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Implementation of Technology-Based Learning in Improving the Quality of Education at SMP IT Darul Ilmi Banyuwangi

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ABSTRACT

This study examines the implementation of technology-based learning to improve the quality of education at SMP IT Darul Ilmi Banyuwangi. Using a qualitative case study approach, this study explores the use of technology, such as interactive multimedia, Learning Management Systems (LMS), and digital learning applications, in the teaching and learning process. These findings suggest integrating technology increases students' motivation, engagement, and understanding of learning materials. The results show that integrating technology in learning increases student motivation and engagement, but challenges such as limited technology infrastructure, unequal access to devices, and teachers' readiness to adopt technology-based learning methods are still the main obstacles. This study concludes that implementing technology-based learning has great potential to improve the quality of education, but its success depends on infrastructure readiness, teacher competence, and supportive education policies. Therefore, continuous teacher training and increased accessibility of digital devices are indispensable to ensure optimal technology implementation in education.

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1. INTRODUCTION

Integrating technology in education is a transformative change that improves teaching methods, encourages student engagement, and improves learning outcomes. Various studies highlight the benefits and application of technology in the educational framework, which significantly affects learning effectiveness.

One of the main benefits of technology in education is increased student engagement and motivation. Research conducted by Aslam et al. [1] demonstrates that technology can create a collaborative and engaging classroom atmosphere, building a sense of community among students that is critical to their academic success. This is also

supported by Fandini et al. [2], who found that using multimedia tools in education positively impacts students' critical thinking skills. In addition, research conducted by Ullah and Farzana [3] emphasizes that technology plays an important role in English language teaching, where students show a higher level of enthusiasm and engagement when technology is applied in the learning process.

Another advantage of integrating technology into education is its ability to personalize the learning experience. In a study by Pratama et al. [4], certain technological tools can increase students' motivation in vocational education by meeting unique learning needs. In line with these findings, research by Gyau et al. [5] shows that students' perceptions of technology acceptance significantly influence their college learning process. These findings suggest that positive engagement with technology can improve students' academic performance. Furthermore, a systematic review by Akintayo et al. [6] emphasizes that technology improves learning outcomes in various educational contexts.

Blended and online learning development has become increasingly evident in recent years. The use of technology allows for the application of more diverse teaching methods and creates more flexible learning opportunities, especially during the COVID-19 pandemic [7]. In research conducted by Wali and Popal [8], combining traditional teaching methods with technological tools has proven effective in increasing student engagement and bridging communication and understanding gaps. Furthermore, the research conducted by Dankers et al. [9] demonstrated that blended learning models not only improve interaction in learning but also strengthen students' self-efficacy and self-regulation skills, which are critical to their academic success.

However, successful technology integration in education requires careful planning and consideration of various factors, including digital literacy among educators and students. The study conducted by Indra et al. [10] and Liwanag and Galicia [11] confirms that understanding these factors assists institutions in designing more effective technology integration strategies to maximize their benefits. In addition, research conducted by Gwasira et al. [12] highlights the importance of a proactive education system in ensuring the readiness of educators and students to utilize technology. Thus, the gap often associated with technology use in education can be minimized [13].

Integrating technology into education is crucial in increasing student engagement, personalizing learning, and creating a more effective educational experience. The existing literature supports the idea that when technology is applied wisely in an educational setting, there will be a significant improvement in student learning outcomes. In addition, the readiness of educational institutions to adopt technology will greatly determine the extent to which the benefits of technology can be optimized in building an educational ecosystem that is adaptive and responsive to the times.

SMP IT Darul Ilmi Banyuwangi is an educational institution that emphasizes modern learning methodologies and technology integration to improve the quality of education. The school has taken innovative steps in modernizing learning to create a more effective and engaging learning environment. These efforts align with the rapid development of the world of education, which increasingly emphasizes the use of technology as the main means of increasing teaching effectiveness.

Information and communication technology (ICT) supports the learning process at SMP IT Darul Ilmi Banyuwangi. By integrating various digital tools and online resources, educators can create a more interactive and engaging learning experience for students. According to Sholihah [14], applying ICT in learning can significantly improve the quality of teaching and student involvement. This is also supported by Salsabila et al. [15], who state that in modern Islamic schools, technology facilitates material delivery and encourages more dynamic interaction between students and teachers.

Technology allows for more active and collaborative learning methods, where students can engage in group projects and utilize various learning resources beyond conventional textbooks [14]. This approach is very relevant in today's digital era, considering that the younger generation is more familiar with using technological devices daily.

SMP IT Darul Ilmi Banyuwangi has designed a curriculum combining modern educational practices and Islamic values. The study by Suparta [16] and Petrytsa [17] shows that this approach can increase students' understanding and appreciation of the subjects taught. By aligning religious values with contemporary pedagogical strategies, schools build students' academic competence and form strong character based on moral and religious values.

In addition, the curriculum designed at SMP IT Darul Ilmi Banyuwangi aims to develop students' critical and creative thinking skills. Applying project-based learning methods is one of the steps taken to achieve this goal. Akram et al. [18] and Azizah and Irsyadi [19] show that project-based learning increases student motivation and hones problem-solving skills in a rapidly changing world. This approach allows students to apply their acquired knowledge to real-life situations, making learning more meaningful and contextual.

In addition to focusing on academic learning, SMP IT Darul Ilmi Banyuwangi also pays great attention to developing students' character and social skills through various extracurricular activities. The extracurricular programs cover various fields, from sports to the arts, which provide a space for students to explore interests and develop leadership and teamwork skills.

Research conducted by Nugroho et al. [20] and Rosadi et al. [21] shows that extracurricular activities positively impact students' social skills and emotional intelligence. Through activities outside the classroom, students can hone their communication skills, build social networks, and learn to work in teams effectively. Thus, schools serve not only as a place for knowledge transfer but also as an environment that supports the holistic development of students' personalities.

The educational approach applied at SMP IT Darul Ilmi Banyuwangi also includes the active involvement of parents and the community in the student learning process. The school recognizes that support from family and the surrounding community is important in shaping students' academic and social success. Research conducted by Ogunet al. [22] and Ibrahim et al. [23] confirmed that parental involvement strongly correlates with students' academic achievement and social well-being.

SMP IT Darul Ilmi Banyuwangi strives to create a more inclusive and supportive educational ecosystem through partnership programs and community-based activities. Parents are involved in various school activities, from discussions about the child's academic development to participation in character-building programs. Thus, a conducive educational environment can be formed where students receive comprehensive support at school and home.

In modern education, conventional learning models, still dominated by traditional methods, face various challenges in improving student engagement and optimal learning outcomes. This problem has become even more real compared to the development of technology that has penetrated almost all aspects of life, including education. Educators are increasingly aware of the urgency of integrating technology to address the limitations of conventional learning more effectively.

