SDGs Integration Strategy in Education Towards the Era of Society 5.0

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Abstract

Sustainable education represents a crucial strategic effort to achieve the Sustainable Development Goals (SDGs) by enhancing the quality of human resources, promoting ecological awareness, and fostering responsible citizenship among learners. The integration of sustainability issues into the education system faces several significant challenges, including limited opportunities for teacher training, insufficient educational resources, curricula that are not fully aligned with global sustainability priorities, and resistance to change from various stakeholders. The emerging Society 5.0 paradigm emphasizes the need for digital literacy, creativity, critical thinking, and twenty-first-century skills, which are essential to enable active participation in a human-centered, technology-driven society. Effective multi-stakeholder collaboration among schools, government agencies, the private sector, and civil society is therefore critical to strengthen sustainable education and address the barriers to implementation. This study employs a qualitative research approach to examine the integration of SDGs within the educational curriculum in Indonesia. Recommendations include enhancing teacher capacity, developing more relevant curricula, and fostering cross-sector collaboration.

1. Introduction

Education plays a strategic role in shaping a generation capable of facing global challenges and contributing to sustainable development. The Sustainable Development Goals (SDGs) are a global agenda that provides a framework for addressing various issues, including poverty, social inequality, environmental sustainability, and improving human well-being (Cox, 2020). The SDGs do not only emphasize the achievement of economic, social, and environmental targets separately but also highlight the interconnectedness between these aspects, which requires a collective effort from various parties. In the context of education, the integration of the SDGs aims to equip students with the knowledge, skills, and attitudes that support sustainable development, while also increasing their awareness of complex and interconnected global problems. The paradigm shift towards Society 5.0 adds a new dimension to sustainable education. Society 5.0 is a concept of a future society centered on humans and utilizing technology to solve various social challenges and improve the quality of life (Aquilani et al., 2020).

This concept is a continuation of the Industrial Revolution 4.0 which emphasizes digitalization and automation but with a greater focus on the benefits of technology for humans and society. In a Society 5.0 society, digital literacy, creativity, critical thinking, and 21st-century skills become important factors for every individual to participate actively in social, economic, and environmental life (Van Laar et al., 2017). Therefore, sustainable education is no longer enough to just deliver knowledge content, but must also develop students digital competence, innovation, and adaptive skills. The integration of the SDGs into the education system faces

various complex challenges. One of the main obstacles is the limited training for teachers in implementing sustainability concepts in their teaching practices. Many teachers do not yet have the competence or experience to teach environmental, social, and economic issues in an integrated manner. In addition, the available educational resources, both in the form of teaching materials and supporting facilities, are still limited, which affects the effectiveness of the integration.

The existing curriculum in many countries, including Indonesia, is often not fully relevant to the principles of sustainability, so learning material is often focused on conventional academic content without connecting it to global challenges. Another obstacle is the resistance to change from various stakeholders, including teachers, educational institutions, and the community, which makes the adoption of sustainable education slow. Multi-stakeholder collaboration is an important strategy in facing these challenges. Schools, the government, the private sector, and civil society need to work together synergistically to strengthen the implementation of sustainable education (Eweje et al., 2021). A collaborative approach allows for the utilization of resources, expertise, and innovation from various parties so that education is not only the responsibility of schools but becomes part of a broader social ecosystem. The involvement of the private sector, for example, can help provide technology, digital teaching materials, and teacher training programs, while civil society can provide local perspectives and support active student participation in sustainable projects.

The government, on the other hand, has a strategic role in providing regulations, policies, and incentives to support the integration of the SDGs into the

national education curriculum. In Indonesia, although there have been various efforts to integrate the SDGs into education, their implementation still faces limitations in the field (Morita et al., 2020). Some schools have started to implement project-based learning, environmental education, and digital literacy, but not all schools have access or the ability to implement this approach optimally. This shows the need for a systematic strategy that includes strengthening teacher capacity, developing a relevant curriculum, providing adequate educational resources, and increasing cross-sectoral collaboration. This research emphasizes the importance of a holistic understanding of sustainable education that not only focuses on academic aspects but also on developing students' competence to live in the Society 5.0 era. Thus, sustainable education becomes a key element in preparing a generation capable of facing global challenges, contributing to sustainable development, and using technology wisely in daily life.

