

## Education for Sustainable Development: An Advanced Step Leading to Environmental Sustainability

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### Abstract

The shape of the environment shapes the future of the populations. Sustainable environment is an emblem of the ecological balance of nature. This paper aims to discuss the genuine concepts of sustainability and sustainable development goals (SDGs) of United Nations (UN), explain the rationale, goals, and importance of ESD, describe the different pedagogic approaches in ESD, and integrate the significant roles of environmental education for attaining sustainable development. Sustainability is the ability to exist harmoniously in nature and develop economically without depleting natural resources for the future generation. The four pillars of sustainability are human sustainability, social sustainability, economic sustainability, and environmental sustainability. ESD is way way to improve the quality of life of the present and future generations. ESD has included key sustainable developmental issues into teaching and learning by focusing on the aspects of climate change, disaster risk reduction, biodiversity, poverty reduction, and sustainable consumption. ESD is aligned with the seventeen SDGs of UN. SDGs aim to transform our world into a better place to thrive in, to end poverty and inequality, to protect the planet, and to ensure that all people enjoy health, justice and prosperity. In various educational settings around the world, critical reflection, participatory and collaborative learning, systematic thinking and analysis, and problem based learning are one of the most effective pedagogic approaches for ESD. Integrating the true essence of environmental education in ESD can promote critical thinking, communication, and problem-solving skill of the educators and learners alike. Environmental education can empower the decision-makers of tomorrow, can improve the public understanding of climate change, and can rehabilitate the altered ecosystems.

**Keywords:** education for sustainable development, pedagogy, sustainable development, sustainable development goals, sustainability

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### Introduction

The detrimental effect of human-induced climate change depicts a conspicuous evidence of deteriorating environmental quality in the recent era of technological breakthrough. The dwindling Earth's resources and declining environmental quality have become serious threats to health, economic activities, and emotional well being of the people around world. It is imperative to note that the current shape of our environment shapes our future; that is why we must be mindful and sensitive to the daily activities that directly and indirectly affect our environment. In the era of global warming and ocean acidification, there are people who remain callous regarding the environmental situation and irrational about their harmful activities towards the nature. Sometimes we cannot put the blame on them because they might lack environmental awareness about various ecological issues and concerns. Take note that education is a light that can shed awareness and spread correct attitude among ignorant people.

Considering the existing social and environmental problems that we have been facing, the environmental scientists, social science researchers, educators, and policy makers around the world sought various ideas to address the diminishing planet's biological and geological resources and declining quality of the

ecosystems. To implement the holistic and integrative approaches on environmental sustainability, the United Nations was able to conceptualize the idea of Education for Sustainable Development (ESD). ESD is a powerful and influential tool utilizing the power of education in influencing people towards the implementation of sustainable development. In connection with those ideas, this paper explains the genuine concepts of sustainable development and sustainable development goals (SDGs) of United Nations, elucidate the rationale, goals, and importance of Education for Sustainable Development, describe the different pedagogical approaches in ESD, and integrate the significant roles of environmental education for attaining sustainable development.

### The Genuine Concepts of Sustainability and Sustainable Development

Sustainability is the ability to exist and develop without depleting natural resources for the future. Sustainability has four pillars. These pillars include human sustainability, social sustainability, economic sustainability, and environmental sustainability. Human sustainability aims to maintain and improve the human capital in society. Investments in the health and education systems, access to services, nutrition, knowledge and skills are all programs under the umbrella of human sustainability (Dyakova, 2017). Social sustainability is a proactive way of managing and identifying business impacts on employees, workers in the value chain, customers, and local communities. Companies that raise the importance of social sustainability recognize the significance of their relationships with people, communities and society (Morrissey and Heidkamp, 2022). Economic sustainability refers to practices designed to create the long-term economic development of a company or nation while also managing the environmental, social, and cultural aspects of its activities. It is about balancing economic growth and generating profit with the impact on the environment and people (Courtneil, 2019). Environmental sustainability is the ability to maintain an ecological balance in our planet's natural environment and conserve natural resources to support the well being of current and future generations (Moldan, 2012; Uralovich et al, 2023).

