
Integration of Learning, Innovation, and SDGs Value in Pesantren: Sustainable Islamic Education Development

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Abstract

Objective: This study aims to examine the implementation of learning innovations and the integration of Sustainable Development Goals (SDGs) values in the Darul Ilmi Islamic Boarding School, as well as the strategies used in dealing with the digital era and the challenges that arise during the integration process. **Theoretical framework:** The theoretical framework of this research is based on the concept of sustainable Islamic education that integrates global values (SDGs), local wisdom, and Islamic principles as a foothold in the development of an Islamic boarding school education system that is adaptive to the changing times. **Literature review:** The literature review includes studies on pesantren education innovations, the integration of SDGs values in the learning system, and the transformation of sustainability value-based education, which is still limited, especially in the context of children's pesantren. **Methods:** This study uses a qualitative approach with data collection techniques in the form of in-depth interviews, direct observation, and documentation. The main informants consist of pesantren caregivers, accompanying teachers, and students who are selected purposively. Data analysis was carried out using the Miles and Huberman model: data reduction, data presentation, and a conclusion drawn. **Results:** The results show that SDGs-based learning innovations are implemented through contextual approaches that combine global, local, and Islamic values. This innovation has a positive impact on the quality of learning and social relevance of Islamic boarding schools, as well as improving the image of Islamic boarding schools in the community. **Implications:** Providing an adaptive and sustainable model of Islamic education in responding to global challenges. **Novelty:** Offers a new study on the integration of SDGs in children's boarding schools, which is still rarely discussed scientifically.

Keywords: learning innovation, sdgs, islamic education, development strategy, pesantren.

INTRODUCTION

Learning in pesantren is generally known as an education system rooted in tradition. This characteristic can be seen from the use of teaching methods and media that tend to be conventional. In the learning process, the approach used still relies heavily on old patterns that have been applied from generation to generation [1]. One of the main characteristics of this system is the use of a one-way teaching method, where the teacher or kyai is the main source of knowledge. This pattern reflects the classical education system that emphasises the delivery of material directly from the teacher to the student, without much mutual interaction. The focus remains on character formation and the strengthening of religious values and morality [2].

In addition to emphasising spiritual and ethical aspects, pesantren also strive to maintain cultural heritage and noble values that have become their identity. This tradition becomes an important foundation in the educational process, which aims to form a person who is not only intellectually intelligent but also spiritually strong. To answer the challenges and needs of modern education, many pesantren have begun to adapt technology and contemporary learning methods that are more varied and interactive. This effort reflects the synergy between the preservation of old values and innovations in the world of education [3].

Learning innovation in pesantren is an important need because the world of education continues to change with the times. Pesantren, as an Islamic educational institution that has a big role in shaping the character and morals of the younger generation, cannot be separated from the demand to remain relevant to social, technological, and globalization developments. Without innovation, pesantren are at risk of being left behind and less able to respond to the challenges of the times, especially in preparing students to be ready to contribute actively to an increasingly complex society. The integration of Sustainable Development Goals (SDGs) values in pesantren is also very crucial. The SDGs are a global development agenda that includes various important aspects, such as poverty alleviation, quality education, gender equality, and environmental conservation. Internalising the values of the SDGs, pesantren can expand their educational vision from just religious education to education that touches on humanitarian issues and the sustainability of life. This will foster social awareness, environmental concern, and a sense of global responsibility among students [4].

Furthermore, learning innovations and the application of SDGs values can improve the quality of pesantren graduates so that they not only excel in religious science but also have 21st-century skills such as critical thinking, collaboration, creativity, and digital literacy [5]. This is very important in equipping students to be actively involved in building a fair, inclusive, and sustainable society. Education in pesantren is no longer enough to only produce spiritually pious individuals, but also to produce agents of change that are solutions to various local and global problems. Learning innovation and strengthening SDGs values in pesantren is not only an option, but a must. This will make pesantren remain relevant, adaptive, and make a real contribution to creating a better future [6].

This paper complements several existing writings related to learning innovation and the integration of SDGs values in pesantren. In line with that, the purpose of this paper is to (a) find out the implementation of learning innovations and SDGs integration in pesantren, (b) find out the implications of learning innovations and SDGs values in pesantren, and (c) identify challenges in learning innovations and integration of SDGs values in pesantren. The benefits of this research are expected to provide a complete picture of learning innovation and the integration of SDGs values as a strategy for sustainable Islamic education development. This paper is

based on three arguments. First, the use of learning innovations and the integration of SDGs values can improve the quality of learning in pesantren. Second, the use of learning can have an impact on the kyais and students directly. Third, the challenges of learning innovation and the integration of SDGs values as a sustainable Islamic education strategy are based on the readiness of human resources to manage pesantren [6].

LITERATURE REVIEW

Learning Innovation

Learning innovation is a response to the dynamics of the times that continue to change, especially in the context of globalisation, digitalisation, and the transformation of student needs [7]. The world of education is required to not only convey knowledge traditionally, but also to be able to create a contextual, fun, and meaningful learning process [8]. Therefore, various scientific studies have begun to underline the importance of new approaches that can adapt learning methods to the characteristics of students and technological developments [9].

Learning innovation is any form of planned change in strategies, methods, or media or learning environments that aim to improve the quality of learning processes and outcomes [10]. Innovation in learning has to do not only with the use of technology but also includes a pedagogical approach that emphasises active student engagement, collaboration, and the creation of meaning [11]. In this context, teachers play the role of adaptive and creative learning facilitators in designing teaching strategies. Learning innovations can be realised in various forms, such as Project-Based Learning [12], collaborative learning, digital technology-based learning, and the flipped classroom. These models not only increase learner engagement but also develop critical thinking, problem-solving, and teamwork skills [13], [14].

