

Transforming Education for a Sustainable Future: A Synthesis of Research on Education for Sustainable Development

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Abstract

The research examines the role of Education for Sustainable Development (ESD) in the contemporary educational landscape. The researchers employed qualitative synthesis approaches to review varied academic research and report data and case study documents to examine the impact of ESD implementation at various educational levels. ESD establishes multiple impacts on education outcomes by developing students academically and strengthened personification alongside environmental responsibility and inter-community collaborations. Even though ESD holds promise, its universal adoption faces challenges from restricted funding along with insufficient instructor backing and inadequate partnership between different parties. The research demonstrates that ESD requires better implementation systems and strengthened teacher education with more integrated digital resources to boost its reach. Furthermore, ESD needs broad-scale implementation to develop global-minded people who will build a sustainable equitable world through educational programs.

Keywords: Sustainable Development Goals, Education for Sustainable Development, School Curriculum and Development, 21st Century Skills Development, Educational Partnership - Stakeholders

Introduction

In today's rapidly changing world, the need for sustainable development has become an urgent priority. The combination of climate change alongside environmental destruction along with poverty and economic trouble and social inequality requires joint action to build sustainable outcomes. Sustainable Development Goals (SDGs) from 2015 offer an extensive plan to overcome these worldwide issues up to 2030 according to United Nations (2015). Education serves as the primary factor because UNESCO (2014) views it as a basic human right and an essential catalyst for sustainable development.

The United Nations emphasizes Education for Sustainable Development integration at all educational levels starting from primary and extending through tertiary education. ESD provides people with essential knowledge alongside skills along with appropriate values and attitudes which help them make well-informed decisions followed by responsible conduct while participating in sustainable community development (UNESCO, 2017). The worldwide view considers ESD as vital in developing young adults' capabilities to tackle complex problems as well as inspire environmental conservation together with social fairness and economic durability to build communities able to support human and natural ecosystems (UNESCO, 2014).

The transformative power of Education for Sustainable Development (ESD) emerges through its disciplinary applications of sustainability principles to build complete knowledge about world problems in students. At the International University of Business Agriculture and Technology (IUBAT) SDGs receive inclusion in core academic requirements because learning becomes enriched by an all-encompassing method that teaches students analytical thinking and problem-solving alongside volunteer community service (Leal Filho et al., 2019). Real-world projects and research reflect an important component of ESD because they connect educational concepts to practical sustainability issues. This experiential teaching method gives educational value to learning so students feel capable of finding solutions independently for SDGs in their societally relevant and creative way.

Higher education can use ESD as an opportunity to develop innovative educational approaches which support the United Nations' Sustainable Development Goals. Successful implementation of ESD needs substantial innovation together with substantial effort when addressing challenges within academic staff. Both curricular revision and sustained educational development for instructors should become compulsory since they prove the necessity of perpetual learning for educators alongside their students (Barth & Rieckmann, 2012). Educators typically understand sustainability concepts adequately yet identifying ways to improve student comprehension of these issues presents a major barrier toward achieving SDG 4 that requires quality education and lifelong learning opportunities for everyone.

One of the key obstacles to the effective integration of SDGs into higher education curricula is the insufficient professional development opportunities for faculty. According to Holdsworth et al. (2008), among 38 Australian universities only one institution provided specialized education for faculty members about sustainability curriculum development. The lack of support for educators to implement sustainability concepts remains a significant deficit in their teaching practice application. Many educators remain puzzled about including SDGs in their classes because they lack proper training in the implementation of these goals. Study participants expressed doubts about the relevance of SDGs to their courses, claiming that certain goals did not align with their subject matter or were not emphasized enough in their teaching (Holdsworth et al., 2008).

Higher education institutions should resolve the uncertainty which exists regarding SDGs implementation within different academic areas. The current situation provides universities with a chance to integrate curricula with the SDGs which leads to enriching educational experiences. Higher education institutions improve their teaching research abilities by linking course content directly with sustainability themes thus developing advanced interdisciplinary understanding of global challenges (Leal Filho et al., 2019). Curriculum-wide sustainability integration enables university students to develop skills for dealing with sustainable development challenges through critical problem-solving and interdisciplinary knowledge acquisition.

Students need Education for Sustainable Development (ESD) which teaches them how to combat climate change and biodiversity loss through specific skill sets yet current methods fail when they focus on individual actions rather than addressing the deeper systemic issues. Kopnina (2020) criticizes ESD initiatives because they lack proper critical assessment of sustainability problems' socio-political and economic origins which hinder their success. Environmental sustainability efforts through ESD will achieve meaningful impact by teaching students to recognize and confront fundamental causes of environmental degradation. According to Leal Filho et al. (2019) HEIs must directly include students in sustainability projects because this approach creates SDG-aligned learning settings for developing students who can participate in important transformative processes.