Closely related concept to sustainability is sustainable development. Sustainable development has been defined in many ways, but the most frequently quoted definition is from Our Common Future, also known as the Brundtland Report. According to the report, sustainable development defined as development that meets the needs of the present without compromising the ability of future generations to meet their own needs (Emina, 2021). Taking holistic and integrative concept of sustainable development into account, Clark and Harley (2020) came up with the capacities for sustainable development (Figure 1). Six interdependent capacities are necessary for the successful pursuit of sustainability. These capacities include (a) capacity to measure progress toward sustainable development, (b) capacity to promote equity within and between generations, (c) capacity to adapt to shocks and surprises, (d) capacity to transform the system onto more sustainable development pathways, (e) capacity to link knowledge with action for sustainability, and (f) capacity to devise governance arrangements that allow people to work together in exercising the other capacities. The capacities are intertwined and interdependent to each other because one works well if it is connected and supported by other aspects.

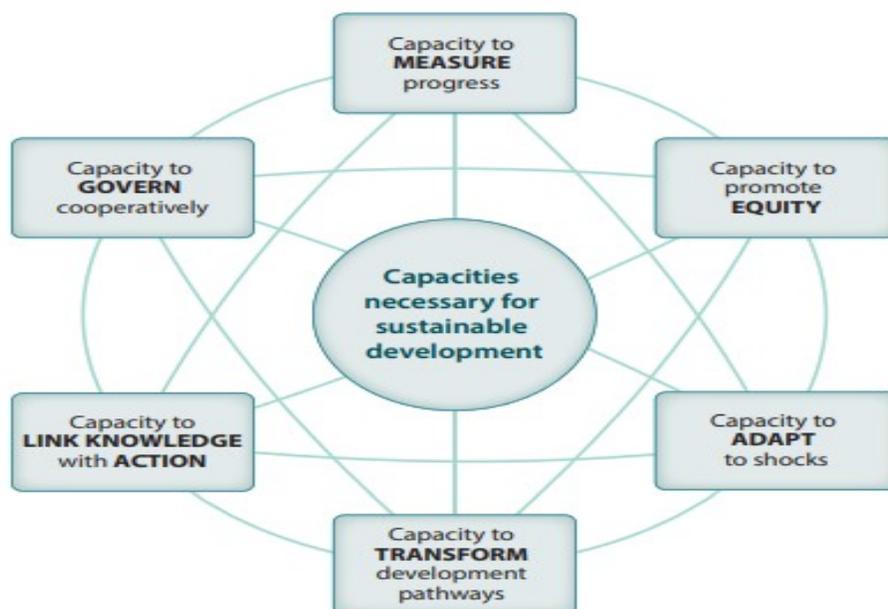


Figure 1. Capacities for sustainable development. (Source: Clark and Harley, 2020)

## Sustainable Development Goals of United Nations

The Sustainable Development Goals (SDGs) aims to transform our world into a better place to thrive in. They are a call to action to end poverty and inequality, protect the planet, and ensure that all people enjoy health, justice and prosperity. It is critical and essential attempt to allow that no one is left behind. As for the background, in 2015, the 193 countries that make up the United Nations (UN) agreed to adopt the 2030 Agenda for Sustainable Development. The historic agenda lays out 17 Sustainable Development Goals (SDGs) and targets for dignity, peace, and prosperity for the planet and humankind, to be completed by the year 2030. The agenda targets multiple areas for action, such as poverty and sanitation, and plans to build up local economies while addressing people's social needs (Source:)



Figure 2. The Seventeen Development Goals of United Nations  
(Source: <https://education.nationalgeographic.org/resource/sustainable-development-goals/>)

