

Technology-based learning strategies in Digital Madrasah Program

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Suggested Citation:

Haddade, H., Nur, A., Mustami, M. K. & Achruh, A. (2023). Technology-based learning strategies in Digital Madrasah Program. *Cypriot Journal on Educational Sciences*. 18(1), 55-70
<https://doi.org/10.18844/cjes.v18i1.8179>

Received from October 11, 2022; revised from December 15, 2022; accepted from January 16, 2023

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Abstract

This study aimed to demonstrate the Research-based Digital Madrasah history and technology-based learning strategies and developments. It is a qualitative descriptive study that uses in-depth interviews for collecting data from informants, including the head of a madrasah, educators, and students, which are analyzed by N-Vivo Software. The results indicated several learning strategies in Research-based Digital Madrasah that were applied and integrated with technology. This includes the use of the tablet in the learning process, especially for the seventh-grade students who were directed at 100% digital-based learning processes. They utilized the technology application in learning, including the Arabic language learning, such as the *Alef* application, and digital-based academic and non-academic service management. The result confirms that the implementation of strategies in technology-based learning significantly supports madrasah development in the future.

Keywords: Digital Madrasah, strategy, technology-based learning, development, learning application.

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1. Introduction

In Indonesia, technological development in supporting all human activities is increasingly experiencing a significant increase. It can almost be stated that all fields or sectors have made technology a new instrument in carrying out performance (Ariani & Festiyed, 2019). In education, several models or innovations originate from supporting all forms of activity from technology-based learning to the application of several innovations in enhancing the quality of education (Aslamiyah et al., 2019).

Technology development has brought several changes in the order and process of implementing performance, especially in the field of education (Jamun, 2018). The closeness between education and technology is no longer a new thing. Since the diagnosis of the spread of the Covid-19 outbreak in 2019, the government in the field of education has made online-based learning designs to overcome the factor of falling behind in learning (Salsabila et al., 2020). For approximately two years, education has used learning design through technology. However, there are several challenges faced in terms of technology-based or digital learning, especially in terms of adaptation and the availability of supporting infrastructure. These challenges can be minimized through educational policies initiated during the pandemic (Mokalu et al., 2022).

Educational technology combines learning, development, and management, to solve problem (Hilir & Kom, 2021). It has a significant role in designing, developing, and utilizing various learning resources to facilitate and accommodate an individual to learn (Efgivia, 2020).

Integration of education and technology in the present day affords the chance to adapt to the times. Additionally, educational institutions are required to strive to develop the quality of education in the digital era through a pattern of integration with the scope of technology (Salim et al., 2020). Education levels in general, such as elementary, junior high, senior high school, vocational school, college, and university, are required to develop the quality of the digital era. Islamic educational institutions, in this case, madrasah, is also expected to develop their educational institutions in the digital era.

The study is interested in analyzing technology-based learning strategies in the digital era and making a research-based digital madrasah at MTsN 1 Makassar as an object and research location. The approach used is the concept of strategy, which is interpreted as a plan for achieving goals. Therefore, this case is of interest to conduct in-depth research on the strategies and steps implemented by MTsN 1 Makassar in achieving a successful research-based digital madrasah with technology-based learning systems. The problem statements are formulated as follows:

1. How is Digital Madrasah history at MTsN 1 Makassar?
2. How are technology-based learning strategies in Digital Madrasah Program at MTsN 1 Makassar?
3. How are technology-based learning developments at MTsN 1 Makassar, including the obstacles and solutions?

1.1 Conceptual or Theoretical Framework

1.1.1 Learning Strategy

Generally, strategy can be interpreted as an instrument in the form of planning and steps in achieving a goal (Sari & El Islami, 2020). In the context of learning within education, it is defined as a comprehensive approach or method related to delivering teaching materials by teaching staff under the characteristics of students and the learning environment conditions to achieve the objectives formulated.

In the case of supporting the implementation of learning strategies, Dick and Carey showed that some main criteria or requirements need to exist (Danday, 2019). This is formulated into five main components, including preliminary learning, information delivery, student participation, tests, and follow-up activities. These five components are prerequisites for a strategy in the learning process carried out by teaching staff (Sumardi, 2021).

