Implementation of ICT Management to Improve Education Quality: A Case Study at Madrasah Aliyah Negeri (MAN) 2 Bandung City

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Abstract

The growth of technology has changed the way we learn and teach. The use of ICT in education has great potential to improve the efficiency, accessibility and quality of learning. Various challenges in the education sector, such as access gaps, unequal quality, lack of resources and curricula that do not always keep up with technological developments can be resolved with appropriate ICT management strategies. Studies on the level of technology adoption in various educational institutions, be they schools, colleges or training centers can provide insight into how effective the use of ICT is in improving the quality of education. This research uses descriptive methods and data collection is carried out using an assessment of primary data sources and secondary data sources. Because the collection and analysis of qualitative research data used in this research is interactive, the researcher interacted with the data sources above by conducting observations, interviews and literature reviews. The results of this research are that ICT planning in MAN 2 Bandung City includes vision and mission, ICT strategy and financing. Organizing ICT at MAN 2 Bandung City includes the infrastructure provided by the madrasah along with the human resources who manage this infrastructure. The implementation of ICT at MAN 2 Bandung City includes the implementation of ICT in learning and educational services. ICT evaluations are carried out regularly monthly by the Head and Deputy Head of the Madrasah and annually at work meetings. The quality of education at MAN 2 Bandung City can be seen from the increasing public interest in enrolling their children in school at this madrasa and from the number of graduates who continue their studies at both state and private universities.

Keywords: *Management, ICT, Quality of Education.*

A. INTRODUCTION

Today's modern civilization is an era where technology, society and culture combine in a complex way, forming the framework of today's society. Modern civilization is defined by extraordinary technological advances. The digital revolution, the development of artificial intelligence, and limitless connectivity via the internet have become the backbone of the way we live, work, and interact.

Modern civilization is characterized by intense globalization. Connectedness between countries, whether in trade, communication and cultural exchange, has created a world that is more integrated economically, politically and socially. Cultural values, norms, and patterns have changed significantly. Openness to diversity, changes in family dynamics, and increased awareness of social issues such as gender equality and inclusion have become an important part of modern civilization. The global economy and the way business is conducted has undergone a major

transformation. Innovation, entrepreneurship, and the increasing role of the technology and service sectors have shaped a new economic map.

Modern civilization is an age of high complexity, where technology and human relations are undergoing rapid shifts. This is an era where we continue to face challenges, seek innovative solutions, and adapt to continuous change. Modern civilization also has an influence on education and knowledge. Access to education and knowledge has never been greater. Modern civilization emphasizes the importance of education in preparing individuals to face the demands of an ever-changing world.

Today's digital civilization is marked by the emergence of a number of icons that have become symbols of drastic changes in the way we interact with technology and information. Here are six icons of digital civilization that represent a paradigm shift in society: 1) Smartphone: Smartphones have become the main icon of digital civilization. More than just a communication tool, smartphones are the center of our digital lives. With its ability to access the internet, apps, social media, and other multi-purpose functions, smartphones have changed the way we communicate, work, learn, and even socialize. 2) Internet: As the main foundation of digital civilization, the internet has changed the world fundamentally. It provides access to global information in seconds, enables collaboration across geographic boundaries, and is the foundation for many other technological innovations. 3) Social Media Platforms: Facebook, Instagram, Twitter and other platforms are important symbols of social changes caused by digitalization. They facilitate limitless social connectivity, empowering individuals to share ideas, experiences and build communities across the globe. 4) Big Data: The concept of Big Data is an icon of digital civilization that shows the enormous potential of massive data analysis. The ability to collect, store, and analyze large amounts of data has enabled new innovations in many areas, such as artificial intelligence, predictive analytics, and better decision making. 5) Artificial Intelligence (AI): AI represents the evolution of technology that allows computers to learn from data, recognize patterns, and make decisions like humans. From virtual assistants to autonomous cars, artificial intelligence has changed the way we work, interact with technology, and even our daily lives. 6) IoT (Internet of Things): IoT is a network of interconnected devices, from household devices to autonomous vehicles, that communicate and share data. This opens the door to greater monitoring, control and efficiency in various aspects of life, such as smart homes, health, transportation and manufacturing.