Learning innovations have been proven to increase the effectiveness of the learning process, increase student motivation, and provide a more meaningful learning experience. Students become more active, creative, and have autonomy in the learning process. In addition, innovation also encourages the transformation of the role of teachers from material presenters to facilitators, mentors, and learning partners. Learning innovation shows the urgency for educational institutions, including pesantren, to continue to innovate to remain relevant to the times. Further research is expected to focus not only on technical implementation but also on exploring the philosophical, social, and cultural aspects of educational innovation. Thus, learning innovation is not only a technical instrument but also an integral part of the ongoing educational transformation process [15].

The Concept of SDGs

Conceptually, the SDGs are understood as a development framework that includes three main dimensions, namely economic, social, and environmental, which are interrelated and inseparable from each other. The SDGs are not only a set of policy targets, but also a representation of humanitarian values and global solidarity. The goals of the SDGs demand the active role of all elements of society, including educational institutions, the private sector, and civil society, in integrating the principles of sustainable development into daily life and institutional policies [16].

One of the goals of the SDGs, namely "Quality Education," is one of the main focuses in the literature that discusses the role of education in supporting sustainable development. The SDGs encourage the creation of an inclusive, equitable, and quality education system, as well as provide lifelong learning

opportunities for all. In this context, education is seen not only to develop cognitive skills, but also as a tool to form character, environmental awareness, and active participation in society [17].

The integration of Sustainable Development Goals (SDGs) values into the education system, especially in the pesantren environment, requires adjustment to the local context and the cultural values of the local community. The application of global values such as the SDGs cannot be done uniformly because each region has different social, economic, and cultural conditions. Therefore, a contextual approach is important so that sustainable development goals can truly touch the needs and realities of local communities. In its implementation, the success of achieving the SDGs is highly dependent on the active involvement of communities and local stakeholders. Their participation is key to ensuring that the implementation of the program runs effectively, inclusively, and sustainably. In this case, pesantren have a strategic role because of their existence, which is integrated with people's lives. Pesantren are not only a center for religious education but can also be agents of social change that bridge local values with the global development agenda in harmony [18].

Islamic Education

Islamic education is a process of fostering and developing individuals based on Islamic teachings sourced from the Qur'an and Hadith. In academic literature, Islamic education is not only interpreted as the transmission of religious sciences, but also as a system that forms the complete personality and character of Muslims, including spiritual, intellectual, moral, and social aspects. The main goal of Islamic education is to form kamil people, namely, complete human beings who are pious, have noble character, and are beneficial to society [19].

In various studies, Islamic education has a strong philosophical and theological foundation. Education in Islam is not only a cognitive process, but also an effort to instill the values of monotheism, morality, and social responsibility [20]. Islamic education has traditionally focused on mastering Islamic sciences such as fiqh, monotheism, tafsir, and hadith. However, in its development, Islamic education began to adopt a more comprehensive and integrative approach with modern sciences. In terms of methodology, Islamic education uses talaqqi methods, discussion, memorisation, and worship practices as a means of character formation. Recent literature shows an increase in the use of technology and an active pedagogical approach in the contemporary Islamic educational environment [21].

Islamic education is held in various forms of institutions, ranging from pesantren, madrasas, integrated Islamic schools, to Islamic universities. The literature shows that each institution has characteristics and strategic roles in preserving Islamic values while responding to the challenges of the times. Pesantren, for example, are known as centres of moral and spiritual education, while Islamic madrasas and universities tend to combine Islamic knowledge with general knowledge in their learning systems [22].

Islamic education faces various challenges in the modern era, including demands to be more adaptive to technological developments, job market needs, and globalisation trends that affect the perspective of the younger generation. Therefore, transformation in Islamic education is urgent, especially in terms of curriculum, learning methods, and strengthening contextual Islamic values. Efforts to integrate Islamic values and 21st-century skills have become an important topic in the current literature [23].

Islamic education indicates the need to continue to develop relevant, transformative, and contextual educational models. Future research is expected to

explore more deeply how Islamic education can contribute to the achievement of the Sustainable Development Goals (SDGs), improve people's quality of life, and strengthen Islamic identity during a changing world. Islamic education must be able to be a bridge between tradition and modernity in responding to global challenges wisely [23].

Development Strategy

Sustainable strategy is a long-term approach used by organisations, institutions, and governments to achieve goals by considering economic, social, and environmental aspects in a balanced manner. In the literature, sustainable strategies are understood as a response to global challenges such as climate change, resource scarcity, social inequality, and demands for transparency. This concept is rooted in the sustainable development paradigm that emphasises the balance between business sustainability and life sustainability in general [24].

In the context of education and society, sustainable strategies are closely related to the development of superior, equitable, and inclusive human resources. Several studies have shown that educational institutions that implement sustainable strategies can create a learning ecosystem that supports environmental literacy, social awareness, and active involvement in the community. This strategy includes the integration of a curriculum based on sustainability values, energy efficiency in the school environment, as well as partnerships with communities to encourage collective action [25].

The implementation of a sustainable strategy requires concrete steps, including data-driven planning, impact evaluation, and stakeholder engagement. The success of this strategy depends not only on policies but also on organisational culture change and visionary leadership. In the business world, for example, sustainable strategies are reflected in the use of renewable resources, production process efficiency, and sustainability reporting. Meanwhile, in the public and education sectors, this strategic practice involves the active participation of all parties in creating systemic change [26].