One of the major drawbacks of conventional learning is the reliance on passive instructional methods that can lead to a lack of student engagement. The commonly used lecture-based approach often does not encourage active learning and interaction in the classroom. Mustakim et al. [24] stated that this method only requires students to absorb information without practical application. On the contrary, a study by Maryani et al. [25] shows that technology readiness in online learning can improve learning outcomes compared to conventional methods. This indicates the need for a more innovative pedagogical approach that utilizes technology to encourage active student participation and interaction.

In addition, conventional learning environments are often inflexible and less able to accommodate diverse learning needs. Edwards et al. [26] revealed that traditional methods fail students' various learning styles and speeds, causing many learners to fall behind. Instead, technology allows for a more personalized learning experience, where resources can be tailored to individual needs [27]. Adaptive learning platforms and interactive tools can help create a more inclusive educational experience and improve student engagement and academic performance.

Furthermore, limitations in conventional assessment methods are an additional challenge that strengthens the urgency of integrating technology into learning. Behera [27] highlights that traditional assessment methods focus on memorization without encouraging critical thinking and problem-solving skills. Using technology in learning evaluations can offer innovative approaches, such as game-based assessments (gamification) and interactive feedback mechanisms, that measure students' understanding and improve their analytical abilities [28]. Bahari et al. [29] added that technology-based assessments provide instant feedback to students so they can instantly identify errors and improve their understanding in a more effective learning cycle.

In addition, another challenge in conventional learning is maintaining student motivation and engagement throughout the academic year. The lack of variety in the material delivery often makes students feel bored and lose interest in learning. Technology can play an important role in this case by presenting tools to encourage group collaboration and student interaction. Gunawan and Shieh [30] emphasized that technology-based

learning activities can increase student motivation and learning outcomes, thus further strengthening the urgency of modernizing educational practices.

Furthermore, the COVID-19 pandemic has been a catalyst in accelerating the adoption of technology in education. The challenges faced by traditional classrooms when transitioning to distance learning demonstrate their reliance on face-to-face interaction and physical resources. Ahn and McEachin [31] emphasized that the integration of technology not only prepares educational institutions to face future crises but also increases resilience to disruptions that can hinder the learning process. The shift to hybrid or fully online learning models requires a robust technological framework accommodating diverse pedagogical strategies.

From the various aspects described, it is clear that conventional learning faces significant limitations in student engagement, personalization of learning experiences, assessment effectiveness, motivation, and readiness to deal with emergencies. However, research gaps still need to be clarified, especially regarding the optimal implementation of technology in education, to ensure that the transition from conventional to technology-based models can be effectively managed.

One of the gaps is how educational institutions can develop the right policies and strategies to integrate technology to improve the student learning experience sustainably. Many studies, such as those conducted by Maryani et al. [25], focus more on the effectiveness of technology in online environments but do not adequately address how technology can be integrated into a hybrid learning environment that combines online and offline aspects in a balanced manner. In addition, research on the readiness of educators to use technology is still limited, even though the success of technology implementation in education is highly dependent on the digital competence of teachers and other educators.

In addition, there is still a gap in the use of technology to improve critical thinking and specific problem-solving skills. Behera [27] has highlighted the importance of technology-based assessment, but there is still a lack of in-depth study of how technology can develop higher-order thinking skills through effective methods. As such, more studies are needed to explore how various digital learning platforms can systematically improve students' cognitive skills.

Another gap is in the aspects of accessibility and equality in technology-based learning. Not all students have equal access to digital devices and adequate internet networks, especially in remote areas. While technology integration promises great benefits in education, there is still a need to explore how education policies can ensure inclusivity in the application of technology so as not to create wider educational gaps.

As such, it is important to research further how technology can be strategically implemented in various learning models to address the challenges faced by conventional education. The transformation of education through technology must consider pedagogical aspects, the readiness of educators, the effectiveness of assessments, and wider accessibility in order to truly improve the quality of education equally. Therefore, future research must focus on developing technology-based learning models that improve academic outcomes and ensure that technology becomes an inclusive and adaptive tool in supporting learning in various educational contexts.

2. METHOD

This study uses a qualitative approach with a case study method to explore the implementation of technology-based learning in improving the quality of education at SMP IT Darul Ilmi Banyuwangi. This method was chosen because it allows researchers to deeply understand the learning dynamics that occur, both from the perspective of teachers and students and how technology is used in the process [32]. This approach provides rich contextual insights into ongoing educational practices [33].

2.1 Research Design

As a case study, this study focuses on a limited system in a certain context, namely the implementation of technology-based learning at SMP IT Darul Ilmi Banyuwangi. This method follows the characteristics of case studies that allow in-depth exploration of specific phenomena in a real environment [32]. This study uses data collection techniques in the form of in-depth interviews with teachers and students, observations of the technology-based learning process, and analysis of school policy documents related to the application of technology in learning [34].

2.2 Research Participants

The participants of this study consisted of 3 teachers and 10 students who were directly involved in implementing technology-based learning in the school. The selection of the number of participants is based on the principle of purposive sampling, where the selected teachers have experience in using technology to support learning, while the students selected are those who actively participate in technology-based learning, both through the use of the Learning Management System (LMS) and other digital learning applications. The number of students involved was selected to cover different levels of academic ability so that the study's results could illustrate the variation in responses to the use of technology. The selection is based on a qualitative approach emphasizing a deep understanding of the participants' experience [35].

2.3 Data Collection Techniques

Data collection is carried out through three main methods:

a. In-depth interviews are used to explore the experiences, perceptions, and challenges teachers and students face using technology in learning [36].
b. Classroom Observation Allows researchers to observe direct interactions between teachers, students, and technology in natural learning [33].
c. Document Analysis Includes school policies, curriculum, and technology-based teaching materials used in learning [37].

2.4 Data Analysis

The data obtained were analyzed thematically to identify the main patterns and findings in implementing technology-based learning. Triangulation techniques are applied to ensure the validity and reliability of the data by comparing information from interviews,

observations, and document analysis [38]. This approach strengthens the credibility of research by presenting a more comprehensive perspective on the phenomenon being studied.

2.5 Research Gap

Although many studies have explored the use of technology in learning, there is still a gap in understanding how technology implementation impacts teacher-student interaction in Islamic-based schools such as SMP IT Darul Ilmi Banyuwangi. Most of the previous studies focused more on aspects of education policy and the effectiveness of technology in improving learning outcomes in general [39], [40]. This research fills this gap by providing deeper insights into how Islamic values are integrated into the application of technology in learning and how teachers and students navigate the challenges that arise.

With a qualitative case study approach, this study provides a theoretical understanding of technology-based learning and offers practical implications for schools in developing more effective strategies to apply educational technology [40].