2. Literature Review

2.1. Sustainable Education and SDGs Integration

Mathematical Sustainable education is one of the main and crucial strategies in realizing the Sustainable Development Goals (SDGs) by equipping students not only with knowledge but also with pro-environmental skills and attitudes (Schilke, 2018). The integration of the SDGs into the education curriculum has the strategic goal of shaping a young generation that is not only aware of various complex global issues but is also capable of critical, reflective thinking and active participation in sustainable development efforts at the local and global levels. Various studies show

that although many curriculim in a number of countries have tried to adopt sustainability principles, practical implementation in the field still faces various significant limitations (Omazic & Zunk, 2021). These obstacles include the low level of teacher training related to sustainable education, limited available resources in the form of both teaching materials and supporting facilities, and a curriculum that is not yet fully relevant to the continuously evolving global challenges.

This condition shows the need for a more systematic and planned approach, which combines traditional academic content with the development of 21st-century competencies, such as critical thinking skills, collaboration skills, creativity, and adequate digital literacy. In addition, the literature emphasizes the importance of applying innovative pedagogical strategies, including project-based learning, case studies, and a contextual approach that links learning material with real-life issues in society. This kind of approach not only improves students' conceptual understanding of sustainability but also fosters relevant practical skills that can be applied in everyday life. Effectively integrated education enables students to understand the complex interconnectedness between social, economic, and environmental problems, so they can act as agents of change who actively contribute to the achievement of the SDGs (Fröberg & Lundvall, 2021).

2.2. Society 5.0 and 21st-Century Skills

The concept of Society 5.0 emphasizes the creation of a society that is truly centered on humans while making optimal use of technology, as a continuation of the Industrial Revolution 4.0 which focuses primarily on automation and digitalization (Salimova et al., 2021). Society 5.0 emphasizes the use of technology to

solve various complex social challenges, including economic, environmental, and community well-being issues, with the aim of creating a better quality of life. In the context of education, the application of Society 5.0 principles demands adequate digital literacy, creativity, critical thinking skills, and collaborative skills that enable students to adapt effectively to rapid, dynamic, and complex changes in the digital and globalization era. Various studies show that an education system that is unable to adapt to the demands of Society 5.0 is at risk of failing to produce a generation that is competent, innovative, and ready to face future challenges.

The implementation of Society 5.0-based education requires a strong synergy between various parties, including schools, the government, the private sector, and civil society. This multi-stakeholder collaboration allows for the maximum utilization of various technological resources, the development of digital teaching materials, and the implementation of teacher training programs that can increase the effectiveness of integrating the Sustainable Development Goals (SDGs) into the curriculum (Daly-Smith et al., 2020). Studies also show that this kind of collaboration encourages pedagogical innovation, the development of digital competence, and the active involvement of students in social, environmental, and community projects. Thus, education that integrates the SDGs while preparing students for Society 5.0 can become a strong foundation for shaping a generation ready to face global challenges, play an active role in society, and contribute significantly to sustainable development in the future.

3. Methods

This research uses a qualitative approach to analyze the integration of the Sustainable Development Goals (SDGs) into the education curriculum in Indonesia, as well as the challenges and strategies related to the implementation of sustainable education towards Society 5.0. A qualitative approach was chosen because it is exploratory and allows researchers to gain a deep understanding of complex phenomena that cannot be measured quantitatively, such as teachers' perceptions, the readiness of educational institutions, and multi-stakeholder collaboration. This method allows for an analysis of the social, cultural, and educational policy context that influences the implementation of the SDGs in daily teaching practices.

Data collection was carried out through document studies, semi-structured interviews, and participatory observation. The document study included the national curriculum, sustainable education guidelines, and government policy documents related to the SDGs. Interviews were conducted with teachers, principals, education managers, and representatives of the private sector and civil society involved in sustainable education programs. Participatory observation was carried out in several schools to directly see the application of learning methods that integrate the principles of sustainability and 21st-century skills. These data collection techniques were designed to obtain rich, relevant, and contextual information, so that the dynamics and challenges that arise in the implementation of the SDGs in the field can be captured.