METHODOLOGY

This research is a qualitative study that aims to examine the implementation of learning innovations and the integration of Sustainable Development Goals (SDGs) values in the pesantren Darul Ilmi Semarang. The selection of the research location is based on the policy direction of the development of the pesantren, which has shown a strong tendency towards the application of learning innovations and the integration of SDGs principles in the education system. This research not only focuses on the implementation aspect but also explores the strategy of pesantren as part of efforts to digitise education in the pesantren environment [27].

The main purpose of this study is to explore in-depth information from informants related to the real practices of learning innovation and the integration of SDGs values in pesantren. In addition, this study also seeks to reveal the implications of the application of these innovations to the learning process in pesantren, as well as the challenges faced in the integration process. This focus is expected to be able to provide a comprehensive picture of the readiness and ability of pesantren in facing the dynamics of global education based on sustainability values [28].

Data collection was carried out using three main techniques, namely in-depth interviews, direct observation, and documentation. These three methods are used simultaneously to obtain valid and reliable data in answering the formulation of research problems. The research was carried out for four months, from January to

April 2025. The qualitative approach was chosen because it is considered most suitable for exploring complex and contextual social and educational phenomena such as those that occur in the pesantren environment [29].

The informants in this study consisted of pesantren caregivers, accompanying teachers, and students. The selection of informants was carried out purposively with the consideration that these three groups have a strategic role and a deep understanding of the implementation of learning innovations and the integration of SDGs values [30]. The data collection process begins with the determination of the problem and the preparation of a research design, followed by the development of instruments consisting of interview guides, observation sheets, and documentation guidelines. Once the instrument is ready, the next step is to determine the research informant and carry out the data collection process. All data collected is then carefully checked to ensure the validity and completeness of the information obtained [31].

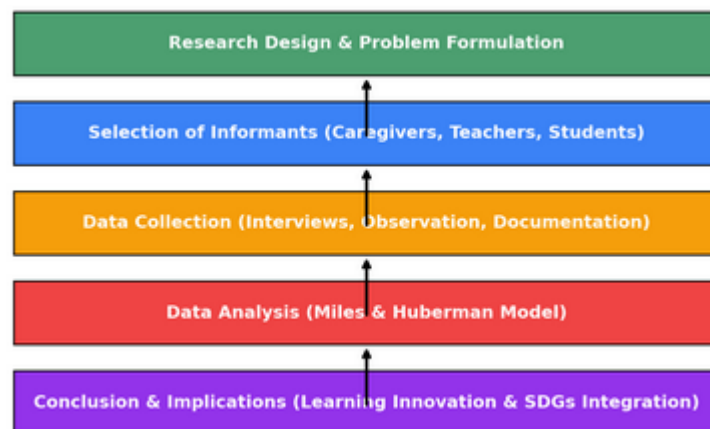


Figure 1. Research Methodology Flow: Learning Innovation and SDGs Integration in Pesantren Darul Ilmi Semarang

The data analysis in this study uses a qualitative analysis model according to Miles and Huberman, which includes four main stages: data collection, data reduction, data presentation, and conclusion drawn. This approach allows researchers to comprehensively understand the dynamics that occur in the field and compile research findings in a systematic and meaningful manner [32]. The results of this research are expected to be a reference for the development of learning innovations and the integration of SDGs in the pesantren environment more broadly.

RESULTS AND DISCUSSION

The application of learning innovations and the integration of Sustainable Development Goals (SDGs) values have been proven to improve the quality of learning in pesantren. At the Darul Ilmi pesantren in Semarang, efforts to improve the quality of education are carried out consistently through a more contextual, adaptive, and technology-based learning approach. This approach not only emphasises the mastery of religious knowledge but also the development of students' insight into global issues relevant to today's life.

One form of innovation applied in this pesantren is the use of diverse and innovative Islamic Religious Education learning methods. The learning process is not only carried out in classes and lectures, but also through hands-on methods, simulations, and learning based on digital media such as podcasts. The use of podcasts as a means of learning provides flexibility for students to access materials anywhere and anytime, thus encouraging them to become more independent and

active learners. Learning at the Darul Ilmi pesantren is not only facilitated by pesantren caregivers but also by accompanying teachers who are competent in their fields. Even on some occasions, pesantren present external resource people who have special skills to enrich the perspectives and knowledge of students. This shows that there is collaboration between various parties in supporting a quality learning process. This is in line with previous research related to collaboration between various parties [33].

The learning process is carried out on a scheduled basis and adjusted to the needs and characteristics of students. With this approach, every student can experience relevant and meaningful learning. This innovation aims to create a learning experience that is varied, not monotonous, and able to stimulate critical thinking and life skills of students outside the pesantren environment. Based on the results of the study, the use of podcast media in learning is considered very helpful in providing alternative learning resources. This medium not only makes it easier to access information but also enriches the learning experience through an engaging audio approach. Students became more enthusiastic in following the material, especially those who were packaged in the form of light discussions, thematic lectures, and interviews with inspirational figures [34].

The integration of SDGs values in learning innovation reflects the commitment of the Darul Ilmi pesantren to become an educational institution that is adaptive to global, social, and environmental developments. Sustainability values are adopted without abandoning the roots of Islamic teachings that are the foundation of education in pesantren. This is an important step to make pesantren a holistic educational centre that is relevant to the challenges of the times [35].