In this study, the main components of the learning strategy refer more to the context of preliminary and the delivery of information. The concept is important in the learning process and relates to the teachers' methods of attracting students' interests (Purwaningtyas et al., 2022). This process can be an introduction to learning material that departs from illustrations related to daily activities encountered. The examples show that the material taught can be understood without memorization (Odo, 2022). In practice, the concept of preliminary learning can be carried out through technology (Önal, 2019).

1.1.2 Madrasah Concept in Indonesia

The definition of madrasah in various uses is diverse but has the same content. Generally, madrasah is Islamic educational institutions where the learning curriculum contains religious subject matter and general lessons. The subjects about religion are more dominant than general subjects, such as those applied in schools (Nurhayati et al., 2021).

Along with its development, education in madrasah also continues to experience changes, especially in learning. Madrasah is the same as the concept of education, but their content is more about religion (Efendi, 2020). Meanwhile, they are formally divided into several levels of education, namely:

1. RA (*Roudhotul Athfal*)

Roudhotul Athfal (RA) is an educational unit categorized as a preschool at the formal education level, and the learning program is the same as Kindergarten (Hidayatullah, 2020). Meanwhile, learning about religion focuses more on children aged four to six.

2. MI (*Madrasah Ibtida'iyah*)

Madrasah Ibtida'iyah (MI) is a form of formal education with the characteristics of the Islamic religion, from the learning atmosphere to the appearance of students and educators who are required to have nuances. MI consists of 6 levels and is equivalent to Elementary School, which is mandatory for all Indonesian children before entering the next level of education. It is an advanced level after RA in Islamic educational institutions, and regarding subjects, MI is the same as public schools. However, additional subjects are mandatory for students to follow, such as Fiqh, Aqidah Akhlaq, Al-Qur'an and Hadith, and Arabic. Islamic Cultural History lessons only started in grade 3.

3. MTs (*Madrasah Tsanawiyah*)

Madrasah Tsanawiyah (MTs) is an educational unit model with general learning at the school level but is almost the same as MI in terms of the characteristics of the Islamic religion. MTs consist of 3 levels as a continuation of Elementary School, MI, or other equivalent forms. They are the same and equivalent to Junior High Schools in learning curriculum. However, the difference is that at MTs, Islamic religious education subjects are a priority, such as Al-Quran and Hadith, *Aqidah Akhlak*, *Fiqh*, History of Islamic Culture, and Arabic.

4. MA (*Madrasah Aliyah*)

Madrasah Aliyah (MA) is a model of an educational unit, and its implementation has the same characteristics as MI and MTs, namely Islamic religious subjects. MA is equivalent to Senior High School and is the highest level in madrasah. In the second year of grade 11, MA students choose one of the 4 existing majors, namely Natural Sciences, Social Sciences, Islamic Religious Sciences, and Languages (Lukens-Bull, 2019).

1.1.3 Digital Madrasah

The development of the digital era has brought a new life axis in people's lives based on the use of network-based technology or the internet without exception. This also applies to the sector of Islamic education institutions such as madrasah (Yasmansyah & Zakir, 2022). The sophistication of internet-based technology creates uncertainty within the scope of madrasah and provides opportunities to develop quality according to the demands of the times. In facing the context of the times that require digital-based transformation, madrasah is required to adapt to the development of digital technology (Efendi, 2021). Therefore, madrasah in the digital era should pay attention to the following:

- 1) Increase its competitiveness in a planned and systematic way, allowing the output of madrasah in the form of quality graduates and innovations to compete in the global arena.
- 2) Take advantage of the opportunities the digital era presents in the world of business and industry. Meanwhile, development should follow the demands of the industrial world.
- 3) Maintain their characteristics as Islamic educational institutions that are inclusive and open to changes without neglecting basic principles and values.
- 4) Make updates based on the context of development to maintain the quality of their education (Santosa & Jazuli, 2022).

