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OBSTACLES IN THE INTEGRATION OF TECHNOLOGY IN LEARNING AT MADRASAH IBTIDAIYAH NURUL ULUM

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ABSTRACT

The combination of information and communication technology in the teaching and learning process at Madrasah Ibtidaiyah is still constrained by various structural aspects and limited resources. Based on research at MI Nurul Ulum, the most significant obstacle lies in the availability of facilities in a number of classrooms that are not equipped with projectors, adequate computers, and stable internet access—so that digital learning practices cannot be carried out evenly. In addition, most teachers have not mastered the use of educational software and supporting digital media, so the effectiveness of the use of technology in the classroom is still not optimal. The lack of firmness in the internal policies of madrasas to support ICT integration further weakens these efforts; Existing directives are often only recommendations without clear evaluation mechanisms, incentives, or sanctions. The pedagogical aspect is also a challenge in itself, where educators are not fully ready to design and implement learning that combines technology with the nuances of Islamic values, because conceptual understanding and digital-based pedagogical skills are still limited. Similar findings in the literature confirm that the readiness of teachers as a whole is the key to the success of the use of technology in religious education, so that the shortcomings in this case are the main inhibiting factors. Therefore, integrated efforts are needed, ranging from improving ICT infrastructure and providing continuous training for teachers to rearranging madrasah policies that are more proactive in facilitating learning innovation. With a holistic strategy and full support from various stakeholders, the integration of information and communication technology at MI Nurul Ulum is expected to run more effectively and sustainably.

Keywords: ICT integration, obstacles, teacher competence, madrasah policies.

INTRODUCTION

In recent years, the wave of digitalization has dramatically changed the face of the world of education. Information and communication technology (ICT) is now not just a complement, but an inseparable part of the teaching and learning process. According to Wang et., al (2023) UNESCO 2023, the proper use of ICT can reduce the gap in access to education, facilitate more personalized learning, while opening up opportunities for cross-border collaboration. However, in many developing countries, including Indonesia, obstacles such as limited equipment, inadequate regulations, and the readiness of educators are still the main obstacles in their implementation (Wang et al., 2023). In Indonesia, the Merdeka Belajar policy emphasizes digital literacy as one of the pillars of the curriculum, but the practical challenges are quite heavy. The APJII report (2024) revealed that national internet penetration reached 80%, but the difference in access between urban (89%) and rural (73%) is still wide. In addition, only about 65% of households with basic education have a personal computer (Dusk, 2022). This situation requires synergy between the government, the private sector, and educational institutions to ensure that every school, especially madrassas in remote areas, receives adequate infrastructure support.

Theoretically, the TPACK model emphasizes the importance of a blend of content knowledge, pedagogy, and technology for the success of ICT in the classroom. However, studies in some madrassas show that there are still many teachers who feel that they are not ready both technically

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and pedagogically while institutions have not yet established a sustainable mentoring mechanism such as professional development units or mentoring programs between teachers (Yusuf et al., 2021). As a result, technology is only used for administrative matters and material presentation, not as a means of designing interactive and contextual learning activities.

At Madrasah Ibtidaiyah Nurul Ulum, direct observation revealed a number of obstacles: only five computer units for eleven classes, frequent internet connections, and an operational budget that did not take into account the need for ICT maintenance. Teachers also admitted that they were not confident in using the online platform because the training they received was in-depth and without follow-up. The head of the madrasah also admitted that there is no internal policy that requires the systematic integration of technology in the RPP (Harahap, 2019). Based on these conditions, this study is designed to further explore the obstacles in technology integration at MI Nurul Ulum, including infrastructure aspects, teacher competence, and institutional support. By understanding the obstacles in the field, it is hoped that madrasas, teachers, and policymakers can formulate concrete strategies, ranging from the addition of facilities, continuous TPACK training programs, to the allocation of special budgets so that the use of technology in learning can run more effectively and have a positive impact on improving the quality of education.

The practical constraints between government policies and real conditions on the ground often go unnoticed in various studies. At Madrasah Ibtidaiyah Nurul Ulum, for example, the results of initial observations revealed that technological facilities are very limited, there are only five computer units to serve eleven study groups while the quality of internet connections is often unstable, and in the operational budget there has been no special post for maintenance or technology development. Furthermore, until now there has been no mentoring or structured training program designed to equip teachers with TPACK competencies on an ongoing basis. This situation emphasizes the urgency of qualitative research that is able to explore the relationship between these barriers and their impact on daily learning practices in madrasas.

