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Implementation of Technology-Based Learning at Madrasah Ibtidaiyah Negeri 1 Alor

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A B S T R A C T

This study aims to analyze the implementation of technology-based learning in Madrasah Ibtidaiyah Negeri 1 Alor, 3T region, by highlighting aspects of consistency of teaching tools, integration of literacy activities, suitability of materials, and utilization of digital media. Using a qualitative approach with a case study design, data were obtained through in-depth interviews, participatory observation, and documentation, then analyzed using the Miles, Huberman, and Saldaña interactive model. The results show that the implementation of technology-based learning at MIN 1 Alor takes place adaptively and contextually. Digital application-based time discipline, integration of religious literacy into daily routines, and utilization of media such as infocus and Google Form, indicate the creation of a collaborative learning environment that is relevant to the characteristics of students in marginalized areas. Theoretically, this research extends the application of POAC principles in the context of digital Islamic education through humanist, spiritual and adaptive managerial integration. Its practical contribution lies in the formulation of an applicable technology-based learning implementation model for madrasahs in disadvantaged areas, as well as the basis for affirmative policies in the transformation of digital education at the madrasah ibtidaiyah level

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Pelaksanaan Pembelajaran Berbasis Teknologi pada Madrasah Ibtidaiyah Negeri 1 Alor

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A B S T R A K

Penelitian ini bertujuan untuk menganalisis pelaksanaan pembelajaran berbasis teknologi di Madrasah Ibtidaiyah Negeri 1 Alor, wilayah 3T, dengan menyoroti aspek konsistensi perangkat ajar, integrasi kegiatan literasi, kesesuaian materi, dan pemanfaatan media digital. Menggunakan pendekatan kualitatif dengan desain studi kasus, data diperoleh melalui wawancara mendalam, observasi partisipatif, dan dokumentasi, kemudian dianalisis menggunakan model interaktif Miles, Huberman, dan Saldaña. Hasil penelitian menunjukkan bahwa pelaksanaan pembelajaran berbasis teknologi di MIN 1 Alor berlangsung secara adaptif dan kontekstual. Disiplin waktu berbasis aplikasi digital, integrasi literasi keagamaan ke dalam rutinitas harian, serta pemanfaatan media seperti infokus dan Google Form, menunjukkan terciptanya lingkungan belajar yang kolaboratif dan relevan dengan karakteristik siswa di wilayah marjinal. Secara teoritis, penelitian ini memperluas penerapan prinsip POAC dalam konteks pendidikan Islam digital melalui integrasi manajerial yang humanis, spiritual, dan adaptif. Kontribusi praktisnya terletak pada perumusan model pelaksanaan pembelajaran berbasis teknologi yang aplikatif bagi madrasah di wilayah tertinggal, serta sebagai dasar untuk kebijakan afirmatif dalam transformasi pendidikan digital pada jenjang madrasah ibtidaiyah

INTRODUCTION

The 21st century has become the era of

The development of technology and information has also changed the implementation of education which requires a transformation of learning patterns (Siswanto, 2022). Digital technology has become an important part of the dynamics of the learning process (Nurul Kamilah & Husen Windayana, 2022). The transformation of learning patterns is an educational process that brings students closer to reality, presents knowledge with a critical and reflective approach, and places the teacher's role as a facilitator who leads and encourages the learning process in accordance with the times (Regina et al., 2023). Learning is a process that is closely related to teaching activities. The term "learning" comes from the word "ajar," which means instructions for someone to be known or followed. With the prefix "pe" and the suffix "an," learning refers to the process, action, or way of teaching so that students are encouraged to learn. Learning involves interaction between learners, educators, and learning resources in a learning environment. In addition, learning functions as a facilitation from educators to help students gain knowledge, skills, and develop attitudes and confidence to support effective learning (Djamaluddin & Wardana, 2019).

In addition, learning is an interactive process that involves various elements to achieve educational goals. The main components include human aspects, such as students, teachers, and support personnel; learning materials, such as books and audiovisual media; facilities and equipment, such as classrooms and computers; and learning procedures that include schedules, methods, practices, and evaluations (Hamalik, 2015). Learning can be interpreted as an attempt to restore the core of the original purpose of education, which is to form humans holistically (Regina et al., 2023). Learning intends to humanize humans, a principle that is actually in line with the objectives of Indonesian national education, as stated in Article 3 of Law Number 20 of 2003 concerning the National Education

System (Republik Indonesia, 2003), namely: "National education functions to develop abilities and shape the character and civilization of a dignified nation in order to educate the nation's life, and aims to develop the potential of students to become human beings who are faithful and devoted to God Almighty, have noble character, are healthy, knowledgeable, capable, creative, independent, and become democratic and responsible citizens (Law No. 20 of 2003)" (Republik Indonesia, 2003).

This goal covers various important aspects of human development, ranging from spiritual, moral, intellectual, to social and civic aspects. Thus, Indonesian national education does not only aim to produce smart individuals, but also individuals who have strong character, noble character, and are able to contribute positively to society and the nation. In line with the above educational goals, Indonesia has seriously implemented changes in the education system through the Merdeka Belajar Movement, which focuses on solving learning problems. Along with that, the Ministry of Education, Culture, Research and Technology (MoECT) also continues to emphasize efforts to create an educational environment that is in line with the times through the implementation of policies that support four priority aspects.