These icons represent the current landscape of our digital civilization, illustrating how technology has become integrated into everyday life, changing the way we interact, work and live overall.

The growth of technology has changed the way we learn and teach. The use of ICT in education has great potential to improve the efficiency, accessibility and quality of learning. Various challenges in the education sector, such as access gaps, unequal quality, lack of resources and curricula that do not always keep up with technological

developments can be resolved with appropriate ICT management strategies (Faridi, 2009; Adisel & Prananosa, 2020; Melyani, 2017; Pahruda et al., 2023).

Studies on the level of technology adoption in various educational institutions, be they schools, colleges or training centers, can provide insight into how effective the use of ICT is in improving the quality of education. Therefore, the implementation of ICT management to improve the quality of education is interesting to research.

B. LITERATURE REVIEW

1. Management

Management in English is known as the word manage, which means managing, arranging, implementing and administering (Echols & Shadily, 2003:372). From this meaning, substantively, the meaning of management contains elements of management activities. Thus, questions arise about what is managed, how to manage it, why it is managed and who acts as manager.

Hasibuan (1996:1) explains that management in English means to manage, that is, to organize. Therefore, according to him, the questions that arise are what is regulated, why it must be regulated, who regulates it, how it is regulated and where it must be regulated. These questions explain the management object of management. Therefore, management is related to the process of planning, organizing, leading and controlling, in which there are efforts by organizational members to achieve predetermined goals by mobilizing the organizational resources they have.

The definition of management must be able to answer the 5W1H formulation (what, when, who, why, where and how). What is regulated? When is it set? Who regulates? Why should it be regulated? Where should it be set? Where should it be set? And How to Set It Up? These six questions must be answered in formulating management theory (Badrudin, 2017:1).

Ramaliyus (2008:362), states that the same meaning as the essence of management is *at-tadbir* (regulation). According to Saefullah (2013:1), this word is a derivation of the word *dabbara* (to regulate) which is often found in the Qur'an, such as the words of Allah SWT:

يُدَبِّرُ ٱلْأَمْرَ مِنَ ٱلسَّمَآءِ إِلَى ٱلْأَرْضِ ثُمَّ يَعْرُجُ إِلَيْهِ فِى يَوْمٍ كَانَ مِقْدَارُهُۥٓ أَلْفَ سَنَةٍ مِّمَّا تَعُدُّونَ

It means: "He regulates all affairs from heaven to earth, then (affairs) ascend to Him in one day whose length (length) is a thousand years according to your calculations." (Q.S. As-Sajdah: 5).

From the verse above it is known that Allah SWT is the regulator of nature. However, as caliphs on this earth, humans must organize and manage the earth as well as possible as Allah SWT manages this universe.

Many management experts express the functions of management so that it seems as if there are no clear boundaries regarding the functions of management itself. However, if you pay attention, all the explanations put forward by experts regarding management functions have the same substance, especially when viewed from the aim of management as a science and art.

In this research, the theory from Terry in Athoillah (2010:96) will be used, namely planning, organizing, actuating and controlling, which can be described as follows:

a. Planning

Planning comes from the word plan, meaning plan, design, aim and intention. Planning means planning. Planning is an activity process, while planning is the result of planning. Planning is an activity related to formulating a program which contains everything that will be implemented, determining goals, policies, directions to be taken, procedures and methods that will be followed in an effort to achieve goals. In planning there are the following determinations:

1). Form or type of activity to be carried out;
2). Procedures for implementing activities;
3). Policies that serve as the basis for activities;
4). Direction and objectives to be achieved;
5). Personal who carries out the plan;
6). Estimated costs required.

b. Organizing

Organizing is cooperation between two or more people in a structured way to achieve a specific goal or a number of goals. Organizing is a process of connecting people involved in a particular organization and integrating their tasks and functions within the organization. In the organizing process, tasks, authority and responsibilities are divided in detail based on each section and field so that work relationships are integrated that are synergistic, cooperative, harmonious and in harmony in achieving the agreed goals.