One of the main values that is integrated is the improvement of the quality of inclusive and equitable education. Its implementation is reflected in technology-based learning, the integration of religious and general science curricula, and teacher capacity in modern learning methods. Pesantren also seeks to strengthen gender equality by providing a fair learning space for male and female students, as well as developing a non-discriminatory learning environment. The value of SDGs integrated in pesantren can be seen in the following table.

Table 1. The Value of The SDGs Integrated in Pesantren

No	The Value of SDGs	Description
1	Improving the quality of inclusive and equitable education	The implementation of learning is emphasised to develop education that is not discriminatory and provides opportunities for all students without discrimination
2	Curriculum that develops religious science and general science	The implementation of learning is not only emphasised on religious knowledge, but also provides general knowledge that is needed for students when living in the community
3	Gender Equality in Education	The learning process provides ample opportunities for all students without distinguishing between men and women.
4	Strengthening the capacity of teachers	Improving the quality of learning is emphasised on the quality of teachers who teach, so that capacity building is always

given to teachers according to their needs.

Based on Table 1, pesantren have made efforts to standardise the values of the SDGs to develop the quality of education in pesantren in a sustainable manner. This is also strengthened by the results of interviews conducted with several informants. The results of the interview with the caregiver of the pesantren show that learning innovations have been implemented by implementing podcast-based learning as one of the innovations implemented in the Darul Ilmi pesantren. Learning is also developed through various methods and practices to provide diverse experiences for students. Learning has also been carried out by strengthening gender equality by providing an interactive space, without distinguishing between male and female students.

With this learning innovation and integration of SDGs values, the Darul Ilmi pesantren in Semarang shows its strategic role as an educational institution that not only preserves Islamic traditions but also responds to the demands of the times. The transformation of education in pesantren through innovation and sustainability values is expected to be able to form students who are broad-minded, concerned about global issues, and ready to contribute positively to society. The implementation of learning innovations that are integrated with the values of the Sustainable Development Goals (SDGs) at the Darul Ilmi Semarang has a significant positive impact, especially in increasing the learning motivation of students. This is in line with the results of previous research that, through a more relevant, contextual, and interactive learning approach, students become more enthusiastic in following the teaching and learning process. This innovation makes learning not only limited to religious aspects but also touches on global issues related to sustainability, the environment, and humanity [36].

In addition, the integration of SDGs values in the pesantren curriculum opens up new insights for students. They are invited to understand their role as part of a global society that has social and environmental responsibility. This encourages the birth of a generation of students who are not only proficient in religious science but also have a concern for social issues and are ready to make a real contribution to society. The positive implications of this transformation are also felt by the pesantren itself. By implementing technology-based learning innovations and utilising social media as a means of publication, the Darul Ilmi pesantren is increasingly known by the wider community. The existence of pesantren is not only limited to the local environment, but also able to reach a larger audience nationally and even internationally [37].

The strategic use of social media also plays an important role in building a positive image of the pesantren. Documentation of learning activities, student involvement in social projects, and the introduction of superior programs that are in line with SDGs values are a special attraction for the community. This shows that pesantren are not educational institutions that are left behind, but institutions that are adaptive and progressive to the changing times [38]. Overall, the transformation of education at the Darul Ilmi Islamic pesantren through the integration of learning innovations and SDGs values is a strategic step in preparing students to face future challenges. Pesantren is not only a place to gain religious knowledge, but also a centre for character development and global insight. Thus, pesantren can produce a superior generation, has noble morals, and cares about the sustainability of life on earth [39].

The implementation of learning innovations in Islamic education in pesantren still faces several challenges that are quite complex. One of the main challenges is the limitation of human resources, especially teaching staff who have competence in developing innovative learning methods that are in line with the values of the SDGs

(Sustainable Development Goals). Many teachers still use traditional approaches that do not fully support contextual, interactive, and development-oriented learning processes. This limitation is exacerbated by the absence of a structured management system to support the development of learning innovations in the pesantren environment. Without clear management, innovative initiatives are often sporadic and unsustainable. As a result, efforts to present more relevant and modern learning have been hampered, both in terms of planning and implementation. This is in line with the results of previous research, which emphasised strong management of pesantren [40].

In addition, the integration of SDGs values in the Islamic pesantren education curriculum is still not optimal. This is due to the lack of understanding and training on the importance of SDGs in the context of Islamic education. Many aspects of the SDGs are very relevant to Islamic values, such as social justice, environmental conservation, and community empowerment. Without an adequate understanding, the process of integrating these values becomes less effective and cannot be applied comprehensively. This condition shows the importance of increasing the capacity of educators through continuous training and mentoring [41]. In addition, support from the management of the pesantren is needed to form a special unit that handles the development of learning innovations. This unit can function as a research and curriculum development centre that combines Islamic education with sustainability principles, so that the resulting innovations can run systematically and consistently [42].

By improving the aspects of resources and management, pesantren will be better prepared to face the challenges of the times and make a real contribution to the achievement of Sustainable Development Goals [43]. This is also corroborated by the results of other research that the management of pesantren plays a very crucial role [44]. Strengthening the Islamic education system through innovation and integration of global values will strengthen the role of pesantren as an educational institution that can produce a generation of superior students, care for the environment, and be oriented towards the benefit of the people [45].

