school. Integrate digital platforms in the learning process to improve learning interaction and effectiveness. Learning Management System (LMS): Using an LMS such as Google Classroom, Moodle, or Edmodo to manage course materials, assignments, and communication between teachers and students. E-Learning: Adopt an e-learning platform to provide access to online learning materials, quizzes and exams. Digital Content: Develop and use digital learning content such as videos, animations and simulations.

According to Angga Eka Yuda Wibawa Digital platform is a set of software that forms a certain system. This software can be opened by the Android system in the form of an application. The Indonesian Ministry of Education and Culture has partnered with various parties to implement digital-based daraing learning including: Gredu, Rumah Belajar, Google Classroom, Google Hangaout, Google Siledes, Google Sheet, Google Drive, Google Doc, Zoom, Zenius (Wibawa, 2021, p. 78).

Meanwhile, the independent teaching platform can access various systems, such as: Education Report Card, Kemendikbudristek also released the Merdeka Mengajar Platform. The Merdeka Mengajar Platform makes it easier for teachers to teach according to student abilities, provide training to improve competence, and work to inspire colleagues. There are several

main menus, namely Student Assessment, Teaching Tools, Independent Training, Proof of Work, Community, and Inspiration Videos

Meanwhile, Akhyar and Sri Wahyuni in implementing PKMS activities at SMA Panca Budi stated "Parents have a duty to supervise or control (parental control) of internet usage for their children, especially during the current pandemic, the use of the internet on android devices has become a primary need (Batubara, Wahyuni, Hariyanto, & Lubis, 2021)."

Furthermore, Akhyar and Sri Wahyuni explained the PKMS activities with material containing a detailed explanation of parental control applications that can facilitate parents to control and control the use of the internet by children. One of the parental control applications trained to parents is Net Nanny where the features provided by Net Nanny are very complete.

Research methodology
1. Research Implementation

The implementation of research with a qualitative approach, the presence of researchers is very necessary. Where the researcher is in charge of planning, carrying out data collection, analyzing, interpreting data, and in the end the researcher is also the one who reports the results of his research. The location of this research was at MAS Tarbiyah Islamiyah Hamparan Perak District, Deli Serdang Regency, while the research time was carried out from June to October 2024.

2. Data Collection Techniques

The data collection techniques used in this qualitative research consist of: observation, interviews, and documentation.

1. Observation (observation): Data collection is intended to be directly to the object when the learning process takes place in the classroom by using research tools that have been prepared / arranged in accordance with the research variables.
2. Interview: Holding a set of questions and answers to the principal, teachers, and students who have been randomized with tools / guides that have been compiled in accordance with the research guide.
3. Documentation: Collecting other data and is expected to be more extensive and truly accountable for the truth.

3. Data Analysis Method

1. Data reduction: Is a data analysis that sharpens, classifies data in such a way that conclusions can be drawn or data verified.
2. Display or presentation of data: Collecting data or information in an organized manner that gives the possibility of drawing conclusions and taking action.
3. Drawing conclusions or verification: Draw conclusions from the research findings and discuss the practical and theoretical implications of valid research results.

Results
1. Implementation of education management

The implementation of education management at Madrasah Tarbiyah Islamiya Hamparan Perak, Deli Serdang, involves various operational parameters that ensure education management runs effectively and efficiently. Here are some of the relevant variable operational parameters, namely:

a. Education Planning

The education planning of MAS Tarbiyah Islamiyah Hamparana Perak recommended: (1) The school needs to improve educational facilities, especially in terms of technology, to support a more effective learning process; (2) Increase collaboration with parents and

the community to support educational activities and student character development; (3) Organize continuous training programs for teachers to ensure they are always updated with the latest and effective teaching methods.

The specifics to be achieved by MAS Tarbiyah Islamiyah Hamparan Perak include: (1) Academic Achievement: (a) Increase the average national exam score; (b) Increase the number of students who continue their education to a higher level; (2) Character Building: (a) Increase student participation in religious and social activities; (b) Reduce the number of student discipline violations; (1) Skills Development: (a) Improve information and communication technology (ICT) skills among students; (b) Develop extracurricular programs that support students' practical skills.

b. Organization

Organizing in the context of education or management often refers to the arrangements or structures made to effectively manage resources and processes. Here are some points implemented at MAS Tarbiyah Islamiyah Hamparan Perak related to organizing as follows: (a) The Head of MAS Tarbiyah Islamiyah Hamparan Perak forms a clear organizational structure with the division of tasks and responsibilities is one of the important elements in the management of an educational institution. The results of observations and interviews regarding the organizational structure in this madrasa cover various aspects, such as the hierarchy of positions, the division of tasks, and the flow of communication and coordination that is clear and structured from the position of the head of the madrasa, deputy head of the madrasa, employees (administration), subject teachers, class representatives, to students have each jobdes.