A thorough study regarding Education for Sustainable Development (ESD) remains crucial because experts need better understanding of its capacity to lead education toward sustainability. Research studies focused on curricular sustainability integration exist but a synthetic review assembling all these findings would both complete fragmented understanding and determine critical areas which need additional focus. Research through synthesis would provide researchers with a detailed understanding of the ways in which ESD develops critical thinking combined with problem-solving and authentic real-world involvement to handle global sustainability matters. This paper examines both obstacles and achievements of ESD adoption across educational environments to demonstrate how it creates transformative change in educational systems. These various perspectives would provide a solid foundation for scaling up ESD initiatives to ensure that education becomes a powerful tool for building a more sustainable and equitable future.

Methodology

This study employed a qualitative synthesis approach through which it examines original publications to investigate Education for Sustainable Development (ESD) contributions to the development of the necessary competencies for addressing global sustainability issues. A wide selection of academic articles, reports and case studies from multiple countries submitted to thematic analysis to establish full understanding of ESD success while identifying implementation challenges in various educational environments.

Results and Discussion

Educational Purposes and Outcomes

Students develop better problem-solving capabilities as a primary educational goal of ESD because it moves educators away from purely theoretical learning to solve actual problems. ESD programs in South Korean schools combine student projects with sustainability-based campaign work. According to Laurie et al. (2016) the practical activities allow students to handle sustainability problems by actively using their learning to address real-life situations. This method not only strengthens students' critical thinking and problem-solving abilities but also motivates them to take an active role in societal issues. Students understand sustainability better through these projects, so their learning becomes meaningful and produces better results during project work.

The link between distance learning and sustainable development demonstrates one main educational goal of Education for Sustainable Development (ESD) which is to make learning accessible while maintaining flexibility. Distance learning according to Al-Jaber and Al-Ghamdi (2020) enables students to obtain first-rate educational experiences regardless of their geographical position. The flexibility of distance learning serves sustainability purposes since students retain the ability to manage their education amidst other personal and professional commitments. Distance learning with sustainability principles integrates better learning styles while producing

improved educational quality that enables students to acquire sustainable development competencies across different environmental settings.

The Japanese educational system uses local resources together with school activities to demonstrate how Environmental Sustainability Development produces beneficial academic results. ESD in Japan according to Ichinose (2019) centers its efforts on teaching teamwork as well as communication and critical thinking abilities. Students participate in collective projects which allow them to face sustainability challenges like real-world sustainability projects require. Even though ESD may not always focus on traditional academic subjects like reading and writing, it extends its educational reach to broader facets of learning. Students participating in ESD programs exhibit enhanced motivation as well as improved critical thinking and a workplace culture of cooperation which prepares them for active sustainable development in society.

Sustainability programs in educational institutions result in improved attendance statistics indicating students show higher educational motivation (Laurie et al., 2016). These sustainability initiatives in educational curricula create a stronger purpose sense that drives students to regularly attend classes while actively engaging in learning activities. Students who study relevant global issues build stronger connections in their coursework that leads to improved motivation for consistent attendance and class engagement. Education programs that emphasize sustainability promote student focus through educational methodologies that are based on participative experiences.

