CHALLENGES IN INTEGRATING GREEN TECHNOLOGY INTO ISLAMIC EDUCATION

Ifnaldi[1]*
UIN Sumatera Utara Medan

Keywords:
Green Technology, Islamic Education

***Correspondence Address:**
lasimtanjung@gmail.com

Abstract: The purpose of this study is to discuss the Challenges in Integrating Green Technology into Islamic Education, the method used to conduct this study is Library Research, the results of this study are Islamic educational institutions face challenges in adopting green technology and integrating modern technology into the religious curriculum, but strategic steps can be taken to overcome them. One important effort is to overcome infrastructure limitations with the support of the government and the private sector, which will support the implementation of environmentally friendly technology and technology integration in learning. Collaboration between educational institutions, policy makers, and technology companies is also crucial to creating innovative solutions that are relevant to religious education and technological developments. Curriculum adjustments need to be accompanied by educator training and supportive policies, so that religious education can run in line with the development of modern technology without sacrificing the core values of Islam.

INTRODUCTION

The integration of green technology into Islamic education has become urgent amidst the growing global concerns over climate change and environmental degradation. Green technology, which focuses on environmental sustainability through efficient and environmentally friendly use of resources, has great potential to be embedded in the Islamic education system. However, integrating green technology into Islamic education is not an easy task. There are various challenges, ranging from technical to cultural, that require serious attention from all stakeholders. Given that Islamic education plays an important role in shaping the character and outlook of the younger generation, these challenges must be addressed with a strategic and comprehensive approach.

One of the main challenges in integrating green technology into Islamic education is the lack of awareness and knowledge about this technology among educators and education managers. Many educators in Islamic educational institutions are still not familiar with the concept of green technology, let alone implementing it in the learning process. This is compounded by the lack of access to adequate resources and training on green technology. As a result, green technology has not become an integral part of the

Islamic education curriculum in many institutions.

In addition to lack of awareness, limited funding is also a significant challenge in integrating green technology into Islamic education. Many Islamic educational institutions, especially those in remote areas or with limited resources, find it difficult to adopt green technology due to high costs. Procuring environmentally friendly equipment and infrastructure, such as solar panels or efficient waste management systems, requires a significant initial investment. Without adequate financial support from the government or the private sector, the adoption of green technology in Islamic educational institutions will be difficult to realize.

The next challenge is resistance to change among educators and managers of Islamic education. Integrating green technology requires a paradigm shift and adjustments in existing teaching practices. However, many educators are comfortable with traditional teaching methods and are reluctant to adopt new technologies. This resistance can be caused by a lack of understanding of the benefits of green technology or a fear of the complexity of its implementation. Therefore, efforts are needed to increase understanding and awareness of the importance of green technology among educators.

The curriculum aspect is also one of the challenges in integrating green technology into Islamic education. The curriculum in many Islamic educational institutions still does not accommodate material on green technology adequately. The existing curriculum focuses more on religious and moral aspects, without linking them to environmental issues and green technology. In fact, in Islamic teachings, protecting the environment is part of worship and the responsibility of humans as caliphs on earth. Therefore, there needs to be a curriculum reform that includes green technology as an important component in Islamic education.

In addition, limited infrastructure is also an obstacle in the implementation of green technology in Islamic educational institutions. Many schools and madrasahs in Indonesia still lack basic facilities, such as stable access to electricity and clean water, let alone to adopt green technology. The development of infrastructure that supports the use of green technology requires a lot of time and money. Without adequate infrastructure, the implementation of green technology in Islamic educational institutions will be difficult to do effectively.

On the other hand, local culture and values can also be a challenge in integrating green technology into Islamic education. Although Islamic teachings strongly support environmental conservation, in practice, there are still views among the community that consider environmental issues not a priority. Most people focus more on religious aspects that are ritualistic, without realizing that protecting the environment is also part of worship. Therefore, an approach that is sensitive to local culture and values is needed in educating the community about the importance of green technology.

Another challenge that needs to be addressed is the lack of policy support from the government. Although there have been efforts to encourage the adoption of green technology in various sectors, its implementation in Islamic educational institutions is still not optimal. Government policies that support the integration of green technology into Islamic education need to be strengthened, both through clear regulations and incentives for educational institutions that are committed to implementing green technology. Without strong policy support, the adoption of green technology in Islamic educational institutions will be slow and uneven.