Based on the results of the research and discussion, this research has novelty in integrating the values of the Sustainable Development Goals (SDGs) into Islamic religious education learning innovations in pesantren, especially in children's pesantren, which are still rarely used as objects of study. This novelty lies in the contextual approach that combines global values with local wisdom and Islamic values in the traditional education system, which has not been widely revealed in depth. These findings broaden the perspective on the potential of pesantren in responding to global challenges through socially and spiritually relevant learning transformation, as well as providing practical references for other pesantren to develop adaptive and sustainable development-oriented learning models.

Table 2. Integration of Learning Innovation and SDGs Values in Darul Ilmi Pesantren Semarang

Aspect	Description	Implications
Strategic Role of Pesantren	The pesantren not only preserves Islamic traditions but also responds to modern demands through learning innovation and SDGs integration.	Shapes students to be broad-minded, aware of global issues, and ready to contribute positively to society.
Impact of Learning Innovation	Contextual, interactive, and relevant innovations increase students' learning motivation. Learning covers religious aspects as well as global issues such as sustainability and the environment.	Students become more enthusiastic, active, and socially as well as environmentally conscious.
Integration of SDGs	The pesantren curriculum provides	Produces a generation proficient

Values	global insights, emphasizing social and environmental responsibility.	in Islamic sciences, socially aware, and ready to make real contributions.
Use of Technology & Social Media	Technology is applied in learning; social media is used for publication, documentation, and building a positive image.	Pesantren gains wider recognition (local, national, international) and is seen as adaptive and progressive.
Human Resource Challenges	Limited teachers with competence in developing innovative learning aligned with SDGs; many still use traditional approaches.	Innovations are sporadic, unsustainable, and less supportive of contextual learning.
Management Challenges	Absence of a structured management system to support innovations; initiatives remain partial.	Barriers to planning and implementing innovative learning processes.
Limited Understanding of SDGs	Lack of training for teachers regarding the relevance of SDGs in Islamic education.	Integration of SDGs is less effective and not comprehensive.
Recommendations for Strengthening	Continuous training and establishment of a special unit for research and curriculum development, combining Islamic education and SDGs.	Pesantren will be better prepared to face modern challenges and contribute to achieving the SDGs.
Research Novelty	Integrating SDGs into learning innovations in children's pesantren, using a contextual approach that combines global, local, and Islamic values.	Broadens perspectives and provides practical references for other pesantren to develop adaptive and sustainable learning models.

Deep Analysis

The study on the integration of learning innovations and Sustainable Development Goals (SDGs) values in Darul Ilmi Pesantren Semarang highlights a transformative shift within traditional Islamic education. Historically, pesantren have preserved classical teaching models centered on character building and religious knowledge. However, this research reveals a growing recognition that such institutions must expand their scope to remain relevant in a globalized era. By embedding SDGs principles—such as inclusivity, gender equality, environmental sustainability, and social justice—into their educational framework, pesantren are not only safeguarding Islamic identity but also positioning themselves as active contributors to global educational reform.

A central finding is the use of contextual and technology-based learning strategies, including podcasts, interactive simulations, and collaborative approaches. These innovations directly enhance student motivation and engagement, enabling learners to develop both religious literacy and 21st-century competencies such as critical thinking, creativity, and digital literacy. This dual focus addresses the increasing demand for graduates who are not only spiritually grounded but also socially responsible and globally aware. Importantly, the research illustrates that innovations are not detached from Islamic traditions; instead, they harmonize global values with local wisdom, reinforcing pesantren as culturally rooted yet outward-looking institutions.

The integration of SDGs values has also generated broader institutional benefits. By leveraging technology and social media, pesantren strengthen their visibility and credibility, both locally and internationally. Documentation of student projects, sustainable practices, and inclusive activities builds a progressive institutional image. This strategic branding challenges outdated perceptions of pesantren as purely traditional institutions, instead projecting them as adaptive and forward-

looking. Furthermore, this visibility fosters trust within communities and enhances pesantren's role as a center of social transformation.

Nevertheless, significant challenges persist. A critical issue is the limited capacity of teaching staff, many of whom still rely on conventional pedagogical methods. Without sufficient training in innovative and contextual approaches, the sustainability of reforms is threatened. Equally, the absence of structured management systems creates inconsistencies, rendering innovations sporadic rather than systemic. These barriers reveal the importance of institutional investment in professional development, structured leadership, and curriculum design aligned with sustainability principles. Establishing specialized units for research and curriculum innovation, as suggested by the study, could help standardize and scale successful practices.

The novelty of this research lies in its contextual focus on children's pesantren, which remain underexplored in academic studies. By highlighting the integration of global sustainability values with Islamic pedagogy at this level, the study offers new insights into the adaptive capacity of Islamic education. It demonstrates that pesantren can serve as models for balancing tradition and modernity, offering both spiritual depth and practical competence. Ultimately, the findings underscore the potential of pesantren to generate a new generation of Muslims who are ethical, environmentally conscious, and capable of shaping a sustainable global future.

CONCLUSION

This research provides a scientific contribution in the form of a clear and in-depth picture of the implementation of Islamic religious education learning innovations that are integrated with the values of the Sustainable Development Goals (SDGs) in the development of pesantren. These findings are expected to be a reference and learning material for other pesantren that want to adopt a similar approach to improve the quality of education and social relevance of pesantren in the global era. However, this study has some limitations. The scope of research is still limited to one location, because the number of children's pesantren that implement learning innovations based on SDGs values is still very limited. In addition, time and access limitations have made researchers unable to reach more pesantren that have developed a similar approach. This research provides a scientific contribution in the form of a clear and in-depth picture of the implementation of Islamic religious education learning innovations that are integrated with the values of the Sustainable Development Goals (SDGs) in the development of pesantren. These findings are expected to be a reference and learning material for other pesantren that want to adopt a similar approach to improve the quality of education and social relevance of pesantren in the global era. However, this study has some limitations. The scope of research is still limited to one location, because the number of children's pesantren that implement learning innovations based on SDGs values is still very limited. In addition, time and access limitations have made researchers unable to reach more pesantren that have developed a similar approach.