3. RESULTS AND DISCUSSION

3.1 RESULTS

3.1.1 Implementation of Technology in Learning

In exploring the implementation of technology-based learning at SMP IT Darul Ilmi Banyuwangi. Case studies allow for in-depth exploration of teacher and student experiences in applying technology in learning. One of the teachers interviewed, Ustad Afif, who has more than five years of teaching experience, explained that technology has brought positive changes in teaching and increased student involvement. Ustad Afif stated that technology, such as the Learning Management System (LMS) and learning videos, helps students to participate in learning more actively and allows them to access materials flexibly outside of lesson hours. In line with the findings of Suyuthi et al. [32], this study focuses on understanding social interaction in the educational process and adaptation to technology-based education policies.

In addition, direct observation in the classroom also provides further insight into the use of technology in learning. In observations during learning sessions, it was seen that students showed higher enthusiasm when the material was delivered through learning videos and interactive applications, such as app-based quizzes. Students were seen to be more engaged in group discussions and more actively asked questions after seeing the videos presented. However, some students have difficulty accessing the material due to their limited personal devices. This constraint hinders some students from fully utilizing the materials provided through technology. These observations support the finding that inadequate infrastructure is still a major obstacle to implementing technology in some schools.

Teachers and students show different levels of adaptation to technology in learning. These findings confirm White and Saqipi's [36] view of the importance of flexibility in qualitative research, especially in understanding sociocultural factors that affect the use of technology in the classroom. Teachers with experience using digital devices are more

likely to adapt their teaching methods, while teachers who are less accustomed to facing technical and pedagogical challenges. This reinforces the findings of Galvez et al. [35] on the use of technology. An interview with Ustad Afif revealed that despite increasing student motivation and involvement, the challenges faced include infrastructure limitations, such as uneven devices among students, and technical difficulties in using LMS by some teachers unfamiliar with the technology. However, despite the obstacles, Ustad Afif emphasized that technology still significantly enriches the learning process, especially in delivering more interesting and easy material for students to understand.

The institutional context and school culture significantly influence the effectiveness of technology implementation in learning. In line with Karimi and Khawaja [33], this study finds that the availability of technological resources and institutional support plays a crucial role in the success of technology integration. At SMP IT Darul Ilmi, the school has provided basic technology infrastructure, but there is no comprehensive evaluation system to assess the effectiveness of its use in improving student learning outcomes.

Although the use of technology in learning offers many advantages, there are several challenges faced by teachers and students. Some main obstacles include limited access to digital devices, lack of digital skills among teachers, and resistance to changes in teaching methods. These findings align with the study by Neliwati et al. [39], which emphasized the importance of flexibility in research approaches to accommodate evolving dynamics in the field.

Students at SMP IT Darul Ilmi show diverse responses to technology-based learning. Some students feel more motivated because learning becomes more interactive, while others have difficulty understanding the material delivered digitally. This reinforces Young and Clerke's [38] findings that technology can improve accessibility and learning experience but can also be a barrier for students with special needs or limited access to technological devices.

Although various previous studies have discussed the benefits and challenges of technology-based learning, there is still a gap in exploring its impact on the effectiveness of learning outcomes, specifically in the context of Islamic values-based schools such as SMP IT Darul Ilmi Banyuwangi. The study shows that although technology has been adopted in learning, there is no systematic approach to measuring its effectiveness in understanding and improving students' academic grades. In addition, little research has explored how faith-based school culture affects the acceptance and integration of technology in learning.

This study emphasizes that implementing technology-based learning at SMP IT Darul Ilmi Banyuwangi has great potential to improve the quality of education but still faces challenges in teacher adaptation and infrastructure readiness. By paying attention to the research approach's flexibility, as White and Saqipi suggested [36], this study provides new insights into how technology can be integrated more effectively in the context of Islamic values-based education. Therefore, more structured policies are needed in teacher training, procurement of technological facilities, and development of evaluation models that can measure the real impact of technology-based learning on student academic achievement. The analysis of documents that include school policies, curriculum, and

technology-based teaching materials at SMP IT Darul Ilmi Banyuwangi shows the school's commitment to integrating technology into the learning process. The school's policy supports using the Learning Management System (LMS) as the primary platform for delivering materials and facilitating interaction between teachers and students. The implemented curriculum has been adapted using digital learning applications such as Google Classroom, which enriches the learning experience and develops students' technology skills. Thus, this research contributes to closing the gap and provides a foundation for further research.

3.1.2 The Impact of Technology-Based Learning

This research was conducted at SMP IT Darul Ilmi Banyuwangi with participants consisting of teachers and students. Based on data collection, it was found that the use of various multimedia formats in technology-based learning, such as learning videos, educational applications, and interactive media, had a significant impact on students' learning motivation.

As Chofivah and Madjid [41] found, using YouTube videos in learning increases student interactivity and engagement. Observations in the classroom show that students are more active in the learning process when the material is presented through educational videos compared to conventional methods. This is reinforced by Utami et al. [41], who emphasized that physics e-books equipped with video tracking methods can increase student motivation through an edutainment approach. At SMP IT Darul Ilmi, the use of animation-based videos and demonstrations of physics experiments also showed increased student understanding.

In addition, the results of interviews with teachers showed that using interactive media and learning videos made it easier for them to convey abstract concepts. Nuriyah et al. [42] found that animated videos can provide a more enjoyable learning experience and help students understand the material better. Romualdi and Sudrajat [43] also emphasized that multimedia videos are important in increasing students' interest in history subjects, which are often considered monotonous. Similar findings occurred in this study, where students were more enthusiastic and actively discussed after watching interactive history videos.

From a pedagogical perspective, the integration of technology-based learning methods with collaborative strategies also has a positive impact on student learning motivation. Rahayu et al. [44] revealed that applying jigsaw techniques with video media increases students' intrinsic motivation. This study applies a similar approach to English subjects, where students in groups analyze video content and discuss its content and messages. This approach has improved students' understanding and active classroom participation.

Furthermore, the research of Rahman et al. [45] highlights the benefits of asynchronous learning through video in improving understanding of English concepts. In the context of SMP IT Darul Ilmi, this learning model allows students to learn at their own pace, ultimately increasing their confidence and motivation.

The gamification aspect in learning videos has also been proven to play a role in increasing learning motivation. Almufareh [46] emphasized that video projects with gamification elements can provide a more engaging learning experience and encourage active student participation. In this study, video-based interactive quizzes and achievement-based reward systems have increased student engagement in learning. Similarly, the research of Botelho and Boubaker [47] shows that using clinical video scenarios in health education can increase student engagement and motivation. This study also found that video-based scenarios in science subjects help students understand the application of scientific concepts in real life.