Table 1. Educational Purposes and Outcomes

Country	Findings
Korea	The problem-solving abilities of students improve through Education for Sustainable Development (ESD) because the program emphasizes real-world applications instead of theoretical information alone. Attached to ESD in Korea are student projects and campaigns which provide students with practical opportunities to address real - world sustainability issues (Laurie et al., 2016).
Qatar	Distance learning creates a link with sustainable development because it uses education as an instrument to develop a sustainable planet through flexible educational methods which increase learning accessibility. Distance learning strategies improve educational quality to enable better results by giving students necessary competencies for participating in sustainable development across different settings (Al-Jaber & Al-Ghamdi, 2020).
Japan	Japanese educational institutions implement local resources with collaborative activities to achieve ESD's purpose of enabling students to develop teamwork abilities along with communication skills and critical thinking competencies. While ESD may not directly enhance traditional academic skills like reading and writing, its outcomes include improved student motivation, thinking abilities, and a cooperative attitude, all of which contribute to a deeper understanding of sustainable development and prepare students for active participation in society (Ichinose, 2019).
Belgium	Student attendance rates increase in ESD schools (Laurie et al., 2016).
Sweden	Students from ESD programs show excellent academic readiness for university through their developed academic abilities and post-secondary educational learning content. Students show high motivation because they find their learning exciting while appreciating their local community relationships through engagement with perceived crucial real-world matters (Laurie et al., 2016).
Finland	ESD creates positive learning effects that enhance student participation in educational matters and their active involvement in their education. The involvement of students in ESD leads them to develop exceptional communication along with writing and mathematical abilities that enhance their academic performance (Laurie et al., 2016).
Netherlands	ESD enables students to develop essential thinking abilities, such as critical, imaginative, and innovative thinking, specifically focused on sustainable development and the Sustainable Development Goals (SDGs) (Kopnina, 2017).
Australia	ESD produces favorable academic results that show student achievement improvements while both learning attendance and the need for school discipline decrease among students who no longer remain at risk. Education for Sustainable Development creates supportive learning environments that improve student behavior together with academic performance levels (Laurie et al., 2016).
Chile	A positive approach to ESD can enhance the physical, mental, and social well-being of students, teachers, and parents, while also fostering a stronger connection to nature. ESD promotes health improvement within schools allowing better conditions for the school community while building sustainable environment (Ampuero, 2014).
Ecuador	ESD enabled academics to acquire deeper knowledge as well as expanded understanding about sustainability topics. It also transformed teaching routines and

	professional performance, fostering a more participative and active approach in the classroom (Barth & Reickmann, 2012)
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Educational Sustainability Development acts as a vital tool to develop innovative thinking skills as well as creative abilities and critical thinking skills among students (Kopnina, 2017). Students become more engaged with sustainability issues and SDGs through which they develop essential critical thinking skills to handle current sustainability-related challenges. ESD creates an environment which promotes students to generate new solutions by developing original perspectives and proposing innovative answers to sustainability problems. The necessary skill of creative critical thinking prepares students to resolve today's complex and changing sustainability issues.

Students as well as their educators and community members experience positive improvement of physical, mental and social welfare through ESD practices. Ampuero (2014) shows that ESD builds better school health due to its nature-focused connection building and its community-wide sustainable practice increase. The entire educational system focuses on environmental and social and personal well-being which enables students to learn academic knowledge in addition to essential sustainability values needed to build a sustainable future. Through ESD programs, school communities develop stronger relationships with the people who live in their proximity. Through their involvement with community, environmental and social matters, students develop local responsibility and strengthened community ties leading to active citizenship participation. The educational setting which focuses on community work strengthens student learning while it powers them to develop into sustainable advocates who champion both domestic and worldwide sustainable practices and policies.

ESD reshapes the educators' teaching methods and expands their knowledge of sustainability issues (Barth & Reickmann, 2012). The teaching methods for educators participating in ESD education promote student-active learning through participatory and interactive activities. Educational institutions transform their teaching methods from traditional teacher-dominated instruction towards student-centered learning strategies that produce active and dynamic instructional settings. The integration of active roles by students and teachers allows ESD to support professional growth that improves educators' abilities to handle sustainability problems in their educational environment.

School Curriculum and Development

An increasing number of educational systems apply ESD principles to adjust their curriculum. The Knowledge Development Program shows sustainability integration through its approach which brings environmental education into science classes and mathematics learning and environmental geography content. Students who participate in this learning approach develop better environmental understanding while simultaneously improving their performance in core academic subjects. The integration described by Ambusaidi & Al Washahi (2016) promotes student commitment to sustainability-focused clubs and environmental activities which enhance their sustainability awareness. The combination of academic achievement with environmental awareness fosters a sense of personal responsibility for sustainable development.

The Japanese educational system shows increasing dedication to sustainability through its educational contents. Some schools implement ESD through these international initiatives named Unesco Associated Schools Project Network (ASPNet) and SGH to develop student capabilities in global sustainability awareness and leadership. However, the main obstacle teachers encounter stems from their difficulties implementing sustainability lessons into their classrooms. Teachers report facing problems stemming from the deficit of motivating examples and expertise and insufficient support from their school management teams according to Fredriksson et al. (2020). Despite these barriers, many educators continue their commitment to ESD development since they understand how this approach helps students both learn and become globally aware.

