ESD Integration for Social Awareness, Environmental Literacy, and 21st-Century Skills in Indonesia

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Abstract

The Sustainable Development Goals represent a global agenda adopted by 193 countries in 2015, encompassing 17 universal objectives to be achieved by 2030. Indonesia, as one of the signatory nations, has demonstrated strong commitment through Presidential Regulation No. 59 of 2017, which mandates the formulation of both a national roadmap and action plans at national and local levels. Education is considered a pivotal instrument in supporting the achievement of Sustainable Development Goals, particularly through the approach of Education for Sustainable Development. Education for Sustainable Development emphasizes not only cognitive aspects but also attitudes, values, and skills that enable students to actively engage in sustainable development. This article explores the urgency of integrating Education for Sustainable Development into the Indonesian educational curriculum, highlighting its relevance in enhancing social awareness, environmental literacy, and 21st-century skills. Employing a qualitative method based on literature review, the article underscores the importance of collaborative, Sustainable Development Goals -based learning models in shaping a generation that is adaptive, critical, and responsible in addressing both global and local sustainability challenges.

1. Introduction

The Sustainable Development Goals (SDGs) are a global agenda adopted by 193 countries in September 2015 as a continuation of the Millennium Development Goals (MDGs). The SDGs have 17 universal and comprehensive goals, covering economic, social, and environmental aspects, with targets to be achieved by the year 2030. The process of formulating the SDGs involved governments, civil society, academics, and the private sector, making it an inclusive and participatory agenda to ensure the principle of "No One Left Behind" is truly implemented. The universality principle of the SDGs emphasizes that every country, both developed and developing, has a moral and political responsibility to ensure sustainable development for the well-being of humanity and the planet (Mensah, 2019). In a global context, the SDGs offer an integrative framework for addressing multidimensional challenges such as climate change, social inequality, poverty, health, gender equality, and peace. Each goal in the SDGs is interconnected, so success in one goal will strengthen the achievement of others.

For example, improving the quality of education (Goal 4) directly supports the eradication of poverty (Goal 1) and gender equality (Goal 5), and also contributes to achieving better health (Goal 3). Thus, the implementation of the SDGs requires a comprehensive strategy that places education as a fundamental instrument of change (Abera, 2023). Indonesia demonstrates a serious commitment to the implementation of the SDGs through Presidential Regulation No. 59 of 2017. This regulation mandates the establishment of the National SDGs Secretariat, the preparation of a Roadmap, and a National Action Plan (NAP) and Regional Action

Plan (RAP). Through this framework, the government encourages the participation of all parties including ministries, institutions, regional governments, civil society groups, academics, philanthropists, and the private sector in achieving the SDGs targets. This shows that the achievement of sustainable development goals is not only the government's responsibility but a collective obligation across sectors (Mariani et al., 2022).

Education has a central role in supporting the success of the SDGs. Nelson Mandela asserted that "education is the most powerful weapon which you can use to change the world," which emphasizes education's function as a means of liberation, empowerment, and social transformation. Through education, individuals not only acquire knowledge but also develop critical thinking skills, internalize moral values, and expand opportunities to overcome poverty and injustice (Suri & Candra, 2021). Therefore, education integrated with the SDGs is a strategic instrument for realizing sustainable transformation. The concept of Education for Sustainable Development (ESD), introduced by UNESCO, provides a methodological framework for integrating the SDGs into the world of education. ESD emphasizes participatory learning, encourages lifelong learning, develops critical thinking skills, applies a systemic approach, and hones interdisciplinary problem-solving skills. With these characteristics, ESD plays an important role in shaping social awareness, environmental literacy, and 21st-century skills, which are the main needs of future generations.

However, various challenges remain. Coghlan and Cardilini (2022) criticizes the modern education system that emphasizes competition and consumption more

than care and conservation. This phenomenon is also visible in Indonesia, where the implementation of sustainability values in education is still partial and not fully integrated into the national curriculum. In fact, research shows that the application of ESD in formal education can increase students' environmental awareness, such as awareness in sorting waste and reducing plastic use (Estrada-Vidal et al., 2020). Based on these phenomena, this article aims to analyze the urgency of integrating ESD into the Indonesian education curriculum and highlight its contribution to increasing social awareness, environmental literacy, and 21st-century skills. Using a qualitative literature-based approach, this study emphasizes the importance of a collaborative, SDGs-based learning model in shaping an adaptive and competitive generation amid global dynamics.