Meanwhile, using technology in learning through the Learning Management System (LMS) and interactive learning applications has increased accessibility and flexibility in the teaching and learning process. Teachers and students who participated in this study stated that the presence of LMS allows them to access learning materials anytime and anywhere. This aligns with Gutiérrez and Ching [48] and Abaricia and Santos [49], which reveal that LMS can eliminate spatial and time barriers, allowing students to stay connected with learning materials.

The observation results show that teachers can easily upload teaching materials, assign assignments, and monitor student progress through the LMS platform. Students also feel more helped by the availability of materials online, especially when reviewing materials that are considered difficult. In line with the research of Zamfiroiu et al. [50], LMS features that support collaboration and individual pace-based learning help increase student engagement and expand educational inclusivity.

In addition to LMS, this study found that mobile-based interactive learning applications contribute greatly to student learning flexibility. The app allows students to access the material dynamically through their mobile devices. Setiawan et al. [51] and Sanoto et al. [52] stated that mobile-based learning applications provide a more adaptive learning environment, allowing students to adapt learning to their schedules and learning styles.

Through interviews with several students, it was found that they felt more motivated to learn using an app that allowed them to access materials in a more varied format, such as videos, interactive quizzes, and discussion forums. This is in line with the findings of Riyantika et al. [53] and Taufik et al. [54], who emphasized that interactive application-based learning increases student satisfaction and motivation because it provides the flexibility to repeat difficult material whenever needed

Learning not only improves accessibility but also positively impacts student learning outcomes. The blended learning model applied at SMP IT Darul Ilmi Banyuwangi significantly improves student understanding. This model allows students to get materials online while interacting directly with teachers in face-to-face sessions. These results confirm the research of Bhadri and Patil [55] and Xiu-li et al. [56], which stated that blended learning can improve student understanding and engagement by combining the advantages of online and offline learning.

In addition, the results of interviews with teachers show that the flexibility of LMS in providing various learning material formats is very helpful in accommodating various

learning styles of students. As Abu-Dalbouh and Alateyahk [58] stated, LMS can present material in various formats that are more accessible to students with different learning preferences, increasing learning effectiveness.

Although there are many benefits obtained from the application of learning technology at SMP IT Darul Ilmi Banyuwangi, there are several challenges faced in its implementation. One of the main challenges is the uneven availability of technology infrastructure among students. Not all students have devices that support LMS access or interactive learning apps. This aligns with the findings of Putri et al. [57], who stated that limited devices and internet access are the main obstacles to learning technology, especially in areas with limited digital infrastructure.

In addition, some teachers have difficulty adapting to the LMS system, especially in designing learning materials that follow digital formats. This study found that training for teachers regarding the use of LMS and interactive learning applications needs to be further improved so that the implementation of learning technology can run more effectively.

3.2 DISCUSSION

The results of this study confirm that technology-based learning has a significant impact on student learning motivation. As explained in previous studies, using learning videos, collaborative strategies, and gamification in education provides a more engaging and effective learning experience.

The increase in student motivation in this study can be explained through the learning motivation theory put forward by Ryan and Deci [58] in Self-Determination Theory (SDT). This theory states that students' intrinsic motivation increases when they feel in control of their learning, have a pleasant experience, and feel competent in understanding the material. Thus, integrating learning videos and interactive media creates a learning environment that supports students' active engagement and increases their sense of competence.

Furthermore, this research has implications for developing curriculum and learning strategies at SMP IT Darul Ilmi Banyuwangi. Based on these findings, schools can consider increasing the use of technology in the learning process, such as by adopting more video-based materials, developing interactive modules, and implementing gamification systems in learning evaluation. In addition, training for teachers in the use of educational technology is also a key factor in increasing the effectiveness of the implementation of this method.

This research emphasizes that integrating multimedia in technology-based learning can increase student learning motivation. The practical implications of these results show that schools and educators must continue to explore and develop innovative technology-based learning strategies to support better-quality education in the digital era.

Important implications that can be used as a reference in the development of technology-based learning. First, it is necessary to increase accessibility to devices and internet connections to ensure all students can enjoy the benefits of learning technology equally. Second, educational institutions need to provide continuous training programs for teachers so that they can optimize the effective use of LMS and interactive learning

applications. Third, developing a technology-based curriculum must pay attention to the balance between online and face-to-face learning to maximize student learning outcomes.

As a recommendation, schools can work with educational technology service providers to provide students with more stable internet access and more affordable devices. Additionally, more innovative pedagogical strategies, such as gamification in LMS or augmented reality-based learning applications, can increase student engagement in the learning process.

Technology-based learning provides new opportunities for students to be more active in the learning process. SMP IT Darul Ilmi students showed increased engagement when using interactive digital platforms such as Kahoot!, Google Classroom, and learning videos. This technology allows for more engaging learning and motivates students to participate.

In addition, technology-based learning also supports teaching differentiation, where teachers can provide materials appropriate to each student's level of understanding. This supports Lim and Koh's [59] argument that technology in education can be used to tailor students' learning experiences to align with individual needs.

Blended learning provides flexibility and allows students to learn at their own pace. In this study, students reported that they had an easier time understanding complex concepts when they were given access to learning videos or supplemental materials online before an in-person class session. Blended learning also allows students to discuss more in-depth with their teachers and classmates. This supports the findings of Din et al. [60], which show that technology can help improve the quality of education and enrich students' learning experiences by providing access to a wider range of learning resources.

One of the important aspects of the successful implementation of technology in education is teachers' readiness and adaptation to these changes. Teachers at SMP IT Darul Ilmi are willing to adopt technology-based learning methods, although some still face challenges in using digital platforms effectively. Reyes et al. [61] emphasized that teachers must utilize various digital tools to create a more dynamic learning environment. In this study, teachers who use technology more often tend to have more interactive classes and get positive student responses.

4 CONCLUSION

This study confirms that implementing technology-based learning at SMP IT Darul Ilmi Banyuwangi significantly impacts the quality of education. Technology, such as interactive multimedia, learning videos, Learning Management Systems (LMS), and digital learning applications, has increased student motivation and engagement in the learning process. Students become more active in understanding the material, especially through technology-based learning strategies that support differentiated teaching and collaborative learning.

Blended learning has proven effective in combining the advantages of online and offline learning, allowing students to learn at their own pace and enriching their learning experience. In addition, integrating technology into learning supports students' critical and

collaborative thinking skills, which are relevant to the demands of the modern world of education.

However, this study also found several challenges in implementing technology, such as limited digital infrastructure, student access gaps, and teachers' readiness and competence in utilizing technology optimally. Therefore, continuous training for teachers and increasing the accessibility of digital devices are needed so that the benefits of technology-based learning can be felt equally.

Overall, this study confirms that integrating technology into learning has great potential to improve the quality of education, but its success is highly dependent on the readiness of infrastructure, the competence of educators, and the right implementation strategies. Therefore, education policies that support the effective use of technology need to be developed to ensure that innovations in learning can provide maximum benefits for all students.