The United Nations has implemented 17 SDGs (Figure 2). The goal 1 is no poverty. End poverty in all its forms everywhere. The goal 2 is zero hunger. End hunger, achieve food security and improved nutrition and promote sustainable agriculture. The goal 3 is good health and well-being. Ensure healthy lives and promote well-being for all at all ages. The goal 4 is quality education. Ensure inclusive and equitable quality education and promote lifelong learning opportunities for all. The goal 5 is gender equality. Achieve gender equality and empower all women and girls. The goal 6 is clean water and sanitation. Ensure availability and sustainable management of water and sanitation for all. The goal 7 is affordable and clean energy. Ensure access to affordable, reliable, sustainable and modern energy for all. The goal 8 is decent work and economic growth. Promote sustained, inclusive and sustainable economic growth, full and productive employment and decent work for all. The goal 9 is industry, innovation, and infrastructure. Build resilient infrastructure, promote inclusive and sustainable industrialization, and foster innovation. The goal 10 is reduced inequality. Reduce inequality within and among countries. The goal 11 is sustainable cities and communities. Make cities and human settlements inclusive, safe, resilient, and sustainable. The goal 12 is responsible consumption and production. Ensure sustainable consumption and production patterns. The goal 13 is climate action. Take urgent action to combat climate change and its impacts. The goal 14 is life below water. Conserve and sustainably use the oceans, seas, and marine resources for sustainable development. The goal 15 is life on land. Protect, restore, and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification, and halt and reverse land degradation and halt biodiversity loss. The goal 16 is peace, justice, and strong Institutions. Promote peaceful and inclusive societies for sustainable development, provide access to justice for all and build effective, accountable, and inclusive institutions at all levels. The goal 17 is partnerships to achieve the goal. Strengthen the means of implementation and revitalize the global partnership for sustainable development (Idowu et al., 2020; Rosen, 2017).

## Education for Sustainable Development: Rationale, Goals, and Importance

It is always the desire of humankind to improve the quality of their lives. Improving the quality of their lives requires the utilization of the various resources from the environment. Breakthrough in technologies is seen as one of the indicators of development. In the light of those scenarios, one of the pressing issues for survival in

the current era is how to sustain the natural environment and our planets' resources while developing wealth and well-being for a growing population. This monumental task has been defined in the concept of sustainable development. During the last few decades the world communities have, under the umbrella of the UN, agreed upon jointly addressing sustainable development. As a response, Education for Sustainable Development (ESD) has been launched as one of the key answers to dealing with sustainability. The underlying idea of ESD is to empower students with sustainability competences through a holistic interdisciplinary perspective of content and pluralistic learner-centered democratic teaching strategies. ESD has been adopted globally as a consequence of the UN Decade for Education for Sustainable Development (DESD; 2005–2014), which has reshaped curricula worldwide (Boeve-de Pauw et al. 2015).

Education for sustainable development (ESD) is a term officially used by the United Nations and is defined as education practices that encourage changes in knowledge, skills, values and attitudes to enable a more sustainable and just society for humanity. ESD is about the learning needed to maintain and improve our quality of life and the quality of life of generations to come. ESD has included key sustainable development issues into teaching and learning; for example, climate change, disaster risk reduction, biodiversity, poverty reduction, and sustainable consumption (UNESCO, 2014). The main goal of ESD aim is to empower and to equip current and future generations to meet their needs using a balanced and integrated approach to the economic, social and environmental dimensions of sustainable development (Kolvoord, 2021). According to UNESCO (2014) ESD aims to enable people to develop the knowledge, values and skills to participate in decisions about the way we do things individually and collectively, both locally and globally, that will improve the quality of life now without damaging the planet for the future.

Agenda 21 was the first international document that identified education as an essential tool for achieving sustainable development and highlighted areas of action for education (Bernad-Cavero and Llevot-Calvet, 2018; Leicht, 2018). ESD is a component of measurement in an indicator for Sustainable Development Goal 12 (SDG) for "responsible consumption and production". SDG 12 has 11 targets and target 12.8 is "By 2030, ensure that people everywhere have the relevant information and awareness for sustainable development and lifestyles in harmony with nature (United Nations, 2017)." After 20 years the Agenda 21 document was declared, the 'Future we want' document was declared in the Rio+20 UN Conference on Sustainable Development, stating that "We resolve to promote education for sustainable development and to integrate sustainable development more actively into education beyond the Decade of Education for Sustainable Development" (Shulla et al., 2020).