Table 2. School Curriculum and Development

Country	Findings
Oman	The Knowledge Development Program establishes a connection to Education for Sustainable Development (ESD) goals by bringing sustainability concepts into science, mathematics and environmental geography curriculum. Through this program students will experience subject performance enhancement as well as learn about environmental consciousness which motivates them to become actively involved in sustainable organizations. Following this approach, education institutions help students develop better comprehension of environmental matters while enabling them to take ownership of sustainable development (Ambusaidi & Al Washahi, 2016).
Japan	The inclusion of a wider social and global agenda in the Course of Study for Upper Secondary School in 2009 reflects the growing emphasis on Education for Sustainable Development (ESD). Several educational institutions including School A use ESD as a foundation to implement both ASPnet and SGH programs which aim to foster international understanding and educational leadership for a global society. Borg's

	study demonstrates teachers face ongoing difficulties in teaching sustainability because they lack inspiring examples and expertise together with adequate time and school management backing. Fredriksson et al. (2020) show that ESD faces various challenges yet numerous teachers continue to be dedicated supporters of these programs to develop an engaged and globally aware student body.
China	Over the past decade, Chinese authorities adopted a New Curriculum that granted schools the flexibility to determine approximately 10% of the total curricular hours, allowing them to integrate Education for Sustainable Development (ESD) programs. Many schools not only taught specific ESD topics but also embedded core ESD values, known as the Four Respects: Respect for All, Respect for Cultural Diversity, Respect for Nature, and Respect for Science. This approach aimed to foster a deeper understanding of sustainability and its principles, ensuring that students develop a well-rounded and globally aware perspective (Elias et al., 2009).
Thailand	The curriculum system of Thailand permits its schools to generate 30% of their total curriculum content tied to community-specific needs which provides a chance to teach Education for Sustainable Development (ESD) in relevant ways. Education institutions gain the freedom to add contents about sustainable lifestyles and livelihoods and self-sustaining economic concepts to their academic plans. Teacher exchanges within this system allow educators from various schools to collaborate for building effective ESD initiatives that respect their unique local challenges and needs (Didham & Ofai-Manu, 2012).
Europe	A school curriculum based on sustainability includes pedagogies which combine project and problem-based learning and community service learning and place-based environmental education. Such educational approaches let students tackle actual problems in the world through the development of systems thinking capabilities as well as integrated problem-solving expertise and interpersonal collaboration abilities. ESD integrated into the curriculum allows schools to deliver sustainability education and develop essential competencies through experiential learning methods and ecojustice and traditional ecological knowledge principles that equip students to make significant contributions to sustainable growth (Kioupi & Voulvoulis, 2019).
	Kopnina promotes alternative educational systems including ecopedagogy mixed with Indigenous knowledge to be taught at schools so students can learn planetary values while promoting degrowth. The alternative educational methods enable students to learn about sustainability together with cultural understanding and sustainable economic practices (Kopnina, 2020).
Iceland	The Icelandic education system offers teachers and schools greater flexibility measures to address issues of sustainable development within their curricula. This approach encourages a more comprehensive and contextually relevant exploration of sustainability, that empowers educators to integrate sustainability topics into various subjects (Jóhannesson et al., 2011).
Sweden	The school designs its approach around individual development of global environmental knowledge to enable societal adaptation of functions and lifestyles for sustainable development. Through a multidisciplinary approach and alignment with the SDGs, the school fosters creativity, critical thinking, and global awareness, encouraging students to understand their potential for personal growth while considering the broader impact of their actions on a sustainable future (Fredriksson et al., 2020).
Kenya	To prepare students for sustainability challenges, the education system is designed to focus on problem-based learning to equip students with the skills to adapt to evolving sustainability issues. This approach encourages life-long learning, enabling students to continuously engage with and address the dynamic nature of environmental and social challenges (Kivati, 2016).
Morocco	In Morocco, while sustainable development is not explicitly mentioned in the curriculum, the content of learning modules effectively introduces the principles of sustainable development and fosters an environment-friendly culture. The curriculum promotes implicit sustainability education that satisfies the goals set by Education for Sustainable Development (ESD) by enabling students to grasp sustainability through academic learning (Benavot, 2014).

In China, the recent adoption of a New Curriculum gives schools the flexibility to allocate around 10% of their total curricular hours to integrate ESD topics. The "Four Respects" represent core values which Chinese schools employ together with specific ESD classes to educate their students about Respect for All, Respect for Cultural Diversity, Respect for Nature and Respect for Science. The holistic educational model promotes student development of global understanding to make sustainability an essential educational cornerstone (Elias et al., 2009). Similarly,

the curriculum in Thailand functions flexibly to enable academic institutions to form their own unique educational content from local needs which extends to 30% of the overall learning material framework. According to Didham & Ofei-Manu (2012), this operating approach simultaneously supports school cooperation and enables ESD initiatives to be developed based on local contexts and challenges. The local implementation of integrated education enables student engagement better because it addresses sustainability matters that specifically impact on their community thus strengthening educational initiatives through shared efforts. On the same manner, the educational curriculum of Iceland enables schools to develop localized approaches for sustainability education which suit regional needs. Icelandic teachers receive more autonomy to incorporate sustainability into different subjects that enables them to connect the SDGs to their teachings while nurturing innovative thinking and worldwide awareness skills (Fredriksson et al., 2020). This multidisciplinary approach helps students understand the interconnectedness of sustainability issues and their potential to create positive change.