These include: first, commitment to basic learning; second, support for teaching skills; third, targeting specific groups; and fourth, utilizing technology to improve and accelerate progress. Hence, since then, technology has become the main pillar of educational transformation, thus, the goal is to create individuals who continue to learn throughout life, are competent, and reflect the values of Pancasila (Ministry of Education, Culture, Research, 2023).

Furthermore, learning is also an interactive and structured process that involves the acquisition of knowledge, skills, and changes in behavior through interaction with the environment, systematic planning, utilization of relevant strategies and media, and mastery of digital literacy to increase the effectiveness and optimization of learning outcomes in accordance with the needs of learners and technological developments, where teachers and students must be digitally literate to face challenges and achieve the required competencies (Jama'ah et al., 2024; Paling et al., 2024; Rahmalia & Sabila, 2024; E. Syahputra, 2024; Utami et al., 2024).

In addition, learning can be interpreted as a dynamic process that includes the acquisition of knowledge, skills, and changes in behavior through interactions with the environment, both in the context of social integration and international business, where individuals and organizations adapt and reduce uncertainty through direct experience and skill strategy development (Alon et al., 2020; Hokkinen & Barner-Rasmussen, 2023).

Furthermore, learning is interpreted as a dynamic process that aims to improve literacy, thinking skills, and the character of learners through fun strategies, utilization of digital technology, and innovation in learning media to create learning experiences that are effective, interactive, and in accordance with the times (Fitri et al., 2024; Handayani & Haryati, 2024; Kusworo et al., 2024; Lubis et al., 2024; Zuhaery et al., 2024).

Based on various perspectives in the literature above, learning can be concluded as a dynamic, interactive, and structured process that not only focuses on the acquisition of knowledge and skills, but also includes character development, digital literacy, and innovation in teaching methods through interactions between learners, educators, and learning resources in an educational environment that continues to adapt to technological developments and the needs of the times. In line with the explanation above, in its development, the implementation of learning has included the principle of technology integration in learning. This shows that the development of technology and science has influenced new opportunities in learning strategies and methods, including in primary school learning (López-Pérez et al., 2019; Selwyn, 2012).

The integration of technology in education in the digital era has the potential to improve the quality of learning through easier access to information, interactivity and personalization, but faces challenges such as the digital divide, technological literacy and data security, so a comprehensive strategy is needed to manage risks and changes (Sundari, 2024). Ideally, these technologies offer various opportunities in education and learning, including in the provision of academic services, easy access to learning materials, improving education

evaluation systems, managing learning content, reporting student learning outcomes, and optimizing the use of digital learning media by educators (Gil-Flores et al., 2017; Rohatgi et al., 2016; Sulisworo & Muqoyyanah, 2018; Uluyol & Sahin, 2016). However, optimizing technology in learning requires a comprehensive approach, including strengthening infrastructure, developing digital literacy, and policies that support technology-based learning in a sustainable manner (Jamilah & Widiyanto, 2021; Okoye et al., 2023; Sulisworo et al., 2021).

In the context of Madrasah Ibtidaiyah Negeri (MIN) 1 Alor, as an integral part of the national education system in Indonesia, it is also required to be able to carry out a pleasant learning process by integrating technology in learning, unfortunately it still faces various major challenges, including the challenge of low internet access which is a serious obstacle in optimizing the use of technology in learning. Specifically, Madrasah Ibtidaiyah in Alor District faces various obstacles in integrating digital technology into learning activities. Some of the obstacles include limited access to technology, difficulty accessing the internet network, and low mastery of technology by teachers (Syukur et al., 2022). In addition, research by Asikin also shows that the management and assistance of teachers in integrating digital technology is still not optimal, so it is a fundamental challenge that must be addressed immediately to improve learning effectiveness (Asikin, 2018). The quality of teachers, including their ability to use digital technology, their welfare and the politicization of teachers, is also a fundamental challenge (Nasir, 2019).

This constraint is also influenced by the geographical condition of Alor Regency, which consists of nine islands. Among them, Alor Island, Pantar Island and Pura Island are three large islands that have been inhabited, while six small islands such as Tereweng Island, Ternate Island, Nuha Kepa Island, Buaya Island, Kangge Island and Kura Island (Province, 2015; Wikipedia, 2021). This condition causes some education units to become remote schools. The remoteness of schools from the city center is a serious obstacle in implementing technology-based learning. However, the challenges of implementing technology-based learning are not limited to geographical and infrastructure issues. In general, variants of education policies during the Covid-19 pandemic, from several research sources, can be categorized into two main groups, namely: (a) technology-based policies and blended learning strategies, where the implementation of distance learning and blended learning is carried out to maintain the continuity of the teaching-learning process despite facing challenges such as limited access to information technology, communication devices, educators' readiness in optimizing the use of technology, as well as difficulties in sorting and evaluating digital information; and (b) adaptive leadership policies and increased parental involvement, where flexible approaches, such as the division of learning tasks with clear guidelines, serve to increase supervision and support for the learning process at home, while democratic leadership provides space for teachers to develop professionally in managing learning in times of crisis (Dariyanto, 2023; Indah, 2022; Murthada, 2021; Salafudin et al., 2020; Sulisworo et al., 2021; Triyanto, 2022).