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Implementation of Technology-Based Learning in Improving the Quality of Education at SMP IT Darul Ilmi Banyuwangi

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ABSTRACT

This study examines the implementation of technology-based learning to improve the quality of education at SMP IT Darul Ilmi Banyuwangi. Using a qualitative case study approach, this study explores the use of technology, such as interactive multimedia, Learning Management Systems (LMS), and digital learning applications, in the teaching and learning process. These findings suggest integrating technology increases students' motivation, engagement, and understanding of learning materials. The results show that integrating technology in learning increases student motivation and engagement, but challenges such as limited technology infrastructure, unequal access to devices, and teachers' readiness to adopt technology-based learning methods are still the main obstacles. This study concludes that implementing technology-based learning has great potential to improve the quality of education, but its success depends on infrastructure readiness, teacher competence, and supportive education policies. Therefore, continuous teacher training and increased accessibility of digital devices are indispensable to ensure optimal technology implementation in education.

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1. INTRODUCTION

Integrating technology in education is a transformative change that improves teaching methods, encourages student engagement, and improves learning outcomes. Various studies highlight the benefits and application of technology in the educational framework, which significantly affects learning effectiveness.

One of the main benefits of technology in education is increased student engagement and motivation. Research conducted by Aslam et al. [1] demonstrates that technology can create a collaborative and engaging classroom atmosphere, building a sense of community among students that is critical to their academic success. This is also

supported by Fandini et al. [2], who found that using multimedia tools in education positively impacts students' critical thinking skills. In addition, research conducted by Ullah and Farzana [3] emphasizes that technology plays an important role in English language teaching, where students show a higher level of enthusiasm and engagement when technology is applied in the learning process.

Another advantage of integrating technology into education is its ability to personalize the learning experience. In a study by Pratama et al. [4], certain technological tools can increase students' motivation in vocational education by meeting unique learning needs. In line with these findings, research by Gyau et al. [5] shows that students' perceptions of technology acceptance significantly influence their college learning process. These findings suggest that positive engagement with technology can improve students' academic performance. Furthermore, a systematic review by Akintayo et al. [6] emphasizes that technology improves learning outcomes in various educational contexts.

Blended and online learning development has become increasingly evident in recent years. The use of technology allows for the application of more diverse teaching methods and creates more flexible learning opportunities, especially during the COVID-19 pandemic [7]. In research conducted by Wali and Popal [8], combining traditional teaching methods with technological tools has proven effective in increasing student engagement and bridging communication and understanding gaps. Furthermore, the research conducted by Dankers et al. [9] demonstrated that blended learning models not only improve interaction in learning but also strengthen students' self-efficacy and self-regulation skills, which are critical to their academic success.

However, successful technology integration in education requires careful planning and consideration of various factors, including digital literacy among educators and students. The study conducted by Indra et al. [10] and Liwanag and Galicia [11] confirms that understanding these factors assists institutions in designing more effective technology integration strategies to maximize their benefits. In addition, research conducted by Gwasira et al. [12] highlights the importance of a proactive education system in ensuring the readiness of educators and students to utilize technology. Thus, the gap often associated with technology use in education can be minimized [13].

Integrating technology into education is crucial in increasing student engagement, personalizing learning, and creating a more effective educational experience. The existing literature supports the idea that when technology is applied wisely in an educational setting, there will be a significant improvement in student learning outcomes. In addition, the readiness of educational institutions to adopt technology will greatly determine the extent to which the benefits of technology can be optimized in building an educational ecosystem that is adaptive and responsive to the times.

SMP IT Darul Ilmi Banyuwangi is an educational institution that emphasizes modern learning methodologies and technology integration to improve the quality of education. The school has taken innovative steps in modernizing learning to create a more effective and engaging learning environment. These efforts align with the rapid development of the world of education, which increasingly emphasizes the use of technology as the main means of increasing teaching effectiveness.

Information and communication technology (ICT) supports the learning process at SMP IT Darul Ilmi Banyuwangi. By integrating various digital tools and online resources, educators can create a more interactive and engaging learning experience for students. According to Sholihah [14], applying ICT in learning can significantly improve the quality of teaching and student involvement. This is also supported by Salsabila et al. [15], who state that in modern Islamic schools, technology facilitates material delivery and encourages more dynamic interaction between students and teachers.

Technology allows for more active and collaborative learning methods, where students can engage in group projects and utilize various learning resources beyond conventional textbooks [14]. This approach is very relevant in today's digital era, considering that the younger generation is more familiar with using technological devices daily.

SMP IT Darul Ilmi Banyuwangi has designed a curriculum combining modern educational practices and Islamic values. The study by Suparta [16] and Petrytsa [17] shows that this approach can increase students' understanding and appreciation of the subjects taught. By aligning religious values with contemporary pedagogical strategies, schools build students' academic competence and form strong character based on moral and religious values.

In addition, the curriculum designed at SMP IT Darul Ilmi Banyuwangi aims to develop students' critical and creative thinking skills. Applying project-based learning methods is one of the steps taken to achieve this goal. Akram et al. [18] and Azizah and Irsyadi [19] show that project-based learning increases student motivation and hones problem-solving skills in a rapidly changing world. This approach allows students to apply their acquired knowledge to real-life situations, making learning more meaningful and contextual.

In addition to focusing on academic learning, SMP IT Darul Ilmi Banyuwangi also pays great attention to developing students' character and social skills through various extracurricular activities. The extracurricular programs cover various fields, from sports to the arts, which provide a space for students to explore interests and develop leadership and teamwork skills.

Research conducted by Nugroho et al. [20] and Rosadi et al. [21] shows that extracurricular activities positively impact students' social skills and emotional intelligence. Through activities outside the classroom, students can hone their communication skills, build social networks, and learn to work in teams effectively. Thus, schools serve not only as a place for knowledge transfer but also as an environment that supports the holistic development of students' personalities.

The educational approach applied at SMP IT Darul Ilmi Banyuwangi also includes the active involvement of parents and the community in the student learning process. The school recognizes that support from family and the surrounding community is important in shaping students' academic and social success. Research conducted by Ogunet al. [22] and Ibrahim et al. [23] confirmed that parental involvement strongly correlates with students' academic achievement and social well-being.

SMP IT Darul Ilmi Banyuwangi strives to create a more inclusive and supportive educational ecosystem through partnership programs and community-based activities. Parents are involved in various school activities, from discussions about the child's academic development to participation in character-building programs. Thus, a conducive educational environment can be formed where students receive comprehensive support at school and home.

In modern education, conventional learning models, still dominated by traditional methods, face various challenges in improving student engagement and optimal learning outcomes. This problem has become even more real compared to the development of technology that has penetrated almost all aspects of life, including education. Educators are increasingly aware of the urgency of integrating technology to address the limitations of conventional learning more effectively.

