

Leveraging Information Technology for Islamic Education Evaluation in the Industry 4.0 Era

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Abstract: This study aims to explore the utilization of information technology in Islamic Education (PAI) learning and evaluation, as well as the supporting and hindering factors. A field research approach was used, gathering both secondary and primary data. The results indicate that information technology has been utilized in PAI learning at SD Negeri Bakti through platforms such as Google Meet, Zoom, and WhatsApp when in-class learning is not possible. For evaluation, applications like Quizizz and Google Classroom have been implemented. The school principal supports the use of ICT in teaching and encourages improving competencies through the Merdeka Mengajar platform. However, challenges include some students lacking mobile phones, difficulties faced by teachers in using ICT, inadequate infrastructure, and limited Wi-Fi access due to high user traffic. These findings highlight both the potential and the obstacles in integrating technology into PAI education.

Kata Kunci: E-Learning; Technology Integration; Islamic Religious Education

Abstrak: Penelitian ini bertujuan untuk mengeksplorasi pemanfaatan teknologi informasi dalam pembelajaran dan evaluasi Pendidikan Agama Islam (PAI), serta faktor pendukung dan penghambatnya. Pendekatan yang digunakan adalah penelitian lapangan dengan mengumpulkan data primer dan sekunder. Hasil penelitian menunjukkan bahwa pemanfaatan teknologi informasi dalam pembelajaran PAI di SD Negeri Bakti telah dilakukan melalui platform seperti Google Meet, Zoom, dan WhatsApp saat pembelajaran tatap muka tidak memungkinkan. Untuk evaluasi, aplikasi seperti Quizizz dan Google Classroom telah mulai digunakan. Kepala sekolah mendukung pemanfaatan TIK dalam pembelajaran dan mendorong peningkatan kompetensi melalui platform Merdeka Mengajar. Namun, tantangan yang dihadapi termasuk beberapa siswa yang belum memiliki ponsel, kesulitan yang dialami pendidik dalam menggunakan TIK, sarana dan prasarana yang perlu ditingkatkan, serta akses Wi-Fi yang terbatas akibat banyaknya pengguna. Temuan ini mengungkapkan potensi serta hambatan dalam integrasi teknologi pada pendidikan PAI.

Keywords: E-Learning; Integrasi Teknologi; Pendidikan Agama Islam

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INTRODUCTION

Education has a very important role in the formation of quality human resources, and teachers as educators have a great responsibility in shaping the character and competence of students (Arifin, 2017; Judrah et al., 2024; Sholeh & Maryati, 2021). A teacher is someone who has competence so that he is said to be a professional in carrying out his duties and functions to provide education and teaching to students in an educational environment (Lubis, 2021; Nofriyanti & Nurhafizah, 2019). So that a teacher will continue to be required to develop his various competencies and knowledge. Education will continue to develop and be dynamic in accordance with various technological developments and scientific fields. All teachers' behavior in carrying out their duties will be an example for those around them so that teachers must have competencies that are integrated in their performance, these competencies include: professional, pedagogic, social and personality competencies (Permana et al., 2024; Susanto, 2016).

The paradigm of society has developed in various ways, one of which is in seeking and obtaining information caused by the development of information technology which is so fast and difficult to predict in recent years. In the beginning, people often obtained limited information from newspapers, radios and other electronic devices that tended to be still undeveloped. However, currently the information that the public can obtain has been opened very widely by utilizing the internet network. The field of education is one of the fields that has obtained a very fundamental result from the development of information technology where initially education is a process of providing educational information through communication between educators and students and considers educators to be an important factor because the main source of information, the media is a connector and as a means to present an innovative thought. Elements that get a touch from technology and information media are educational materials and students (Husaini, 2017; Zubaidah, 2019)

Changes in the world of work, education and various aspects of life in it are caused by the development of information technology, there has been a lot of discussion about this which says that we are facing the era of the industrial revolution 4.0 and even some other countries have developed several steps regarding the development of this technology. The first requirement in the Industrial Revolution 4.0 is the very rapid development in technology and digitalization, because it influences the procedures for students to learn and develop various abilities that are expected to be able to answer various challenges that should be overcome in times when competition is greater. Students must

start carrying out various learning activities using technology, which supports helping students to get used to the era of the industrial revolution 4.0. Various benefits will be obtained by various groups by using technology, both students, educators and educational institutions. Increased effectiveness, quality of learning and efficiency will be better with the use of technology (Alimuddin et al., 2023).