Education policies during the pandemic reflect a diversity of strategies that not only focus on optimizing technology, but also consider social aspects, leadership, and the involvement of parents and teachers to ensure the sustainability of the teaching-learning process (Dariyanto, 2023; Indah, 2022; Murthada, 2021; Salafudin et al., 2020; Sulisworo et al., 2021; Triyanto, 2022).

Further analysis, researchers identified that the inhibiting factors of technology integration in learning in six MINs in Alor district include (a) there is no roadmap for the process of adopting and adapting digital technology for education; (b) there is no solid strategy for synchronizing digital technology with learning needs; (c) the uneven distribution of technologybased learning support facilities and (d) the lack of teacher empowerment in utilizing digital technology for learning. If these problems are not addressed, it will be difficult to achieve learning in accordance with the times, namely a good integration between learning materials, the role of teachers, learning facilities, especially digital facilities, and student involvement that support each other. Meanwhile, the community's expectations of education standards are quite high, where the community wants graduates to be able to master technology while understanding relevant learning materials.

LITERATURE REVIEW

The integration of technology in learning in madrasah ibtidaiyah can be implemented through a good learning management process. The implementation of learning management in madrasah ibtidaiyah involves various elements such as human resources, infrastructure, facilities, atmosphere, space, time, funds, and regulations. The principal is responsible for leading all activities in the school, while teachers act as educators, implementers of learning, and assessors of student learning outcomes. The roles of students, education personnel, parents and communities are also important. Control from central to local levels is required. Effective management of all these elements is important for optimal learning outcomes, both academically and non-academically. This research is intended to analyze and examine more deeply the implementation of technology-based learning in Madrasah Ibtidaiyah Negeri (MIN) in Alor district.

METHODOLOGY

This research uses a qualitative approach with a case study design, which is focused on the implementation of Technology-Based Learning Planning in Madrasah Ibtidaiyah Negeri (MIN) 6 Alor. The choice of this approach aims to explore in depth the managerial dynamics and practices of technology-based learning in the 3T (Disadvantaged, Frontier, and Outermost) areas, especially in the context of Islamic education. Data were obtained through participatory observation, in-depth interviews, documentation, and field photos, and strengthened through triangulation techniques of sources, techniques, and time. Primary data were obtained from direct interactions in the field, while secondary data were collected from documents, institutional reports and related literature. The data analysis technique refers to the interactive model of Miles, Huberman, and Saldaña which includes three main stages: data condensation, data presentation, and conclusion drawing/verification. Condensation was done through a process of selection, abstraction, and transformation of findings, which were then arranged in a thematic format for conceptual Commented [P2]: Need to add supporting literature analysis. Data presentation was done in the form of descriptive narratives that facilitated the interpretation of relationships between managerial aspects.

RESULTS AND DISCUSSION

Implementation is the stage where a plan or activity is implemented or carried out in accordance with predetermined procedures. In certain contexts, implementation can also refer to the implementation of a plan or policy in daily practice. In the implementation process, it is important to ensure that all necessary steps are carried out properly and in accordance with the set objectives. Implementation is a crucial stage in the management cycle, where carefully formulated plans and strategies are translated into concrete actions. In a broader context, implementation is the arena where theory is tested by practice, demonstrating managerial capability in coordinating the various elements of the organization to move synergistically towards the set goals. It is a dynamic phase that integrates the art and science of management, ensuring that the organizational vision is manifested in daily operational reality. In the realm of education, particularly the learning context, implementation refers to the crucial stage where the prepared curriculum design, teaching materials and learning tools are actively implemented in the classroom or relevant learning environment. This stage tests the educator's capability to transform the curriculum blueprint into a concrete, interactive and valueadded learning experience for learners. This process involves a series of important aspects, including consistency in the schedule of Teaching and Learning Activities (KBM), alignment between the material delivered and the learning tools that have been prepared, and optimizing the use of relevant and innovative learning media. The teacher, as the main facilitator, plays an essential role in ensuring that all these components interact effectively to achieve the set educational goals.

The next section will elaborate specifically on the implementation of technology-based learning management (MPBT) in Madrasah Ibtidaiyah Negeri (MIN) 1 Alor. The focus of the analysis will include several key dimensions,

namely: (1) Consistency of Learning Tools and Their Implementation in Learning Spaces, which will elaborate on the sub-dimensions of Conformity of KBM Implementation with Learning Tools and Conformity of KBM Implementation Time and Learning Tools; (2) Literacy Activities in Learning; and (3) Conformity of Learning Materials and Learning Tools, and (4) Learning Media. This presentation will be based on empirical data to provide an in-depth understanding of the learning implementation practices in the two madrasahs.

a. Consistency of Learning Tools and Their Implementation in the Learning Space The consistency of learning tools and their implementation in the learning space is a fundamental element in ensuring the effectiveness of a holistic and structured teaching and learning process. This aspect inherently includes the alignment between curriculum design, instructional planning and pedagogical execution in the classroom. Achieving such consistency means ensuring that every component-from the time allocation of Teaching and Learning Activities (KBM), to the substance of learning materials, to the selection and utilization of learning media-works synergistically. When all these elements are aligned and function in an integrated manner, educators are able to create an optimal, conducive and productive learning environment for the development of student competencies.
b. Appropriateness of time allocation for teaching and learning activities and learning tools. The compatibility between the time allocation of Teaching and Learning Activities (KBM) and learning tools is a crucial dimension in instructional management, especially in the context of technology-based learning (MPBT). The significance of this aspect goes beyond mere schedule adherence; it fundamentally contributes to improved discipline, pedagogical efficiency, stimulation of students' intrinsic motivation, and intensification of their engagement in the learning process. By formulating adaptive timetables and integrating relevant learning tools, madrasas can ensure each learner has a structured and optimized learning experience, thus comprehensively achieving educational goals.

