RESEARCH ARTICLE

EDUCATION FOR SUSTAINABLE FUTURE: A FOUNDATION FOR GLOBAL TRANSFORMATION

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ABSTRACT

The education which can contribute to a sustainable future has resulted in the "education for sustainable development" (ESD) campaign. What is implied here is that a sustainable future can be achieved if people are properly educated. ESD ignores the current, popular perception that the future is non-shapeable and determined regarding sustainability issues; ESD presupposes a necessary understanding of a future that can be formed. The logic of standard education supports the perception of a future non-shapeable through the promotion of competencies designed for flexibility. Nevertheless both systems still conceive of education mainly as training, closing down the future. In this contribution, I argue that ESD needs to take current educational systems and today's society with their non-sustainable future-building practices into account, because otherwise ESD would not make any difference to the educational and societal status quo. My main objective is to show that education must be thought of as something other than just training: considering education predominantly as subjectification holds the possibility for open and alternative futures. In this article, I discuss the potentials of this understanding (and the notion of an open future) for education with a view to sustainability. I explicitly address an interdisciplinary audience with the aim of raising awareness that education is more than training.

INTRODUCTION

The 21st century is a pivotal time for humanity. As the world grapples with pressing issues such as climate change, deforestation, species extinction, widening social & economic inequalities and resource depletion, the need for sustainable development has become a global imperative. At the heart of this transition lies education—a transformative tool that shapes the minds, values, and behaviors necessary for building a sustainable future. Education for a Sustainable Future (ESF) seeks to equip individuals with the knowledge, skills, and attitudes to address complex global challenges, fostering a sense of responsibility and empowering learners to act as agents of change. These issues demand urgent action, but solutions cannot merely focus on technological innovations or short-term policies. Instead, they require a fundamental shift in how we think, act, and interact with the world around us.

Education for a Sustainable Future (ESF) is the bridge to this shift, offering a transformative approach to equipping individuals, communities, and nations with the knowledge, values, and skills necessary to build a sustainable society. Education is often hailed as the great equalizer, the foundation for personal growth, economic opportunity, and societal progress. But in the context of sustainability, it becomes even more profound. It is not just about imparting knowledge; it is about inspiring a sense of stewardship for the planet, fostering empathy for all living beings, and preparing individuals to tackle the global challenges of today and tomorrow. It is impossible to think about educational matters without making references to the future. Our understanding of future determines, for example, what knowledge and which skills are considered to be important for the next generation. Regarding sustainability issues, it makes a difference whether sustainability is thought as a concrete aim which can be reached through technical innovation and efficiency, or whether it is more a normative direction which needs to be determined democratically. Futures in education determine decisions in the present and thus can be understood as "futures for the present." If the future is the same as the present or can be predicted with any certainty, then it would seem to be not so difficult to decide what the next generation should best be equipped with. However, if the future is presumed to be uncertain, which is ultimately the case, then the necessary knowledge and skills are not that easy to determine. Future in education is more than a mere temporal category: future is a symbol of "something better" (Milojević 2005). Future ought to (and can) always be better than the past; so in that sense it is different from the present. Future is understood as something which belongs to the next generation; they should have a better future than the present (Pfeiffer 2007). Thus, future needs to be understood as open, not determined, where one has the freedom to shape one's own future. So future in education is

strongly related to freedom (Biesta 2010). This understanding became possible after Enlightenment, at a time when humanism—the notion of human freedom and progress—became the dominant perspective, and when the development of a better society was the main ideal. Education should make this ideal realizable through active engagement of the individual with his or her (human and non-human) environment. This means, further, that the notion of future in education is always considered as a result of human actions (Bokelmann 1969), but it is not understood as radically open, that is, shapeable in the sense to design a better future, something that would be closer to the ideal of a humane world. The future should be obliged to promote and support values such as democracy and self-determination. This ideal of a humane future should be understood as a guiding principle, one that imposes clear limitations on non-humane developments, rather than as a realistically achievable objective. Hence future, based on a humanistic understanding of education, is a guiding normative idea and less a prediction of a certain development (ibid.). Education has been considered as something which is free of any direct purpose or external will but, at the same time, clearly normative: it should help to bring society closer to an idealized humane future. Postmodern and postcolonial theories made us aware of the contingency of society and the problematic linear understanding of time and progress, as well as a teleological understanding of future (Milojević 2005). From a normative point of view, we must be aware that a teleological understanding of future is problematic in education today; however, what we should hold on to is the close connection between future and freedom (Biesta 2010), future as a symbol for shape ability, openness, change and self-determination.