1.2 Related Research

Several previous studies have been carried out on the development of madrasah in the digital era. These include research from Rully Rina Widyasari and M. Mukhibat (2020) entitled "Repositioning and Re-actualizing Madrasah Education in Strengthening Education Existence in Era 4.0". The purpose is to make efforts to reposition madrasah through changes in institutional management to a more professional direction according to the context of the times. The results show that three steps should be taken by Islamic educational institutions, especially madrasah, in facing Era 4.0, namely disruptive mindset, self-driving, and reshaping or creating. These three steps are a pattern of change that should be present in educational institutions (Widyasari, 2020). Furthermore, as Islamic educational institutions, madrasah is expected to develop the quality of their education in the face of the digital

era (Borker, 2018). Based on data compiled from <http://emispendis.kemenag.go.id/>, the number of madrasah consisting of *Raudlatul Athfal*, *Madrasah Ibtidaiyah*, *Madrasah Tsanawiyah*, and *Madrasah Aliyah* from 34 provinces in 2021 is 83,391 institutions (Lukens-Bull, 2019).

Research on “Civilized Madrasas in Era 5.0” was conducted by Nur Isnaini Albanjari (2021). The results concluded that the factors acting as the main measure in developing the concept of madrasah 5.0, which continued to prioritize aspects of civilized morality, could upgrade learning methods (Albanjari, 2021). The difference between this study and the previously conducted is the method. The current result uses a library approach to obtain data for field research. Meanwhile, the similarity is in the aspect of madrasas in the digital era. The research emphasizes the concept of good and effective madrasah facing the 5.0 era. It focuses on technology-based learning strategies in a madrasah facing the digital era at MTsN 1 Makassar.

Research from Eristiana et al. (2022) was titled “Efforts to Improve the Quality of Madrasah Education in the Digital Era.” The results concluded that models and concepts for improving the quality of education in madrasah could be carried out through the ability to use technology, such as digital-based learning processes and management according to developmental demands (Saidi et al., 2022). There are significant differences, namely in the type of research used and improving the quality of education. This is a type of literature study that analyzes efforts to improve education, while the research that will be carried out uses a type of field research and demonstrates a model for developing madrasah in remote areas of eastern Indonesia. The similarities between the two are in the aspects of madrasah in the digital era.

1.3 Purpose of the Study

Based on the problem statements, the aims of the study are formulated as follows:

1. To explain digital madrasah history at MTsN 1 Makassar.
2. To demonstrate technology-based learning strategies in the digital madrasah Program at MTsN 1 Makassar.
3. To explain the technology-based learning developments at MTsN 1 Makassar.

The significance of this study is:

1. Highlighting and enriching strategies that can be applied in Digital Madrasah and its integration toward educational technology.
2. Presenting the development model of a Digital Madrasah in the current era through learning applications to face the digital era.

2. Methods and Materials

2.1 Research Model

The research design was conducted under natural conditions using a qualitative descriptive approach. Furthermore, the main data source was words from the interview with the collected documentation (Bilgin, 2017). This research was conducted using various data collection procedures to obtain complete information. It was committed to observation and in-depth interviews at MTsN 1

Makassar for 4 months, from February to May 2022, and directly participated in exploring learning strategies through observing the learning process.

2.2 Participants

The study informants were 10 people, consisting of the head of the madrasah, teachers, students, and staff. They were determined based on purposive sampling in which all participants were chosen through their roles in the madrasah and knew well about the situation and condition of the learning ecosystem at MTsN 1 Makassar.

2.3 Data Collection Tools

The in-depth interview, directed by Interview Guidance and observation of participation, became tools to collect data in this study. The tools identified the reality of technology-based learning applied at MTsN 1 Makassar, and the Interview Guidance consisted of several questions, as follows:

Table 1. The Interview Guidance to identify technology-based learning strategies

Questions
How is research-based digital madrasah history at MTsN 1 Makassar?
What is the legal standing of digital madrasah from the concept?
What are the obstacles in developing a digital madrasah at MTsN 1 Makassar?
How is the learning process in the classroom by using learning applications?
How is a learning indicator to achieve learning success?
How are learning steps in the classroom?
What is the application used in the classroom?

2.4 Data Collection Process

The techniques used in collecting data were observation, interview, and documentation. The observation technique was carried out by first visiting MTsN 1 Makassar, taking notes on all matters relating to the design that had been made, including the research problem, and asking about the willingness of the selected informants to be interviewed. Furthermore, the interview technique was carried out using a semi-structured model using the interview guidelines for directing research data (Thomas, 2022). Semi-structured interviews were conducted with each informant, and the reliability of the data was measured based on the level of repeatability of the data or information conveyed (Klar & Leeper, 2019). In addition to observations and interviews, data were collected through documentation related to research problems at MTsN 1 Makassar.

