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Technology Integration in Islamic Education: Policy Framework and Adoption Challenges

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Abstract

This study aims to find out how the strategy for implementing technology integration in Islamic education is effective and how to overcome the challenges of adopting technology integration in Islamic education. The method used in this study is a descriptive qualitative approach. Qualitative descriptive research is research that produces descriptive data in the form of written or spoken words from people and observable behavior. The type of research used in this research is literature study. Data analysis was carried out using a descriptive analysis, by looking for patterns and finding themes that emerged from the materials collected. This study was analyzed by the stages of data collection, data presentation, data condensation and drawing conclusions. The results of the study show that the strategy for implementing technology integration in Islamic education is through improving technology infrastructure, training and professional development for teachers and education managers, preparing relevant digital Islamic content, and a technology-based curriculum approach. Addressing the challenges of adopting technology integration in Islamic education through increasing the accessibility of technology, developing technology training and certification programs for teachers, diversifying funding sources for technology integration, and a flexible approach to curriculum development and evaluation

Keywords: Technology Integration, Islamic Education, Policy, Challenges, Adoption

Introduction

The integration of technology in Islamic education has become a crucial issue in a global context marked by the rapid development of information and communication technology (ICT). (Oktavianti Nendra Utami et al., 2023) In an educational setting, technology offers great potential for improving the quality of learning, expanding accessibility, and creating more interactive and skill-based learning models. However, the challenges and constraints in

integrating technology in the Islamic education system need to be identified in depth to maximize its benefits.

In the context of the Muslim world, differences in the accessibility of technology in various regions are one of the obstacles in adopting technology in Islamic education. Infrastructure constraints and economic conditions may be factors influencing technology adoption in Islamic educational institutions. In addition, the role of technology in changing the way of learning and teaching in the context of the Islamic religion must be considered in depth to ensure that Islamic values are maintained. The use of e-learning applications and platforms has provided easy access and flexibility in learning, but keep in mind that the content presented must be in accordance with Islamic religious values and the quality of the content must be maintained (Rohmah, 2011) . It is also necessary to pay attention to the influence of technology on students' religious identity so that the use of technology does not reduce their love for Islam.

The use of e-learning applications and platforms has brought about significant changes in the way education is delivered and accessed (Chandrawati, 2010) . In the context of Islamic education, this technology provides a great opportunity to improve educational accessibility and provide flexibility for students and teachers. Through applications and e-learning platforms, students can access learning materials, assignments and exams from anywhere and at any time, without being limited by time and location. This allows students who are in remote areas or far from educational centers to continue to have access to quality education.

In integrating technology in Islamic education, it is important to pay attention that the content presented must be in accordance with Islamic religious values (Ifadah, 2019) . In addition to delivering academic material, e-learning applications and platforms must also consider moral and ethical aspects that are in line with Islamic teachings. The content presented must uphold Islamic values, avoid material that is contrary to religious teachings, and not cause controversy from a religious perspective. The quality of the content presented must also be maintained properly. Learning materials must be accurate, reliable, and relevant to the Islamic religious context. High-quality content will help increase students' understanding of religious teachings and improve the overall quality of learning.

The COVID-19 pandemic has also opened our eyes to the importance of integrating technology in Islamic education, especially in dealing with distance learning (Salsabila et al., 2021) . The impacts and challenges that emerged during the pandemic are relevant in digging deeper into the adoption of technology in Islamic education. So that the integration of technology in Islamic education offers great potential to advance the quality and accessibility of education. However, the challenges and obstacles faced must be overcome effectively through appropriate policies and the active role of various stakeholders, including the government, educational institutions and the community. Thus, the integration of technology in Islamic education can be well-directed to achieve long-term goals in improving the quality of education and the sustainability of Islamic religious values in this digital era.

Literature Review

In addition to the content aspect, the use of technology must also pay attention to its effect on students' religious identity (Saputra et al., 2017) . Learning experiences using

technology can shape students' perceptions of Islam and about themselves as religious individuals. Therefore, efforts need to be made so that the use of technology in Islamic education does not reduce students' love for their religion, but instead strengthens and sharpens their understanding of Islam as their religious identity.

Another challenge is the lack of training and increasing teacher competency in using ICT in Islamic education (Myori et al., 2019) . Teachers play a key role in integrating technology, so efforts need to be made to improve their understanding and skills in applying technology in the learning process. The availability of adequate technological infrastructure in schools and madrasas is also an obstacle in the adoption of technology in Islamic education. This requires adequate financial investment, and these resources may not always be readily available to less affluent educational institutions.

Policy support from the government is also very important in integrating technology in Islamic education (Fitriyadi, 2013) . Policies that support and encourage technology adoption can accelerate implementation and ensure compliance with national needs. Responses from society and parents to the use of technology in Islamic education can also affect the acceptance and sustainability of implementation. In facing these challenges, it is important to pay attention to best practices and experiences from developed countries that have successfully integrated technology into Islamic education.