c. Implementation

The Head of Madrasah Tarbiyah Islamiyah Hamparan Perak stated that with the existence of short, medium and long term programs in the implementation of educational programs comprehensively has aspects that support success including: (a) Curriculum Implementation, namely by implementing the curriculum with innovative teaching methods and according to student needs. Curriculum implementation at MAS Tarbiyah Islamiyah Hamparan Perak is an important aspect in achieving the school's educational goals. The following are the results of observations and research interviews, namely: (1). The foundation of the National Curriculum of MAS Tarbiyah Islamiyah Hamparan Perak follows the 2013 Curriculum (K-13), and currently the start of the Merdeka Curriculum set by the government, with adjustments to include Islamic values and school-specific programs; (2) Integrating Islamic values in every subject and learning activity to shape the character of students in accordance with the school's vision and mission; (3) The learning process in the classroom is carried out with a varied approach, such as the lecture method, discussion, practice, and the use of interactive learning media; (4) Assessment is carried out continuously and includes cognitive, affective, and psychomotor assessments. Formative and summative assessments are used to measure students' progress and learning outcomes; (5) Teachers at MAS Tarbiyah Islamiyah Hamparan Perak regularly attend training and workshops to improve their competence in implementing the curriculum; (6) The school provides mentoring and supervision for teachers, both from the principal and school supervisors, to ensure the curriculum is implemented well and identify areas for improvement.

d. Monitoring and Evaluation

(1) The madrasah principal conducts regular monitoring and evaluation of educational processes and outcomes. The monitoring and evaluation carried out at MAS

Tarbiyah Islamiyah Hamparan Perak provides an overview of how the school ensures the quality of education, program effectiveness and achievement of educational goals.

(2) Performance appraisal of teachers and staff at MAS Tarbiyah Islamiyah Hamparan Perak is an important aspect in ensuring the quality of education and the effectiveness of school operations.

(3) Providing training and professional development programs for teachers and staff to improve their competencies. The professional development of teachers and staff at MAS Tarbiyah Islamiyah Hamparan Perak reveals the various efforts made to improve their competencies and performance.

e. Facilities and Infrastructure

Facilities and infrastructure at MAS Tarbiyah Islamiyah Hamparan Perak provide insight into the condition of physical facilities and infrastructure, and how they support the education process. The following are the results of observation and research interviews as follows: (1) Classrooms: Generally the classrooms at MAS Tarbiyah Islamiyah Hamparan Perak are adequate, but some rooms require repair and updating of facilities such as tables, chairs, and whiteboards, projectors or screens for presentations, and adequate lighting systems; (2) There are laboratories for science subjects such as physics, chemistry, and biology. (3) The school library provides a varied collection of books, but the number and variety of books still need to be increased to meet the literacy needs of students; (4) The school has a sports field for activities such as futsal; (5) There is a computer room with several computer units for information technology learning; (6) The teacher and administration rooms are adequate but require better organization to improve work efficiency, there are desks, chairs, computers, and other office equipment for administration, as well as a break room or small meeting room for teachers; (7) Toilet facilities are available but require improvement in terms of cleanliness and the number of units to meet the needs of all students and staff; (8) Canteen: There is a canteen that provides food and drinks for students and staff.

Integrating technology in the learning process to improve effectiveness and efficiency at MAS Tarbiyah Islamiyah Hamparan Perak: (1) Evaluation of the number and type of ICT devices available at school such as computers, laptops, tablets, and other hardware; (2) Assessment of the quality and speed of internet access throughout the school area; (3) Integration of ICT in Learning.

2. Implementation of Digitalization at MAS Tarbiyah Islamiyah Hamparan Perak

a. Implementation of Digitalization

Implementation of digitization-based education management at MAS Tarbiyah Islamiyah Hamparan Perak, Deli Serdang. The implementation process includes several operational parameters of relevant variables, namely: (1) Technological infrastructure at MAS Tarbiyah Islamiyah Hamparan Perak includes all hardware and software that supports educational and administrative activities. Here are some of the main components of the technology infrastructure: (a).Hardware: (1) Desktop computers, laptops, and other mobile devices used by teachers, students and administrative staff for office work, learning, and data management; (2) Presentation and Multimedia Devices: (a) For classroom or auditorium presentations, facilitating learning with greater visualization; (b) Interactive Screens: Enables direct interaction with digital content, such as writing on the screen or controlling applications; (c) Speakers and Audio Equipment: To enhance the audiovisual experience in learning and presentations; (3) Servers: Provide data storage, applications, and network services