Precise synchronization between KBM time and learning tools becomes more significant in the MPBT ecosystem. It allows educators to present materials systematically, utilizing technological features for concept exploration, interactive discussions, and real-time practical applications. Relevant learning tools, supported by the right technological infrastructure, not only facilitate a deeper understanding of the material, but also transform the learning process to be more dynamic, personalized, and engaging. Such alignment is an essential pedagogical prerequisite to improve the quality of student learning outcomes and support the achievement of overall educational goals in the digital age. Further analysis will explore how this principle of congruence is realized and managed in Madrasah Ibtidaiyah Negeri (MIN) 1 Alor.

At MIN 1 Alor, the suitability of KBM implementation time and learning tools is strictly regulated, supported by the use of information technology. The head of MIN 1 Alor, specifically outlines a strict daily schedule, starting at 07.00 WITA with morning roll call and followed by tadarus before the KBM starts at

07.15 WITA. The head of MIN 1 Alor emphasized that this time discipline is strongly supported by the Pusaka application, which denies attendance if teachers are late, so that "the principal doesn't talk too much anymore because he doesn't arrive late like this at school". This app, which uses location points, effectively regulates teacher discipline. While the MASOOK app (whose admin is at the school) can be accessed outside, the Pusaka app cannot because it is regulated by the office admin, forcing physical presence on time. The head of MIN 1 Alor also underlined that every morning roll call and weekly evaluation meeting, motivation is given for teachers to come on time, considering that the loss of learning time will have an impact on students.

From the results of the interview with the head of MIN 1 Alor, it appears that the implementation of the PUSAKA application has succeeded in improving the discipline of students and teachers in carrying out the school activity schedule. Timely attendance of students and teachers is prioritized because of the strict consequences of being late, namely the rejection of attendance through the PUSAKA application. This creates a more organized and efficient learning environment. In addition, the SIMPATIKA and MASOOK applications also make important contributions to school administrative management, facilitating access to information and improving the efficiency of school management. In conclusion, the application of information technology, such as the PUSAKA, SIMPATIKA, and MASOOK applications, has helped improve the quality and effectiveness of school management and encouraged the creation of a more disciplined and organized learning environment for students and teachers at MIN 1 Alor.

The Curriculum Coordinator Teacher of MIN 1 Alor, added that MIN 1 Alor uses two ITbased Attendance systems: the MASOOK application for all teachers (ASN and honorary) and the Pusaka application specifically for ASN teachers. In case of server constraints or forgotten absences, a certificate can be made as an alternative. This dual system demonstrates MIN 1 Alor's efforts in ensuring accountability of teacher attendance. In general, the application of information technology such as PUSAKA, SIMPATIKA, and MASOOK applications at MIN 1 Alor has succeeded in improving the discipline and effectiveness of school management. Structured morning routines and regular direction and motivation also play an important role in creating an organized and disciplined learning environment. Overall, the integration of technology and good management has supported the creation of an efficient and conducive learning environment for students and teachers at MIN 1 Alor. The same research shows that the implementation of information technology systems in schools can improve education management and the learning process. Several studies found that applications such as Dapodik, SIMPATIKA and e-learning platforms improve data management, administrative efficiency and teaching effectiveness (Zamroni, 2020; Dewi & Hilma, 2024).

Overall, the integration of information technology in schools has shown the potential to create a more efficient and conducive learning environment. The above findings are also in line with the opinions of research results which show that the utilization of information and communication technology (ICT) in school

management can improve the efficiency and effectiveness of education management. ICT implementation includes the use of applications developed by the government and schools themselves (Azis, 2018).

Education management information systems facilitate the learning process by integrating technological infrastructure such as computers and wifi (Zamroni, 2020). The utilization of ICT in school administration involves principals and staff but still faces challenges such as lack of support and mastery of technology (AMIRUDIN, 2015). ICT applications in primary and secondary education management include the use of hardware and software for information processing, which plays an important role in improving services and efficiency (Setyanto et al., 2018).

Literacy Activities in Learning

In the context of 21st century education characterized by social complexity, technological development and massive information flows, literacy has experienced a significant expansion in meaning. No longer interpreted solely as the basic skills of reading and writing, literacy now covers a broader spectrum of competencies, including the ability to think critically, analyse information, communicate effectively, and understand and produce various forms of text, both verbal and visual. The development of this definition reflects a shift in the educational paradigm from mere transmission of knowledge to the formation of reflective and transformative thinking capacities for learners.