Research Method

The approach used in this study is a descriptive qualitative approach. Qualitative descriptive research is research that produces descriptive data in the form of written or spoken words from people and observable behavior. The type of research used in this research is literature study, which collects data through written sources such as relevant journals and books. Data analysis was carried out using a descriptive analysis, by looking for patterns and finding themes that emerged from the materials collected. The results of this study are expected to contribute to an understanding of how technology integrates in Islamic education: policy frameworks and adoption challenges(Sugiyono, 2017, p. 146). This research was analyzed by the stages of data collection, data presentation, data condensation and drawing conclusions. (Miles et al., 2014, p. 17)

Results and Discussion

The basic concept of Technology Integration in Islamic Education

The basic concept of technology integration in Islamic education refers to the use of information and communication technology (ICT) in all aspects of learning and teaching in an Islamic education environment (Siregar & Marpaung, 2020) . Technology integration aims to enrich students' learning experiences, improve the quality of learning, and help achieve Islamic education goals more effectively. Technology Technology integration leads to a paradigm shift from traditional learning to technology-based learning. In the traditional approach, the learning process is more one-way, where the teacher delivers the material and students become the recipients of the information. With the integration of technology, learning becomes more

interactive and collaborative. Students can access various digital learning resources, participate in online discussions, and interact with learning content through multimedia media.

Technology integration allows open access to digital learning resources that are relevant to Islamic teachings (Francisca et al., 2022) . These resources include digital Korans, hadiths, commentaries, religious literature, and other study materials. With this open access, students and teachers can obtain Islamic information and knowledge easily and quickly. Technology integration includes the use of educational applications and software specifically designed to enhance learning effectiveness. These applications can be in the form of online learning platforms, interactive quizzes, simulations, and other tools that can help students understand and apply Islamic concepts better.

With the integration of technology, learning can be enhanced to be more experience-based. The use of simulations, videos and multimedia in learning can help students experience real and in-depth learning experiences (Ashoumi, 2019) . For example, through virtual simulations, students can "visit" Islamic historical places or attend important events in Islamic history. Technology integration requires the development of quality digital Islamic content. This content must be in accordance with Islamic values and teachings, and consider the needs and characteristics of students. This digital Islamic content can be in the form of Islamic e-books, video lectures, daily prayer applications, and so on.

Technology integration also allows for a differentiated approach to learning (Purwanto & Dwi Gita, 2023) . With technology, teachers can arrange learning materials that are tailored to the pace of learning and student interests. This will help students with different abilities to develop their potential optimally. The concept of technology integration in Islamic education encourages the adoption of a lifelong learning approach. Students and teachers are empowered to continue learning and developing themselves through digital learning resources that are continuously updated. Thus, the learning process does not stop after leaving the school environment, but continues throughout life.

The integration of technology in Islamic education is a basic concept that focuses on using technology to improve the quality of learning and present learning experiences that are more interactive, innovative, and relevant to Islamic values. By adopting this concept, Islamic educational institutions can prepare generations of Muslims who are qualified, have good morals, and are ready to face future challenges in the digital era.

Technology Integration Policy Framework in Islamic Education

The policy framework for technology integration in Islamic education is a strategic guidance document that aims to provide direction, goals, and concrete steps in implementing technology integration in the context of Islamic education (Nurdin, 2016) . This policy framework covers various aspects, from technology infrastructure, curriculum development, teacher training, to monitoring and evaluation. Following are some of the key points that are usually included in the policy framework of technology integration in Islamic education:

- Technology Integration Vision and Mission: The policy framework should contain a clear vision and mission regarding the goals of technology integration in Islamic education. This vision can include aspirations to create quality Islamic education, globally competitive, and adaptive to technological developments.

- Setting Goals and Targets: The policy framework should set specific and measurable goals and targets in integrating technology in Islamic education. These goals may include increasing access to technology for students and teachers, improving the quality of learning with a technological approach, and using technology to increase the efficiency of school administration.
- Technology Infrastructure: The policy framework should identify the necessary technology infrastructure needs, such as stable and fast internet access, hardware (computers, tablets, and mobile devices), and software (learning applications and platforms). This document should present a plan to meet these infrastructure needs taking into account the budget and timeframe aspects.
- Technology-Based Curriculum Development (Nur'ariyani, 2022) : The policy framework must contain strategies and steps to develop a technology-based curriculum that is in accordance with Islamic teachings and integrate technology effectively in the learning process. The use of relevant and quality digital Islamic content must also be accommodated within this policy framework.
- Professional Training and Development: The policy framework should include plans to provide training and professional development for teachers and education administrators. This training must cover technical and pedagogical aspects in the use of technology in learning and school management.
- Safety and Ethics of Technology Use (Nugraha et al., 2023) : The policy framework must regulate security and ethical aspects of the use of technology in Islamic education. This includes protecting students' personal data, controlling access to content that is in accordance with Islamic teachings, and the ethics of using technology by students and teachers.
- Monitoring and Evaluation: The policy framework should include a mechanism for monitoring and evaluating the implementation of technology integration in Islamic education. This evaluation must involve all stakeholders, including students, teachers, education administrators, and parents, to evaluate the successes and challenges faced in adopting technology.
- Policy Monitoring: Within the framework of this policy, it is necessary to define how the process of monitoring and assessing this policy will be carried out. If there is a need for adjustments or changes in implementation, then regular monitoring can help educational institutions to overcome obstacles and achieve the goals that have been set.

The technology integration policy framework in Islamic education is an important foundation in directing and implementing the process of technology integration in Islamic educational institutions. With a clear and comprehensive policy framework, educational institutions can optimize the potential of technology to improve the quality of education and form a generation of Muslims who are competitive in this digital era.

Challenges of Adoption of Technology Integration in Islamic Education

Technology Accessibility Limitations. One of the main challenges in adopting technology integration in Islamic education is the limited accessibility of technology, especially in areas that have not been reached by adequate internet networks and technology supporting infrastructure (Zebua, 2023) . Rural or remote areas often face limited access to adequate internet. Internet speed that is slow or even non-existent can hinder educational

institutions' efforts to implement technology in learning. In this situation, teachers and students may find it difficult to access digital learning resources, online learning platforms, or relevant digital Islamic content.