On closer observation of society and educational practice, the described idealized picture of education seems difficult to maintain. Especially institutionalized education is far from being free of external influences (e.g., the educator or society's interests). The promise of a better future has been shattered because of a number of severe global crises. Future in post-modern societies has come to be understood, instead, as uncertain and contingent. But which understanding of future should serve today as the reference point for educational decisions? It would be conceivable to adhere to some desired vision of the future but also to adhere to a future forecasted from the present dominant perception of it. Those two different perceptions1 of "futures for the present" mark the parameters within which education occurs in education programs as well as in the public discourse. The future understandings give information about how education is perceived: education could be considered as a means to approach a specific end; it could also be seen as a means to respond to a given situation in the future. Neither viewpoint takes the idea of future in education seriously. In the first case, future is not understood as open and left to the next generation. Education serves rather as an instrument for attaining some specified objective. In the second case, futureis not considered as the result of human actions, it is reduced to being just something we react to. In both cases, education is a means, a qualification which can be reached. And in both cases, the understanding of education contradicts the importance we attach to self-determination and openness. This essay explores ESF in depth, examining its principles, significance, practical implementation, challenges, potential, offering a comprehensive examination of its role in fostering resilience, equity, environmental stewardship and real-world applications. Through a combination of theory

implementation strategies, challenges, real-world examples and case studies, we will illustrate how education can serve as a catalyst for creating a more equitable, resilient and sustainable world.

The Role of Education in Achieving Sustainability

What is Sustainability?: At its core, Sustainability refers to the capacity to meet present needs without compromising the ability of future generations to meet their own needs. Rooted in the three pillars of sustainability—environmental, economic, and social—this concept emphasizes the interconnectedness of ecological health, human well-being, and economic vitality. The concept of sustainability, popularized by the 1987 Brundtl and Report, emphasizes balancing three interconnected dimensions:

- **Environmental Sustainability**: The preservation of ecosystems, natural resources for future generations and biodiversity.
- **Social Sustainability**: Ensuring equity, justice, and well-being for all members of society.
- **Economic Sustainability**: Promoting stable and inclusive economic systems that prioritize long-term health over short-term gains.

These pillars are interdependent; a thriving society cannot exist without a healthy environment and a robust, equitable economy. Education plays a vital role in addressing this complexity by helping individuals understand the links between these dimensions and empowering them to act responsibly.

Why is Education Critical for Sustainability?: Education is the foundation upon which sustainable development is built. It empowers individuals to make informed decisions, innovate solutions, and advocate for change. Specifically, it enables:

- **Awareness**: Helping learners understand the causes and consequences of sustainability challenges, such as climate change and social inequality.
- **Skill Development**: Equipping individuals with practical skills, such as critical thinking, problem-solving, and teamwork.
- **Value Formation**: Instilling values such as empathy, respect for nature, and a commitment to justice and equity.
- **Behavioral Change**: Encouraging sustainable consumption, responsible decision-making, and active citizenship.

Through education, people become agents of change, capable of addressing not only environmental issues but also the broader social and economic structures that contribute to unsustainable practices.

Principles of Education for a Sustainable Future: Education for a Sustainable Future is guided by key principles that ensure its relevance and effectiveness:

Holistic and Interdisciplinary Approach: Sustainability issues are complex and multifaceted. ESF integrates diverse disciplines—ranging from environmental science and economics to sociology and ethics—offering learners a comprehensive perspective. This approach helps students connect the dots between disparate topics, such as the impact

of economic policies on ecosystems or the role of cultural practices in resource conservation.

Emphasis on Values and Ethics: A sustainable future requires more than technical solutions; it demands a shift in values and attitudes. ESF emphasizes ethical principles such as intergenerational equity, stewardship of the planet, and social justice, cultivating a mindset that prioritizes long-term well-being over short-term gains.

Participatory and Experiential Learning: Traditional lecture-based education often fails to engage learners deeply. ESF prioritizes participatory methods, such as group projects, community service, and hands-on activities. For example, students might conduct waste audits in their schools or design energy-efficient systems for local use, bridging the gap between theory and practice.

Lifelong Learning: Sustainability education is not confined to the classroom. It spans all stages of life, from early childhood to adulthood, ensuring that individuals continuously acquire the knowledge and skills needed to adapt to evolving challenges.

Local and Global Relevance: While sustainability challenges are global in nature, their impacts and solutions are often local. ESF emphasizes the importance of addressing local issues—such as water scarcity or deforestation—while connecting them to broader global frameworks like the United Nations Sustainable Development Goals (SDGs).

Implementing Education for a Sustainable Future

Formal Education: Formal education systems—schools, colleges, and universities—play a crucial role in advancing ESF. Strategies for implementation include:

Curriculum Integration: Sustainability topics should not be confined to a single course or subject. Instead, they should be woven into the fabric of education, spanning disciplines such as science, history, geography, and economics. For example:

Science: Exploring renewable energy technologies or the impacts of pollution on ecosystems.