Learning strategies, teaching, mindsets and ways of interacting in education in the era of the industrial revolution 4.0 want a change both as educators and students in increasing innovation, creativity and enthusiasm in various fields of science and aspects of life. Educators in the future must have the ability to adapt and collaborate with the demands of changing times so that meaningful learning can be realized and students have the ability to face the challenges of the industrial revolution 4.0. There are 3 skills as the initial abilities of students that must continue to be encouraged equally to all students so that Gen Z is able to answer all the great complexities in the era of the industrial revolution 4.0. The three abilities are as follows: 1) life skills, the ability so that students can understand their personalities and have responsibilities with the social environment of their society 2) learning and innovation skills, the ability for participants to sit down to have innovation, critical thinking, creativity and destruction of big problems, good communication and a great desire to collaborate 3) literacy skills, the ability so that students have comprehensive knowledge and being able to operate technology can solve the daily problems that are being faced (Santika, 2021).

Learning evaluation is one of the most important components in education, including in Islamic religious education (Febriana, 2021; Hidayat & Asyafah, 2019; Suryadi, 2020). Evaluation not only serves to assess the extent to which students master the teaching material, but also as a tool to measure the seriousness of educators in carrying out their duties and functions (Qodir, 2017). In this context, the evaluation aims to measure students' knowledge, test their understanding of the material that has been taught, and identify areas that need more attention. In addition, evaluation also serves to encourage students to repeat the material that has been taught, so that the memorization process becomes more effective. Furthermore, this evaluation is also used to find out the level of intelligence of learners and to give special attention to those who are still experiencing difficulties in the learning material, so that they can catch up and move on to the next level (Maulani et al., 2024). According to Ainissyifa, it is important for the evaluation to not only focus on students, but also on educators, in order to assess whether they have fulfilled their duties well in achieving the goals of Islamic education (Ainissyifa, 2017).

With the rapid development of information technology, the learning and evaluation process in Islamic religious education has also undergone significant

changes. One form of technology utilization that is widely applied is e-learning, which is a learning process that is carried out electronically through the internet network. Nofriyanti et al. explained that e-learning utilizes internet media or other computer networks to deliver learning materials to students (Nofriyanti & Nurhafizah, 2019). With this technology, students can access teaching materials flexibly, without being limited by time and place. Information technology allows learning to be carried out in a more interactive way, which supports the improvement of the quality of Islamic education, both in terms of material delivery and in terms of evaluating student learning outcomes.

The use of technology is not only limited to the delivery of teaching materials, but also in the learning evaluation process. With the existence of a computer-based evaluation system or e-learning platform, the assessment of students can be carried out more efficiently, objectively, and accurately (Hartanto, 2016). Information technology allows for digitization in learning evaluation, such as the creation of exam questions, quizzes, and assignments that can be completed online. Platforms like Google Classroom, Quizizz, and Kahoot! It is now often used by educators to compile and distribute exam questions and provide feedback to students directly. In addition, with a technology-based evaluation application, teachers can also easily store and manage exam result data and monitor student progress in real-time. This allows educators to pay more attention to students who need help and improvement in teaching materials.

However, although the use of technology in learning evaluation offers various advantages, there are several challenges that must be faced. One of the main challenges is the digital divide, especially in areas that do not have good internet access. Alimuddin et al. revealed that not all students have equal access to technology, which is an obstacle in the implementation of technology-based evaluation. This limited access can affect the effectiveness of learning and evaluation, especially for students who are in remote areas or with inadequate technological infrastructure (Warni et al., 2023). In addition, the digital competence of educators is also an important factor in the successful use of technology in evaluation. As said by (Hasan et al., 2023). Many educators still find it difficult to operate technology effectively, especially in creating and administering online exams. Therefore, training and improving digital skills for educators are urgently needed so that they can make optimal use of technology in the evaluation process. They also found that the use of technology allows teachers to analyze exam results automatically, so the time spent on evaluation can be minimized. It is also supported by research (Saputra, 2022), which revealed that the use of technology in evaluation allows for more accurate and objective assessments, as well as makes it easier for educators to document the results of student evaluations.

On the other hand, Menurut Fawid and Nurfadilah said that although there are many advantages in using technology, not a few educators find it difficult to use technology in evaluation due to the limitations of digital skills. They also noted that while access to technology in large cities is quite good, in remote areas there are still gaps in terms of accessibility and technology skills. Therefore, they suggest an increase in training and technology facilitation for educators in all regions so that the use of technology in learning evaluation can be applied evenly (Fawaid & Nadifah, 2024).