In organizing the following things are carried out:

1). Receipt of facilities, equipment and staff necessary to implement the plan;
2). Grouping and dividing work into an orderly organizational structure;
3). Establishment of authority structures and coordination mechanisms;
4). Determination of work methods and procedures;
5). Selection, training and provision of information to staff.

c. Actuating

Actuating is an activity that moves and ensures that workers carry out their duties and obligations. Workers according to their skills and proportions immediately carry out plans in concrete activities directed at predetermined goals, by always maintaining communication, good human relations, effective leadership, providing motivation, making orders and instructions and carrying out supervision, by improving attitudes. and the morals of each group member. Thus, in actuating there are the following things:

1). Determination of the start of work plan implementation;
2). Providing examples of work implementation procedures from leadership;
3). Providing motivation for workers to work immediately in accordance with their respective duties and responsibilities;
4). Communicating all work directions with all work units;

5). Training of workers;
6). Improving quality and quality of work;
7). Monitoring employee performance and morality.

d. Controlling

Controlling or supervision and controlling is one of the management functions in the form of conducting assessments, making corrections to everything that has been done by subordinates so that they can be directed to the right path in accordance with the objectives.

Supervision, namely researching and supervising so that all tasks are carried out properly and in accordance with existing regulations or in accordance with the job description of each personal. Supervision can be carried out vertically and horizontally, that is, superiors can exercise control over their subordinates, as well as subordinates can criticize their superiors. This method is termed an embedded monitoring system. Inherent supervision focuses more on awareness and sincerity in work.

According to Saefullah (2013:38), control consists of:

a. Research on work results in accordance with work plans/programs;
b. Reporting work results and collecting data on various problems;
c. Evaluation of work results and problem solving.

In Islamic education, supervision is a continuous monitoring process to ensure the consistent implementation of plans, both material and spiritual. In the Islamic view, supervision is carried out to straighten out what is not straight, correct what is wrong and justify what is right.

2. Information and Communication Technology (ICT)

ICT is the abbreviation of Information and Communication Technology. It includes a variety of technologies used to collect, store, process, and disseminate information. This term includes hardware (such as computers and mobile devices), software (applications, programs, operating systems), networks (Internet, intranet), as well as various communications technologies (email, telephone, video conferencing). In the educational context, ICT refers to the use of this technology in the learning and teaching process. This may include the use of computers in the classroom, access to online learning resources, learning applications, and technology-based teaching approaches.

The application of ICT in education aims to improve the accessibility, quality and efficiency of learning. It also opens up new opportunities in the way we learn, teach and collaborate, enabling more dynamic interactions between teachers and students and facilitating more interactive and personalized learning.

3. Education Quality

Improving the quality of education is a very important goal in facing the challenges of the times (Saifulloh et al., 2012). Some steps that can be taken to improve the quality of education include:

a. Inclusive Education: Building an inclusive education system, which allows equal access and opportunities for all students, regardless of economic, social or disability background.
b. Relevant Curriculum Development: Designing a curriculum that is responsive to current developments, incorporating 21st century skills such as critical skills, creativity, communication and problem solving.
c. Ongoing Teacher Training: Provides ongoing training and professional development for teachers to update their teaching methods, integrate technology, and adopt the best strategies to address diverse student needs.
d. Utilization of Technology: Utilizing technology in the teaching and learning process to increase access to quality educational resources, provide interactive platforms, and facilitate more dynamic learning.
e. Performance-Based Evaluation: Implement a comprehensive, performance-based evaluation system to monitor and evaluate the effectiveness of educational programs, teachers, and institutions.
f. Partnerships between Schools and Communities: Building strong partnerships between schools, families, and communities to support student learning inside and outside the school environment.
g. Character Education: Incorporate learning about values, character, empathy, social awareness, and interpersonal skills in the curriculum to form responsible and caring individuals.
h. Broad Access to Higher Education: Ensure broad and fair access to higher education to enable the development of the full potential of diverse levels of society.
i. Research and Innovation: Encourage research in education to improve educational practices, identify new needs, and integrate innovation in the education system.