Within the learning framework, the integration of literacy activities not only acts as a support for the academic process but also as a key instrument in developing students' intellectual andsocial-emotional potential. Literacy enables students to explore ideas in depth, understand multiple perspectives and build contextualized insights into the phenomena around them. Through in-depth reading skills and reflective writing activities, students are encouraged to develop logical argumentation, a critical attitude towards information, and the ability to articulate thoughts systematically. Discussion, presentation and dialogue activities between students are also important means of honing active speaking and listening skills, which are essential in social and academic life. Strengthening literacy in learning demands creative and diverse pedagogical approaches. Educators need to provide relevant and interesting reading materials, develop creative writing activities such as essays, poems and short stories and organize group discussions that encourage collaboration and exchange of ideas. In addition, problem-based projects that require independent information seeking, data synthesis and problem solving can be a strategic vehicle for integrating literacy with higher order thinking skills. In the digital context, the utilization of technologies such as the digital Qur'an, e-books, blogs and educational social media expands the scope and access of students' literacy, allowing them to learn adaptively according to their individual learning styles.

However, the implementation of literacy activities in learning is not free from challenges. Some of the obstacles that are often encountered in the field include students' low interest in reading, the limited availability of relevant and contextualized reading materials and the limited competence of teachers in designing and implementing effective literacy strategies. This situation demands

systematic efforts to improve teachers' capacity through continuous training, the provision of varied and affordable learning resources and active collaboration between education units and libraries as literacy resource centers. Literacy, in the end, is not only about academic skills but also about character building and students' readiness to face the challenges of a dynamic and multicultural real world. Therefore, literacy must be positioned as the foundation of a transformative educational process that is not only oriented towards cognitive outcomes but also towards the formation of reflective, communicative and competitive citizens. Starting from this conceptual understanding, the following section will present empirical findings related to how literacy activities are integrated in the learning process at Madrasah Ibtidaiyah Negeri (MIN) 1 Alor.

These findings were obtained through in-depth interviews with madrasah principals and teachers and analysis of learning practices that reflect the literacy approach as part of the strategy to improve the quality of education. In Madrasah Ibtidaiyah Negeri (MIN) 1 Alor, literacy activities are systematically integrated into students' daily routines and curriculum structures. This process begins with the morning routine, which includes roll call, sholawatan and tadarus, before the Teaching and Learning Activities (KBM) officially begin at 7.15am. This practice emphasizes the madrasah's commitment to spiritual and religious literacy as a foundation before entering academic material. In addition, literacy in this madrasah also includes a memorization program of short letters from the 30th Juz, which is implemented in stages from grade 1 to grade 6.

Based on an interview with the head of MIN 1 Alor, it can be concluded that literacy activities at this school are well integrated into the daily routine and start from the beginning of the day. The activity starts at 07.00 WITA with a morning assembly followed by the children chanting sholawatan. After that, they enter the room to carry out tadarus Al-Quran. Only after tadarus is completed, teaching and learning activities (KBM) begin at 07.15 WITA. This morning routine shows the school's commitment to starting the day with spiritual and literacy activities, creating a conducive learning atmosphere and supporting students' character development. The morning routine at MIN 1 Alor, which begins with literacy and spiritual activities before the KBM, reflects a holistic approach to education that supports time discipline, character development, and the creation of a conducive learning atmosphere. In line with this, Fauziah said that a holistic approach that integrates Islamic values in the nine pillars of character can produce a complete Islamic character in students (Fauziah, 2012). However, there are challenges in implementing character education, such as the lack of concern of some parents, the diversity of student characters, and unfavorable environmental influences (Hadirman, 2022). Nevertheless, support from teachers, parents and the surrounding community is a major supporting factor in the formation of student character in Islamic primary schools (Hadirman, 2022).

The Coordinating Teacher for Education at MIN 1 Alor, explained that the program has shown significant improvement in students' memorization skills, with most students having mastered the set memorization targets. This approach not only strengthens religious literacy, but also trains students' discipline and

memory. An interview with the Education Coordinator Teacher of MIN 1 Alor shows that literacy activities in this madrasah also include memorization of short Quranic letters. This memorization activity is carried out in stages starting from grade 1 to grade 6, with the target of memorizing short letters from the 30th Juz. The program has shown significant improvement, with most students having successfully memorized the short letters. This reflects the effectiveness of the faith-based literacy program at MIN 1 Alor, which not only improves the ability to read and memorize the Quran, but also strengthens students' character and spirituality.

Overall, the interview results show that MIN 1 Alor has an effective and structured Quran memorization program, which is able to improve students' memorization skills and also support the development of their character and spirituality. This is in line with the principle that good and systematic memorization program management is needed to achieve goals effectively and efficiently (Riduan, 2016). The implementation of disciplinary character education through exemplary, guidance, and supervision can improve students' Quran memorization (Fatmawati & Darmiyanti, 2022). Morning Al-Quran learning activities are effective in shaping students' religious and disciplinary characters (Hamli, 2023).

The above description shows that MIN 1 Alor has reflected effective integration of literacy in learning, including regular activities and a curriculum that supports the development of reading, writing and memorization skills. The proper integration of literacy in this school is believed to improve students' literacy skills and prepare them for success in various aspects of life, contributing to the establishment of a strong educational foundation. In line with research conducted by Ningsi which shows that the implementation of literacy in the Merdeka Belajar curriculum can improve students' writing skills through the use of interesting learning media and appropriate writing techniques (Ningsih et al., 2024). The implementation of literacy in schools has proven effective, with 60% of students showing interest in reading activities and 40% in writing activities (Simbolon, 2023). Literacy programs such as reading 15 minutes before class, library visits and literacy competitions have been successfully implemented in MIN 1 Medan to build a literacy-rich school (Afriatama & Sapri, 2023).