One version of education for Sustainable Development recognizes modern-day environmental challenges and seeks to define new ways to adjust to a changing biosphere, as well as engage individuals to address societal issues that come with them (Jucker et al., 2014). In the International Encyclopedia of Education, this approach to education is seen as an attempt to "shift consciousness toward an ethics of life-giving relationships that respects the interconnection of man to his natural world" in order to equip future members of society with environmental awareness and a sense of responsibility to sustainability (Peterson et al., 2010). For UNESCO, education for sustainable development involves integrating key sustainable development issues into teaching and learning. This may include, for example, instruction about climate change, disaster risk reduction, biodiversity, and poverty reduction and sustainable consumption. It also requires participatory teaching and learning methods that motivate and empower learners to change their behaviors and take action for sustainable development. ESD consequently promotes competencies like critical thinking, imagining future scenarios and making decisions in a collaborative way (Marope et al., 2015).

### **Pedagogical Approaches in Education for Sustainable Development**

There is no such thing as absolutely correct approaches applied in the sustainability education. The approaches should be geared towards the significant goals of education for sustainable development. GEMS Legacy School believes that Sustainability Education or ESD is essential to transform the next generation into eco-conscious, self-sustaining global citizens, who understand the urgency of environmental responsibility. Although there is no universally correct pedagogical approach to facilitate ESD in the classroom, the school realizes that the best way to do so is by shifting toward teaching-learning methods that are reflective, critical, active, participating, collaborative, experiential and inquiry-driven. The aim of these pedagogical approaches are that they will motivate and empower the learner to change their behavior and consequently adapt to the real scenarios of the world. These approaches include critical reflection, systematic thinking and analysis, participatory and collaborative learning, and problem based learning (Figure 3).



Figure 3. Pedagogic Approaches in Sustainability Education at GEMS Legacy School  
(Source: <https://www.gemslegacyschool-dubai.com/Life-at-GLS/Education-for-Sustainable-Education---ESD> ).

Critical reflection approach applies traditional lecture method, but also includes the newer approaches in education. These novel approaches are reflexive accounts, learning journals, and discussion groups. Systemic thinking and analysis approach refers to the use of real-world case studies and critical incidents, project-based learning, stimulus activities, and the use of the campus as a learning resource. Participatory learning is emphasized on group or peer learning, developing dialogue, experiential learning, action research/learning to act, and developing case studies with local community groups and business. Collaborative learning approach includes contributions from guest speakers, work-based learning, interdisciplinary/ multidisciplinary working, and collaborative learning and co-inquiry. Problem-based learning (PBL) is a student-centered approach in which students learn about a subject by working in groups to solve an open-ended problem. This problem is what drives the motivation and the learning. . A well-designed PBL project provides students with the opportunity to develop skills related to working in teams, managing projects and holding leadership roles, oral and written communication, self-awareness and evaluation of group processes, working independently, critical thinking and analysis, explaining concepts, self-directed learning, and applying course content to real-world examples, researching and information literacy, and problem solving across disciplines (Nilson, 2010).

In the study of Lozano et al (2017), they presented twelve pedagogical approaches selected from those that have well-cited references in ESD literature or are known to be broadly used. These pedagogical approaches are non-exclusive, with some overlap in techniques among them and a clear potential to use two or more of these educational strategies synergistically. A breadth of pedagogical approaches, from philosophical perspectives on SD instruction (e.g., eco-justice and community), were included in specific teaching and learning activities (e.g., mind and concept maps). The pedagogical approaches have been separated into universal, community and social justice and environmental education. Universal pedagogical approaches are broadly applicable pedagogies that have been used in many disciplines and contexts. These include case studies, interdisciplinary team teaching, lecturing, mind and concept maps, and project and/or problem-based learning. Community and social justice approaches involve pedagogies developed specifically for use in addressing social justice and community-building. These approaches include community service learning, jigsaw or interlinked teams, and participatory action research. Environmental education are comprised of the pedagogies emerging from environmental sciences and environmental education practices. These approaches are composed of eco-justice and community, place-based environmental education, supply chain/Life cycle analysis, and traditional ecological knowledge.