Based on the above background, this research is directed to identify and explore various obstacles in the integration of technology in the learning process at MI Nurul Ulum. The study focused on three main aspects: the availability of technological infrastructure, the technical and pedagogical capabilities of teachers, and institutional support from madrasah management. By comprehensively understanding these inhibiting factors, it is hoped that the results of the research can be the basis for formulating the right strategies for madrasas, educators, and policymakers in an effort to strengthen and optimize the use of technology to answer the challenges of 21st century education.

METHOD

This study adopts **Qualitative Case Studies** to understand in depth the obstacles of technology integration in learning at MI Nurul Ulum. This design was chosen because of its ability to map the socio-cultural context of madrasas thoroughly and is relevant to the theoretical framework of educational technology integration (Muzakki, 2024). Data collection was carried out in the September-November 2024 period, where field conditions reflected infrastructure challenges and human resource readiness. Through a qualitative approach, the research seeks to connect empirical findings with the concept of TPACK and the Freedom of Learning policy. Thus, this study is expected

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to produce a comprehensive picture of the factors that inhibit the use of technology at the madrasah ibtidaiyah level.

The study participants consisted of ***seven teachers*** who represent various subjects and grade levels, one madrasah head, and two school committee members. Participant selection using purposive sampling techniques based on at least two years of teaching experience and active involvement in ICT implementation (Sinaga et al., 2025). This criterion ensures that the data obtained is rich in practical perspectives and according to the context of the madrasah. The sample size is relatively small but adequate for case studies that emphasize depth of analysis. With this composition, the research can explore the internal dynamics of madrasah in a representative manner.

Data collection techniques combine **Semi Interview-Structured, Participatory Observation,** and **document analysis**. In-depth interviews were conducted for 60–90 minutes for each teacher and the madrasah, recording a narrative about their experiences and perceptions (Bariah, 2021). Participatory observations lasted for four weeks in classrooms and computer labs, documenting teacher-student interactions and technical constraints that arose. Documents such as RPP, RAPBS, and meeting minutes are reviewed to map internal policies and budget allocations. The combination of these methods guarantees data triangulation and the sustainability of the findings.

Data analysis follows procedure ***open, axial, dan selective coding*** based with the help of software (Sarosa, 2021). The first step, *open coding*, used to identify the initial concepts and categories of interview transcripts and observational results. Next *axial coding* mapping the relationships between categories, while *selective coding* Construct a thematic narrative that reflects the structure of the barriers. Data triangulation was carried out by comparing the findings of the three collection methods to ensure credibility (Saadah et al., 2022). The member checking process is also implemented by involving teachers and madrasah heads to verify the accuracy of interpretation. The ethical aspects of the research are carried out through written informed consent, participant anonymity, and secure data storage with password protection. With a systematic methodology, this study is expected to be able to present practical strategy recommendations for madrasas, teachers, and policy makers. The results are expected to strengthen the use of ICT for 21st century learning at MI Nurul Ulum.

RESULTS AND DISCUSSION

At Madrasah Ibtidaiyah Nurul Ulum, the problem of ICT infrastructure is the main obstacle in the application of learning technology. With only five computers to serve eleven classes, teachers are often forced to take turns using the lab, so interactive sessions are often delayed. *"I have to make a rotating schedule for each class, even though students should be able to try the material digitally,"* explained one of the grade IV teachers. Not to mention erratic internet connections, often disrupting online learning and forcing the cancellation of online platform-based activities.

Although almost all teachers have attended short ICT training, real application in the classroom is still limited to basic functions such as making slides or using other media. They feel that they have not mastered more complex applications enough to make learning interactive. *"I can make presentations, but when I have to make interactive quizzes on Kahoot, I'm still confused,"* said the science teacher. Without ongoing mentoring or systematic mentoring programs, the development of teachers' technical skills is slow.