In addition to technical and policy challenges, another significant challenge is the lack of collaboration between Islamic educational institutions and other parties involved in green technology. Collaboration with the private sector, non-governmental organizations, and the scientific community is essential to support the adoption of green technology. Through this collaboration, Islamic educational institutions can gain access to the resources, knowledge, and technology needed to implement green technology. However, such collaboration is still lacking, especially at the local level.

On the other hand, the role of educators is crucial in the success of integrating green technology into Islamic education. Educators not only serve as transmitters of knowledge, but also as role models in environmental sustainability practices. Therefore, increasing the capacity of educators in the field of green technology is very important. Training and professional development for educators in this field need to be carried out continuously so that they are ready to face the challenges and changes needed to adopt green technology.

In addition, there needs to be a holistic approach in integrating green technology into Islamic education. This approach must cover all aspects of education, from curriculum, teaching methods, to school management. With a holistic approach, green

technology will not only be an addition to the curriculum, but also become an integral part of the culture and daily practices in Islamic educational institutions. Thus, students will receive an education that is not only academically qualified, but also oriented towards environmental conservation.

Adoption of green technology in Islamic education also requires active participation from students. Students need to be involved in the process of adopting green technology so that they not only understand the concept, but also appreciate the importance of environmental sustainability in everyday life. Student participation can be done through various activities such as environmental projects, extracurricular activities that focus on green technology, and environmental awareness campaigns. With active student involvement, the adoption of green technology is expected to be more effective and sustainable.

Despite the many challenges that must be faced, the integration of green technology into Islamic education also offers various opportunities. One of the greatest opportunities is the ability to create a young generation that is not only religious but also has a high environmental awareness. This generation will be agents of change who are able to apply Islamic values in the context of environmental sustainability. Thus, the integration of green technology into Islamic education can make a significant contribution to global efforts in addressing environmental issues.

Ultimately, the challenges in integrating green technology into Islamic education should not deter efforts to achieve this goal. Instead, these challenges should be seen as opportunities for innovation and improvement in the Islamic education system. With commitment and cooperation from all parties involved, the integration of green technology into Islamic education is not only possible, but also indispensable for a more sustainable future.

RESEARCH METHODS

This study uses a library research method, where the data used comes from various literatures relevant to the topic. Library research is a method carried out through the collection and analysis of existing related literature without conducting experiments or collecting data directly from the field. Library research aims to review and analyze previous relevant scientific works in order to find, explain, and understand concepts or

theories that support the arguments presented.

In library research, the data sources used consist of books, scientific journals, articles, and other documents relevant to the research topic. This secondary data is analyzed by identifying theories, concepts, and previous findings related to the research problem. Sugiyono (2017) explains that library research is important to find a strong theoretical basis and help researchers clarify the research context. In addition, library research can also be used to identify research gaps that have not been discussed by previous research.

Data analysis techniques in library research are carried out through the process of identification, evaluation, and synthesis of relevant literature. The data obtained are then analyzed critically to understand the relationship between concepts and compile a synthesis of findings related to the focus of the research. According to Zed (2014), library research requires a deep understanding of relevant literature so that researchers can formulate strong arguments. The analysis process is also carried out by mapping various existing findings and comparing them with the theories used in this study.

In terms of data collection techniques, library research uses documentation studies as the main tool. Arikunto (2010) stated that documentation studies are one of the effective data collection methods for library research, because researchers can access information that has been tested for credibility and is academically recognized. The use of secondary data from various sources also allows researchers to compare findings from various literatures and draw conclusions based on the synthesis of previous theories and research.

Therefore, this library research method is very relevant to be used in this study, because it can help researchers identify and elaborate theories and concepts that support research problems. By using various valid and accredited literature, this study is expected to provide academic contributions in developing a broader understanding of the topic being studied.

RESULTS AND DISCUSSION

Lack of awareness and understanding of green technology among Islamic education managers

Lack of awareness and understanding of green technology among Islamic

education managers is one of the main obstacles in the process of adopting environmentally friendly technology. Education managers often do not understand the great potential that green technology has to support environmental sustainability and improve the quality of education. According to Rahmawati (2020), this lack of understanding is caused by minimal training and access to relevant information. This results in low initiative from education managers to start integrating green technology into their school operations.