One of the major drawbacks of conventional learning is the reliance on passive instructional methods that can lead to a lack of student engagement. The commonly used lecture-based approach often does not encourage active learning and interaction in the classroom. Mustakim et al. [24] stated that this method only requires students to absorb information without practical application. On the contrary, a study by Maryani et al. [25] shows that technology readiness in online learning can improve learning outcomes compared to conventional methods. This indicates the need for a more innovative pedagogical approach that utilizes technology to encourage active student participation and interaction.

In addition, conventional learning environments are often inflexible and less able to accommodate diverse learning needs. Edwards et al. [26] revealed that traditional methods fail students' various learning styles and speeds, causing many learners to fall behind. Instead, technology allows for a more personalized learning experience, where resources can be tailored to individual needs [27]. Adaptive learning platforms and interactive tools can help create a more inclusive educational experience and improve student engagement and academic performance.

Furthermore, limitations in conventional assessment methods are an additional challenge that strengthens the urgency of integrating technology into learning. Behera [27] highlights that traditional assessment methods focus on memorization without encouraging critical thinking and problem-solving skills. Using technology in learning evaluations can offer innovative approaches, such as game-based assessments (gamification) and interactive feedback mechanisms, that measure students' understanding and improve their analytical abilities [28]. Bahari et al. [29] added that technology-based assessments provide instant feedback to students so they can instantly identify errors and improve their understanding in a more effective learning cycle.

In addition, another challenge in conventional learning is maintaining student motivation and engagement throughout the academic year. The lack of variety in the material delivery often makes students feel bored and lose interest in learning. Technology can play an important role in this case by presenting tools to encourage group collaboration and student interaction. Gunawan and Shieh [30] emphasized that technology-based

learning activities can increase student motivation and learning outcomes, thus further strengthening the urgency of modernizing educational practices.

Furthermore, the COVID-19 pandemic has been a catalyst in accelerating the adoption of technology in education. The challenges faced by traditional classrooms when transitioning to distance learning demonstrate their reliance on face-to-face interaction and physical resources. Ahn and McEachin [31] emphasized that the integration of technology not only prepares educational institutions to face future crises but also increases resilience to disruptions that can hinder the learning process. The shift to hybrid or fully online learning models requires a robust technological framework accommodating diverse pedagogical strategies.

From the various aspects described, it is clear that conventional learning faces significant limitations in student engagement, personalization of learning experiences, assessment effectiveness, motivation, and readiness to deal with emergencies. However, research gaps still need to be clarified, especially regarding the optimal implementation of technology in education, to ensure that the transition from conventional to technology-based models can be effectively managed.

One of the gaps is how educational institutions can develop the right policies and strategies to integrate technology to improve the student learning experience sustainably. Many studies, such as those conducted by Maryani et al. [25], focus more on the effectiveness of technology in online environments but do not adequately address how technology can be integrated into a hybrid learning environment that combines online and offline aspects in a balanced manner. In addition, research on the readiness of educators to use technology is still limited, even though the success of technology implementation in education is highly dependent on the digital competence of teachers and other educators.

In addition, there is still a gap in the use of technology to improve critical thinking and specific problem-solving skills. Behera [27] has highlighted the importance of technology-based assessment, but there is still a lack of in-depth study of how technology can develop higher-order thinking skills through effective methods. As such, more studies are needed to explore how various digital learning platforms can systematically improve students' cognitive skills.

Another gap is in the aspects of accessibility and equality in technology-based learning. Not all students have equal access to digital devices and adequate internet networks, especially in remote areas. While technology integration promises great benefits in education, there is still a need to explore how education policies can ensure inclusivity in the application of technology so as not to create wider educational gaps.

As such, it is important to research further how technology can be strategically implemented in various learning models to address the challenges faced by conventional education. The transformation of education through technology must consider pedagogical aspects, the readiness of educators, the effectiveness of assessments, and wider accessibility in order to truly improve the quality of education equally. Therefore, future research must focus on developing technology-based learning models that improve academic outcomes and ensure that technology becomes an inclusive and adaptive tool in supporting learning in various educational contexts.

2. METHOD

This study uses a qualitative approach with a case study method to explore the implementation of technology-based learning in improving the quality of education at SMP IT Darul Ilmi Banyuwangi. This method was chosen because it allows researchers to deeply understand the learning dynamics that occur, both from the perspective of teachers and students and how technology is used in the process [32]. This approach provides rich contextual insights into ongoing educational practices [33].

2.1 Research Design

As a case study, this study focuses on a limited system in a certain context, namely the implementation of technology-based learning at SMP IT Darul Ilmi Banyuwangi. This method follows the characteristics of case studies that allow in-depth exploration of specific phenomena in a real environment [32]. This study uses data collection techniques in the form of in-depth interviews with teachers and students, observations of the technology-based learning process, and analysis of school policy documents related to the application of technology in learning [34].

2.2 Research Participants

The participants of this study consisted of 3 teachers and 10 students who were directly involved in implementing technology-based learning in the school. The selection of the number of participants is based on the principle of purposive sampling, where the selected teachers have experience in using technology to support learning, while the students selected are those who actively participate in technology-based learning, both through the use of the Learning Management System (LMS) and other digital learning applications. The number of students involved was selected to cover different levels of academic ability so that the study's results could illustrate the variation in responses to the use of technology. The selection is based on a qualitative approach emphasizing a deep understanding of the participants' experience [35].

2.3 Data Collection Techniques

Data collection is carried out through three main methods:

a. In-depth interviews are used to explore the experiences, perceptions, and challenges teachers and students face using technology in learning [36].
b. Classroom Observation Allows researchers to observe direct interactions between teachers, students, and technology in natural learning [33].
c. Document Analysis Includes school policies, curriculum, and technology-based teaching materials used in learning [37].

2.4 Data Analysis

The data obtained were analyzed thematically to identify the main patterns and findings in implementing technology-based learning. Triangulation techniques are applied to ensure the validity and reliability of the data by comparing information from interviews,

observations, and document analysis [38]. This approach strengthens the credibility of research by presenting a more comprehensive perspective on the phenomenon being studied.

2.5 Research Gap

Although many studies have explored the use of technology in learning, there is still a gap in understanding how technology implementation impacts teacher-student interaction in Islamic-based schools such as SMP IT Darul Ilmi Banyuwangi. Most of the previous studies focused more on aspects of education policy and the effectiveness of technology in improving learning outcomes in general [39], [40]. This research fills this gap by providing deeper insights into how Islamic values are integrated into the application of technology in learning and how teachers and students navigate the challenges that arise.

With a qualitative case study approach, this study provides a theoretical understanding of technology-based learning and offers practical implications for schools in developing more effective strategies to apply educational technology [40].