Improving the quality of education is not a simple task, but with a holistic approach, involving all stakeholders, and a commitment to sustainable change, we can achieve significant improvements in global education (Rabiah, 2019; Barlian & Solekah, 2022; Erdiyanto et al., 2020; Fadhli, 2017; Faridi, 2009; Gudiato et al., 2023; Hamdi, 2011; Handoko, 2020; Lestari, 2017).

The large number of Madrasah Aliyah (MA) graduates who continue to tertiary institutions can be a positive indicator regarding increasing students' access and ambition to increase their level of education, which can then become an indicator of improving the quality of education.

The number of MA graduates who continue on to higher education could indicate increased access to higher education, which could be interpreted as success in providing wider access for students from various backgrounds. Students' decisions to continue their studies at university also reflect their personal ambition and motivation in achieving higher education, which may occur due to encouragement from their family, teachers or the surrounding community. The quality of education

can also be reflected in how well MA graduates are able to pursue desired careers or advanced studies that suit their interests and skills.

So, while seeing the number of MA graduates who continue to college can be a positive indicator, it is also necessary to consider other factors that influence the quality of education, such as academic readiness, relevant curriculum, systemic support, and the final educational outcomes achieved.

C. METHOD

The method used in this research is a descriptive method, namely research that seeks to capture or observe problems systematically and accurately regarding the facts and characteristics of certain objects, which in this research concerns the Implementation of ICT Management that is Capable of Improving the Quality of Education. Descriptive research is aimed at explaining, describing and mapping facts based on a certain perspective or frame of mind. This method seeks to describe and interpret what exists, opinions that are growing, processes that are ongoing, consequences or effects that are occurring, or trends that are developing. In this research, data collection was carried out using an assessment of primary data sources and secondary data sources (Sugiyono, 2009:225). Because the collection and analysis of qualitative research data used in this research is interactive, the researcher interacted with the data sources above by conducting observations, interviews and literature reviews.

D. RESULTS AND DISCUSSION

1. ICT Planning at Madrasah Aliyah Negeri (MAN) 2 Bandung City

All educational institutions certainly have a vision and mission to achieve their goals. The vision of MAN 2 Bandung City is "To Become a Leading Educational Institution in Perfecting the Civilization Morals of the Nation's Generation" and the mission of MAN 2 Bandung City is as follows:

a. Strengthening the professionalism and innovation of teaching staff and madrasa education;
b. Increasing the meaningfulness of life skills of madrasah students;
c. Establishing educational communication productivity that encourages accelerated improvement in the quality of excellent service and the quality of madrasah graduates with good morals;
d. Creating a madrasah environment that is educational, cultural, healthy, clean and civilized;
e. Strengthening the system of excellent service and management of madrasa education.

In achieving this vision and mission, several strategies are implemented in the implementation of ICT in the context of developing academic and learning services, as follows:

a. ICT implementation planning which is an initiation/creation of the madrasah, namely the PPDB (New Student Admission) application and Digital

Information/Electronic Madrasah which is stored in the front of the administration room which contains information about finances, student affairs and other general information related to the madrasah and its activities -madrasa activities.

b. ICT implementation planning that has been provided by the government and is part of the madrasah, namely the SAKTI application (related to state finances from the Ministry of Finance), EDM (Madrasah Self-Evaluation), RDM (Madrasah Digital Report) and EMIS (Education Management System) from the Ministry of Religion.
c. ICT implementation planning is a collaborative program, namely the government/private sector provides the template, then the madrasah develops the template, namely the Examandaba application (MAN 2 exam application), library application (Senayan Library Management System/SLIM) and learning/virtual lab application.

Funding related to the implementation of ICT comes from DSP (Education Contribution Fund) and SPP (Education Development Contribution) funds, which are determined by the Madrasah Committee after communicating, coordinating and deliberating with the madrasah and parents.

2. Organizing ICT in Madrasah Aliyah Negeri (MAN) 2 Bandung City

ICT organizing activities at MAN 2 Bandung City include the following:

a. The infrastructure provided by MAN 2 Bandung City related to ICT, namely the availability of 32 GB internet access at several points around the madrasah, 3 (three) Computer Laboratories with 40 computers in each room and 5 computers in the library.
b. In relation to Human Resources (HR) in ICT management, there are 4 (four) managers, consisting of: 2 (two) operators, 1 (one) administrative infrastructure staff and the Deputy Head of the Madrasah for facilities and infrastructure. .