In addition to internet network problems, limited technological devices such as computers, tablets or mobile devices are also problems that are often encountered in less developed areas (Zakariyah & Hamid, 2020) . Without access to adequate hardware, it is difficult for teachers and students to utilize technology in learning, including interacting with learning applications or using devices to access digital learning resources. In some areas, the availability of stable and sustainable electricity is also a problem. Without adequate access to electric power, the use of technological devices is limited and allows distraction or interruption in the learning process.

The challenge of technology accessibility is also related to the uneven distribution of technology across regions (Lestari, 2015) . Some schools may already be equipped with adequate technological infrastructure, while others may still experience limitations. This creates a digital divide between technologically advanced regions and those that are still lagging behind. Limited accessibility of technology can create learning gaps between students in areas who have access to technology and those who do not. Students in less developed areas may not have equal opportunities to access relevant digital learning resources or participate in technology-based learning. Limited accessibility of technology can hinder the potential of technology in improving the quality of learning and teaching effectiveness. Teachers and students who do not have adequate access to technology may find it difficult to utilize a variety of learning applications and tools that can enhance interactivity and creativity in learning.

Technology-based curriculum requires adequate access to technology to be implemented effectively. Limited accessibility of technology can be an obstacle in implementing a curriculum that integrates technology in the learning process. Limited technological accessibility can also hinder the development of relevant and quality digital Islamic content. The development of digital Islamic content requires the availability of adequate technology to create and distribute this content throughout the region.

Another challenge is the lack of technological knowledge and skills among teachers and education managers (Akbar, 2019) . This can hinder the effective use of technology in learning and reduce its potential benefits. The lack of technological knowledge and skills among teachers and education administrators is a serious challenge in adopting technology integration in Islamic education. Many teachers and education managers are unfamiliar or do not have an in-depth understanding of the use of technology in the learning process. As a result, the use of technology in learning tends to be limited or even not used at all.

Teachers who are less skilled in technology may find it difficult to integrate learning apps or software into their teaching. They may not know how to take advantage of online learning platforms or multimedia media to make learning more interactive and interesting for students. In addition, limited technical knowledge can also make it difficult for teachers to overcome technical problems or errors that may occur during learning.

Meanwhile, education managers who are less skilled in technology may have difficulty managing and optimizing the use of technology in educational institutions. They may not know how to identify and adopt technologies that suit the needs and goals of Islamic education. In

addition, a lack of understanding of the potential of technology can also hinder managers from advocating for the use of technology in improving the quality of education

Cost and Financial Resources. Technology integration in Islamic education requires significant financial investment to purchase hardware and software, train, and maintain infrastructure. This cost may be an obstacle for some educational institutions that have limited budgets. The use of technology in education requires hardware such as computers, laptops, tablets, or mobile devices, as well as relevant and quality learning software or applications. The cost of purchasing these hardware and software licenses can be a huge burden on an educational institution, especially if it has to provide a device for every student and teacher.

Training and professional development for teachers and education managers in using technology also requires a significant budget (Rivalina, 2015) . This training is important to improve their competence and skills in integrating technology in the learning process. After the technology infrastructure is implemented, costs are required for maintenance and upgrading of the infrastructure. Hardware and software must be maintained in order to function properly and updated according to the latest technological developments. Budgetary constraints are also a major challenge in adopting technology integration in Islamic education. Educational institutions with limited funds may find it difficult to allocate a large enough budget to invest in technology, especially if there are other priorities that also need to be financed.

Technology integration must be carefully considered so that it is in line with the existing Islamic education curriculum. In addition, developing appropriate evaluation methods to measure the success of technology integration is also a challenge in itself. Technology integration must be carefully considered so that it is in line with the existing Islamic education curriculum and the values to be instilled in education. This involves adapting learning materials to the use of technology without compromising the core of the Islamic curriculum. Flexibility and adaptability of the curriculum also need to be considered to accommodate technological changes that occur from time to time.

The development of an appropriate evaluation method is a challenge in itself to measure the success of technology integration in Islamic education. Traditional evaluation methods may not adequately reflect the impact of technology on the learning process. Evaluation must go beyond just measuring how much technology is used, but must also measure the real impact of technology integration in improving the quality of learning, student participation, and their learning outcomes.

Technology Integration Implementation Strategy in Islamic Education

One of the main strategies in implementing technology integration in Islamic education is to develop a technology-based curriculum approach. The curriculum must be designed taking into account the use of technology as a tool to achieve learning goals and integrate it into each subject. This approach will help create an innovative and interesting learning environment for students (Nur'ariyani, 2022) . The technology-based curriculum approach is a curriculum development method that integrates information and communication technology (ICT) in the learning process (Divayana et al., 2016) . In this approach, technology becomes an integral part of the entire curriculum, from planning to implementation, with the aim of increasing the efficiency, quality and relevance of education. The following are strategies in the technology-based curriculum approach:

- Technology Integration in Learning: This approach applies technology as a whole in learning, so that technology is not only used as a tool, but also as a means to support interaction and collaboration between teachers and students, as well as students and students.
- Use of Hardware and Software: Technology-based curricula involve the use of hardware such as computers, laptops, tablets, and mobile devices, as well as relevant learning software or applications. The use of this device allows students to access digital learning resources more easily and flexibly.
- Access to Information and Learning Resources: With the existence of technology, students have wider and easier access to various information and learning resources from the internet. They can access learning materials, e-textbooks, instructional videos, and a variety of other educational content, which helps increase understanding and active participation in learning.
- Web-Based Learning: Technology-based curricula can include web-based learning, where students can take online lectures or study independently via e-learning platforms. Web-based learning allows 24/7 access and flexibility in the learning process.
- Development of Creativity and Digital Skills: In this approach, students are encouraged to develop creativity and digital skills through the use of technology. They can create multimedia presentations, videos or other creative content as part of learning assignments.
- Project-Based Learning: Technology can support a project-based learning approach where students learn through practical projects that require the application of technology in their completion.
- Increase Student Engagement: Integration of technology in the curriculum can increase student engagement in learning. Interactive and engaging technology can help increase student interest and make learning more fun.
- Teacher Training and Development: Technology-based curricula also require training and professional development for teachers so that they are able to integrate technology effectively in learning. Teachers need to master technology and develop relevant teaching skills.
- Impact Measurement: This approach requires measuring the impact of technology integration in learning. Evaluation needs to include qualitative and quantitative aspects to assess the extent to which technology contributes to achieving educational goals.
- Implementing an Adaptive Curriculum: In a world of ever-evolving technology, a technology-based curriculum must also be adaptive and responsive to changes in technology and evolving educational needs.

The technology-based curriculum approach is an important strategy to improve the quality and relevance of education. Appropriate technology integration will help create learning that is innovative, creative, and strengthen students' digital skills, as well as equip them with the relevant capabilities to face the challenges of the future.

The development of relevant and quality digital Islamic content is key in integrating technology in Islamic education. The content must be in accordance with Islamic values and teachings and be able to inspire and support the learning process. The use of multimedia content such as videos, animations, and interactive applications can increase student interest and understanding of subject matter (Hartanto, 2016) . The preparation of relevant digital Islamic

content is crucial in the integration of technology in Islamic education. Appropriate digital content can be an effective means of conveying Islamic teachings, teaching religious values, and strengthening students' understanding of Islam. The following are techniques for compiling relevant digital Islamic content:

- Understanding Learning Needs: The first step in compiling relevant digital Islamic content is understanding students' learning needs. Content creators need to understand the level of understanding and characteristics of students, and focus on aspects of Islam that need to be emphasized according to their stage of development.
- Adhering to Islamic Pedagogical Principles: Digital content must comply with Islamic pedagogical principles, such as experiential learning methods, social interaction based learning, and project based approaches. The content must motivate and inspire students to learn and improve their morals and faith.
- Accuracy and Quality of Content: Digital Islamic content must be accurate and quality guaranteed. This means that content creators must refer to authoritative sources in the Islamic religion and verify the accuracy of the information before presenting it to students.
- Relevance to Real Life: Relevant digital content is what can be connected to students' everyday lives. The content must be able to relate Islamic teachings to the context of their lives so that they can understand it better and apply it in their daily lives.
- Multiple Forms of Content: Digital Islamic content can be in the form of text, images, audio, video or interactive. Multiple forms of content will allow students to choose a learning style that suits their preferences.
- Innovation in Presentation: Relevant digital Islamic content must reflect innovation in presentation. The use of technology can be used to present Islamic teachings in an interesting and interactive manner, thereby increasing student interest and participation in learning.
- Use of Easy-to-Understand Language: Digital Islamic content should use language that students can easily understand. Simple and clear language will help students more easily absorb information and understand Islamic teachings.
- Integrating Islamic Values: Digital content must reinforce Islamic values in every discussion. The content should promote tolerance, compassion, justice and Islamic morality, so that students can understand and internalize these values.
- Support Independent Learning: Digital Islamic content should be designed to support students' independent learning. Students should be able to access this content anytime and anywhere, so that they can study independently and deepen their understanding of Islam.
- Content Impact Evaluation: It is important to evaluate the impact of digital Islamic content that has been compiled. This evaluation will assist in identifying successes and improvements that need to be made to improve the quality and effectiveness of content in achieving Islamic education goals.

By taking into account all of these aspects, the preparation of relevant digital Islamic content will be an effective means of strengthening Islamic education and helping students better understand, internalize, and practice religious teachings in their daily lives.

To overcome the challenges of a lack of knowledge and technological skills, training and professional development are needed for teachers and education administrators (Susanti & Sa'ud, 2017) . This training must cover technical aspects, such as the use of technology devices and applications, as well as the integration of technology in the learning process and school management. In addition, professional development must also focus on strengthening the pedagogical competence of teachers so that they can optimize the potential of technology in teaching. Professional training and development for teachers and education managers is an important component of technology integration in Islamic education. This approach aims to increase their knowledge, skills and understanding of the use of technology in the learning process and management of education (Herliani & Wahyudin, 2019) . Following are the importance of training and professional development for teachers and education administrators:

- Technology Mastery: Through training and professional development, teachers and education administrators can master a variety of relevant hardware, software and technology applications to support learning and education management. They will be more confident in using technology and make effective use of it in their daily activities.
- Integration of Technology in the Curriculum: Professional training and development assists teachers in structuring and integrating technology into the existing curriculum. They can identify opportunities to integrate technology in learning and create effective learning plans with the support of technology.
- Development of Innovative Learning Methods: Through training and professional development, teachers can gain an understanding of innovative and relevant learning methods that can be enhanced through the use of technology. They can adopt more engaging and interactive approaches to project-based learning, collaborative learning, and problem-based learning.
- Applying Online and Blended Learning Approaches: Professional training and development helps teachers to better design and implement online and blended learning. They can take advantage of e-learning platforms and online communication tools to interact with students and create a responsive and inclusive learning environment.
- Effective Classroom Management: Professional training and development also involves learning about effective classroom management with technology. Teachers can use technology to manage learning, assign assignments, and provide feedback to students in a more organized and efficient manner.
- Utilization of Digital Resources: Training and professional development assist teachers in finding and using relevant, high-quality digital resources to support the learning process. They can access e-books, learning videos, and other digital teaching materials to enrich learning.
- Evaluation and Monitoring of Technology Use: Professional training and development enables education managers to evaluate and monitor the use of technology in learning. They can analyze the impact of using technology on student learning outcomes and make necessary improvements or adjustments.
- Technology Infrastructure Management: Education managers also need skills in managing the technology infrastructure needed for the integration of technology in Islamic education. Through professional training and development, they can optimize

the use of hardware and software, and ensure the sustainability and proper maintenance of infrastructure.