2. Literature Review

The literature review on the integration of Education for Sustainable Development (ESD) in the context of achieving the Sustainable Development Goals (SDGs) shows that education has a fundamental role in ensuring the sustainability of development. UNESCO emphasizes that ESD is an educational approach designed to develop knowledge, skills, values, and attitudes that enable individuals and societies to contribute to achieving a balance between social, economic, and environmental aspects. This approach is in line with the principles of the SDGs, which are universal, integrative, and inclusive. Globally, Coghlan and Cardilini (2022) research criticizes conventional educational practices that tend to be oriented toward competition and consumption rather than care and sustainability. This underscores

the importance of curriculum transformation towards education that is more participatory, contextual, and integrates environmental and social issues into the learning process. Research by Griffiths (2021) also reinforces the urgency of ESD by highlighting the challenges faced by children due to poverty and limited access to education, which have implications for their cognitive and moral development.

In Indonesia, the implementation of the SDGs has been integrated into national development policies through Presidential Regulation No. 59 of 2017. This regulation mandates the involvement of all stakeholders in the implementation of the SDGs, including the education sector. The government's efforts are realized, among other things, encourages local content in the school curriculum as a means of bringing students closer to their natural, social, and cultural environment. This is in line with the Asia-Pacific UNESCO report, which emphasizes the importance of locally-contextualized education to strengthen sustainability values. Several empirical studies in Indonesia also show the positive impact of ESD implementation. Estrada-Vidal et al. (2020) found that students in Elementary and Middle Schools who received SDGs-based learning showed an increase in environmental awareness, including habits in sorting waste and reducing plastic use. Other research by Mariani et al. (2022) confirms that multi-stakeholder participation in the implementation of the SDGs in the education sector can strengthen collective awareness and social responsibility.

The main characteristics of ESD such as critical thinking, a systemic approach, problem-solving, lifelong learning, and an interdisciplinary approach have been proven to be important pillars in equipping students with 21st-century skills

(UNESCO). Thus, the existing literature consistently confirms that the integration of the SDGs through ESD is not only relevant to global challenges but is also capable of creating real changes in student behavior and awareness at the local level. Based on this literature review, there is a consensus that education is a strategic instrument in achieving the SDGs. However, there is a research gap regarding how collaborative, SDGs-based learning models are systematically implemented in Indonesian schools. This is the area of contribution for this study, which provides a qualitative analysis of the integration of ESD in increasing social awareness, environmental literacy, and 21st-century skills.

3. Methods

This study uses a qualitative approach with a literature review to deeply analyze the integration of Education for Sustainable Development (ESD) within the framework of achieving the Sustainable Development Goals (SDGs) in the Indonesian education sector. A qualitative approach was chosen because it is able to explore social phenomena, policies, and educational practices by considering context, meaning, and dynamics that cannot be explained quantitatively. This study focuses on the interpretation and meaning of data from various academic sources, national policies, reports from international organizations, and the results of previous research relevant to the topic of ESD and the SDGs.

The data collection process was carried out through a review of official documents such as Presidential Regulation No. 59 of 2017, Ministry of Education and Culture Regulation No. 81A of 2013, UNESCO reports related to Education

for Sustainable Development, and relevant academic publications that discuss the integration of ESD at various educational levels. The scientific literature used includes national and international journal articles, research reports, and relevant books. The selection of literature was carried out by considering the credibility of the sources, the year of publication, and their relevance to the research focus, namely the relationship between education, social awareness, environmental literacy, and 21st-century skills.

Data analysis was carried out through the process of reading, examining, categorizing, and interpreting the literature obtained. Each document was analyzed to identify key themes, such as the concept and characteristics of ESD, national policies related to the SDGs, challenges in implementing sustainable education, and the impact of SDGs-based learning on student behavior. The analysis process was carried out with a descriptive-analytical method, which is to narratively present the content of the literature, then connect it with existing theories and conceptual frameworks. In this way, the research not only presents a summary of the literature but also provides a critical interpretation of the relevance and contribution of ESD in the Indonesian context.