Appropriateness of Learning Materials and Learning Tools at MIN 1 Alor Comprehensively, the synergy between learning materials and learning tools is a crucial factor in creating a conducive learning environment and strengthening students' learning experience. By ensuring that these two components support and enrich each other, educators can facilitate students to achieve their maximum learning potential. This harmony reflects the principle of student-centered instructional design, where the ultimate goal is the formation of deep understanding and the development of relevant skills to face contemporary challenges. In the context of MIN 1 Alor, the madrasah head emphasized that the learning tools developed by teachers must be aligned with the learning indicators, methods and media used. In practice, the implementation of learning in the lower grades is designed to be concrete-based, for example by utilizing surrounding objects such as tables and balls to introduce the concept of letters

and numbers. This reflects the contextualized thematic learning approach designed to build the link between literacy and numeracy simultaneously in one learning flow. This also confirms that teachers are required to not only understand the material but also master appropriate pedagogical strategies according to the students' developmental stage. In addition, the madrasah head also added that the lesson plans must explicitly include the suitability of materials and methods and support the achievement of madrasah programs such as the juz 30 memorization target which has become part of integrated learning.

The results of the interview with the head of Madrasah Ibtidaiyah Negeri (MIN) 1 Alor comprehensively show the effective adoption and implementation of Curriculum 2013 (K13), especially in ensuring alignment between materials and learning tools. The implementation of Curriculum 2013 at the primary school level has gone well, although it still faces some challenges. Teachers generally understand the concept of the curriculum, but are constrained in its implementation due to lack of socialization and information technology skills (Qomariah et al., 2021).

Schools have implemented the curriculum from the preparation stage to evaluation, with government assistance (Yani & Krismadewi, 2022). Good curriculum implementation is necessary to create quality graduates and affects various aspects of education, including religious education (Pura, 2021). Furthermore, this madrasah also adaptively uses methods and media relevant to students' cognitive development, exemplified through the use of pictures and real objects to support basic understanding of reading and counting in the early grades. In an effort to meet the challenges of the digital era, MIN 1 Alor shows progressive initiatives by investing in technological infrastructure-including the procurement of computers as well as the setup of servers and Wi-Fiwhichaims to facilitate students' independent learning and expand access to information. Nonetheless, the madrasah still emphasizes the central role of teachers in customizing lesson plans so that the material presented is relevant and can be mastered by every student. This strategic integration of traditional pedagogy and the use of modern technology reflects MIN 1 Alor's commitment to creating a learning environment that is holistic, effective, and oriented towards academic achievement and overall student character building. The assertion of the importance of compatibility between materials and learning tools at MIN 1 Alor was also reinforced by the Coordinator of Curriculum, who stated that all teachers' lesson plan documents must be checked and signed by the madrasah head every day or before the implementation of learning. This control mechanism is complemented by the preparation of classroom journals and daily teacher performance reports that are compiled in a monthly work agenda and reported regularly to the Islamic Education Section at the Alor District Ministry of Religious Affairs Office.

Such practices reflect the existence of a structured managerial system in ensuring that the implementation of learning goes according to the plan that has been prepared, while ensuring the accountability of the teaching process, and showing that MIN 1 Alor has a strict monitoring and evaluation system in the learning process. In line with that, learning supervision always has an important

role in improving the quality of education in schools. This finding reinforces the view that supervision not only functions as an evaluation tool, but also as a means of teacher professional development (Yoseptry et al., 2024). Effective implementation of supervision can create a conducive learning environment and improve teacher performance (Aminah et al., 2023).

The supervision model applied includes direct and indirect supervision, and involves internal and external parties of the school (H. R. Setiawan, 2021). Principals have a key role in implementing supervision, with activities including goal setting, curriculum development, evaluation of learning tools, and follow-up (Prayitno, 2022). In addition, the above description reflects the madrasah's dedication to educational quality and accountability, as well as creating an organized and efficient learning environment. This madrasah fundamentally emphasizes the integration of lesson plans, methods, media and assessments. A distinctive characteristic of this implementation is seen in MIN 1 Alor with its structured Juz 30 memorization program, demonstrating the integration of religious literacy in the curriculum. Essentially, this congruence is not just a technical implementation of the curriculum but also an integral part of a broader managerial and pedagogical strategy. The aim is to achieve comprehensive and holistic learning objectives, reflecting institutional adaptation to the demands of the curriculum and the needs of students in the modern education era.