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Author Contribution

All authors contributed equally to this research. The first author designed and completed the article. The second author conducted field research and analyzed data. The third author provided research support and translated the manuscript. The fourth author critically reviewed, improved coherence, and finalized the overall content.

Conflicts of Interest

The authors declare no conflict of interest in this research. All contributions and findings presented remain solely academic, without any institutional bias or external influence. The study was conducted independently to strengthen Islamic education through sustainable development principles aligned with SDGs values in pesantren learning.

REFERENCES

- [1] P. Shenoy and T. Kumar, "A Platform for Model-based Learning and Gamification in Design Education," *Procedia CIRP*, vol. 128, pp. 7–12, 2024, <https://doi.org/10.1016/j.procir.2024.06.003>.
- [2] J. P. Davim, "Sustainable Development Goals: A Bibliometric Analysis," *J. Sustain. Res.*, vol. 7, no. 1, 2025, <https://doi.org/10.20900/jsr20250008>.
- [3] J. J. González-Cortés, D. Cantero, and M. Ramírez, "Project-Based Learning in Bioprocess Engineering: MATLAB Software as a Tool for Industrial-Scale Bioreactor Design," *Comput. Appl. Eng. Educ.*, vol. 33, no. 1, 2025, <https://doi.org/10.1002/cae.22811>.
- [4] S. Sarwenda, H. Rahim, D. Rosyada, A. Zamhari, and A. Salim, "Development of digital entrepreneurship programs in pesantren in Indonesia," in *Religion, Education, Science and Technology towards a More Inclusive and Sustainable Future: Proceedings of the 5th International Colloquium on Interdisciplinary Islamic Studies (ICIIS 2022), Lombok, Indonesia, 19-20 October 2022*, London: Routledge, 2024, pp. 273–278. <https://doi.org/10.1201/9781003322054-46>.
- [5] Z. Fuady and M. Daud, "Fiqh Across Madhhabs : An Alternative to Pesantren Students ' School of Thought Exclusivism in the Post-Truth Era. The schools of thought (madhhabs) within fiqh (Islamic jurisprudence) are one of the ijthad products explored by qualified Muslim jurists," *Maz. J. Pemikir. Huk. Islam*, vol. 20, no. 1, pp. 143–168, 2021, [Online]. Available: <https://journal.uinsi.ac.id/index.php/mazahib/article/view/3081/pdf>
- [6] A. Salim, I. Suyuti, M. Gafarurrozi, L. Badriah, and N. M. S. A. B. N. Abdullah, "Transformation of State Religious School Competence: An Analysis of the 1975 Joint Ministerial Decree and Its Implications in Indonesia," *J. Pendidik. Agama Islam*, vol. 21, no. 2, pp. 442–460, 2024, <https://doi.org/10.14421/jpai.v21i2.9481>.
- [7] S. Huda, N. Tadjuddin, A. Sholihuddin, H. Kato, and K. Cengiz, "Character and Adab Education in Indonesia, Turkey, and Japan: A Comparative Study," *Islam. Guid. Couns. J.*, vol. 6, no. 1, pp. 1–17, 2023, <https://doi.org/10.25217/igcj.v6i1.2973>.
- [8] Yuhelmi *et al.*, "Practicality of syntax soft skill-based learning (Ss-BL): a new model in web-based entrepreneurship learning," *Data Metadata*, vol. 3, 2024, <https://doi.org/10.56294/dm2024.407>.
- [9] J. Zhang, J. Wu, X. Sun, Y. Yang, and M. Zhou, "Technology-Enabled Project-Based Learning: Let Every Child Embrace 'Good Learning,'" *Lecture Notes in Educational Technology*, vol. Part F1761, pp. 93–99, 2023. https://doi.org/10.1007/978-981-99-6225-9_11.
- [10] E. Levin, A. Rixon, and M. Keating, "How can a 'sense of belonging' inform your teaching strategy? Reflections from a core business unit. A practice report," *Student Success*, vol. 10, no. 2, pp. 71–78, 2019, <https://doi.org/10.5204/ssj.v10i2.1307>.
- [11] M. Situmorang, M. Sinaga, M. Sitorus, and A. Sudrajat, "Implementation of Project-based Learning Innovation to Develop Students' Critical Thinking Skills as a Strategy to Achieve Analytical Chemistry Competencies," *Indian J. Pharm. Educ. Res.*, vol. 56, no. 1, pp. S41–S51, 2022, <https://doi.org/10.5530/ijper.56.1s.41>.
- [12] Sudir, M. F. Hidayatullah, M. Yusuf, and Subagya, "Total Quality Management (TQM) in Islamic Boarding Schools: Teacher and Principal Perspectives," *Educ. Process Int. J.*, vol. 15, no. 1, 2025, <https://doi.org/10.22521/edupij.2025.15.136>.
- [13] S. Anam, I. N. S. Degeng, N. Murtadho, and D. Kuswandi, "The moral education and internalization of humanitarian values in pesantren," *J. Educ. Gift. Young Sci.*, vol. 7, no. 4, pp. 815–834, 2019,

<https://doi.org/10.17478/jegys.629726>.