Despite the challenges, the use of technology in the evaluation of learning in Islamic Religious Education has great potential to improve the quality and effectiveness of education. Technology allows evaluations to be carried out in a more interactive and efficient way, which can ultimately help educators in monitoring and evaluating student development more appropriately. On the other hand, the use of technology can also speed up the process of giving feedback, which is very important in supporting students in improving their understanding of teaching materials. With the wise application of technology, Islamic religious education can further develop, provide wider benefits for students, and make it easier for educators to achieve Islamic education goals.

Overall, although challenges in the use of technology remain, the success of integrating technology in the evaluation of learning in Islamic Religious Education can have a great positive impact. With improved technological infrastructure, training for educators, and awareness of the importance of equitable access, technology can be used to improve the quality of learning and evaluation, so as to achieve the goal of a more effective and inclusive Islamic education.

This study identifies the formulation of the problem to be analyzed, which is as follows: 1) How is the use of information technology by Islamic Religious Education teachers in the evaluation of learning at SD Negeri Bakti? 2) What are the obstacles and challenges faced by teachers in the use of information technology? The purpose of this study is to identify how Islamic Religious Education teachers utilize information technology in learning evaluation at SD Negeri Bakti, as well as to find out the obstacles and challenges faced by teachers in implementing information technology in the learning process.

The formulation of this problem is in line with previous findings that show that the use of ICT in Islamic religious education can improve the quality of learning evaluation and accelerate the assessment process. It is hoped that the results of this study can provide a clearer picture of ways to overcome existing challenges and increase the use of technology in learning evaluation, so that the learning process of Islamic Religious Education can be carried out more effectively and in accordance with current technological developments.

RESEARCH METHODS

The researcher makes direct observations of the object to be used as research and directly goes into the field, the explanation illustrates that this research is a type of field research or commonly called (*field research*). The qualitative method used in this study which relies on postpositivism is done to provide an image of the object being studied in a natural way. The researcher is a key instrument and the data collection technique is carried out by collecting various sources then the results are analyzed and finally concluded (Safitri et al., 2023).

The results of the study will describe a number of facts including how Islamic religious education teachers utilize information technology in learning evaluation at SD Negeri Bakti with various obstacles and challenges. Descriptive qualitative is an approach that researchers use with various data collection techniques, namely journal materials, documentation, observation and interviews. This illustrates that the data needed in this study are secondary and primary data. The object of this study is the principal and teachers of Islamic religious education. SD Negeri Bakti, Bandung Regency which is located on Jln. Cibisoro Rt/003 Rw/015 Bojongsoang. SD Negeri Bakti is an elementary school that has B accreditation and is quite famous in the city and district of Bandung which will be used as a research site.

RESEARCH RESULTS AND DISCUSSION

Research Results

In an interview with Mrs. Siti Maesaroh, an Islamic Religious Education (PAI) teacher at SD Negeri Bakti, she explained the use of information technology in learning Islamic Religious Education at the school. Mrs. Siti stated that although technology is not fully used in all aspects of learning, she sees a positive impact in its application, especially in materials that require visual media to clarify the context of Islamic religious teachings. For example, in teaching the history of Islam, he uses videos from the YouTube platform to enrich the teaching material. The use of videos is considered effective because it can increase student engagement in the learning process, in a more interactive and engaging way. This shows that the application of information technology in learning can not only increase the variety of methods, but also strengthen students' understanding of the material presented.

Furthermore, Mrs. Siti revealed that since the COVID-19 pandemic, the learning system at SD Negeri Bakti has had to adapt to the online learning model. In this condition, video conferencing applications such as Zoom and Google Meet are an important means to continue carrying out learning activities even though most teachers are involved in other activities such as meetings or Subject Teacher Conferences (MGMP). In addition, he also mentioned the use of an asynchronous learning model that allows students to access materials and complete

assignments outside of class hours. This asynchronous learning is implemented through communication platforms such as WhatsApp, which includes not only students and teachers, but also parents as educational partners. The involvement of parents in this learning process is expected to support students in completing tasks well, so that they can strengthen their role in children's education.

In addition, an interview with Mr. Asep Hidayat, a fellow PAI teacher at SD Negeri Bakti, expressed a similar view on the use of technology in learning evaluation. Mr. Asep emphasized that evaluation is an important component in learning that allows teachers to measure student development and identify areas that need improvement. In this context, Mr. Asep uses applications such as Quizizz to develop evaluation questions. With the use of this application, students can immediately receive feedback in the form of grades after completing the questions, which of course speeds up the assessment process. Additionally, the use of Google Classroom allows teachers to upload materials or assignments in an organized manner, which can then be accessed by students and collected according to a predetermined schedule. However, he also noted that SD Negeri Bakti does not have a Learning Management System (LMS) that is specifically managed by the school's education staff, which is one of the challenges in the optimal use of technology.