Schools have adopted various educational approaches which serve to activate student involvement while fostering critical thinking skills for teaching sustainability. Students can tackle realistic sustainability issues through three main learning approaches: project-based learning, community service learning and place-based environmental education. These methods described by Kioupi & Voulvoulis (2019) develop important competencies such as systems thinking along with integrated problem-solving and collaborative capacities required to handle sustainability complexities. With these hands-on educational methods embedded with ESD within the curriculum boost students' academic abilities and develop their skills needed for successful sustainable development engagement. For instance, through community service learning, students can gain practical experience by addressing local sustainability challenges, while place-based education allows them to explore environmental issues within the context of their own communities.

Kopnina (2020) promotes alternative teaching methods including indigenous learning and ecopedagogy as solutions for developing planetary ethic and sustainable economic practices. Such educational models teach students how to respect diverse cultures while promoting sustainable practices and different economic approaches which expand student perspectives regarding sustainability and environmental matters. The combination between deeper sustainability comprehension and knowledge of multiple worldviews enables students to understand their global influence better.

Sustainable development stands absent from Moroccan education curricula but learning modules deliver principles of sustainability to students. Benavot (2014) establishes that schools develop sustainable cultural environments through their teaching of sustainability-related ideas although they lack formal ESD recognition. The curricular integration of environmental sensibility shows that minimal changes support student development of environmental mindfulness and responsibility.

ESD equips students with 21st Century Skills

The Japanese educational program demonstrates how ESD guides student development of 21st-century competencies through its restructuring of learning systems toward hands-on participation. Educational reforms in Japan now concentrate on teaching students to pose and solve problems according to the Ministry of Education, Culture, Sports, Science and Technology (MEXT, 2019). Educational reform adds social and global issues into the curriculum to teach students essential competencies for understanding actual sustainability challenges. Active learning methods that combine collaborative projects and discussions enable students to develop abilities both mentally and interpersonally. The essential skills of leadership, collaborative work and communicational ability serve as basic tools for solving difficult international challenges as well as future sustainability missions. Critical thinking and problem-solving competence originate from ESD since the education model teaches students to create solutions together for sustainability challenges (Ichinose, 2019).

Educational institutions through ESD concentrate on academic progress while creating emphasis on non-cognitive traits needed to handle worldwide sustainability matters. Kioupi & Voulvoulis (2019) establish that ESD helps students develop teamwork capabilities along with communication abilities and analytical thinking competencies to handle complex undefined problems. Students who develop these abilities become better at teamwork and cultural communication, including applying innovative solutions to environmental, social and economic problems. The transformative learning experience through ESD gives students chances to examine their learning developments and participate in thought-provoking reflective actions that boost their problem-solving abilities and collaboration effectiveness. These educational processes foster student development of abilities that will support success in future sustainable environments and social contributions. According to Laurie et al. (2016) ESD allows students to become better prepared for the current and future challenges thus enabling their active participation in sustainability initiatives globally.

Table 3. ESD equips students with 21st Century Skills

Country	Findings
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Japan	The educational reforms focus on teaching methods which adapt to fast-changing social settings. Students must now develop cognitive skills together with soft skills along with non-cognitive abilities. The Japanese course of study adjusted to active learning methods which promote problem-posing and problem-solving education for student attainment. The revised curriculum features an expanded teaching focus with a social and global approach to develop students' abilities for addressing contemporary human issues (The Ministry of Education, Culture, Sports, Science and Technology (MEXT), 2019). ESD equips students with 21st-century skills essential for addressing sustainable development challenges by fostering active participation, leadership, collaboration, and problem-solving. The acquisition of these specific capabilities enables students to develop co-created solutions while leading sustainability initiatives. Students in this educational setting acquire cognitive and non-cognitive abilities including collaboration and leadership since these fundamentals have tremendous importance when confronting global complex issues (Icihnose, 2019).
Europe	Education for Sustainable Development (ESD) equips students with critical thinking, collaboration, communication, and problem-solving skills, which are necessary for addressing complex and ill-defined challenges. This method increases learning outcomes of competences and simultaneously fosters creative and reflective learning interactions among students which facilitates transformative education. Students who develop these skills become more capable at handling global sustainability issues and produce beneficial outcomes (Kioupi & Voulvoulis, 2019).
Canada	Education for Sustainable Development (ESD) equips students to thrive in a sustainable future through the development of their ability to be environmentally responsible along with globally aware, economically savvy, socially accountable, and technologically proficient. Students develop necessary abilities from ESD to handle present and forthcoming difficulties thus enabling their adaptation and innovation in a constantly changing world (Laurie et al., 2016).
Chilean	Through ESD, children, as the future adult generation, can develop a clearer, more accurate, and comprehensive understanding of environmental issues affecting the Earth. This awareness arises from reflection concerning a situation that strengthens their global awareness and critical thinking and reflective skills (Ampuero et al., 2014).