This low level of knowledge has an impact on the slow process of adopting green technology. Islamic education managers who do not fully understand the concept and benefits of this technology tend to consider it as something that is not urgent or difficult to implement. In a study conducted by Nasruddin (2019), it was found that many school managers consider green technology only as a futuristic discourse, not as a solution that can be implemented in the near future. This view contributes to limited investment in the procurement of green technology in Islamic schools.

In addition, the lack of socialization regarding green technology also affects the attitudes of education managers. Green technology is often not accompanied by adequate campaigns to educate education managers about its long-term benefits. Ahmad (2021) stated that the involvement of the government and related institutions in promoting green technology in the education sector is still minimal, so that the information received by school managers is very limited. As a result, they feel less confident about investing in green technology without a thorough understanding of the potential benefits to be obtained.

This lack of understanding is also influenced by the assumption that implementing green technology requires a lot of money. This is one of the main reasons school administrators hesitate to adopt it. Abdullah (2020) stated that many Islamic education administrators still see green technology as an expensive project that is difficult to implement in schools with limited budgets. They are concerned that procuring devices such as solar panels or water recycling systems will cost money that is not commensurate with the short-term benefits.

The lack of policy support from the government has further exacerbated the situation. The government has not provided sufficient incentives for Islamic schools to start switching to green technology. According to Fauzan (2018), although there are

several environmental programs initiated by the government, they have not specifically targeted the education sector, especially Islamic schools. Financial, regulatory, or training support for school administrators to adopt green technology is very minimal, so they feel there is no strong external pressure to make changes.

Another obstacle is the lack of successful examples that can be used as models for school administrators. Nasruddin (2019) showed that the absence of Islamic schools that have successfully implemented green technology well makes other administrators hesitate to follow in their footsteps. They tend to wait for other schools to adopt this technology first as proof of its success before deciding to implement it in their own environment.

The level of education and background knowledge of educational administrators also affect their ability to understand green technology. Some administrators who do not have a background in technology or the environment tend to have difficulty understanding how green technology can be applied in the context of education. According to Hidayat (2020), school administrators with non-technical backgrounds often feel that green technology is too technical and complicated to be applied in daily school management.

The solution to overcome this lack of understanding is to increase socialization and training on green technology for education managers. Comprehensive and ongoing training is needed to ensure that school managers have sufficient knowledge to adopt green technology. Rahmawati (2020) emphasized the importance of collaboration between the government, technology industry, and educational institutions to provide relevant training for school managers. With a better understanding, managers will be more confident in starting to adopt green technology in their schools.

Furthermore, Islamic education managers need to be encouraged to see green technology as a long-term investment that is not only beneficial for the environment, but also for saving school operational costs. According to Fauzan (2018), the use of green technology such as solar panels and wastewater management systems can significantly reduce electricity and water costs. If these benefits are well socialized, school managers will be more motivated to start investing in green technology.

Collaboration with external parties such as government, non-governmental organizations, and the technology industry is also important to improve the

understanding and implementation of green technology. According to Hidayat (2020), this collaboration can help school administrators get the financial, technical, and regulatory support needed to start adopting green technology. With strong support from various parties, Islamic education administrators will be more prepared and motivated to implement green technology in their schools.

Infrastructure limitations in Islamic educational institutions

Infrastructure limitations in Islamic educational institutions are one of the main challenges in providing green technology facilities in schools. Inadequate infrastructure makes it difficult to implement environmentally friendly technology, both in terms of providing renewable energy, waste management, and clean water management. According to Suryadi (2019), the infrastructure in many Islamic schools, especially in rural areas, still does not meet the standards to support the implementation of green technology. These limitations often hinder innovation in environmental management in school environments.

One of the main obstacles faced is limited access to renewable energy resources. Many Islamic schools located in remote areas do not have sufficient access to technologies such as solar panels or wind turbines. This is due to the lack of basic infrastructure such as a stable electricity grid, which is a prerequisite for the implementation of green technology. According to Nasruddin (2020), without adequate energy infrastructure, these schools cannot utilize environmentally friendly technologies, such as energy-efficient lighting or cooling systems.