Meanwhile, in an interview with Mrs. Evi Sovia, Principal of SD Negeri Bakti, she gave a more comprehensive overview of the challenges and factors that affect the implementation of technology in learning and evaluation at the school. Ms. Evi highlighted that the use of information technology in the learning process allows the creation of more interesting, interactive, and flexible methods. In addition, technology can also speed up the school administration process and facilitate communication between educators, students, and parents. However, Mrs. Evi realizes that the application of technology in learning still faces various obstacles, one of which is the lack of access to technology devices among students. Some students, according to him, do not have adequate cellphones or other devices to participate in online learning. In addition, the problem of unstable internet networks is also an obstacle in the technology-based learning process.

Mrs. Evi also explained that to support digital transformation at SD Negeri Bakti, the school has made efforts to improve the necessary facilities and infrastructure, such as the procurement of technology devices and projectors to support technology-based learning. Furthermore, he revealed that his party is committed to continuing to improve teacher competence through continuous trainings. One of the efforts made is to encourage teachers to take advantage of the various modules available on the Merdeka Teaching Platform and implement good practices in implementing technology in learning. However, Ms. Evi also noted that there are still a number of challenges, such as the difficulty of

operating technology by some elderly teachers, who need special training to facilitate them in the use of technology.

Overall, although information technology has been used in learning and evaluation at SD Negeri Bakti, there are various challenges that must be faced to optimize its use. Limited access to technological devices, inadequate internet network quality, and lack of training for some teachers who are not familiar with technology, are obstacles that need to be overcome. However, with the commitment of the principal and teachers to continue to improve technological competence and improve existing facilities and infrastructure, it is hoped that the use of technology in education at SD Negeri Bakti can further develop. The application of more optimal technology can open up opportunities to create more interactive, flexible, and efficient learning, as well as improve the overall quality of education.

Discussion

The availability of technology is a factor that supports the development of online learning. If you look at it, the development of technology and information in this era of globalization makes it easier for humans to do various things and this should be appreciated in the midst of a modern human civilization. Information and communication technology can be interpreted with various things that make it easier for humans to channel information so effectively and quickly, it can be in the form of a program or a piece of equipment. There are several ICTs that are familiar to the public in general such as laptops, internet, printers, LCD projectors, computers and others. However, what we rarely know is that in essence, mobile phones, televisions and radios are also included in ICT devices consisting of software and hardware (Abdulai et al., 2023).

Learning applications are something unique and the latest innovation in the world of education as a learning medium that seeks for students to learn to operate them by providing flexibility in using them (Pardomuan et al., 2023). In essence, the benefit of the learning application is so that students feel that with the application learning becomes easier. For online learning, you need an application or media that is needed in an educational institution. There are online learning applications that are familiar to be used among educators and students such as WhatsApp, Google Meet, Zoom and others. Learning media that use videos are zoom meetings and google meet. The zoom meeting itself is the creation of Eric Yuan 2011 right in his office, which is in the San Jose area, California. Zoom meetings are not only used for teaching and learning activities, but also for office activities and even other activities (Far-Far, 2021).

According to Kuntarto, video conferencing applications such as Zoom provide many benefits for the online learning process. One of them is the ability of this application to improve interaction between teachers and students. In the

context of Islamic religious education, where communication and Q&A between educators and students are essential to understand the material more deeply, Zoom can be an effective means to achieve this goal. This application also provides a more varied and enjoyable learning experience, thereby reducing students' boredom during lessons. This is in line with the goal of online learning which not only focuses on learning outcomes, but also on the creation of active and enjoyable learning experiences (Kuntarto et al., 2021). The use of this application makes it easier for educators to achieve learning goals, as well as strengthen interaction with students.

On the other hand, the video conferencing application has been developed by Google LLC, one of the giant start-up companies from the United States. Google meet is one of the services that is developing very well and even experiencing rapid growth. Google Meet can be used as an alternative medium for learning activities that involve interaction between educators and students, socializing with various groups to hold a work meeting that is not limited to both inside and outside the home. Google meet can be used by users to hold a video for free and is not limited to the number of users 100 people at each time a video conference meeting is held (Yuliana, 2022).

In addition, various applications are widely used to conduct student assessments, of course, digital-based. These applications include *quizizz*, which is a game-like application in learning and is narrative and very flexible for students to use. This *quizizz* can be used as an intermediary for material delivery and can be used as a tool for student assessment with its interesting and fun nature. The *quizizz* application is able to create an enthusiastic and active learning atmosphere, which is expected to be able to make learning goals well realized.