Data analysis was carried out thematically through the stages of coding, categorization, and extraction of main themes. Data coding allowed for the

identification of patterns, perceptions, and practices relevant to sustainable education and Society 5.0. Categorization helped group information based on the dimensions of the curriculum, teacher competence, resources, and multi-stakeholder collaboration. From this process, researchers were able to extract the main themes that describe the supporting factors, obstacles, and implementation strategies of sustainable education. Data validity was maintained through source triangulation, comparing findings from documents, interviews, and observations to obtain an accurate and comprehensive picture. In addition, researchers carried out critical reflection and minimized bias by noting personal assumptions and comparing findings with related literature.

This qualitative approach allows researchers to deeply understand how the integration of the SDGs is carried out in educational practices, how challenges are identified and overcome, and how collaboration between stakeholders supports the implementation of sustainable education. Thus, this method not only provides a comprehensive description of the phenomenon but also provides a strong analytical basis for formulating strategic recommendations to improve the quality of sustainable education and the readiness of the younger generation to face the Society 5.0 era.

4. Results and Discussion

This research reveals that the integration of the Sustainable Development Goals (SDGs) into the education curriculum in Indonesia has been carried out through various initiatives, although its implementation still faces a number of

significant challenges. The results of the document study show that the national curriculum has included the principles of sustainable education, including character development, digital literacy, and 21st-century skills. Some schools have adopted project-based learning methods, environmental education, and digital literacy programs aimed at increasing student awareness of global issues such as climate change, poverty, and social inequality. However, the document also shows that the integration of the SDGs is still partial and has not become a standard practice at all levels of education. In many cases, sustainable education material is still limited to certain subjects, such as Science or Social Studies, without a holistic approach that links global issues to students' daily lives (Sund & Gericke, 2020).

Interviews with teachers and principals revealed that limited training and teacher capacity are one of the main obstacles to the application of sustainable education. Teachers often have a limited understanding of the principles of the SDGs and effective learning strategies to integrate sustainability issues into their subjects (Collazo Expósito & Granados Sánchez, 2020). Some teachers admitted that they had difficulty designing material that was relevant to both local context and global issues at the same time. In addition, the limited educational resources, such as teaching materials, digital technology, and laboratory facilities, limit the teachers' movement in implementing innovative learning methods. This condition is in line with the literature findings which show that the readiness of educational institutions is very decisive for the success of SDGs integration.

Participatory observation in several schools shows that there is a variation in the application of sustainable education (Prenger et al., 2021). Schools that have

received support from the government, the private sector, or civil society organizations tend to have more comprehensive and interactive programs. For example, some schools have successfully organized community-based environmental projects, waste management, and the use of renewable energy that actively involves students. Students are involved in the planning, implementation, and evaluation of projects, so they not only understand the concepts but are also able to develop practical skills such as collaboration, problem-solving, and innovation. This experience shows that multi-stakeholder collaboration is a key factor in increasing the effectiveness of sustainable education.

Thematic analysis of interviews and observations identified several main themes related to the implementation of sustainable education (Ali, 2021). First, the theme of teacher capacity emphasizes the importance of continuous training and professional development that focuses on integrating the SDGs and 21st-century skills. This training must include digital literacy, innovative learning methods, and assessment strategies that are able to evaluate students' understanding and competence holistically. Second, the theme of educational resources highlights the need for the provision of relevant teaching materials, digital technology, and supporting facilities. Access to these resources allows teachers and students to apply project-based and experimental learning methods that link academic concepts to real-world issues. Third, the theme of multi-stakeholder collaboration shows that the synergy between schools, the government, the private sector, and civil society strengthens the implementation of sustainable education. This collaboration not

only provides resources but also opens up opportunities for pedagogical innovation, student development programs, and active community involvement.