An important feature of ESD teaches students to develop global awareness and responsibility that makes them grow into responsible global citizens. Ampuero et al. (2014) demonstrates how ESD lets students grasp environmental concerns through its approach to critical examination of global environmental difficulties. The logistical reflective method expands students' sustainability knowledge while instructing them to generate well-informed choices that lead to reliable behaviors. The educational approach promotes universal thinking and leads students toward bright community-led initiatives. Students attain advanced knowledge of how environmental, social, and economic systems are interconnected, which gives them the tools to contribute positively to sustainability efforts in their communities and beyond.

Educational Partnership – Stakeholders

The success of implementing Education for Sustainable Development (ESD) depends heavily on participatory involvement from government institutions, educational bodies, teachers, students and members of the wider community. The collaborative effort between different groups integrates sustainability education throughout educational institutions and society which prevents its isolation. Educational partnerships play a vital role in advancing ESD by providing the necessary resources, policy support, and institutional backing to effectively promote sustainability goals.

The Taiwanese government actively supports environmental initiatives throughout both national educational programs and international relationships. Over the past decade, Taiwan seized the Decade of Education for Sustainable Development (ESD) to demonstrate its global sustainability commitment. The Environmental Education Act from 2011 established environmental and sustainability education requirements for all Taiwan government institutions and K-12 schools including government-funded community organizations. Environmental and sustainability education courses represent a mandatory requirement for all governmental institutions and education staff which include both administrative and academic personnel according to the policy defined by Huang & Asghar (2021). The policy underscores the significant contribution that national institutions together with the government make toward embedding sustainability education into Taiwan's educational structure.

The notion of sustainable societal education has strongly taken root in Japan since it allows multiple stakeholders to collaborate effectively. The educational activities for sustainable development in Japan now extend beyond students to include adults who take on roles as community change agents as reported by Maruyama (2010). The growing interest in finding such a guidebook reveals that educators and learners want to focus on social

competencies together with traditional academic skills. Different stakeholders including students along with faculty staff and community representatives demonstrate how Japan embraces ESD inclusively. Economic support from public authorities plays a key role in funding the development of sustainable development programs at Japanese higher educational establishments (Nomura & Abe, 2010). The extensive participation demonstrates sustainability education goes beyond classroom learning because it should involve multiple stakeholders as part of an inclusive social process for success.

Through initiatives such as the Regional Centres of Expertise on ESD (RCE) network, students gain hope and resilience to deal with sustainability challenges by implementing workshops developed by eco-psychologists. These workshops operate under the RCE Network (2018) to teach students about social and emotional abilities that form the basis of sustainable development. Educational institutions along with eco-psychologists recognize that students need emotional and social competencies and social competencies as much as cognitive abilities to face sustainability issues. Through this collaborative partnership academic learning becomes broader as the initiative develops emotional competencies students need to participate actively in sustainability programs.