3. RESULTS AND DISCUSSION

3.1 RESULTS

3.1.1 Implementation of Technology in Learning

In exploring the implementation of technology-based learning at SMP IT Darul Ilmi Banyuwangi. Case studies allow for in-depth exploration of teacher and student experiences in applying technology in learning. One of the teachers interviewed, Ustad Afif, who has more than five years of teaching experience, explained that technology has brought positive changes in teaching and increased student involvement. Ustad Afif stated that technology, such as the Learning Management System (LMS) and learning videos, helps students to participate in learning more actively and allows them to access materials flexibly outside of lesson hours. In line with the findings of Suyuthi et al. [32], this study focuses on understanding social interaction in the educational process and adaptation to technology-based education policies.

In addition, direct observation in the classroom also provides further insight into the use of technology in learning. In observations during learning sessions, it was seen that students showed higher enthusiasm when the material was delivered through learning videos and interactive applications, such as app-based quizzes. Students were seen to be more engaged in group discussions and more actively asked questions after seeing the videos presented. However, some students have difficulty accessing the material due to their limited personal devices. This constraint hinders some students from fully utilizing the materials provided through technology. These observations support the finding that inadequate infrastructure is still a major obstacle to implementing technology in some schools.

Teachers and students show different levels of adaptation to technology in learning. These findings confirm White and Saqipi's [36] view of the importance of flexibility in qualitative research, especially in understanding sociocultural factors that affect the use of technology in the classroom. Teachers with experience using digital devices are more

likely to adapt their teaching methods, while teachers who are less accustomed to facing technical and pedagogical challenges. This reinforces the findings of Galvez et al. [35] on the use of technology. An interview with Ustad Afif revealed that despite increasing student motivation and involvement, the challenges faced include infrastructure limitations, such as uneven devices among students, and technical difficulties in using LMS by some teachers unfamiliar with the technology. However, despite the obstacles, Ustad Afif emphasized that technology still significantly enriches the learning process, especially in delivering more interesting and easy material for students to understand.

The institutional context and school culture significantly influence the effectiveness of technology implementation in learning. In line with Karimi and Khawaja [33], this study finds that the availability of technological resources and institutional support plays a crucial role in the success of technology integration. At SMP IT Darul Ilmi, the school has provided basic technology infrastructure, but there is no comprehensive evaluation system to assess the effectiveness of its use in improving student learning outcomes.

Although the use of technology in learning offers many advantages, there are several challenges faced by teachers and students. Some main obstacles include limited access to digital devices, lack of digital skills among teachers, and resistance to changes in teaching methods. These findings align with the study by Neliwati et al. [39], which emphasized the importance of flexibility in research approaches to accommodate evolving dynamics in the field.

Students at SMP IT Darul Ilmi show diverse responses to technology-based learning. Some students feel more motivated because learning becomes more interactive, while others have difficulty understanding the material delivered digitally. This reinforces Young and Clerke's [38] findings that technology can improve accessibility and learning experience but can also be a barrier for students with special needs or limited access to technological devices.

Although various previous studies have discussed the benefits and challenges of technology-based learning, there is still a gap in exploring its impact on the effectiveness of learning outcomes, specifically in the context of Islamic values-based schools such as SMP IT Darul Ilmi Banyuwangi. The study shows that although technology has been adopted in learning, there is no systematic approach to measuring its effectiveness in understanding and improving students' academic grades. In addition, little research has explored how faith-based school culture affects the acceptance and integration of technology in learning.

This study emphasizes that implementing technology-based learning at SMP IT Darul Ilmi Banyuwangi has great potential to improve the quality of education but still faces challenges in teacher adaptation and infrastructure readiness. By paying attention to the research approach's flexibility, as White and Saqipi suggested [36], this study provides new insights into how technology can be integrated more effectively in the context of Islamic values-based education. Therefore, more structured policies are needed in teacher training, procurement of technological facilities, and development of evaluation models that can measure the real impact of technology-based learning on student academic achievement. The analysis of documents that include school policies, curriculum, and

technology-based teaching materials at SMP IT Darul Ilmi Banyuwangi shows the school's commitment to integrating technology into the learning process. The school's policy supports using the Learning Management System (LMS) as the primary platform for delivering materials and facilitating interaction between teachers and students. The implemented curriculum has been adapted using digital learning applications such as Google Classroom, which enriches the learning experience and develops students' technology skills. Thus, this research contributes to closing the gap and provides a foundation for further research.

3.1.2 The Impact of Technology-Based Learning

This research was conducted at SMP IT Darul Ilmi Banyuwangi with participants consisting of teachers and students. Based on data collection, it was found that the use of various multimedia formats in technology-based learning, such as learning videos, educational applications, and interactive media, had a significant impact on students' learning motivation.

As Chofivah and Madjid [41] found, using YouTube videos in learning increases student interactivity and engagement. Observations in the classroom show that students are more active in the learning process when the material is presented through educational videos compared to conventional methods. This is reinforced by Utami et al. [41], who emphasized that physics e-books equipped with video tracking methods can increase student motivation through an edutainment approach. At SMP IT Darul Ilmi, the use of animation-based videos and demonstrations of physics experiments also showed increased student understanding.

In addition, the results of interviews with teachers showed that using interactive media and learning videos made it easier for them to convey abstract concepts. Nuriyah et al. [42] found that animated videos can provide a more enjoyable learning experience and help students understand the material better. Romualdi and Sudrajat [43] also emphasized that multimedia videos are important in increasing students' interest in history subjects, which are often considered monotonous. Similar findings occurred in this study, where students were more enthusiastic and actively discussed after watching interactive history videos.

From a pedagogical perspective, the integration of technology-based learning methods with collaborative strategies also has a positive impact on student learning motivation. Rahayu et al. [44] revealed that applying jigsaw techniques with video media increases students' intrinsic motivation. This study applies a similar approach to English subjects, where students in groups analyze video content and discuss its content and messages. This approach has improved students' understanding and active classroom participation.

Furthermore, the research of Rahman et al. [45] highlights the benefits of asynchronous learning through video in improving understanding of English concepts. In the context of SMP IT Darul Ilmi, this learning model allows students to learn at their own pace, ultimately increasing their confidence and motivation.

The gamification aspect in learning videos has also been proven to play a role in increasing learning motivation. Almufareh [46] emphasized that video projects with gamification elements can provide a more engaging learning experience and encourage active student participation. In this study, video-based interactive quizzes and achievement-based reward systems have increased student engagement in learning. Similarly, the research of Botelho and Boubaker [47] shows that using clinical video scenarios in health education can increase student engagement and motivation. This study also found that video-based scenarios in science subjects help students understand the application of scientific concepts in real life.