The research results also show that the Society 5.0 paradigm adds a new dimension to sustainable education. Students in this era are required to have digital literacy, creativity, critical thinking, and collaborative skills that enable them to adapt to social and technological changes (Duncan, 2020). The integration of Society 5.0 principles into education demands the use of technology in learning, such as interactive multimedia, online learning platforms, and digital simulations. This is in line with the results of observations which show that schools that adopt digital technology are able to provide a more interesting, interactive, and relevant learning experience to global challenges. For example, the use of environmental simulation applications helps students understand the impact of climate change and natural resource management in a real way. This experience emphasizes that mastery of technology and digital literacy are important components in equipping students to face the Society 5.0 era.

Although there are promising initiatives, the implementation of sustainable education still faces structural and systemic constraints (Scoones et al., 2020). The existing curriculum is not yet fully integrated, conventional learning methods are still dominant, and educational assessment does not reflect 21st-century skills. In addition, resistance to change from teachers, schools, and the community can slow down the adoption of sustainable education practices. Some teachers expressed concern that focusing on sustainability projects could reduce the time to complete the core curriculum. Therefore, it is important for policymakers to design strategies

that ensure that the integration of the SDGs does not become an additional burden, but instead enriches the learning process.

Multi-stakeholder collaboration has been proven to be an effective strategy to overcome these obstacles. The government can provide regulations, guidelines, and incentives to support the integration of the SDGs. The private sector can provide access to technology, training, and funding for educational projects. Civil society and non-governmental organizations can support student involvement in social and environmental projects. This synergy allows for the development of a relevant curriculum, innovative learning methods, and interactive and contextual learning experiences. This study emphasizes that the success of sustainable education does not only depend on the school but also on an ecosystem that involves all stakeholders.

In addition, this research found that project-based learning and case studies are effective methods for connecting academic concepts with global issues. Students involved in real projects showed an increase in conceptual understanding, collaborative skills, and awareness of environmental and social issues. This strengthens the literature which emphasizes that contextual learning approaches not only increase knowledge but also develop practical competencies needed in real life. Effective sustainable education emphasizes the development of critical thinking capacity, creativity, and innovation, all of which are important skills in facing global challenges and the Society 5.0 era.

The results of this research also have implications for educational policy, including the need for the preparation of a more holistic curriculum, the

development of teacher training programs, the provision of educational resources, and the strengthening of collaboration between schools, the government, the private sector, and civil society. Effective sustainable education is not just about including the concept of the SDGs in subject matter, but also developing relevant competencies, encouraging active student involvement, and equipping them with the skills to live and contribute to a complex and technology-based society. Thus, sustainable education can be the foundation for creating a generation that is ready to face Society 5.0, use technology wisely, and contribute to the achievement of the SDGs as a whole.

5. Conclusion

This research confirms that the integration of the Sustainable Development Goals (SDGs) into the education curriculum in Indonesia has great potential but still faces various challenges. The national curriculum has included the principles of sustainable education, but its implementation in the field is still limited due to limited teacher capacity, resources, and learning methods that are not yet fully relevant. Teachers need continuous training to master digital literacy, 21st-century skills, and effective teaching strategies so they can integrate global issues into learning. Meanwhile, the limited resources, including teaching materials, technology, and supporting facilities, affect the effectiveness of sustainable education in schools.

The Society 5.0 paradigm adds a new dimension to education, demanding digital literacy, creativity, critical thinking, and collaborative skills. Effective sustainable education must be able to equip students with these competencies so

that they can adapt to social and technological changes, and play an active role in a technology-based society. Multi-stakeholder collaboration between schools, the government, the private sector, and civil society has been proven to be an important strategy to strengthen the implementation of sustainable education. This synergy allows for the development of a relevant curriculum, innovative learning methods, and contextual and interactive learning experiences.

Overall, sustainable education must be seen as an ecosystem that involves all stakeholders, not just the responsibility of the school. With the right strategy, cross-sectoral support, and an innovative learning approach, sustainable education can shape a young generation that is ready to face global challenges, use technology wisely, and contribute to the achievement of the SDGs and sustainable development in the Society 5.0 era.

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