### **The Significant Roles of Environmental Education for Attaining Sustainable Development**

Education is a powerful tool that opens the mind of the people concerning different societal realities. Citizens will aware regarding the causes and effects of various economic, political, and environmental issues once they are adept and grounded to the issues themselves. Knowledge about these issues can be acquired both from formal and informal forms of education. Through constant gaining of novel information through education, people have developed their critical mindedness and analytical thinking skills about potential economic strategies, social development programs, and environmental laws and policies leaning towards sustainable development.

Education is often overlooked in the fight against climate change. While policy changes and global commitments are necessary to prevent global warming from further worsening, improved education is the first step toward achieving our goals. Environmental education can also help alleviate climate anxiety. (Browne, 2023). This is broadly defined as a “chronic fear of environmental doom” and may be exacerbated by a lack of understanding. Educational resources that clearly explain the mechanisms behind global warming equip students with the knowledge they need to do something about climate change. This can help them feel empowered and foster a greater appreciation for the planet’s resources.

Environmental education can also promote critical thinking, communication, and problem-solving skills. This is particularly important today, as students need to be able to evaluate the long-term impact of social, economic, and ecological policies. Combating climate change effectively requires a global effort and activism often relies heavily on a thorough understanding of the issue and the ability to persuade others that something must be done (Felix, 2023).

Improvements in public education may also promote a sense of stewardship and aid conservation efforts. In particular, environmental education programming can make a real difference to researchers who are advocating for policy changes. For example, recent public programs like the BBC’s Planet Earth II and Wild Isles appear to have significantly impacted researchers at the University of Exeter in the United Kingdom. Reflecting on the public program, Professor Callum Roberts states that the “UK must now deliver genuine protection for wildlife,” and should focus on building resilience against climate change (Fletcher, 2023).

Environmental education can empower the decision-makers of tomorrow and improve the public understanding of climate change. However, connecting students with the resources they need to understand global warming can be difficult – particularly if students live in a nation like the United States, where climate change is seen as a partisan “political” issue. Climate-aware parents can introduce their children to climate change with outdoor play in natural environments. Natural playgrounds, like those built from sustainable materials and found objects, are the perfect place to discuss environmental protection and the importance of stewardship over the Earth’s resources. Teaching the children at home about the possible means of how to promote sustainable lifestyle is very integral party of environmental education. At home, it is always the roles of the parents to allow their children to have a full grasp of sustainability through mitigating their own carbon footprints at home and implementing and practicing environmentally friendly habits. Teaching them how to perform simple sustainable activities at home like composting leftover food scraps and recycling the waste materials in order to reduce the Carbon emissions is essential in fostering greater sense of responsibility towards sustainable environment (Suryatna et al., 2023; von Braun et al., 2017).

## Conclusions

For many years of implementation around the world, Education for Sustainable Development plays integral roles for the emergence and evolution of knowledge, skills, understanding, values and actions significant to the creation of a sustainable world. ESD over time has ensured environmental protection and conservation which promotes social equity and encourages economic sustainability. Many educational institutions around the globe have incorporated ESD in their curricular offerings in order to contribute to the sustainable development goals of United Nations. In the academic setting, ESD gives learners of all ages the knowledge, skills, values and agency to address interconnected global challenges including climate change, loss of biodiversity, unsustainable use of resources, and inequality. These knowledge, skills, and values are essential aspects in providing alternative solutions to the perennial environmental problems existing in the local communities in particular and global environmental concerns in general.

## Recommendations

Education is a light that can shed awareness and spread sustainable actions. ESD should be integrated in all educational levels in all academic institutions around the world in order to instill the genuine spirit of sustainability among people of all ages of all walks of life. ESD should be advocated of all government agencies and non-governmental organizations around the globe for meaningful results. True spirit of environmental cooperation and genuine essence of environmental sustainability through education should be advocated and upheld to ensure that our micro-effort will reap a macro-effect in the near future. In schools, various educational strategies and pedagogic methods should be explored for sustainable education towards sustainable environment.

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