- [14] K. Muthrofin, H. Ikmal, and E. Wahyudi, "The Implementation of Islamic Religious Education (PAI) in Shaping the Profile of Rahmatan lil alamin Students in a Madrasah," *Educ. J. Educ.*, vol. 8, no. 1, pp. 370–381, 2023, [Online]. Available: <http://staimnglawak.ac.id/ejournal/index.php/educatio/article/view/1182%0Ahttp://staimnglawak.ac.id/ejournal/index.php/educatio/article/download/1182/383>
- [15] E. Fatmawati, B. Suharto, M. Dahlan, W. K. Suhma, and A. Yudiawan, "Challenges of Educational Management in the Islamic Higher Education Sector Based on Pesantren," *J. Educ. Soc. Res.*, vol. 13, no. 6, pp. 105–118, 2023, <https://doi.org/10.36941/jesr-2023-0151>.
- [16] S. S. Maulida, C. Nursaniah, and L. H. Sari, "Study of implementation of the eco-pesantren concept at Dayah Terpadu Inshafuddin, Banda Aceh," *IOP Conf. Ser.. Earth Environ. Sci.*, vol. 1290, no. 1, p. 12037, 2024, <https://doi.org/10.1088/1755-1315/1290/1/012037>.
- [17] A. Misno, K. L. Rochman, A. Idi, D. Maharani, and Hanna, "Development of Islamic education (PAI) curriculum based on anti-corruption fiqh," *Int. J. Psychosoc. Rehabil.*, vol. 24, no. 3, pp. 2434–2446, 2020, <https://doi.org/10.37200/IJPR/V24I3/PR201891>.
- [18] A. Kholiq, "Strengthening Anticorruption Character at Elementary Schools in Indonesia: Study on Instructional Practices by In-Service Islamic Education Teachers," *Al Ibtida J. Pendidik. Guru MI*, vol. 9, no. 2, p. 355, 2022, <https://doi.org/10.24235/al.ibtida.snj.v9i2.11579>.
- [19] E. Nurtawab and D. Wahyudi, "Restructuring Traditional Islamic Education in Indonesia: Challenges for Pesantren Institution," *Stud. Islam*, vol. 29, no. 1, pp. 55–81, 2022, <https://doi.org/10.36712/sdi.v29i1.17414>.
- [20] C. He, Z. Jiang, and Y. Yi, "Developing an Online Teaching Platform for Practice in Prosthetics and Orthotics," in *2024 17th International Convention on Rehabilitation Engineering and Assistive Technology, i-CRETe 2024 and World Rehabilitation Robot Convention, WRRC 2024 - Proceedings*, 2024, pp. 1–4. <https://doi.org/10.1109/i-CRETe62067.2024.10776193>.
- [21] S. Suwendi, C. B. Gama, M. F. F. Farabi, F. Fuady, and A. Arman, "Roles and Challenges of Pesantren Intellectual Networks," *J. Ilm. Islam Futur.*, vol. 24, no. 2, p. 453, 2024, <https://doi.org/10.22373/jiif.v24i2.23134>.
- [22] Sahri and A. U. Hali, "Building Character in Sufism-Based Students in Madrasah West Kalimantan," *Nazhruna J. Pendidik. Islam*, vol. 6, no. 2, pp. 240–252, 2023, <https://doi.org/10.31538/nzh.v6i2.2974>.
- [23] M. Mahfudz and S. Sukarno, "The effect of ex-add learning techniques on critical thinking skills and pedagogic competence of Islamic education students," *J. Educ. Learn.*, vol. 17, no. 2, pp. 221–228, 2023, <https://doi.org/10.11591/edulearn.v17i2.20782>.
- [24] M. Fukushima and T. Ohji, "Macroporous ceramics for the sustainable development goals (SDGs): Review," *Int. J. Appl. Ceram. Technol.*, vol. 20, no. 2, pp. 660–680, 2023, <https://doi.org/10.1111/ijac.14261>.
- [25] Mutammam, D. Anggraeni, A. Afroni, Sutrisno, A. Zubaidah, and G. Irfanullah, "Adaptation and Transformation of Pesantren Education in Facing The Era of Muslim Society 5.0," *Nazhruna J. Pendidik. Islam*, vol. 7, no. 3, pp. 705–726, 2024, <https://doi.org/10.31538/nzh.v7i3.114>.
- [26] A. M. Alfoudari, C. M. Durugbo, and F. M. Aldhmour, "Understanding socio-technological challenges of smart classrooms using a systematic review," *Comput. Educ.*, vol. 173, p. 104282, 2021, <https://doi.org/10.1016/j.compedu.2021.104282>.
- [27] D. Susanto, Risnita, and M. S. Jailani, "Teknik Pemeriksaan Keabsahan Data Dalam Penelitian Ilmiah," *J. QOSIM J. Pendidikan, Sos. Hum.*, vol. 1, no. 1, pp. 53–61, 2023, <https://doi.org/10.61104/jq.v1i1.60>.
- [28] H. Zukriadi, Sulaiman, U., "Aneka Macam Penelitian," *SAMBARA J. Pengabd. Kpd. Masy.*, vol. 1, no. 1, pp. 36–46, 2023, <https://doi.org/10.58540/sambarapkm.v1i1.157>.
- [29] W. Yuliani, "Metode Penelitian Deskriptif Kualitatif Dalam Perspektif Bimbingan Dan Konseling," *QUANTA J. Kaji. Bimbing. dan Konseling dalam Pendidik.*, vol. 2, no. 2, pp. 1–10, 2018, <https://doi.org/10.22460/q.v2i1p21-30.642>.
- [30] S. Y. L. Tumangkeng and J. B. Maramis, "Kajian Pendekatan Fenomenologi : Literature Review," *J. Pembang. Ekon. Dan Keuang. Drh.*, vol. 23, no. 1, pp. 14–32, 2022, <https://doi.org/10.35794/jpekd.41379.23.1.2022>.
- [31] R. Surayya, "Pendekatan Kualitatif Dalam Penelitian Kesehatan," *AVERROUS J. Kedokt. Dan Kesehat. Malikussaleh*, vol. 1, no. 2, p. 75, 2018, <https://doi.org/10.29103/averrous.v1i2.415>.
- [32] M. Mulyadi, "Penelitian Kuantitatif Dan Kualitatif Serta Pemikiran Dasar Menggabungkannya," *J. Stud. Komun. dan Media*, vol. 15, no. 1, p. 128, 2013, <https://doi.org/10.31445/jskm.2011.150106>.