within the school; (4) Network: Network infrastructure such as routers, switches, and cables to connect all devices in a local network (LAN); (5) Presentation Devices: Projectors, touch screens and other hardware for presentations and interactive teaching. (b) Software: Software at MAS Tarbiyah Islamiyah Hamparan Perak includes various types of applications and systems used to manage school operations, support learning, and improve administrative efficiency. Implementing educational software, including Learning Management System (LMS) (1) Digital Learning Applications: (a) E-books and Digital Text Materials: For quick and easy access to digital textbooks and learning resources; (b) Learning Videos: For presentation and visual demonstration of learning concepts; (2) Operating System: Such as Windows, Macos, or Linux used on school computers; (3) Educational Applications: Includes applications for student management, digital library, e- learning, and school administration; (4)Antivirus and Security: Security programs to protect school data and networks from cyber security threats;(4) Productivity Applications: Such as Microsoft Office or Google Workspace for productivity purposes. (c) Network and Internet Access: (1) Internet Connection: Infrastructure to provide fast and reliable internet connection throughout the school premises; (2) Wi-Fi: A wireless network to provide internet access to students and staff throughout the school building. (d) Computer Laboratory: (1) Computer Room: A special place equipped with computers and software needed for ICT practicum activities; (2) Supporting Devices: Printers, scanners, and other hardware that support learning and administrative activities; (e) Additional Technology Infrastructure; (1) School Management System: Software for student management, attendance, assessment, and overall school administration ; (2) Security System: CCTV and other security systems to monitor and protect the school environment.

The Internet network at MAS Tarbiyah Islamiyah Hamparan Perak provides stable and fast internet access to support all teaching and learning activities and madrasah management. Another thing related to the internet network in Madrasah is the existence of internet network components: (1) Internet Connections have served and provide global access to information, resources, and applications through global networks that providers in local or national internet implementations, such as fiber optics, DSL cables, and wireless networks (Wi-Fi); (2) Network Infrastructure, this includes all the hardware and software needed to provide and manage internet access in madrasah; (3) Components with Routers, switches, network cables, and other devices that regulate the distribution and management of data traffic; (4) Wi-Fi (Wireless network) provides wireless internet access throughout the madrasah area. This with its implementation provides internet access for mobile devices, such as student laptops, teachers and smartphones, as well as other devices that require a wireless connection; (5) Network and data security from cyber security threats, such as malware, viruses, and hacker attacks.

b. Digital Curriculum Development
Digital curriculum development at MAS Tarbiyah Islamiyah Hamparan Perak. Digital curriculum development involves the integration of information and communication technology (ICT) in curriculum design to improve learning and teaching. Here are some things that can be a focus in digital curriculum development at MAS Tarbiyah Islamiyah Hamparan Perak, Deli Serdang, namely: (1) Digital Curriculum Design: Digital Content Development: (a) Creation of digital-based learning materials such as e-books, learning videos, and other interactive learning resources; (b) Integration of Technology in Learning: Aligning technology with learning objectives, adding interactive and collaborative elements; (2). Teacher Training: (a) Training in the Use

of ICT: Ensuring teachers understand and are able to integrate technology in daily teaching; (b) Mentoring and Support: Assisting teachers in overcoming technical and pedagogical challenges in using technology; (3). Evaluation and Renewal: (a) Evaluation of Effectiveness: Evaluating the use of technology in learning and adjusting the curriculum based on the evaluation results; (b) Content Update: Regularly update and improve digital content to meet evolving learning needs; (4). ICT Infrastructure: (a) Security and Accessibility: Ensure ICT infrastructure is secure, reliable and has adequate accessibility for all students and teachers; (5) Stakeholder Engagement; (a) Parent and Student Engagement: Inform and engage parents in the use of technology and integration of digital curriculum; (b) Collaboration with Industry: Engage external stakeholders to enrich the learning experience through collaborative projects and additional resources. (3)Learning Material Development Creating e-books, learning videos, animations, simulations, and other educational applications, and integrating the content into digital learning platforms; Digital curriculum development at MAS Tarbiyah Islamiyah Hamparan Perak is the process of designing and integrating information and communication technology (ICT) into the educational curriculum. Here are some aspects related to digital curriculum development. Digital curriculum development at MAS Tarbiyah Islamiyah Hamparan Perak should consider the unique needs of students and ensure technology integration has a positive impact on the learning process.