2.5 Data Analysis

The analysis technique began with data management in the form of a transcript. Furthermore, transcripts were read repeatedly to obtain an overall picture of the data and identified segments that had the potential to show aspects of the phenomenon. The data experienced conceptualization, classification, categorization, and identification of themes, then connected with theoretical constructs before concluding. An interpretation was conducted by rearranging, examining, and discussing textual

data while conveying the original understanding of the participants. The process of analyzing this data used N-Vivo Software as a tool for qualitative analysis, as illustrated below.

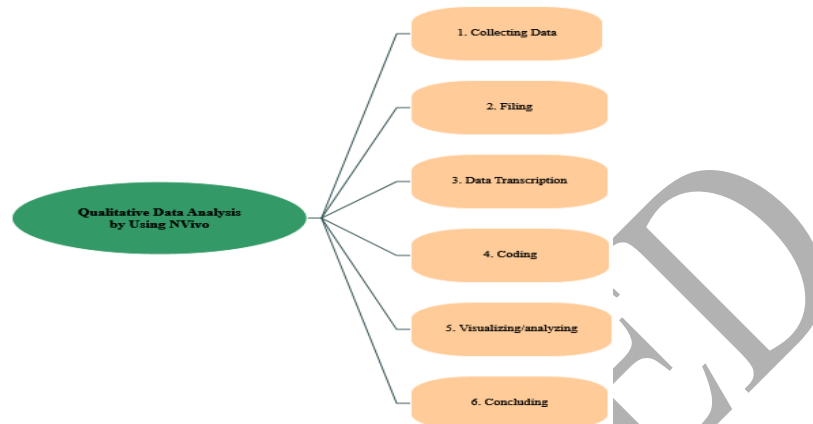


Figure 1. The process of qualitative data analysis using N-Vivo Software

3. Results

3.1 History of Research-Based Digital Madrasah at MTsN 1 Makassar

The Digital Madrasah, implemented at MTsN 1 Makassar, was officially launched on Friday, 9 October 2020, by Vice Minister of Religion Zainut Tauhid Sa'adi. The launching process was marked by a hand scan by the Vice Minister of Religion, Head of the Regional Office of the Ministry of Religion of South Sulawesi, and the representative from BNI Bank as a partner of Digital Madrasah of MTsN 1 Makassar in the use of the *eduPatrol* application to track the progress of learning and student activities (Dalimunthe et al., 2021). From the historical aspect, the digital madrasah at MTsN 1 Makassar has a long history in its development phase. Based on data from an interview with the Head of the Madrasah (Kamad) of MTsN 1 Makassar City, Zulfikah Nur, the stages of development are described in the form of a Mind Map below.

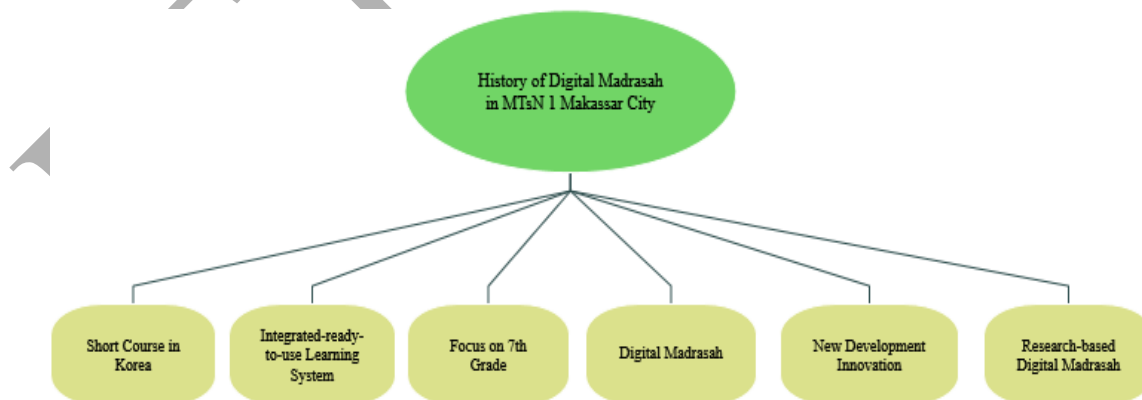


Figure 2. Mind Map of Digital Madrasah History in MTsN 1 Makassar

Based on the Mind Map above, the idea of learning with technology integration into the madrasah was obtained from the reflection of the journey of Zulfikah Nur as the Head of Madrasah MTsN 1