History: Examining how industrialization has shaped environmental and social systems.

Economics: Analyzing the costs and benefits of sustainable development policies.

Teacher Training: Educators must be equipped to deliver sustainability content effectively. Professional development programs can provide teachers with the tools, resources, and confidence to integrate ESF into their classrooms.

Project-Based Learning: Encouraging students to engage in hands-on projects that address real-world issues. For instance, students could develop a school-wide composting program or create awareness campaigns about energy conservation.

Informal and Non-Formal Education: Learning does not stop at the classroom door. Informal and non-formal education are critical for engaging broader communities:

- **Community-Based Programs**: Initiatives such as urban gardening, beach cleanups, and water conservation workshops empower citizens to contribute to sustainability efforts.
- **Media and Technology**: Documentaries, social media campaigns, and online courses can reach diverse audiences, raising awareness and inspiring action. Platforms like Coursera and edX offer free courses on topics ranging from climate science to sustainable agriculture.
- **Corporate Training**: Many companies now incorporate sustainability training into their employee development programs, fostering a culture of corporate responsibility.

Policy and Institutional Support: Governments and institutions must prioritize sustainability education at all levels.

This includes:

- Establishing national frameworks for Education for Sustainable Development (ESD), aligning with international goals such as the UNESCO ESD for 2030 roadmap.
- Providing funding for sustainability initiatives in schools and communities.
- Creating partnerships between schools, businesses, and NGOs to foster innovation and collaboration.

Key Themes in Education for a Sustainable Future

Climate Change Education: Climate change is one of the most urgent challenges facing humanity. Education equips individuals with the knowledge and skills needed to mitigate its effects and adapt to its impacts. This includes:

- Understanding the science of climate change, including the role of greenhouse gases and the effects of global warming.
- Exploring mitigation strategies, such as transitioning to renewable energy and promoting energy efficiency.
- Encouraging adaptation measures, such as building resilient infrastructure and developing sustainable agricultural practices.

Biodiversity and Ecosystem Conservation

Biodiversity is essential for maintaining ecosystem health and human well-being. ESF emphasizes the importance of:

- Protecting endangered species and habitats.
- Promoting sustainable land-use practices, such as agro forestry and perm culture.
- Raising awareness about the benefits of biodiversity, from food security to climate regulation.

Sustainable Consumption and Production

Unsustainable consumption patterns are a major driver of environmental degradation. Education fosters responsible consumption by:

- Teaching about the environmental impacts of consumer goods.
- Encouraging practices such as recycling, upcycling, and reducing waste.

- Promoting the concept of a circular economy, where resources are reused and recycled rather than discarded.

Equity and Inclusion

A sustainable future cannot be achieved without addressing social disparities. ESF prioritizes equity and inclusion by:

- Empowering marginalized communities through access to education and resources.
- Promoting gender equality, ensuring that women and girls have equal opportunities to contribute to sustainability efforts.
- Encouraging intercultural dialogue and understanding, fostering global solidarity.

Challenges in Advancing Education for a Sustainable Future

Despite its importance, ESF faces numerous challenges:

- **Lack of Awareness**: In many regions, there is limited understanding of sustainability issues and their relevance to daily life.
- **Resource Constraints**: Implementing ESF requires significant investment in training, materials, and infrastructure.
- **Resistance to Change**: Traditional education systems often prioritize standardized testing and rote learning, which may conflict with the participatory and interdisciplinary nature of ESF.
- **Cultural Barriers**: Different cultural attitudes toward education and sustainability can influence how ESF is perceived and implemented.

Case Studies and Success Stories

Finland's Green Schools Initiative: Finland has integrated sustainability into its education system, emphasizing outdoor learning, student-led projects, and energy-efficient school buildings. Students actively participate in initiatives such as tree planting and waste reduction, fostering a culture of environmental responsibility.

Kenya's Eco-Schools Program: In Kenya, the Eco-Schools program engages students in practical sustainability efforts, including water conservation, tree planting, and organic farming. These activities not only enhance environmental awareness but also improve local livelihoods.

Digital Learning Platforms: Global platforms like the UN's *Earth School* offer free, interactive lessons on sustainability topics, making education accessible to learners worldwide.