3. Implementation of ICT at Madrasah Aliyah Negeri (MAN) 2 Bandung City

The implementation of ICT at Madrasah Aliyah Negeri (MAN) 2 Bandung City, apart from being implemented in learning, is also implemented in other fields, namely in educational services in order to achieve the goals stated in the vision and mission of MAN 2 Bandung City.

In learning, there are differences in the position/function of ICT in curriculum 13 and the Merdeka curriculum. In the Independent Curriculum, ICT is a special subject, namely for class X. Meanwhile for classes XI and is there via stellarium, which is open source software used to simulate virtual planetariums. This is a computer application that allows users to view the sky as seen from the earth in madrasah laboratories. Another example, students are given the task of making a research report, so in the laboratory they are taught Microsoft Word, searching for information and strengthening modules.

In terms of services, MAN 2 Bandung City uses the SAKTI application in financial matters, EMIS for access to Teacher, TU and Student data and Digital Information/Electronic Madrasah for information about finances, students and other general information related to madrasas and madrasa activities. Then monitoring students via CCTV to minimize empty classes.

In implementing ICT, it is necessary to increase manager competency, namely through training. The training that has been attended by Teachers/Lab Heads/Operators includes:

a. Training on the use of the CANVA application, which is an application that can help teachers and operators in creating presentation materials, creating logos, documents and reports.
b. Lab Head Training located at the Regional Library Agency.
c. Online training attended by teachers and operators via the web intelligent.kemenag.go.id, namely IT, Artificial Intelligence (AI) and Multimedia training by the Central Ministry of Religion Research and Development.

4. Evaluation of ICT at Madrasah Aliyah Negeri (MAN) 2 Bandung City

This ICT implementation has received good managerial support in terms of policy and finance. However, there is still a shortage of human resources in terms of managing ICT, where there are no ASN or P3K human resources with an educational background in Information Engineering.

Evaluation of ICT at Madrasah Aliyah Negeri (MAN) 2 Bandung City is carried out in 2 ways, namely at routine monthly discussion activities held by the Head and Deputy Heads of the Madrasah and at work meetings held once every 1 (one) year.

5. ICT Implementation Can Improve the Quality of Education at Madrasah Aliyah Negeri (MAN) 2 Bandung City

Implementation of Information and Communication Technology (ICT) management in education can contribute significantly to improving the quality of education. The quality of education at MAN 2 Bandung City can be seen from the increasing public interest in enrolling their children in school at this madrasa and from the number of graduates who continue their studies at both state and private universities, which can be seen in the following table:

Table 1 Data on Graduates Who Continued their Studies at Higher Education from MAN 2 Bandung City in 2021, 2022, 2023

No	Year	Number of Graduates	Number of Graduates Who Continue to Higher Education	Percentage (%)
1	2021	388	257	66%
2	2022	369	200	54%
3	2023	375	225	60%

Data on graduate students at tertiary institutions based on the results of data collection and student reports, may still be more than the data listed above.

E. CONCLUSION

ICT planning at MAN 2 Bandung City includes vision and mission, ICT strategy and financing. In achieving the vision and mission in implementing ICT, several strategies are carried out in the context of developing academic and learning services, including ICT implementation planning which is the initiation/creation of madrasas, ICT implementation planning which has been provided by the government and is madrasah participation and collaboration programs, namely government/private which provides the template, then the madrasah develops the template. Organizing ICT at MAN 2 Bandung City includes the infrastructure provided by the madrasah along with the human resources who manage this infrastructure. The implementation of ICT at MAN 2 Bandung City includes the implementation of ICT in learning and educational services. The implementation of ICT is supported managerially and financially, however in terms of human resources it is still lacking.

ICT evaluations are carried out regularly monthly by the Head and Deputy Head of the Madrasah and annually at work meetings. The quality of education at MAN 2 Bandung City can be seen from the increasing public interest in enrolling their children in school at this madrasa and from the number of graduates who continue their studies at both state and private universities.

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