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Madrasah policies and budget allocation add their own challenges. The results of the RAPBS study show that less than 5% of operational funds are budgeted for maintenance or technology improvement. Until now, there is no internal rule that requires teachers to include the use of technology in the Learning Implementation Plan consistently. *"We don't have official guidelines on the frequency and context of using technology in teaching,"* said the head of the madrasah. As a result, technology utilization initiatives are highly dependent on each teacher's personal initiative.

On the other hand, some teachers see that technology is able to increase students' interest and creativity. When the material is presented through digital media such as simulations or interactive videos, the students' enthusiasm is much higher than the lecture method. *"When students try to simulate physics in an app, their enthusiasm is much different than listening to a lecture*," said the math teacher. This positive attitude is an important foundation to encourage cooperation between teachers and develop more targeted training programs.

Overall, this study found that the barriers to technology integration at MI Nurul Ulum are complex, including limited facilities, teacher competence, institutional policies, and school culture. The addition of tools alone will not be effective without efforts to improve teachers' technical and pedagogical abilities on an ongoing basis, accompanied by clear internal policy making. Therefore, an integrated approach is needed starting from infrastructure improvement, technology training, to budgeting policies so that technology can be integrated in a sustainable manner and improve the quality of learning.

Technology at MI Nurul Ulum acts as a bridge between academic theory and Islamic values in a real context. Within the framework of TPACK, the use of technology combined with a problem-solving approach supports students to explore concepts in depth, while instilling the value of honesty and scientific responsibility according to Islamic teachings. This approach is in line with the principles of contextual learning with Islamic nuances, where every academic activity is also a place for internalizing ethics and spirituality. Therefore, the meaning of PBL in madrasah is not just a teaching method, but a means of combining scientific knowledge and Islamic values simultaneously.

The rapid development of digital technology has penetrated and affected various dimensions of human life. Especially in the field of education, this progress has helped shape the learning system by offering increased effectiveness and efficiency (Sholihah et al., 2023), thus fostering a higher interest in technology-based learning. MI teacher Nurul Ulum develops various tactics to instill Islamic values into every stage of digital learning use. In the planning phase, they invite students to set the intention that the project will be carried out to share benefits with the community. During the implementation, the narrative of the prophet's exemplary story is often used as a stimulus for problems so that students are encouraged to look for solutions that are not only scientific, but also ethical (SPRING, 2024). At the end of the project, group reflection was complemented by a brief muhasabah where the students were asked to relate their work to the principles of trust and deliberation in Islam. This multi-layered strategy shows the teacher's commitment to making technology not only effective pedagogically, but also solid based on Islamic values.

Despite its great potential, the use of technology at MI Nurul Ulum is faced with complex structural and pedagogical obstacles. Limited facilities, such as a minimal number of computers and an unstable internet connection, often hinder the digital-based exploration phase (Prinanda, 2025). From the pedagogical side, some teachers still need in-depth assistance to design projects that truly

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integrate technology, not just moving materials to digital media (Nurjanah et al., 2025). In addition, the absence of a standard internal policy regarding the standard for the use of technology as a learning medium causes the implementation to be highly dependent on teachers' personal initiatives. Factor-This factor emphasizes the need for integrated interventions, including infrastructure improvements and continuous training, so that this method can run consistently and have a positive impact on the quality of learning in madrasas.

CONCLUSION

Based on the results of research conducted at Madrasah Ibtidaiyah Nurul Ulum, it was found that the integration of technology in learning activities has not been running optimally. Some of the main obstacles faced include the lack of available digital devices, internet connections that are often disrupted, and the lack of training that can improve teachers' skills in using technology pedagogically. In addition, teachers also experience difficulties in associating the use of technology with a contextual learning approach with Islamic values. On the other hand, institutional support for the learning digitalization program is still limited, both in terms of internal regulations and budget allocation. This condition reflects the gap between ideal policies at the national level and real practices that occur at the level of educational units.

Nevertheless, the teacher's enthusiasm and willingness to learn and try still looks strong. This is an important capital for madrasas to start making gradual but directed changes. Therefore, it is very important for schools and policy makers to start taking strategic steps to support the integration of technology that is in accordance with the characteristics of madrasas. These efforts can start from improving infrastructure, developing teacher competencies, to developing internal policies that support sustainable digital transformation. With the right strategy, madrasas are not only able to keep up with the flow of educational technology developments, but also maintain Islamic values as the spirit of the learning process.

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