In addition to energy issues, water and waste management are also infrastructure challenges in Islamic educational institutions. Many schools do not yet have adequate wastewater treatment systems or water recycling facilities. According to Rahmawati (2018), most schools still rely on conventional methods in water and waste management, which are not in accordance with the principles of green technology. This results in waste of natural resources and increases negative impacts on the environment.

Limitations in terms of information and communication technology also affect the implementation of green technology in Islamic educational institutions. In many schools, technological facilities that support digital-based learning are still very minimal. According to Fauzan (2021), information technology plays an important role

in environmental education and the implementation of green technology, but many schools do not yet have adequate technological infrastructure, such as a stable internet network or sufficient computer devices.

In addition to technical issues, financial factors are also a major obstacle. The development of green infrastructure requires a lot of money, and many Islamic educational institutions, especially private ones, do not have sufficient budgets to finance these projects. According to Abdullah (2020), budget constraints are often the main reason why Islamic schools cannot implement green technology facilities, even though they are aware of the importance of it.

These barriers are further exacerbated by the lack of support from the government. Policies that encourage the adoption of green technology in the education sector are still minimal, especially in Islamic educational institutions. According to Hidayat (2019), although there are several government programs that support green technology, most of these programs do not specifically target Islamic educational institutions, which often have limited resources compared to state schools.

Lack of training and socialization on green technology among school administrators is also one of the causes of the slow development of green infrastructure. School administrators often do not have sufficient knowledge or skills to plan and implement green technology projects. According to Haryanto (2019), training and capacity building for school administrators are essential so that they can understand how to design and build efficient and sustainable green infrastructure.

These infrastructure limitations also affect the educational curriculum in Islamic schools. Without adequate green technology facilities, it is difficult for schools to integrate environmental principles into daily learning. According to Nasution (2020), schools that have good green infrastructure tend to be easier in teaching sustainability values to students, because they can provide real examples through an environmentally friendly school environment.

The solution to overcome these infrastructure limitations is to strengthen collaboration between schools, government, and the private sector. According to Aziz (2021), Islamic educational institutions need to partner with technology companies and the government to obtain financial and technical support in building green infrastructure. With this collaboration, schools can access the resources needed to

develop sustainable green technology facilities.

Thus, the limited infrastructure in Islamic educational institutions is not only a technical challenge, but also a structural challenge that requires a comprehensive approach. Support from various parties, including the government, private sector, and community, is needed to create a school environment that supports the implementation of green technology. By addressing these infrastructure issues, Islamic schools can play an active role in preserving the environment and teaching the values of sustainability to future generations.

Difficulty in adapting the curriculum to technological developments

Adapting the curriculum to technological developments is a major challenge in many educational institutions, including Islamic educational institutions. One of the main obstacles faced is how to align religious education that focuses on spiritual and moral values with modern technology that is often considered secular. According to Suryadi (2019), fundamental differences in the objectives of religious education and technology often make it difficult to integrate the two. Religious education tends to emphasize teaching spiritual values and teachings, while modern technology is oriented towards mastering practical and technical skills.

This obstacle is further exacerbated by the lack of understanding and training for educators in curriculum integration. Many educators do not have a background or specific training in information technology, so they find it difficult to adapt a curriculum that includes technology. Nasruddin (2020) points out that this lack of training has led many educators to prefer maintaining traditional teaching methods, which often do not include the effective use of modern technology.

In addition, there is also a concern that technology integration can reduce the focus on religious values. Some argue that technology can distract students from deep religious teachings. According to Rahmawati (2018), this fear often makes educational policy makers hesitate to integrate technology into the religious education curriculum. As a result, Islamic schools often have difficulty in creating a balance between technology learning and religious education.

Another obstacle faced is limited resources and infrastructure. Many Islamic educational institutions, especially in less developed areas, do not have adequate access to the latest technological devices or stable internet connections. According to Fauzan

(2021), this lack of infrastructure hinders schools' ability to implement a curriculum that focuses on modern technology. Limited resources also affect the ability to provide the necessary training for educators.