- [33] M. Athoillah, A. S. Rahman, A. S. Firdaus, and M. A. Septiadi, “Policies and Practices of Religious Moderation in Pesantren,” *J. Pendidik. Islam*, vol. 10, no. 2, pp. 387–396, 2024, <https://doi.org/10.15575/jpi.v10i2.27543>.
- [34] F. Soltan, “The 2030 Agenda for Sustainable Development: What are its implications for future generations?” in *Giving Future Generations a Voice: Normative Frameworks, Institutions and Practice*, Edward Elgar Publishing, 2021, pp. 108–126. <https://doi.org/10.4337/9781839108259.00014>.
- [35] A. S. Bello, “Innovative Experiences in Teaching and Learning,” in *Overcoming Challenges in Online Learning: Perspectives from Asia and Africa*, London: Routledge, 2023, pp. 171–179. <https://doi.org/10.4324/9781003342335-20>.
- [36] J. Purnomo, S. Anantanyu, H. Saptaningtyas, and F. M. Mangunjaya, “Prophetic Approach in Environmental Education and Community Empowerment: a Case Study of Sustainable Pesantren Development,” *Rev. Gest. Soc. e Ambient.*, vol. 18, no. 8, p. 6259, 2024, <https://doi.org/10.24857/rgsa.v18n8-047>.
- [37] L. Anwar, C. Sa’dijah, I. R. Hidayah, and A. H. Abdullah, “Integrating Local Wisdom and Project-Based Learning to Enhance Critical Thinking, Collaboration, and Creativity in Mathematics Education: A Pilot Study with Eighth Grade Students in Malang,” *International Conference of Mathematics Education, Learning and Application (ICOMELA)*, p. 40032, 2023. <https://doi.org/10.1063/5.0241446>.
- [38] Y. Agustina, Margana, N. H. P. S. Putro, and M. A. Nazri, “Designing English Instructions for Islamic Settings: A Needs Analysis in Indonesian Pesantren,” *World J. English Lang.*, vol. 13, no. 8, pp. 373–382, 2023, <https://doi.org/10.5430/wjel.v13n8p373>.
- [39] M. Mustaqim and A. Atabik, “Challenges in Implementing the Pesantren Endowment Fund: a Study of Presidential Regulation Number 82 of 2021 on Operational Funding of Pesantren,” *J. Huk. Unissula*, vol. 40, no. 1, pp. 129–140, 2024, <https://doi.org/10.26532/jh.v40i1.39042>.
- [40] Y. Huang, L. Liu, and L. An, “Are the Teachers and Students Satisfied: Sustainable Development Mode of Entrepreneurship Education in Chinese Universities?” *Front. Psychol.*, vol. 11, 2020, <https://doi.org/10.3389/fpsyg.2020.01738>.
- [41] I. Mujahid, “Islamic orthodoxy-based character education: creating moderate Muslims in a modern pesantren in Indonesia,” *Indones. J. Islam Muslim Soc.*, vol. 11, no. 2, pp. 185–212, 2021, <https://doi.org/10.18326/ijims.v11i2.185-212>.
- [42] A. Ben-Eliyahu, “Sustainable learning in education,” *Sustain.*, vol. 13, no. 8, 2021, <https://doi.org/10.3390/su13084250>.
- [43] S. Zainal, M. A. Manumanoso Prasetyo, C. M. Aziz Yaacob, and Y. Jamali, “Adopting Pesantren-Based Junior High School Programs: the Pesantren Changes Its Educational System Without Conflict,” *J. Ilm. Islam Futur.*, vol. 22, no. 2, pp. 260–276, 2022, <https://doi.org/10.22373/JIIF.V22I2.13525>.
- [44] Jusubaidi, T. Lindgren, A. Mujahidin, and A. C. Rofiq, “A Model of Transformative Religious Education: Teaching and Learning Islam in Pondok Modern Darussalam Gontor, Indonesia,” *Millah J. Relig. Stud.*, vol. 23, no. 1, pp. 171–212, 2024, <https://doi.org/10.20885/millah.vol23.iss1.art6>.
- [45] R. Basori, T. J. Raharjo, T. Prihatin, and A. Yulianto, “Maintaining Salafi Values Through Innovative Management Practices At Pesantren,” *J. Pendidik. Islam*, vol. 9, no. 2, pp. 145–156, 2023, <https://doi.org/10.15575/jpi.v9i2.25376>.