c. Types of Digital Learning Materials
The type of digital learning material at MAS Tarbiyah Islamiyah Hamparan Perak, as stated by IT Teacher Mr. Ibnuh Suni that determining the type of digital matarei that collaborates with other materials is certainly more specific in studies, steps and factors that need to be considered. Identification of Types of Digital Learning Materials: (1) E-Books: and Digital Text Materials Electronic books used as primary or supplementary reading material. Learning materials presented in electronic format, such as e-books, can be accessed through a computer or tablet device; (2) Learning Videos: Videos that contain explanations of subject matter, experiments, or demonstrations; (3) Digital Presentations: Presentation slides created using software such as PowerPoint or Google Slides; (4) Simulations and Animations (Educational Games): Interactive programs that allow students to understand concepts through visualization. This type of learning process allows students to experience the real situation more quickly; (5) Educational Apps and Software: Specialized applications designed Simulation applications or educational games are designed to teach specific concepts through active interaction; (6) Online Modules: Modules provided through e-learning platforms or school websites; (7) Virtual Classrooms: Virtual classrooms allow direct interaction between teachers and students via the internet, including group discussions, presentations, and online exams. It thus strongly supports collaborative learning and communication between students and teachers despite being in different locations.
The same thing Mr. Mhd.Rajali as the Head of Madrasah stated that the type of material on digital learning materials with Smart TV is accompanied by the presence of a teacher projector presenting various materials in accordance with the teaching program in the lesson plan, This platform is connected with YouTube. And all teachers make youtube, recordings, text material that is developed digitally. And other things in the learning space in the computer laboratory are also in accordance with the SOP in its operation, so that the order of use is guaranteed and maintained. In addition to specific materials, there are also materials that are developed, namely: entrepreneurial material

in the field of graphics, making digital banners in every odd and even semester. The material development program that uses digital is also collaborating on diversity subjects, such as dakwa islam, khutbah jumat, akhlaq material, and science and mathematics materials based on digitalization and teaching innovation.

   d. Learning Management System (LMS)

The use of the Learning Management System (LMS) at MAS Tarbiyah Islamiyah Hamparan Perak provides a structured and organized framework for managing the learning process. The following observation results some of the main aspects in managing the learning process using the LMS: (a) Provision of Learning Materials: Teachers can upload learning materials such as presentation slides, text documents, learning videos, and other resources into the LMS; (b) Teacher-Student Interaction: Through the LMS, teachers can interact with students through discussion forums, private messages, or online consultation sessions; (c) Task and Assignment Management: Teachers can give assignments to students through the LMS and receive the results online. The system also supports automatic grading for several types of assignments such as online quizzes or exams; (d) Student Progress Monitoring: The LMS allows teachers to track individual students' learning progress, including participation in discussions, completion of assignments, and evaluation results.

By using the LMS, MAS Hamparan Perak can improve efficiency in educational administration, expand educational accessibility, and provide a more interactive and technology-based learning environment to meet the demands of modern education and Islamic values.

Conclusion

From the results of the research analysis described in the previous chapter, it can be concluded that digitization-based education management: A Case Study at MAS Tarbiyah Islamiyah Hamparan Perak Deli Serdang provides an overview of the potential and challenges faced in the digital transformation of education in Indonesia. Comprehensive support and collaboration between various parties are essential to achieve sustainable success. The following conclusion points can be outlined as follows:

1. Implementation of Digital Technology: (a) MAS Tarbiyah Islamiyah has adopted digital technology in various aspects of education management, such as school management information systems, online learning platforms, and the use of social media for communication between teachers, students, and parents; (b) The use of digital applications and devices has helped in automating school administration and improving operational efficiency.
2. Improved Learning Effectiveness: (a) The implementation of digital technology has had a positive impact on learning effectiveness. Access to online learning materials allows students to learn more flexibly and interactively; (b) Technology-based learning facilitates more diverse teaching methods that can be tailored to the individual needs of students.
3. Challenges and Constraints: (a)There are several challenges in the implementation of digitization, such as limited technological infrastructure, lack of adequate internet access, and low level of digital literacy among teachers and students; (b) Technical constraints often hinder the implementation of online learning, especially in areas with poor internet connectivity.
4. Readiness and Competence of Human Resources: (a) The successful implementation of digitalization is highly influenced by the readiness and competence of human

resources. Teachers and administrative staff need to receive continuous training and digital skills development; (b)Adequate support is needed to improve digital literacy among educators and learners.

5. Student and parent responses: (a) Students and parents generally responded positively to the implementation of technology in education. As students and parents appreciate the flexibility and accessibility provided by digital learning; (b) It is essential that technical support and training on the use of technology for parents is also needed to ensure they can accompany their children in the learning process.

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