Table 4. Educational Partnership – Stakeholders

Country	Findings
Taiwan	During the last ten years, Taiwan's government has conducted environmental protection programs as part of its international diplomatic strategy to attract worldwide backing for its self-governing mission. During the Decade of Education for Sustainable Development, Taiwan found an essential opportunity to prove its international sustainability dedication which resulted in the Environmental Education Act being established in 2011. The implementation of this law mandated environmental education and sustainability training in every government agency that included K-12 schools together with government-sponsored community organizations. Annual environmental and sustainability education programs totaling at least four hours become mandatory for all personnel associated with education including government staff members and school leadership teams alongside educators and learners. The government policy places an essential emphasis on how educational institutions together with various stakeholders create progress in sustainable development education across Taiwan while integrating sustainability instruction throughout the educational system (Huang & Asghar, 2021).
Japan	Education for sustainable society functions as an essential concept in Japan as it motivates different groups to work together by enabling Education for Sustainable Development (ESD) activities conducted both within and beyond educational institutions. The activities include educational participation from children and adult change agents who lead community transformations. A rising number of Japanese educators and learners now seek guidance about social competency development along with their traditional academic training until the present. The commitment to prepare individuals for sustainable development of societies continues to grow as Maruyama (2010) observes. Japanese higher education institutions received essential support from government policies and funding to develop Education for Sustainable Development (ESD) (Nomura & Abe 2010).
Portland	Members of the RCE Sustainability Education Network work alongside eco-psychologists to establish student workshops which help students gain resilience and hope against challenging sustainability problems. The educational programs concentrate on equipping learners with fundamental abilities to handle environmental disasters and environmental injustice. Educational institutions alongside eco-psychologists take part in this initiative to develop sustainable development competencies through different stakeholders as per Regional Centres of Expertise on ESD Network (RCE Network) (2018).
United Kingdom	The progression of sustainability education faces three main obstacles including insufficient financial backing alongside weak governmental commitment coupled with inadequate institutional support. Therefore, the effective promotion of Education for Sustainable Development (ESD) goals can be attained through strategic partnerships along with necessary resources, institutional support and policy backing to ensure their sustainability (Leal Filho et al., 2019).
Asia	Education for Sustainable Development (ESD) becomes more effective when stakeholders work together in partnership research projects. The partnerships create opportunities to discover ESD gaps better through ongoing individual and institutional learning processes. Such collaborations establish an action-reflection cycle that

supports the ongoing review and improvement of ESD practices and implementation (Didham & Ofei-Manu, 2012).

Multiple positive collaboration efforts exist to support sustainability education, but significant barriers continue to prevent the field's advancement. The implementation and sustainable execution of effective ESD initiatives face barriers because of insufficient financial support from governments along with weak institutional backing and official financial backing according to Leal Filho et al. (2019). Building partnerships between governments, educational institutions, private sector entities and civil society interests remains essential to overcome these current challenges. Multi-stakeholder alliances enable the resolution of funding gaps and improve the acquisition of policy compliance and develop institutional structures for reaching ESD targets. The establishment of collaborative research partnerships enables institutions to detect ongoing gaps in ESD alongside developing a feedback system which helps ESD practices evolve through continuous improvement (Didham & Ofei-Manu, 2012). Stakeholders through these partnerships participate in an ongoing process of action followed by reflection which leads to active enhancement of ESD implementation.

Conclusion

Education for Sustainable Development (ESD) is a powerful approach that weaves sustainability into the fabric of the school curriculum, which yields not only academic performance but also personal growth. It nurtures critical thinking, problem-solving, teamwork, and global awareness, preparing students to address the complex sustainability challenges of today and tomorrow. ESD goes beyond improving grades, it also supports students' well-being, encourages community involvement, and fosters a sense of environmental responsibility. Innovative teaching methods as well as strong partnerships between governments, schools, and communities help ESD equip students with the tools, knowledge, and values needed to build a more sustainable world. Additionally, the ongoing support from every stakeholder group enables ESD to remain the essential path for creating more globally aware and sustainability-conscious generations.

However, despite the significant strides made in embedding ESD into educational systems, there are still important challenges that need to be addressed. The implementation of ESD faces significant challenges because various educational institutions lack integrated support for teachers and enough resources to support sustainability teaching in classrooms. Many countries have adopted ESD principles, but its application remains inconsistent due to insufficient collaboration between key stakeholders or educators face challenges in defining sustainability integration positions in current curriculum frameworks. Future research needs to study ESD implementation strategies between educational systems while evaluating how ESD shapes student actions through time and developing solutions for inadequate trainer resources. Additionally, further studies could examine how digital tools, and technology could help expand the reach and impact of ESD, especially in underserved or remote areas where access to traditional resources is limited.