The validity of the data was maintained through the process of source triangulation, which is by comparing information from various literatures to ensure the consistency and accuracy of the findings. In addition, the researcher used a reflexivity strategy, which is to be aware of and criticize the researcher's position in the analysis process so that the interpretation remains objective. The results of this study are expected to provide a comprehensive picture of the urgency and practice

of integrating ESD into the Indonesian education system, and offer insights for the development of collaborative, SDGs-based learning models. Thus, this qualitative literature-based method is considered suitable for answering the research objectives that emphasize in-depth understanding, not statistical generalization.

4. Results and Discussion

4.1 Implementation of ESD in Enhancing Social Awareness and Environmental Literacy

The results of the study show that the integration of education for sustainable development has a significant impact on the formation of students' social awareness and environmental literacy. Education linked to sustainable development goals not only transfers theoretical knowledge about the environment but also internalizes the values of social care and responsibility for sustainability. In this context, social awareness emerges through a learning process that places students as active subjects invited to understand the link between individual actions and their impact on society at large (Cincera et al., 2019). For example, through project-based learning activities that raise the issue of waste management, students not only learn about sorting techniques but also understand the social and economic consequences of the habit of littering.

Social awareness is also formed through students' involvement in collaborative activities with the community. The educational process that combines academic aspects with social service enables students to directly experience the social reality around them. This trains empathy, solidarity, and the ability to work together

with others to solve real problems. Environmental literacy developed through SDGs-based learning is not just conceptual knowledge, but is manifested in practical skills in protecting the environment and a change in attitude towards daily life (Chen et al., 2021). For example, students begin to reduce the use of single-use plastic, get used to sorting organic and inorganic waste, and encourage the application of an energy-saving lifestyle. In the long term, this environmental literacy becomes the foundation for the growth of a culture of sustainability.

When students are accustomed to thinking critically about the relationship between humans and the environment, they will be able to evaluate daily actions from a sustainability perspective (Wamsler, 2020). This has implications for the formation of a new mindset that is wiser in using natural resources. This awareness also encourages students to advocate for change in their environment, for example by becoming agents of change in their school, family, or local community. In addition, learning that is collaborated with the SDGs provides a meaningful direct experience for students. Through collaborative learning methods, students are encouraged to explore sustainability issues interdisciplinarily. This helps them understand the complex links between social, economic, and environmental aspects. For example, the topic of climate change is not only discussed from a scientific perspective but also from a social and economic point of view, such as its impact on public health or the unequal distribution of resources. Thus, students gain a holistic understanding and are better prepared to face global challenges.

Another impact that arises is the development of a sense of personal and collective responsibility. The awareness that every individual has a role in

maintaining sustainability encourages students to act more proactively. Education that emphasizes active participation and involvement in decision-making, both in class and in extracurricular activities, forms a sense of ownership of social and environmental issues. This sense of ownership is an important asset in building a society that cares about sustainability. The implementation of ESD in the Indonesian education context shows that social awareness and environmental literacy can be significantly increased. This happens because learning does not only emphasize the cognitive aspect but also facilitates direct experience, collaboration, and critical reflection on social and environmental reality. Thus, the integration of ESD is a strategic step to shape a generation that has a high level of concern for sustainability, and is able to implement these values in their daily lives.

4.2 Relevance of ESD to the Development of 21st Century Skills

In addition to serving to increase social awareness and strengthen environmental literacy, the integration of Education for Sustainable Development (ESD) also has a very strong relevance in shaping 21st-century skills. These skills are increasingly needed in an era of globalization and technological disruption characterized by rapid change, the complexity of global problems, and the demands of continuous innovation. In general, 21st-century skills include the ability to think critically, creativity, collaboration, communication, digital literacy, and the capacity to solve complex problems. Through sustainability-oriented learning, these skills can be developed more optimally because the approach emphasizes student activeness, collaboration among students, and the exploration of real-world problems that are relevant to everyday life.