Learning Media

Learning media, in its broad spectrum, represents all forms of tools, methods and technologies that are systematically designed to support the teaching and learning process. The scope of this media is very diverse, ranging from conventional forms such as textbooks and visual aids, to the latest digital technologies such as computers, the internet, and multimedia devices. The fundamental purpose of utilizing learning media is to facilitate the understanding of complex concepts, improve the effectiveness and efficiency of the learning process, while empowering students to learn independently and access unlimited information resources. In the context of modern education characterized by the accelerated development of information and communication technology, learning media has transformed into a central and inseparable element of the teaching material itself. The use of digital technologies in education is becoming increasingly common and essential, serving as a vital instrument to address the challenges of learning in the 21st century. These technologies not only expand access to various sources of information and knowledge, but also enable the creation of learning environments that are more interactive, engaging and adaptive to students' diverse learning styles. Therefore, learning media, whether visual, audio, or multimedia, together with the teaching materials delivered (including concepts, facts, theories, and skills), form an integral unit that significantly improves the quality and effectiveness of the overall learning process. Technology Utilization Strategy as Learning Media at MIN 1 Alor shows a strong commitment in integrating technology as a learning media to catch up and improve the quality of teaching and learning process. The head of MIN 1 Alor, explained that the madrasah has gradually procured computers, with plans to add units every year. Supporting infrastructure such as

servers and WiFi connections have also been prepared to facilitate technology-based learning. The head of MIN 1 Alor emphasized that the procurement of these devices aims to enable students to independently search for information and answers through the internet, with teachers acting as facilitators. In a separate interview, the Head of MIN 1 Alor elaborated on a more in-depth vision of technology utilization. Although the concept is already in place, implementation will only be realized after the procurement of devices begins in 2023. Projectors are used as the main media in the classroom to display materials, but still accompanied by direct guidance from teachers. In the future, the Head of MIN 1 Alor plans a more in-depth integration of technology, especially in grades 5 and 6. Teachers will provide questions through Google Form, and students will work in groups using computers (due to limited units) to find references and answers from the internet.

Afterwards, students will present their findings, and the teacher will refine the explanation. This concept aims to encourage student activeness, which is considered more effective than the dominant lecture method. This technology integration will be adjusted to the stages in the lesson plan, where the teacher provides an introduction, then students search for answers, and then discuss. The head of MIN 1 Alor emphasized that synchronization between the learning process and technology-based evaluation, such as the use of computers and Google Forms, is a priority. The findings above indicate significant innovative efforts at MIN 1 Alor in supporting active learning and the development of students' collaborative skills, even in the midst of limited technological infrastructure. Adaptive strategies are implemented to overcome the limited number of computers, namely through the division of students into small groups. This approach ensures that every student remains actively involved in the technology-based learning process.

With the central role of teachers as facilitators, MIN 1 Alor effectively adopts a learning model centered on student engagement, not just as passive recipients of information. This demonstrates the madrasah's commitment in ensuring optimal learning quality, where technology utilization is pedagogically integrated to enhance interactivity and collaboration, reflecting the success of contextual adaptation to achieve holistic educational goals. Recent studies highlight the importance of technology integration in basic education. The implementation of digital tools such as computers, projectors and educational software improves learning effectiveness and student engagement (W. D. Lestari et al., 2024). However, challenges such as limited resources and the need for teacher training remain (W. D. Lestari et al., 2024).

Schools are adopting innovative approaches, including active and collaborative learning methods, to prepare students for a complex society (Nisa et al., 2023). While technology plays an important role, maintaining a balance with traditional teaching methods and focusing on character development remains essential (W. D. Lestari et al., 2024). Despite the barriers, technology integration in basic education shows a positive impact on the quality of learning and equal access to education. The Curriculum Area Coordinator teacher of MIN 1 Alor confirmed the availability of supporting technology such as computers,

WiFi, infocus and absence applications. The Curriculum Coordinator Teacher of MIN 1 Alor also mentioned that the madrasah has social media accounts such as YouTube and Facebook which are managed by the public relations department. The utilization of technology in learning is currently focused on the use of infocus to display images or materials in lower grades, and almost all teachers have used laptops, infocus, and the internet in the learning process. From the interview with the Curriculum Coordinator Teacher of MIN 1 Alor, it can be concluded that the school has effectively adopted various modern learning media. The available technology includes computers, WiFi, infocus, and attendance application. In addition, social media platforms such as YouTube and Facebook are used to support communication and information delivery. The use of infocus is relied upon heavily, especially for displaying visual materials in the lower grades, while almost all teachers utilize laptops and the internet in learning activities. By utilizing media such as infocus to display images and visual materials, MIN 1 Alor demonstrates technology integration that supports a more interactive and engaging learning experience. This integration demonstrates the school's commitment to improving the quality of learning through the use of diverse media that meet students' needs.

The above approach reflects the school's efforts to improve the quality of education and student engagement through modern tools that support a more interactive and effective learning experience. Ayu Nur Fatimah explains that integrating information and communication technology (ICT) into education can improve learning quality and student engagement. Research has shown that using ICT tools such as laptops, LCD projectors and speakers in thematic learning can increase student motivation and active participation (Ayu Nur Fatimah, 2020). The application of ICT in education has shifted the role of the teacher from the main source of information to a facilitator, promoting student creativity (Cholik, 2017a). A quantitative study found that the use of ICT as a learning medium significantly affects student achievement (Manshur, 2020). To maximize the benefits of ICT, teachers are encouraged to creatively utilize available media while maintaining traditional learning resources such as textbooks (Rahman et al., 2021).

Based on the picture showing the learning process at Madrasah Ibtidaiyah Negeri (MIN) 1 Alor by utilizing technology at MIN 1 Alor, which shows that this school has successfully integrated technology in learning well. The use of technological devices such as laptops and projectors makes learning more interesting and interactive and helps students develop digital skills that are essential for their future. These efforts demonstrate MIN 1 Alor's strong commitment to improving the quality of education and preparing their students for the challenges of the digital era.