- Understanding the Challenges and Opportunities of Technology: Professional training and development helps teachers and education administrators to understand the challenges and opportunities that may arise in adopting technology. They can anticipate technological changes and respond with appropriate strategies.
- Collaboration and Exchange of Experiences: Through training and professional development, teachers and education managers can collaborate and share experiences with colleagues or other educational institutions. This opens up opportunities to learn from experience and best practices in the use of technology in Islamic education.

By attending training and professional development, teachers and education managers can become more effective learning facilitators, make the most of technology, and create a more interactive and inclusive learning environment (Tarihoran & Cendana, 2020) . This will help improve the quality and relevance of Islamic education and prepare young people to face the challenges and opportunities of the future.

Improvement of technology infrastructure (Darwis & Mahmud, 2017) . Ensuring the availability of adequate technological infrastructure is a crucial step in implementing technology integration in Islamic education. Educational institutions must invest in procuring stable and fast hardware, software and internet networks (Rostini et al., 2023) . These infrastructure improvements will facilitate access to and effective use of technology by students and teachers. Increasing technological infrastructure is an important step in supporting the integration of technology in Islamic education. Adequate and reliable technological infrastructure will create a learning environment that is more effective and responsive to technological developments. The following is the importance of improving technological infrastructure in Islamic education:

- Stable and Fast Internet Access: Technology infrastructure should provide stable and fast internet access in all areas of schools and educational institutions. Reliable internet access allows teachers and students to access digital learning resources, communicate online, and follow distance learning smoothly.
- Availability of Hardware: Provision of adequate hardware, such as computers, laptops, tablets, and mobile devices, is key to supporting technology-based learning. Adequate technological infrastructure must be able to provide a sufficient number of these devices to support all learning activities.
- Learning Software and Applications: The technology infrastructure must have relevant and high-quality learning software and applications. This software includes learning management systems, online learning platforms, and other learning support applications.
- Local Networks and Security: The technology infrastructure must be equipped with sufficient local networks to connect all the devices in the learning environment. In addition, cyber security measures must be implemented to protect student data and prevent other security threats.
- Integration of Technology in the Classroom: The technology infrastructure should also include technology facilities and equipment in the classroom. For example, an adequate

interactive screen, projector or audiovisual system can be used to present learning content in a more interesting and interactive manner.

- Access to Digital Resources: Technology infrastructure should provide easy and fast access to a wide range of digital resources, including e-books, learning videos, and other digital teaching materials. Students and teachers should be able to access these resources anytime and anywhere.
- Training and Technical Support: Technological infrastructure improvements must also be supported by training and technical support for teachers and education administrators. This training will help them to use technology more effectively and solve technical problems that may arise.
- Sustainability and Maintenance: Technology infrastructure must be sustainable and continuously updated according to technological developments. Regular hardware and software maintenance is required to maintain infrastructure quality and reliability.

By improving the technological infrastructure, Islamic education institutions will have a strong foundation to integrate technology more effectively in the learning process and educational management. Adequate technological infrastructure will open up new opportunities for teachers and students in improving the quality of Islamic education and preparing young people to face future challenges.

Overcoming the Challenges of Adoption of Technology Integration in Islamic Education

Improved Technology Accessibility. To overcome the challenges of limited technological accessibility, efforts are needed to expand the reach of internet networks and provide adequate technological infrastructure in remote areas (Rostini et al., 2023) . Collaboration with the government, technology companies and private institutions can help increase the accessibility of technology evenly (Mustaqim, 2023) . Increasing the accessibility of technology is a form of effort to ensure that technology and related services can be accessed easily and efficiently by as many people as possible, including those who may have physical or economic limitations (Yani, 2023) . This aims to create equality in the opportunities and benefits provided by technology, and ensure digital inclusion for all levels of society. There are several steps and strategies that can be taken to increase the accessibility of technology:

- Physical accessibility: Ensuring that hardware and software are designed taking into account the needs of people with physical limitations. This can involve using easy-to-reach buttons, responsive touch screen devices, or software that can be operated with tools such as screen reader software.
- Digital inclusion: Providing training and support for people unfamiliar with technology, especially in less developed regions or communities. This may include training in the use of relevant computer, internet and application devices.
- Internet access: Improving internet accessibility through efforts to expand network infrastructure, especially in remote or less developed areas. These initiatives could include setting up WiFi hotspots in public places or providing high-speed internet access at affordable costs.
- Content accessibility: Ensuring that websites, apps, and other platforms are designed with accessibility in mind for people with a variety of needs. This includes providing alternative text for images (alt text), high contrast colors for easy reading, and easy-to-read fonts.