This *quizizz application* is used very easily by its users, both used for assessment and material delivery. When the quiz is run, it will be displayed, then it can be arranged 4-5 answers in it with the right answer. Users can adjust the background display to the desired image or based on the correlation between the question and the answer. If the quiz is finished, the quiz can be distributed to students by entering the 6-digit code that has been set.

Quizizz can be used as an effort by educators to make learning strategies that are more interesting and fun, it can have an impact on meaningful learning and of course the essence of learning will not be lost. Some of the advantages of *the quizizz* application are as follows: 1) it makes it easier for educators to present questions that have been created and is very flexible to be edited at any time 2) students can find out the truth and mistakes in answering directly and be able to see the ranking in answering the quiz 3) students can know the correct answer so that it can be used as an evaluation or record in the future so that if they find such a question again can be answered correctly 4) At the end of filling out the quiz, a

review question will be presented so that you can re-examine the answer that has been selected previously.

There are various other features contained in the application *quizizz*. It can be used for various means of educators to convey and provide assignment instructions. Students will feel that the learning process is not so heavy, especially in finding answers to the task, because basically this application has an attractive appearance and is rich in various fun things because this application is game-based (Rahmawati et al., 2022).

Google Classroom is an application that can be used specifically for online learning, meaning that learning is carried out at a distance, which makes it easier for educators to create a group, distribute assignments and work on student assessment results anywhere without being limited by space and place. Then educators and students are able to hold learning on the application, can read the material that has been presented, listen to audio, send assignments and assignment answers to educators, of course, all of these activities are carried out online. Google Classroom is a free learning application that has been provided by Google as a learning management system. Google Classroom is basically made to make it easier for educators to convey assignments and collect them by not wasting paper meaning (*paperless*), as well as time-saving features such as the ability to automatically create a copy of Google Docs. Google Drive can be created by the class by first creating a folder. Online learning process activities using Google Classroom can be used as the leading information technology (Lestari & Marhamah, 2022).

Edwin in his journal that the obstacles to the use of ICT in the learning and teaching process can be classified into 2 factors, namely factors related to physical and vice versa. Physically, this obstacle is the lack of facilitation of facilities and infrastructure, which means the need to improve facilities and infrastructure, especially in educational institutions that come from rural areas and are difficult and still have difficult internet coverage. Although there are several facilities and infrastructure, the quantity and quality of the equipment is still minimal. Many educational institutions in rural areas that still use used multimedia devices with specifications tend to lag behind, which has an impact on the inability of schools to compete with ICT developments that are difficult to predict and so fast.

As for non-physical barriers, the first obstacle is the lack of confidence of educators in the use of ICT during the learning process. Educators often feel that when teaching with ICT, they are afraid of a failure due to a lack of mastery in using it, even though its use must be recommended by various professionals, especially education experts. The second obstacle is that the ability of educators to use ICT still needs to be at the level so that they can operate it optimally. Many teachers do not have good knowledge and skills in operating computers and are not enthusiastic about various changes in integrating ICT in their classrooms.

Another non-physical obstacle is the teacher's attitude and resistance to change. Many teachers think that the use of ICT in learning does not have any outstanding benefits or advantages, so they are reluctant to change their teaching strategies. This attitude of resistance is one of the main obstacles in efforts to integrate ICT effectively in the teaching and learning process (Sawitri et al., 2019).

CONCLUSIONS AND IMPLICATIONS

Conclusion

The development of information and technology affects the learning process and the evaluation of Islamic religious education. Some of them are the use of E-Learning is a learning activity carried out through a network which is expected to be able to answer various challenges in the future. In the SD Negeri Bakti environment, the use of technology in the learning process has been utilized, while several applications are used to support learning, including learning media that use videos, namely zoom meetings and google meet. In addition, in the evaluation of Islamic religious education, educators use applications including *quizizz* and google classroom where educators can assess the assignments given to students. The supporting factor in the use of ICT in SD Negeri Bakti is the principal's commitment to support various programs related to the use of technology in learning, encouraging all educators and education staff to improve their competence with various platforms, one of which is the independent teaching platform by working on modules and doing good practices. Meanwhile, the inhibiting factors are that there are some students who do not have mobile phones, some educators still have difficulty using ICT in learning, infrastructure facilities that need to be improved, and wifi access is still constrained because many people access.

Implication

This study emphasizes the importance of strengthening educator competence, improving infrastructure, and internet access to support ICT-based learning. Collaboration of those in charge of education is needed to overcome obstacles, so that the use of technology can be more optimal in learning and evaluating Islamic Religious Education.

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