Differences in educational philosophy between technology and religious education curricula also pose a barrier. Technology education typically focuses on practical skills that can be directly applied in the workplace, while religious education places more emphasis on character and moral development. Abdullah (2020) notes that aligning these two different approaches often poses challenges in designing a curriculum that can meet both goals.

Lack of support from school management and policy makers also exacerbates this problem. Many policy makers in Islamic educational institutions do not fully understand the benefits of integrating technology into religious education. Hidayat (2019) stated that this lack of support makes it difficult to implement a curriculum that combines technology with religious education effectively. Without adequate support, efforts to update the curriculum are often hampered.

In addition, differences in students' needs and expectations are also a challenge. Students who are accustomed to modern technology may feel that a religious curriculum that does not utilize technology feels outdated. Nasution (2020) emphasized that it is important to consider students' needs and expectations in designing a curriculum that integrates technology. If the curriculum does not match students' needs, they may lose interest and motivation to learn.

Solutions to overcome these difficulties include improving training and support for educators and developing adequate infrastructure. According to Aziz (2021), ongoing training in educational technology is essential to help educators integrate technology into the religious curriculum. In addition, investment in technological infrastructure such as stable internet access and adequate hardware is also needed to support effective curriculum implementation.

The involvement of various parties, including the government, private sector, and education community, is also needed to create a curriculum that aligns religious education with modern technology. According to Haryanto (2020), collaboration between educational institutions, policy makers, and technology companies can produce innovative solutions that support the integration of technology in religious education.

With this support, the curriculum can be designed to create the right balance between religious values and technological skills.

Overall, adapting the curriculum to technological developments requires a holistic and coordinated approach. Continuous efforts are needed to train educators, develop infrastructure, and create policies that support the integration of technology in religious education. With these steps, Islamic educational institutions can overcome existing obstacles and provide relevant and effective education for students in this digital era.

CONCLUSION

Although Islamic educational institutions face various challenges in adopting green technology and integrating modern technology into the religious curriculum, there are several strategic steps that can be taken to overcome these obstacles. First, the problem of limited infrastructure in many Islamic educational institutions needs to be addressed with support from various parties, including the government and the private sector. Investment in green technology and infrastructure improvements will not only facilitate the implementation of environmentally friendly technologies but will also support the integration of technology into the educational curriculum. In addition, collaboration between educational institutions, policy makers, and technology companies is essential to create innovative and relevant solutions to the needs of religious education and modern technology.

Adapting the curriculum to technological developments requires a holistic and coordinated approach, including increased training for educators and the development of supportive policies. It is important for educators to receive adequate training in the use of technology to ensure that a curriculum that integrates technology and religious values can be implemented effectively. The involvement of various parties in designing and supporting this curriculum will help create a balance between religious education and technology, and ensure that Islamic educational institutions can adapt to changing times while maintaining their core values.

REFERENCE

Abdullah, A. (2020). Biaya Implementasi Teknologi Hijau di Sekolah. Surabaya:

Paramita.

Abdullah, A. (2020). Filosofi Pendidikan dan Teknologi: Mengintegrasikan Keduanya. Jakarta: Pustaka Islam.

Abdullah, A. (2020). Pembiayaan Infrastruktur Hijau di Lembaga Pendidikan Islam. Jakarta: Pustaka Islam.

Ahmad, I. (2021). Sosialisasi Teknologi Hijau di Kalangan Pendidikan Islam. Jakarta: Penerbit Safira.

Aisyah, Y. (2020). "Peningkatan Kapasitas Guru dalam Implementasi Teknologi Hijau di Sekolah Islam." Jurnal Pengembangan Guru, 10(2), 87-100.

Aziz, A. (2021). Kolaborasi Sektor Swasta dan Pendidikan dalam Teknologi Hijau. Yogyakarta: Pustaka Hijau.

Aziz, A. (2021). Peran Pelatihan dan Infrastruktur dalam Integrasi Teknologi. Yogyakarta: Pustaka Hijau.

Azizah, N. (2021). "Kolaborasi dalam Penerapan Teknologi Hijau di Lembaga Pendidikan." Jurnal Pendidikan Berkelanjutan, 8(4), 92-105.