- Technical support: Provides effective technical support for users with accessibility issues. This could be a dedicated help center, online guide or support through other communication channels.
- Affordable prices: Make technology and related services available at affordable prices for all levels of society, especially for critical technologies such as communication devices or other accessibility devices.
- Partnerships and collaborations: Engage the private sector, non-profit organizations, and governments to work together to create broader and more sustainable technology accessibility initiatives.
- Accessibility testing: Integrate accessibility testing as part of the new technology development process, so that potential accessibility issues can be identified and corrected before the product or service is launched.

Efforts to increase the accessibility of technology are important steps to ensure inclusion and equality in the ever-evolving digital era. By making technology accessible to everyone, we can expand the positive potential of technology to benefit society as a whole.

Development of Technology Certification and Training Programs for Teachers Islamic education institutions should develop specific technology training and certification programs for teachers (Nahdi et al., 2020) . This program must include comprehensive training on the use of technology in learning, management of virtual classrooms, and development of digital Islamic content (Ilham et al., 2023) . Technology certification can provide recognition for teacher competency in using technology effectively in the learning process. The development of technology training and certification programs for teachers is a key step in preparing educators to integrate technology in the learning process. This program aims to improve teacher competency and skills in using technology effectively in their teaching, so as to provide a more interesting and efficient learning experience for students (Sulastri et al., 2020) . The following are steps that can be taken in developing a technology training and certification program for teachers:

- Needs analysis: Conducts a thorough analysis to determine the appropriate technology training needs of teachers. In this stage, it is necessary to carry out surveys and consultations with teachers to understand their level of understanding of technology, the challenges they face, and what skills need to be improved.
- Setting goals: Setting clear and specific goals for the training program, both in terms of the technological knowledge that must be mastered and the ability to integrate technology in learning.
- Program design: Design a training program that includes material that is relevant and appropriate to the needs of teachers. Training materials can include an introduction to the latest technology devices and applications, techniques for using technology in learning, creating digital content, and technology-based evaluation strategies.
- Training methods: Selecting effective training methods, including face-to-face training, online training, or a combination of the two. The training's interactive and hands-on approach will help teachers feel more confident about using technology in the classroom.

- Teaching team: Uses teaching staff who are skilled and experienced in educational technology to provide training. This team may consist of internal instructors from the educational institution or involve outside educational technology experts.
- Ongoing training: Provide ongoing training for teachers after the certification program is completed. Technology is constantly evolving, so teachers need to be given the opportunity to continuously update their knowledge and skills in dealing with technological changes.
- Assessment and certification: Measure the progress and success of teachers through structured evaluations and appropriate assessments. Teachers who successfully complete the training program and meet the assessment criteria may be awarded a technology certification in recognition of their efforts.

Technology training and certification programs for teachers are a long-term investment in improving the quality of education and preparing students to face the challenges of the digital age. With teachers who are skilled in technology, it is hoped that the learning process will be more interesting, relevant, and have a positive impact on the development of students.

Diversification of Funding Sources for Technology Integration. Facing challenges in costs and financial resources, Islamic educational institutions need to find various sources of funds to support technology integration (Muammarulloh & Wiyani, 2023) . Apart from government funds, grants from foundations and donations from the public as well as company participation in social responsibility programs can be an alternative to finance technology investments (Komariah, 2018) . Diversification of funding sources for technology integration is a process of seeking different funding sources to support the use and implementation of technology in the educational context. The aim is to reduce dependence on a single source of funding and increase opportunities to obtain sufficient funds to integrate technology effectively in educational institutions. Following are some steps and strategies to diversify funding sources for technology integration:

- Education budget: Ensure that in the education budget in educational institutions, special allocations for technology and technology-based education are included. This budget should cover purchases of hardware (e.g. computers, tablets or other devices), software (educational apps, learning platforms, etc.), and training and technical support for teachers and staff.
- Government assistance: Seek and apply for government assistance or grants aimed at supporting technology integration in educational institutions. Governments, both central and regional levels, often have assistance programs or grants for technology-based education that can be utilized.
- Donations and sponsorships: Seek support from companies, foundations, or individuals willing to make donations or sponsor technology integration programs. Some technology companies even have special programs to support digital education and literacy.
- Private sector partnerships: Establish partnerships with technology companies or other companies within the private sector interested in supporting education. In this partnership, collaboration can be carried out in the form of providing tools and software, training, or technical support.

- Investment funds and crowdsourcing: Consider using crowdsourcing platforms or investment funds (venture capital) to obtain the necessary funds. Several crowdsourcing platforms provide funding for educational projects, including technology integration in educational institutions.
- Private funding program: Organizing a private funding program among members of the school community, alumni, or parents interested in participating in increasing the use of technology in the educational institution.
- Internal resources: Look for ways to leverage the educational institution's internal resources, such as raising money from charities, merchandise sales, or other fundraising programs.
- Long term planning: Planning well and focusing on long term goals. Diversification of funding sources requires a mature strategy and patience in finding the right funding.

Diversifying funding sources for technology integration can help educational institutions achieve their goal of using technology more effectively and sustainably. By combining various sources of funding, educational institutions can create a more modern, interactive learning environment and prepare students to be better prepared to face future technological developments.