Similarly, Rosiana Mufliva asserts that the integration of digital technology in learning in Indonesia has become a priority issue for building the society of the future (Mufliva & Permana, n.d.-a). The use of technology such as laptops, LCDs and speakers in thematic learning can increase student motivation and participation (Ayu Nur Fatimah, 2020). However, there are challenges such as gaps in access and technology infrastructure that need to be addressed

(Subroto et al., 2023). The implementation of technology in schools requires a gradual approach and is integrated with the curriculum to improve learning effectiveness (Yunita et al., 2023). The use of technology in learning at MIN 1 Alor as described above is expected to provide several main benefits. First, students can develop digital literacy skills which are very important in the current era of globalization. Second, teachers are able to deliver learning materials in a more interesting and dynamic way. Finally, by ensuring that infrastructure such as servers and WiFi are ready for use, schools demonstrate their readiness to support digital learning in a sustainable manner. As stated by several recent studies, schools utilize various digital devices such as computers, projectors, smartphones and internet-based applications to enhance the teaching and learning process (Calora et al., 2023a). These technologies enable more interactive and innovative learning experiences, fostering creativity and digital literacy among students (Calora et al., 2023a). However, challenges remain, including the digital divide and the need for appropriate professional development for educators (Subroto et al., 2023). To fully harness the potential of technology in education, it is imperative to address these challenges, localize digital content, and create technology-based inclusive learning environments that prepare students for an increasingly technology-centric future (Subroto et al., 2023).

The learning schedule at MIN 1 Alor for grade 6 above shows a structured approach, with a balance between religious and general subjects, and an emphasis on religious values through religious lessons and activities. Studies show that subjects such as Aqidah Akhlak incorporate values such as tolerance, mutual respect and justice (Yosita et al., 2023). The internalization of religious values in Islamic education aims to develop students' religious knowledge, feelings, and behavior (Fibriyan Irodati, 2015). The implementation of character education in the Aqidah Akhlak class has shown positive results in shaping student character (P. Putra, 2018a). In addition, Islamic education values are instilled through various activities outside the classroom, including congregational prayers, Qur'an recitation, and nature-based learning programs (Mery et al., 2023a). Teachers play an important role in modeling religious behavior and environmental awareness, in line with the school's vision to develop students who are faithful, devoted and environmentally aware (Mery et al., 2023a).

The integration of technology-based learning media in Madrasah Ibtidaiyah Negeri (MIN) 1 Alor faces limited ICT facilities, teachers show creativity in optimizing the use of available technology. Interview results with several MIN 1 Alor teachers consistently indicated that the projector became the central device in technology integration efforts in the classroom (E.1, F.1). Teachers use the projector to display various visual materials, such as pictures and videos of Qur'anic verses, which aim to attract students' attention and overcome boredom with conventional textbook displays (C.6). In addition, teaching materials that have been compiled, both manually and digitally, are then put together and displayed through projectors (D.6, E.6). Besides the projector, the use of digital technology also extends to the aspect of searching and

delivering content. Teachers utilize the internet, especially Google, to search for relevant learning materials (F.6). YouTube is also an application often used by teachers to display learning videos (G.6, G.8), which serves as additional material to enrich students' learning experience. Another innovation is the utilization of Google Forms in learning (D.8), showing an effort to integrate interactive technology in classroom activities. The availability of devices such as laptops and computers (F.2) also supports the smooth implementation of this strategy. In-depth analysis shows that the integration of technology-based learning media at MIN 1 Alor centers on pragmatic and adaptive approaches. Although ICT facilities may not be abundant, the madrasah and its teachers maximize existing devices, especially projectors and internet access, to create a more engaging and interactive learning experience. The utilization of visuals and audio-visuals through projectors and YouTube directly addresses the challenge of student engagement. Meanwhile, the use of Google Forms indicates a transition towards more participatory learning and testing students' digital literacy. This reflects teachers' pedagogical awareness to not only use technology as a tool, but as a strategic instrument in transforming learning to be more relevant to the characteristics of learners in the digital era, while optimizing the potential of available resources.

CONCLUSION AND RECOMMENDATION

This study shows that the implementation of Technology-Based Learning at MIN 1 Alor has taken place adaptively and contextually through the application of structured and integrative learning strategies. The findings show that the integration of learning tools, religious literacy, suitability of teaching materials, and utilization of digital media has succeeded in creating a learning environment that is conducive, interactive, and relevant to the needs of students in the 3T area. Literacy activities integrated into morning routines such as tadarus and memorization of the Qur'an, as well as the cultivation of character values through spiritual learning, form the foundation of learning that is not only cognitively oriented but also affective and spiritual. The use of technology such as infocus, PUSAKA application and Google Form, shows a paradigm shift from conventional learning towards a collaborative digital learning model that is more responsive to the needs of the times. Theoretically, the findings extend the application of the POAC approach in the context of digital madrasahs in disadvantaged areas, emphasizing the importance of humanist, spiritual and adaptive managerial integration. The practical contribution lies in the realistic and measurable implementation model of technology-based learning, which can be a reference for other madrasah digital transformation policies, especially in areas with limited infrastructure.

FUTHER STUDY

This research still has delays, so it is necessary to conduct further research related to the topic of Implementation of Technology-Based Learning at Madrasah Ibtidaiyah Negeri 1 Alor in order to improve this research and add insight for readers.

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