Makassar while conducting a Short Course in Korea. The learning model was adapted to be an integrated-ready-to-use Learning System. The main idea about technology integration in the education world then developed into an integrated ready-to-use learning system and applied sustainably. This was immediately implemented in 2020 after returning from Korea.

Furthermore, the ready-to-use learning system was only focused on 7th Grade Students at MTsN 1 Makassar, and they should have a tablet. However, with a limited budget, the procurement of a tablet is charged by including cooperation with a willing association or educational institution. In the future, it is hoped that there will be a fixed budget for the madrasah to procure tablets and computers in every classroom. The use of tablets has been connected to all learning materials in the madrasah.

After the use of a tablet for 7th grade and evaluation for development continued until the madrasah was included in the digital category. A digital learning system in the MTsN 1 Makassar is a collaboration of innovation from the head and managers. In addition to the digital concept applied at MTsN 1 Makassar, a model was also developed that was integrated with the scope of research. This sustainable innovation was conducted because of an understanding of the importance of synchronizing the digital world with research in producing competitive madrasah graduates.

From the historical aspect, MTsN 1 Makassar is a type of modeling madrasah in Makassar City, which changed its name in 2015. As a modeling, it certainly excels in academic terms to embed research in digital madrasah. In addition, MTsN 1 Makassar also has special classes for research and science learning. This development model becomes a special laboratory in honing students' abilities to be actively involved in every competition at national and international levels.

3.2 The Strategies of Technology-based Learning at MTsN 1 Makassar

In terms of the learning process, there are several strategies applied by research-based digital madrasah at MTsN 1 Makassar as described in the Project Map below.

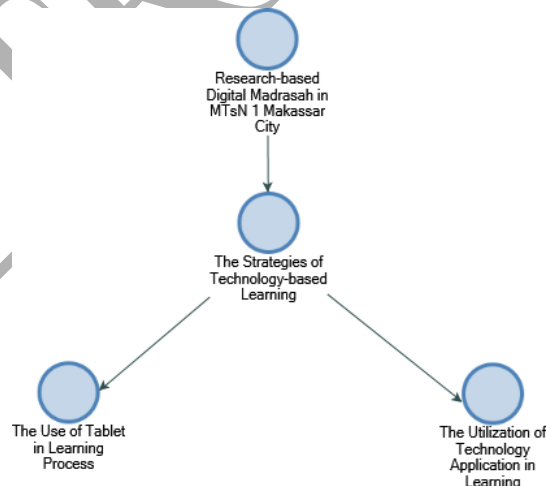


Figure 3. Project Map of the strategies of technology-based learning

Based on data analysis using the N-Vivo software with the Project Map tool, two technology-based learning strategies were found in the research-based digital madrasah, MTsN 1 Makassar. They can then be listened to through the Result of the Matrix Coding Query below:

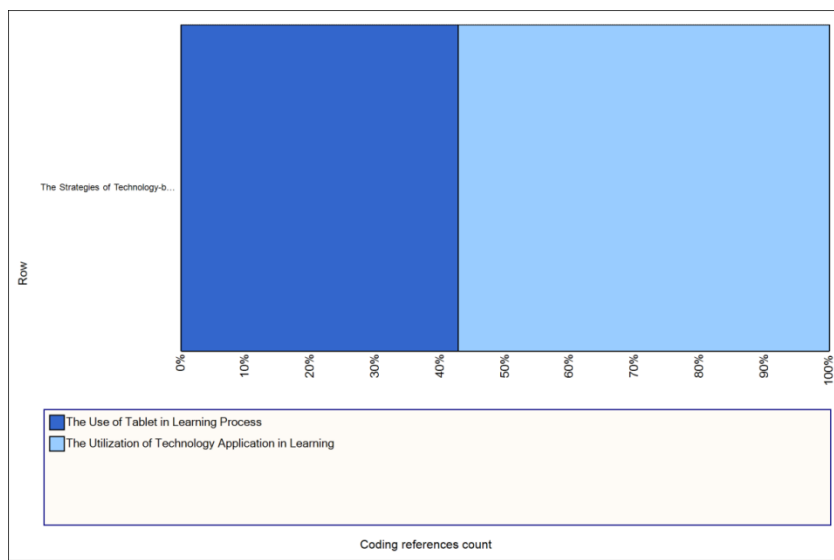


Figure 4. Matrix Coding Query of the strategies of technology-based learning

3.2.1 The Use of Tablet in the Learning Process

The use of the tablet in the learning process at the research-based digital madrasah at MTsN 1 Makassar is one of the learning strategies implemented. A digital-based learning system is carried out in full and specifically for 7th-grade students as the initial stage in integrating digital technology using tablets described by Abd. Rahman as an Arabic teacher, stated that

“The learning process begins, and each student opens a tablet from the start only for classroom learning, hence the contents of the tablet are only the materials needed.”

As an effort to achieve indicators of success through the use of the tablet, several strategic steps and mechanisms are also implemented, such as transforming teaching materials into each student’s tablet, providing understanding, training, and simulating the use of a tablet for each student based on the results of the assessment.

The use of the tablet in the learning process in a research-based digital madrasah at MTsN 1 Makassar can facilitate the learning process and affect student outcomes, and is fairly efficient and effective. This can be seen through the tactical steps in the classroom, starting from providing initial material before the learning process takes place to assess understanding of using a tablet. Furthermore, the teacher will provide additional explanations related to the initial assessment, which is monitored directly to identify students with learning difficulties.

3.2.2 The Utilization of Technology Application in Learning

The management of the research-based digital madrasah at MTsN 1 Makassar also uses technology applications to support the ecosystem, such as changing the attendance system to Scan Barcode as the first step when entering the classroom. Digital counseling guidance services are also implemented for all 7th-grade students, such as virtual, formal rooms, outdoor, and spiritual counseling. Furthermore, some applications are used by managers and teachers at the madrasah, such as learning materials.

“In addition, there is a special application for learning Arabic, including lesson plans, basic competencies, learning objectives, learning materials, and videos.”

The madrasah designed a special android-based application to support Arabic learning. It contained several core components, such as basic competencies, learning objectives, integrated materials, videos, ice-breaking, exercises, and worksheets, and the application is shown in the image below:



Figure 5. (a) The Main Appearance, (b) The Homepage Appearance, (c) and (d) The Menu Appearance of the Application

The application used to support the learning process in research-based digital madrasah at MTsN 1 Makassar is *Alef* or *Alefed*, based on Artificial Intelligence (AI). This application has been present

through a collaborative decision between *Alef Education* and the Ministry of Religion in November 2021 as an effort to realize the global education industry. Moreover, the *Alef* application has been integrated with the learning curriculum to support student achievement. The following is the display in learning Arabic and integrated with research-based digital madrasah at MTsN 1 Makassar:

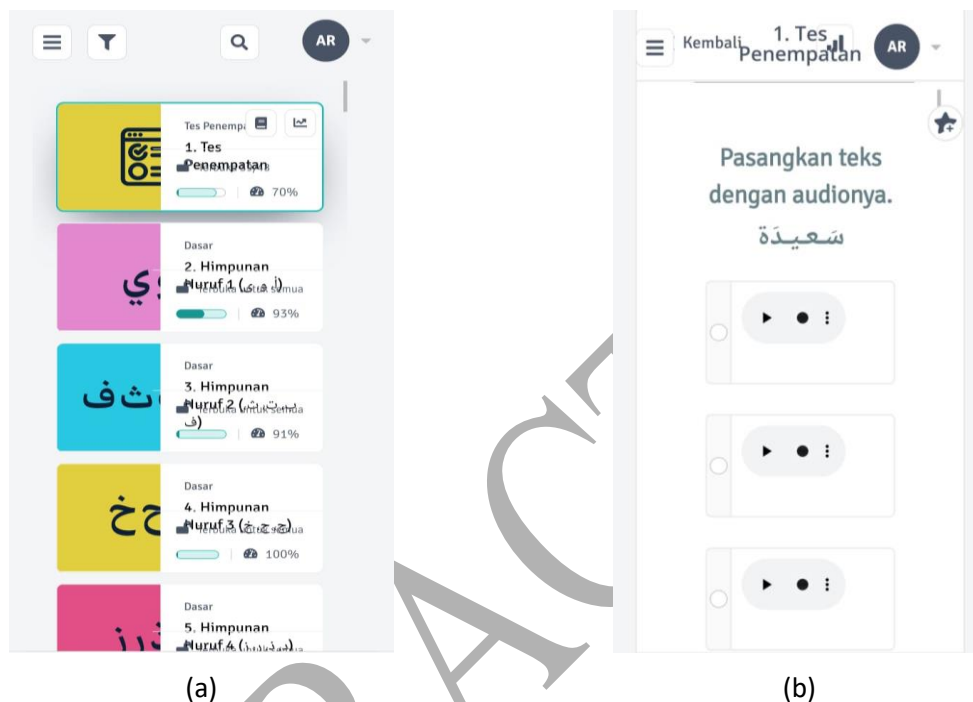


Figure 6. Display of *Alef* Application in Arabic Learning at MTsN 1 Makassar

Meanwhile, several other applications are used in research-based digital madrasah at MTsN 1 Makassar for learning and assessment needs. This was stated by Zulfikah Nur, the Head of MTsN 1 Makassar:

“Everyone uses it, but their transferring style is different. In this madrasah, I want fast and precise, and technology should be used when that is the case. Some applications are Auto Play, Microsoft Office, Macro media, Google sites, Crazy, and E-Learning. For the assessment, there are Kahoot, Quizzes, Speech, and Google Form.”

The commitment of research-based digital madrasah managers at MTsN 1 Makassar can be seen from their ongoing efforts to utilize technology. Applications such as Auto Play and other E-Learning devices continue to be maximized in the learning system, as well as Kahoot and Google Forms in conducting assessments.

3.3 The Development of Technology-based Learning: An Overview of Obstacles and Solutions

Some factors become obstacles in developing a technology-based learning system in a digital madrasah at MTsN 1 Makassar. Based on the data analysis in the field, the factors that hinder the development of technology-based learning are described through Matrix Coding below:

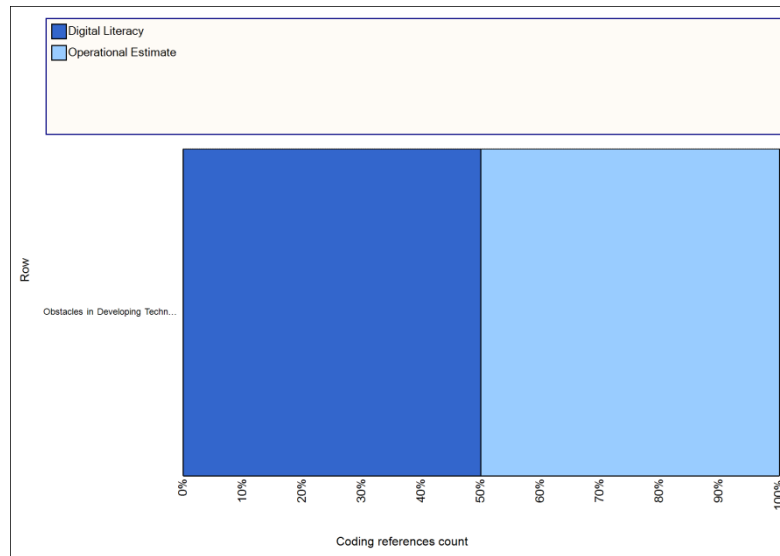


Figure 7. The Obstacles in Developing Technology-based Learning at MTsN 1 Makassar

There are two factors hindering the development of technology-based learning, namely Operational Estimate and Digital Literacy. Asykin stated:

“Each student has a tablet, and the madrasah does not provide it because they cannot afford it in terms of budget.”