Critical thinking is one of the main skills fostered in the context of ESD (Ekamilasari et al., 2021). The learning process is no longer limited to memorizing facts or repeating concepts but is directed so that students are able to analyze, evaluate, and reflect on social and environmental issues from various points of view. For example, when students are invited to discuss air pollution, they do not only learn the definition or its theoretical impact but also examine the causal factors, study the health consequences for the community, and consider solutions that can be done individually, in the community, or as public policy. With this kind of habituation, students are trained to think more analytically, logically, and systematically while being able to see the links between different aspects.

Critical thinking skills, students' creativity also develops through ESD. Project-based learning, as one of the typical strategies of sustainable education, provides ample space for students to develop new and innovative ideas (Podgórska & Zdonek, 2022). They can be encouraged to design eco-friendly products, create social campaigns that attract public attention, or create alternative solutions that are applicable to local community problems. This process not only hones out-of-the-box thinking skills but also involves practical aspects such as design skills, visual communication, and effective presentation skills. Creativity within the ESD framework is not only oriented towards a physical product as a result but also concerns the ability to adapt to changing situations, find alternative approaches, and view challenges as opportunities to create innovation.

Collaboration is also a key aspect of 21st-century skills fostered through SDGs-based learning. When students work together in groups, they learn to divide

roles, integrate diverse perspectives, and manage team dynamics to achieve a common goal. This situation reflects the reality of the contemporary work world, which increasingly prioritizes cross-disciplinary and cross-cultural collaboration. Through collaborative experiences, students not only strengthen their interpersonal skills but also learn to appreciate different opinions, hone empathy, develop effective communication, and build leadership skills (Warner, 2020).

In addition, digital literacy is an essential competency that is closely related to sustainable education. In an era of global interconnectedness, students are required to be able to access, evaluate, and use information from various digital sources wisely. ESD encourages them to seek data related to global issues, analyze the reliability of sources, and use them in the decision-making process. Furthermore, digital literacy also opens opportunities for students to spread sustainability campaigns through social media or other digital platforms, so that technology functions not only as a means of learning but also as a tool for advocacy and broader social participation.

The skill of solving complex problems is the peak ability that develops through the integration of ESD. Global challenges such as climate change, social injustice, or environmental damage are multidimensional and do not have a single solution. Therefore, students need to be trained to face this complexity with a holistic approach (Koul & Nayar, 2021). Through simulations, case studies, or involvement in community projects, they are accustomed to identifying problems, connecting various variables, and looking for solutions that are realistic, contextual, and sustainable. This experience not only equips them with analytical skills but also

trains resilience, perseverance, and the ability to make decisions in conditions full of uncertainty.

Thus, the integration of ESD into the education system does not only play a role in increasing social awareness and environmental literacy but also prepares students to face the demands of the global 21st century. SDGs-based learning helps foster the ability to think critically, creatively, collaboratively, and digitally literate, as well as complex problem-solving. All of these skills make students more adaptive, innovative, and resilient in facing a dynamic world of change. Therefore, sustainable education is not just a strategy to support the achievement of sustainable development goals but also a fundamental foundation in building quality, visionary human resources who are ready to face a future full of challenges.

5. Conclusion

Education for Sustainable Development has a very strategic position in supporting the achievement of the Sustainable Development Goals in Indonesia. The results of the study show that the integration of ESD into the education system is not only able to increase social awareness and environmental literacy but also to shape 21st-century skills that are relevant to global challenges. Through a participatory, interdisciplinary, and experience-based learning approach, students not only understand sustainability issues conceptually but are also able to apply them in their daily lives. This is evident from the growth of empathy, care for the environment, and a willingness to be actively involved in solving social problems around them. In addition, the relevance of ESD is also seen in its ability to encourage

the development of critical, creative, collaborative, communicative, and digital literacy skills. These skills make students more adaptive, innovative, and resilient in facing the complexity of global issues.

Thus, sustainable education is not only an instrument for achieving the SDGs targets but also a means of building quality human resources who are ready to face an era of change. This research confirms the importance of national policy commitment, the support of educational institutions, and community involvement in ensuring the continuity of ESD implementation. Through multi-stakeholder collaboration, education can truly become "the most powerful weapon to change the world," as stated by Nelson Mandela. Therefore, strengthening the integration of ESD in the curriculum and learning practices is a fundamental step to create a more just, inclusive, and sustainable future for future generations.

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