A Flexible Approach to Curriculum Development and Evaluation. To deal with curriculum and evaluation challenges, educational institutions must apply a flexible approach (Wiguna & Tristaningrat, 2022) . The curriculum can be developed periodically to accommodate technological developments and student needs (Sholeh, 2023) . Evaluation development must also reflect the progress and achievements produced through the use of technology in learning (Ambarwati et al., 2021) . A flexible approach in curriculum development and evaluation is an approach that adapts to changes and developments in the context of education and society in a more dynamic manner (Purnomo, 2020) . This approach allows curriculum and evaluation to remain relevant and adaptive to student needs, technological developments, and changes in the social and economic environment. Several strategies for a flexible approach to curriculum development and evaluation:

- Responsive to Change: Curriculum and evaluation must be able to respond to changes in the demands and expectations of society, the world of work, and scientific developments. This ensures that students will have knowledge and skills that are relevant and up to date with the latest developments.
- Participation and Collaboration: Engaging participation and collaboration from various parties, such as teachers, students, parents, and other stakeholders, will enable the development of a curriculum that is more holistic and represents multiple perspectives.
- Teacher Involvement in Development: Teachers as the main actors in the educational process must be actively involved in curriculum development. They have a first-hand understanding of student needs and can provide valuable insights into designing relevant curricula.
- Integrated and Thematic Curriculum: A flexible approach can allow for the development of a more integrated and thematic curriculum. This allows students to see the relationships between different disciplines and develop a holistic understanding.

- Innovation and Creativity: Flexibility in curriculum and evaluation can provide space for innovation and creativity in the learning process. Teachers can seek more interesting and effective approaches to teaching.
- Use of Technology in Learning: The flexible approach facilitates the use of technology in learning, enriches the student experience, and assists in monitoring and evaluating student progress.
- Ability to Adapt to Individual Needs: A flexible curriculum and evaluation can help accommodate the different learning needs of each individual, ensuring that students with varying levels of abilities and interests develop optimally.

The flexible approach to curriculum development and evaluation recognizes that education is a constantly changing and dynamic process. With the adoption of this approach, curriculum and evaluation can be more adaptive, relevant, and provide greater benefits for students and society.

Conclusion

Technology integration in Islamic education is a crucial step to increase the effectiveness and relevance of education in the digital era. However, existing technology adoption challenges need to be addressed wisely. First, it is necessary to improve technological infrastructure, such as fast internet access and adequate hardware, so that teachers and students can access digital resources smoothly. Furthermore, training and professional development for teachers and education managers is essential so that they can master the use of digital tools, develop relevant digital Islamic content, and integrate technology effectively in the curriculum.

The development of quality digital Islamic content also needs to be a focus in implementing this technology integration. The content must prioritize religious values and teach Islamic principles appropriately and in accordance with today's educational needs. In facing curriculum challenges, a technology-based approach can be adopted to enrich students' learning experiences by utilizing technology as a learning tool.

The strategy for implementing technology integration in Islamic education is through improving technology infrastructure, training and professional development for teachers and education managers, compiling relevant digital Islamic content, and a technology-based curriculum approach. Addressing the challenges of adopting technology integration in Islamic education through increasing the accessibility of technology, developing technology training and certification programs for teachers, diversifying funding sources for technology integration, and a flexible approach to curriculum development and evaluation

References

Akbar, a. (2019). *Challenges and solutions in the development of educational technology in Indonesia* .

Ambarwati, d., Wibowo, u. B., Arshiaadanti, H., & Susanti, S. (2021). Literature study: the role of educational innovation in digital technology-based learning. *Journal of educational technology innovation* , *8* (2).

Ashoumi, h. (2019). Increasing student learning activities with Google classroom virtual classroom learning media. *Snasteks e-proceedings, 1* (1), 149-160.

Chandrawati, s. R. (2010). Utilization of e-learning in learning. *Journal of educational horizons , 8* (2).

Darwis, a., & Mahmud, h. (2017). Management information systems in Islamic educational institutions. *Manage: journal of Islamic education management , 2* (1). Https://doi.org/10.24256/kelola.v2i1.444

Divayana, d. GH, Suyasa, p. WA, & Sugihartini, n. (2016). Development of web-based learning media for curriculum and teaching courses in the informatics engineering education department at Ganesha University of Education. *National journal of informatics engineering education (janapati) , 5* (3), 149. Https://doi.org/10.23887/janapati.v5i3.9922

Fitriyadi, h. (2013). Information and communication technology integration in education: potential benefits, knowledge-based society, value education, implementation strategies and professional development. *Journal of technology and vocational education, volume 21, number 3, .*

Francisca, f., zahra, j. OV, Anggraini, S. H., & Aeni, a. N. (2022). Development of the Budimas e-book "Islamic religious digital book" for pie learning in elementary school students. *Basicedu journal , 6* (3), 5268–5277. https://doi.org/10.31004/basicdu.v6i3.3043

Hartanto, w. (2016). The use of e-learning as a learning medium. *Journal of economic education: scientific journals of education, economics and social sciences, 10* (1).

Herliani, a. A., & Wahyudin, d. (2019). Teacher information and communication technology competency mapping on the pedagogic dimension. *Journal of educational science research , 11* (2), 134–148. https://doi.org/10.21831/jpipfip.v11i2.19825

Ifadah, l. (2019). Learning strategies for Islamic religious education in facing the challenges of the 4.0 industrial revolution era. *Al Ghazali, 2* (2).

Ilham, a., fathurrohman, a., sam'an, m., safuan, s., munsarif, m., assaffat, l., kindarto, a., ramadhani, a., adinullhaq, j. M., febrianto, f., nurmantoro, i., ardhani, y. A., & Ariyanto, n. (2023). Increasing the competence of Madrasah Ibtidayah Duren and Sabilul Huda Bandungan teachers through information technology-based learning training. *Journal of community solar , 5* (2), 264. https://doi.org/10.26714/jsm.5.2.2023.264-269

Komariah, n. (2018). Education finance management concept. *Al-afkar: journal of Islam & civilization, 6* (1), 67-94.