References

- Al-Jaber, M. A., & Al-Ghamdi, S. G. (2020). Effect of virtual learning on delivering the education as part of the sustainable development goals in Qatar. *Energy Reports*, 6, 371–375. doi:10.1016/j.egyr.2020.11.17
- Ambusaidi, A., & Al Washahi, M. (2016). Prospective Teachers' Perceptions about the Concept of Sustainable Development and Related Issues in Oman. *Journal of Education for Sustainable Development*, 10(1), 3–19. doi:10.1177/0973408215625528
- Ampuero, D. A., Miranda, C., & Goyen, S. (2014). Positive psychology in education for sustainable development at a primary-education institution. *Local Environment*, 20(7), 745–763. doi:10.1080/13549839.2013.86
- Barth, M., & Reickmann, M. (2012). Academic staff development as a catalyst for curriculum change towards education for sustainable development: an output perspective. *Journal of Cleaner Production*, 26(2012), 28–36.
- Benavot, A. (2014). Education for sustainable development in primary and secondary education. University at Albany-State University of New York. doi:10.
- Didham, R. J., & Ofei-Manu, P. (2012). Education for Sustainable Development Country Status Reports: An Evaluation of National Implementation During the UN Decade of Education for Sustainable Development (2005-2014) in East and Southeast Asia. Kanagawa, IGES.
- Elias, D., Sachathap, K., & Kulapongse, P. P. (2009). ESD currents: Changing perspectives from the Asia-Pacific. Bangkok: UNESCO Bangkok. Retrieved October, 1, 2011.
- Fredriksson, U., Kusanagi, K., Gougoulakis, P., Matsuda, Y., & Kitamura, Y. (2020). A comparative study of curriculums for education for sustainable development (ESD) in Sweden and Japan. *Sustainability*, 12(3), 1123.
- Holdsworth, S., Wyborn, C., Bekessy, S., & Thomas, I. (2008). Professional development for education for sustainability. *International Journal of Sustainability in Higher Education*, 9(2008), 131–146.
- Ichinose, T. (2019, December). The effectiveness of the methods and approaches of ESD for 2030 sustainable development goals; from analysis of the questionnaire survey to the school teachers. In *Journal of Physics: Conference Series* (Vol. 1417, No. 1, p. 012072). IOP Publishing.

- Jóhannesson, I. Á., Norðdahl, K., Óskarsdóttir, G., Pálsdóttir, A., & Pétursdóttir, B. (2011). Curriculum analysis and education for sustainable development in Iceland. *Environmental Education Research*, 17(3), 375–391. <https://doi.org/10.1080/13504622.2010.545872>
- Kioui, V., & Voulvoulis, N. (2019). Education for sustainable development: A systemic framework for connecting the SDGs to educational outcomes. *Sustainability*, 11(21), 6104.
- Kopnina, H. (2017). Teaching Sustainable Development Goals in The Netherlands: a critical Environmental. doi:10.1080/13504622.2017.1303819
- Kopnina, H. (2020). Education for the future? Critical evaluation of education for sustainable development goals. *The Journal of Environmental Education*, 51(4), 280–291.
- Kivati, G. (2016). The Role of Kenya's formal higher education in sustainable development within the context of globalization. In Filho, W. L., Skanavis, C., do Paço, A., Rogers, J., Kuznetsova, O., & Castro, P. (Eds.), *Handbook of theory and practice of sustainable development in higher education* (Vol. 2, pp. 17–34). <https://doi.org/10.1007/978-3-319-47889-0>
- Laurie, R., Nonoyama-Tarumi, Y., Mckeown, R., & Hopkins, C. (2016). Contributions of Education for Sustainable Development (ESD) to Quality Education: A Synthesis of Research. *Journal of Education for Sustainable Development*, 10(2), 226–242. doi:10.1177/0973408216661442
- Leal Filho, W., Shiel, C., Paço, A., Mifsud, M., Ávila, L. V., Brandli, L. L., ... & Caeiro, S. (2019). Sustainable Development Goals and sustainability teaching at universities: Falling behind or getting ahead of the pack?. *Journal of Cleaner Production*, 232, 285–294.
- Maruyama, H. (2010). Social Competence: A Learning Outcome of Policy and School Practice in Education for Sustainable Development in Japan. *International Journal of Educational Policies*, 4(2), 5–18.
- Nomura, K., & Abe, O. (2010). Higher education for sustainable development in Japan: policy and progress. *International Journal of Sustainability in Higher Education*, 11(2), 120–129. <https://doi.org/10.1108/14676371011031847>
- Regional Centres of Expertise on ESD Network (RCE Network). (2018). RCE Vision and mission. Retrieved from <https://www.rcenetwork.org/portal/rce-vision-and-mission>. Accessed 30 Jan 2018.
- The Ministry of Education, Culture, Sports, Science and Technology (MEXT). (2019). Available online: http://www.mext.go.jp/a_menu/shotou/new-cs/1383986.htm#section4 (accessed on 24 June 2019).
- United Nations. (2015). *Transforming our world: The 2030 Agenda for Sustainable Development*. United Nations.
- UNESCO. (2014). *UNESCO education strategy 2014–2021*. United Nations Educational, Scientific and Cultural Organization.
- UNESCO. (2017). *Education for Sustainable Development Goals: Learning Objectives*. United Nations Educational, Scientific and Cultural Organization.