Meanwhile, using technology in learning through the Learning Management System (LMS) and interactive learning applications has increased accessibility and flexibility in the teaching and learning process. Teachers and students who participated in this study stated that the presence of LMS allows them to access learning materials anytime and anywhere. This aligns with Gutiérrez and Ching [48] and Abaricia and Santos [49], which reveal that LMS can eliminate spatial and time barriers, allowing students to stay connected with learning materials.

The observation results show that teachers can easily upload teaching materials, assign assignments, and monitor student progress through the LMS platform. Students also feel more helped by the availability of materials online, especially when reviewing materials that are considered difficult. In line with the research of Zamfiroiu et al. [50], LMS features that support collaboration and individual pace-based learning help increase student engagement and expand educational inclusivity.

In addition to LMS, this study found that mobile-based interactive learning applications contribute greatly to student learning flexibility. The app allows students to access the material dynamically through their mobile devices. Setiawan et al. [51] and Sanoto et al. [52] stated that mobile-based learning applications provide a more adaptive learning environment, allowing students to adapt learning to their schedules and learning styles.

Through interviews with several students, it was found that they felt more motivated to learn using an app that allowed them to access materials in a more varied format, such as videos, interactive quizzes, and discussion forums. This is in line with the findings of Riyantika et al. [53] and Taufik et al. [54], who emphasized that interactive application-based learning increases student satisfaction and motivation because it provides the flexibility to repeat difficult material whenever needed

Learning not only improves accessibility but also positively impacts student learning outcomes. The blended learning model applied at SMP IT Darul Ilmi Banyuwangi significantly improves student understanding. This model allows students to get materials online while interacting directly with teachers in face-to-face sessions. These results confirm the research of Bhadri and Patil [55] and Xiu-li et al. [56], which stated that blended learning can improve student understanding and engagement by combining the advantages of online and offline learning.

In addition, the results of interviews with teachers show that the flexibility of LMS in providing various learning material formats is very helpful in accommodating various

learning styles of students. As Abu-Dalbouh and Alateyahk [58] stated, LMS can present material in various formats that are more accessible to students with different learning preferences, increasing learning effectiveness.

Although there are many benefits obtained from the application of learning technology at SMP IT Darul Ilmi Banyuwangi, there are several challenges faced in its implementation. One of the main challenges is the uneven availability of technology infrastructure among students. Not all students have devices that support LMS access or interactive learning apps. This aligns with the findings of Putri et al. [57], who stated that limited devices and internet access are the main obstacles to learning technology, especially in areas with limited digital infrastructure.

In addition, some teachers have difficulty adapting to the LMS system, especially in designing learning materials that follow digital formats. This study found that training for teachers regarding the use of LMS and interactive learning applications needs to be further improved so that the implementation of learning technology can run more effectively.

3.2 DISCUSSION

The results of this study confirm that technology-based learning has a significant impact on student learning motivation. As explained in previous studies, using learning videos, collaborative strategies, and gamification in education provides a more engaging and effective learning experience.

The increase in student motivation in this study can be explained through the learning motivation theory put forward by Ryan and Deci [58] in Self-Determination Theory (SDT). This theory states that students' intrinsic motivation increases when they feel in control of their learning, have a pleasant experience, and feel competent in understanding the material. Thus, integrating learning videos and interactive media creates a learning environment that supports students' active engagement and increases their sense of competence.

Furthermore, this research has implications for developing curriculum and learning strategies at SMP IT Darul Ilmi Banyuwangi. Based on these findings, schools can consider increasing the use of technology in the learning process, such as by adopting more video-based materials, developing interactive modules, and implementing gamification systems in learning evaluation. In addition, training for teachers in the use of educational technology is also a key factor in increasing the effectiveness of the implementation of this method.

This research emphasizes that integrating multimedia in technology-based learning can increase student learning motivation. The practical implications of these results show that schools and educators must continue to explore and develop innovative technology-based learning strategies to support better-quality education in the digital era.

Important implications that can be used as a reference in the development of technology-based learning. First, it is necessary to increase accessibility to devices and internet connections to ensure all students can enjoy the benefits of learning technology equally. Second, educational institutions need to provide continuous training programs for teachers so that they can optimize the effective use of LMS and interactive learning

applications. Third, developing a technology-based curriculum must pay attention to the balance between online and face-to-face learning to maximize student learning outcomes.

As a recommendation, schools can work with educational technology service providers to provide students with more stable internet access and more affordable devices. Additionally, more innovative pedagogical strategies, such as gamification in LMS or augmented reality-based learning applications, can increase student engagement in the learning process.

Technology-based learning provides new opportunities for students to be more active in the learning process. SMP IT Darul Ilmi students showed increased engagement when using interactive digital platforms such as Kahoot!, Google Classroom, and learning videos. This technology allows for more engaging learning and motivates students to participate.

In addition, technology-based learning also supports teaching differentiation, where teachers can provide materials appropriate to each student's level of understanding. This supports Lim and Koh's [59] argument that technology in education can be used to tailor students' learning experiences to align with individual needs.

Blended learning provides flexibility and allows students to learn at their own pace. In this study, students reported that they had an easier time understanding complex concepts when they were given access to learning videos or supplemental materials online before an in-person class session. Blended learning also allows students to discuss more in-depth with their teachers and classmates. This supports the findings of Din et al. [60], which show that technology can help improve the quality of education and enrich students' learning experiences by providing access to a wider range of learning resources.

One of the important aspects of the successful implementation of technology in education is teachers' readiness and adaptation to these changes. Teachers at SMP IT Darul Ilmi are willing to adopt technology-based learning methods, although some still face challenges in using digital platforms effectively. Reyes et al. [61] emphasized that teachers must utilize various digital tools to create a more dynamic learning environment. In this study, teachers who use technology more often tend to have more interactive classes and get positive student responses.

4 CONCLUSION

This study confirms that implementing technology-based learning at SMP IT Darul Ilmi Banyuwangi significantly impacts the quality of education. Technology, such as interactive multimedia, learning videos, Learning Management Systems (LMS), and digital learning applications, has increased student motivation and engagement in the learning process. Students become more active in understanding the material, especially through technology-based learning strategies that support differentiated teaching and collaborative learning.

Blended learning has proven effective in combining the advantages of online and offline learning, allowing students to learn at their own pace and enriching their learning experience. In addition, integrating technology into learning supports students' critical and

collaborative thinking skills, which are relevant to the demands of the modern world of education.

However, this study also found several challenges in implementing technology, such as limited digital infrastructure, student access gaps, and teachers' readiness and competence in utilizing technology optimally. Therefore, continuous training for teachers and increasing the accessibility of digital devices are needed so that the benefits of technology-based learning can be felt equally.

Overall, this study confirms that integrating technology into learning has great potential to improve the quality of education, but its success is highly dependent on the readiness of infrastructure, the competence of educators, and the right implementation strategies. Therefore, education policies that support the effective use of technology need to be developed to ensure that innovations in learning can provide maximum benefits for all students.

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