Lestari, S. (2015). Factors that influence the use of ICT by teachers. *Kwangsan: educational technology journal, 3* (2), 121-134.

Miles, m. B., Huberman, a. M., & saldana, j. (2014). *Qualitative data analysis* . Sage.

Muammarullah, a. GA, & wiyani, n. A. (2023). SWOT analysis of the implementation of the Madrasah digital report card website in improving the quality of institutions where there is an interest in success. *Journal of social sciences and education (jisip) , 7* (3).

Mustaqim, d. A. (2023). The role of teacher professional education is to increase the professionalism and quality of learning in Indonesia. *Literacy: education management journal, 1* (2), 168-176.

Myori, d. E., Chaniago, K., Hidayat, R., Eliza, F., & Fadli, R. (2019). Increasing teacher competence in mastering information and communication technology through training in the development of Android-based learning media. *Jtev (Journal of Electrical and Vocational Engineering) , 5* (2), 102. https://doi.org/10.24036/jtev.v5i2.106832

Nahdi, d. S., Rashid, a., & cahyaningsih, u. (2020). Improving the professional competence of teachers through the development of information technology-based learning media. *Bernas: community service journal , 1* (2), 76–81. https://doi.org/10.31949/jb.v1i2.234

Nugraha, m. S., maskar, d. K., & rohayani, a. (2023). The concept of Islamic ethics that is relevant to digital technology. *Proceedings of international conference on Islamic civilization and humanities (icons)* , *1* (1), 106–123.

Nur'ariyani, s. (2022). Technology-based educational curriculum development. *Journal of education and counseling (jpdk), 4* (6), 10770–10775.

Nurdin, a. (2016). Islamic religious education learning innovation in the era of information and communication technology. *Tadris: journal of Islamic education, 11* (1), 49-64.

Oktavianti Nendra Utami, Khoirunnisa Endah Setiawati, Eka Salma Dina, Mau'idi Hafida, & unique Hanifah Salsabila. (2023). The development of information and communication technology in learning Islamic religious education. *Journal of Islamic Education* , *9* (1), 46–54. https://doi.org/10.37286/ojs.v9i1.218

Purnomo, s. (2020). Reformulation of Islamic education leadership in the industrial revolution era 4.0. *Insania: educational alternative thought journal, 25* (1), 54–64.

Purwanto, a. J., & Dwi Gita, R. S. (2023). Development of android-based differentiated mathematics learning media. *Prismatics: journal of mathematics education and research* , *5* (2), 131–142. Https://doi.org/10.33503/prismatika.v5i2.2696

Rivalina, r. (2015). Information and communication technology competence of teachers in improving the quality of learning. *Technodic journal* , *3* (1), 165–176. Https://doi.org/10.32550/teknodik.v0i0.121

Rohma, l. (2011). The concept of e-learning and its application to Islamic educational institutions. *An nur: journal of Islamic studies, 3(2),* 255-270.

Rostini, d., Aryani, W. D., konidin, t., politedi, u., ubaydillah, m., & lau, h. (2023). Information system resource development management at SMP Plus Al-Aitam, Bandung Regency. *Journal on education , 5* (2), 3864–3873. https://doi.org/10.31004/joe.v5i2.1071

Salsabila, u. H., riyadi, d. S., Farhani, U. A., Arrozaq, M. R., & Dalan, U. A. (2021). The role of educational technology in pie learning during the Covid-19 pandemic. *Edition, 3* (3), 489-499.

Saputra, g. W., Rivai, M. A., Su'udah, M., Wulandari, S. LG, & goddess, t. R. (2017). The influence of information technology on intelligence (intellectual, spiritual, emotional and social) case study: children. *Journal of information systems , 10* (2), 77–88.

Sholeh, m. I. (2023). *Facing fierce competition in educational institutions: a differentiation strategy in the marketing of Islamic education institutions in Indonesia . 1* (3).

Siregar, Z., & Marpaung, T. B. (2020). Utilization of information and communication technology (ICT) in learning in schools. *Best journal (biology education, science and technology)* , *3* (1), 61–69. https://doi.org/10.30743/best.v3i1.2437

Sugiyono. (2017). *Educational research methods are quantitative, qualitative and r&d approaches* . Cv. Alphabet.

Sulastri, s., Fitria, H., & Martha, a. (2020). Teacher professional competence in improving the quality of education. *Journal of education research* , *1* (3), 258–264. https://doi.org/10.37985/jer.v1i3.30

Susanti, a., & sa'ud, u. S. (2017). The effectiveness of the management of teacher professional development. *Journal of educational administration* , *13* (2). https://doi.org/10.17509/jap.v23i2.5632

Tarihoran, n. M., & Sandalwood, W. (2020). Teacher efforts in adapting classroom management for the effectiveness of online learning. *Perseda journal: journal of elementary school teacher education , 3* (3).

Wiguna, i. KW, & tristaningrat, m. AN (2022). Steps to accelerate the development of the independent learning curriculum. *Education: journal of basic education* , *3* (1), 17. https://doi.org/10.55115/edukasi.v3i1.2296

Yani, a. (2023). Technology transformation in learning in the era of the industrial revolution 4.0. *Penkomi journal: educational and economic studies, 6* (2), 68-75.

Zakariyah, a., & hamid, a. (2020). Collaborating the roles of parents and teachers in online-based Islamic religious education learning at home. *Intizar* , *26* (1), 17–26. Https://doi.org/10.19109/intizar.v26i1.5892

Zebua, f. RS (2023). Analysis of challenges and opportunities for teachers in the digital era. *Journal of informatics and educational technology* , *3* (1), 21–28.