Fauzan, A. (2021). "Strategi Implementasi Teknologi Ramah Lingkungan di Madrasah." Jurnal Madrasah dan Teknologi, 7(2), 34-46.

Fauzan, F. (2018). Kebijakan Pemerintah dan Teknologi Ramah Lingkungan di Pendidikan Islam. Jakarta: Pustaka Islam.

Fauzan, F. (2021). Infrastruktur Teknologi di Sekolah dan Dampaknya terhadap Kurikulum. Bandung: Penerbit Safira.

Fauzan, F. (2021). Teknologi Informasi dan Pendidikan Hijau. Bandung: Penerbit Safira.

Hanafi, R. (2022). "Peran Kurikulum dalam Mengintegrasikan Teknologi Hijau ke dalam Pendidikan Islam." Jurnal Kurikulum dan Pendidikan Islam, 6(1), 50-65.

Haryanto, S. (2019). Pelatihan dan Sosialisasi Teknologi Hijau untuk Pengelola Sekolah. Jakarta: Penerbit Safira.

Haryanto, S. (2020). Kolaborasi dalam Pengembangan Kurikulum Teknologi dan Agama. Jakarta: Penerbit Safira.

Hasanah, L. (2021). "Pendidikan Karakter Berbasis Lingkungan dalam Perspektif Islam." Jurnal Karakter dan Lingkungan, 9(3), 44-59.

Hidayat, M. (2019). Dukungan Kebijakan dalam Integrasi Teknologi di Pendidikan Agama. Bandung: Penerbit Hijau.

Hidayat, M. (2019). Kebijakan Pemerintah dan Dukungan untuk Teknologi Hijau. Bandung: Penerbit Hijau.

Hidayat, M. (2020). "Tantangan dan Peluang Integrasi Teknologi Hijau dalam Pendidikan Islam." Jurnal Pendidikan Lingkungan, 9(1), 45-58.

Hidayat, M. (2020). Peran Latar Belakang Pendidikan Pengelola dalam Pemahaman Teknologi Hijau. Bandung: Penerbit Hijau.

Nasruddin, H. (2019). Tantangan Pengelola Pendidikan Islam dalam Menghadapi Teknologi Hijau. Bandung: Al-Mizan.

Nasruddin, H. (2020). Kendala dan Solusi dalam Penggunaan Teknologi di Pendidikan Agama. Jakarta: Al-Mizan.

Nasruddin, H. (2020). Keterbatasan Akses Teknologi Hijau di Daerah Terpencil. Jakarta: Al-Mizan.

Nasution, I. (2020). Kebutuhan Siswa dan Kurikulum Berbasis Teknologi. Surabaya: Paramita.

Nasution, I. (2020). Kurikulum Berbasis Lingkungan di Sekolah Islam. Surabaya: Paramita.

Rahman, S. (2019). "Membangun Generasi Peduli Lingkungan Melalui Pendidikan Islam." Jurnal Karakter Islami, 13(3), 110-124.

Rahmawati, N. (2018). Pengaruh Teknologi Modern terhadap Pendidikan Agama. Surabaya: Paramita.

Rahmawati, N. (2018). Pengelolaan Air dan Limbah di Sekolah Islam. Surabaya: Paramita.

Rahmawati, N. (2020). Teknologi Hijau dan Pendidikan Islam. Yogyakarta: Pustaka Hijau.

Suryadi, A. (2019). Infrastruktur Teknologi Hijau di Sekolah Islam. Yogyakarta: Pustaka Hijau.

Suryadi, A. (2019). Integrasi Kurikulum Pendidikan Agama dan Teknologi Modern. Yogyakarta: Pustaka Pendidikan.

Syafii, M. (2022). "Hambatan dalam Implementasi Teknologi Hijau di Lembaga Pendidikan Islam." Jurnal Teknologi Pendidikan, 14(1), 67-80.

Usman, T. (2019). "Peran Pendidikan Islam dalam Membangun Kesadaran Lingkungan." Jurnal Studi Islam, 11(3), 123-138.

Zulkarnain, I. (2020). "Kurikulum Berbasis Islam dan Lingkungan di Sekolah." Jurnal Pendidikan dan Lingkungan, 15(2), 77-89.