Education for a sustainable future: The education as one important contribution to sustainable development. This resulted ultimately in the ESD campaign, initiated by UNESCO and promoted worldwide during the UN Decade of education for sustainable development beginning in 2005. Education(mainly understood as enabling the learner to acquire certain competencies) is supposed to make a significant contribution to sustainable development. The ESD program is a highly ambitious one; it implies the hope of actually making a sustainable future:

ESD is an essential contribution to all efforts to achieve the SDGs, enabling individuals to contribute to sustainable development by promoting societal, economic and political change as well as by transforming their own behavior. ESD can produce specific cognitive, socio-emotional and behavioral learning outcomes that enable individuals to deal with the particular challenges of each SDG, thus facilitating its achievement. In short, ESD enables all individuals to contribute to achieving the SDGs by equipping them with the knowledge and competencies they need, not only to understand what the SDGs are about, but to engage as informed citizens in bringing about the necessary transformation (UNESCO 2017). The aim of the campaign has been to educate people so that they acquire competencies and learn to think and behave in a sustainable way. ESD is a wide-ranging project that concerns all types of education (formal and non-formal, general and specialized vocational), all disciplines, and persons of any age. It goes beyond imparting knowledge or raising awareness. Its main focus is on fostering sustainable behavior, in private and non-private contexts. In the academic milieu, the call to foster sustainable behavior was mainly answered by determining what the necessary competencies for so doing must be. Among the more important proficiencies are systems-thinking competence, anticipatory competence, normative competence, strategic competence, interpersonal competence and critical thinking (Wiek et al. 2011; Rieckmann 2013). In general, competencies are understood as a combination of cognitive skills and abilities as well as the motivational, volitional, and social readiness to solve problems responsibly in a variety of situations (cf. Weinert 2001). Consequently, competencies are not based on any specific knowledge content, but rather more oriented toward questions of how the acquisition of the required competencies can be made possible. Many scholars stress the point that innovative learning (enabling students to acquire competencies) is indispensable for ESD (e.g. Gidley 2012).

ESD clearly exceeds the goal to impart knowledge and raise awareness; it is about a variety of learning outcomes that are conceived as a contribution to societal transformation. The success of education in accordance with the logic of the political call will be determined by the extent to which sustainable development goals (SDGs) are realized. This ambitious and all-embracing objective is surprising because of the gap between knowledge, awareness, and action, something that is well-known from decades ofenvironmental education (Kollmuss and Agyeman 2002). But the hope of creating a better future through education seems to rest on the development of more innovative and alternative methods and the focus on competencies. This "new orientation" tries to improve the negative image of environmental education which is still burdened with having an image of being indoctrination and instrumentalization (cf. Jickling and Sterling 2017). In addition, the lack of success of environmental education is often attributed to its focus on catastrophes. According to the promoters of ESD, however, shifting this focus to competencies would be one plausible response to this criticism. The claim is that competencies combine the openness to reflect on values with one's own viewpoint in conjunction with the focus on actions. This focus on actions is further strengthened by an orientation toward a positive vision (Haan 2006).

The presented analysis on ESD is based on normative arguments. I would like to expand the discussion of education in terms of sustainability by integrating structural and empirical arguments into it. So far, success or limitations are discussed mainly on the individual psychological level. ESD (like all education) is clearly a project about the future. My objective here is to draw to the special attention of my readership that a human being is socialized in particular way, depending on the society of which he or she is a part and on the particular school system in which he or she is educated, with its established future practices.

It is therefore important that we have a look at how the future is perceived in current educational systems (part III) and Western developed societies (part IV). My argument is that if ESD really wants to contribute to societal transformation in the direction of sustainability, the preconditions for so doing need to be addressed and, at the same time, the limitations of education beyond the knowledge-action gap need to be recognized (part V).

Vision for the Future: Achieving a sustainable future requires a collective commitment to reimagining education. By embedding sustainability into all aspects of learning, we can cultivate a generation of informed, responsible, and empowered individuals capable of transforming society. This vision calls for:

- **Inclusive Access**: Ensuring that all individuals, regardless of their socioeconomic status, can access quality sustainability education.
- **Policy Integration**: Aligning educational policies with global sustainability goals.
- **Community Engagement**: Involving local communities in co-creating and implementing educational initiatives.

CONCLUSION

In contrast, the ESD campaign promotes the idea that a sustainable future is possible if people are educated in a certain way. It assumes that people consider the societal future as shapeable, an assumption that ignores the prevailing societal perception. But ESD also follows a similar understanding of what education ought to be: namely, it is conceived as training for achieving a specific aim. In both cases, future is a closed concept; the kind of future the learners should be educated for is already prescribed and, to that extent, immutable.

This implies a shortsighted view of the individual and of education itself, which misses the real potentials of education for the desired societal transformation. But if education is also conceived of as a form of subjectification, educational approaches would be oriented towards the individuals' formability and creativity. In the context of ESD this would mean to support and enable learners' self-efficacy with regards to the societal future. Education for a Sustainable Future is both a necessity and an opportunity. By equipping individuals with the tools to address complex global challenges, ESF lays the groundwork for a world that is equitable, resilient, and thriving. Its success depends on collaboration, innovation, and a shared commitment to sustainability. As we move forward, education will remain the cornerstone of our collective journey toward a better future.

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