The budget constraint is the main obstacle and generally applies to almost every educational institution. In MTsN 1 Makassar, the problem of procuring tablets is handled by a partnership between parents and government institutions. Meanwhile, all parents fully support the learning innovations implemented by MTsN 1 Makassar. Another factor is Digital Literacy, as stated by Zulfikah Nur, concerning information and communication technology constraints. This is not only experienced by 7th-grade students but also teachers. Therefore, a routine program on training in the use of learning technology should be implemented to overcome this problem.

4. Discussion

In this study, the research-based digital madrasah at MTsN 1 Makassar is the innovation in facing the context of the times, allowing Islamic educational institutions to coexist in the digital era and create quality young generations. Zulfikah Nur first obtained the idea of developing a digital-based madrasah based on travel experience taking the Short Course in Korea. The Ministry of Religion has also initiated the concept of a digital madrasah in Indonesia through the launch of the Manual for Organizing Digital Madrasas in 2019 and seeking the transformation towards the use of technology in supporting the learning process (Tim Peneliti Pendidikan Agama dan Keagamaan Jakarta, 2019).

In the case of maximizing the madrasah digitalization process, MTsN 1 Makassar applies several learning strategies that are integrated with the world of technology. In this study, the use of tablets and technology applications as a learning strategy in dealing with the digital era had a major impact on education management, especially in terms of integration (Rafi et al., 2019). Additionally, it can also

significantly improve the quality of education according to the context of the times and offers management effectiveness in terms of learning support in the classroom (AL-Majali, 2022).

The triumph of the integration process through technological tools and applications shows that the development of technology-based education is not impossible. This can be seen through the use of the *Alef* or *Alefed* application in learning Arabic at MTsN 1 Makassar (Herawati, 2022). The application is a technology-based learning medium focused on Arabic and Mathematics for junior high school and *Madrasah Tsanawiyah* students (Swastika Waranggani, 2021). At MTsN 1 Makassar, the use of the *Alef* application in learning Arabic is a strategy to support learning achievements in the digital era. However, there are challenges in terms of the operation of technological tools, which are very minimal. These constraints can be minimized through regular implementation of technology training.

The process of adapting to technology is a necessity to improve the quality of education and achieve success indicators of the vision and mission of the educational institution. This study cannot only describe the historical aspects of the development of research-based digital madrasah at MTsN 1 Makassar and the strategies implemented, especially in learning technology and solutions.

5. Conclusion

Based on the results of the research and discussion above, this study concludes that two main strategies are applied by research-based digital madrasah at MTsN 1 Makassar in developing a technology-based learning system, namely: First, the use of the tablet in the learning process. This strategy is specifically applied to 7th-grade students with a fully digital-based model. All learning materials, processes, and assessments are presented and transformed into each student's tablet in the classroom. Second, the utilization of technology applications in learning. This strategy relates to the use of applications that support digital-based learning systems, such as lesson plans, materials, and Arabic learning videos that can be accessed through the Android version. In addition, other supporting applications are *Alef* or *Alefed*, integrated with the madrasah curriculum. This application is specifically for learning Arabic and Mathematics at the madrasah level, and it is used like Google Classroom. Regarding learning assessment, the applications needed at MTsN 1 Makassar are Kahoot, Quizzes, and Google Forms.

The technology-based learning strategies at MTsN 1 Makassar positively impact teachers and students through the ease of understanding learning materials, transforming knowledge, and the preferred learning situation. Furthermore, some factors hinder learning, namely the lack of an operational budget for the development and literacy of information and communication technology among teachers. In overcoming these obstacles, MTsN 1 Makassar restructured the allocation of School Operational Assistance (BOS) funds into digital-based learning management and conducted regular training on digital literacy and technology applications for all teachers in the madrasah.

6. Recommendations

This study only focuses on aspects of technology-based learning strategies in the digital madrasah at MTsN 1 Makassar and aspects of history as well as challenges and solutions. To implement further related findings, the study suggests analyzing the development of technology-based madrasah that identify a wide area, especially madrasahs in eastern Indonesia. The subsequent study can also conduct

further investigations related to the adaptation of technology-based learning, such as using applications and other learning media.

Acknowledgments

The author is grateful to the Head of MTsN 1 Makassar, who has given the researcher a chance to conduct this study, and to all teachers, staff, and librarians who have contributively helped during this study. The author is also grateful for all the contributions rendered during the interviews.

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