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Policy Brief
Environmental Education in Higher Education Institutions (HEIs).

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Executive summary

- Climate change is a critical global issue. Higher education curricula must integrate and address Sustainable Development Goals (SDGs) directly to engage students and create resilience in sustainability practices.
- Integrating climate education and sustainability into national curricula needs to be more in-depth, focusing mainly on primary and secondary levels. Higher education institutions face challenges, including insufficient funding, time, information, expertise, tools, and participation.
- Countries around the globe adopt various strategies in higher education institutions and policy frameworks to create extensive climate-related academic programs to enhance understanding and proactive responses to environmental challenges.
- Higher education is recommended to integrate climate change and sustainability across all undergraduate programs, emphasizing interdisciplinary collaboration and comprehensive teacher training to create innovation and effective education. Additionally, governments should ensure ample funding, invest in technology, establish supportive policies, and foster international partnerships to enhance climate action outcomes.

Introduction

According to the United Nations, "Climate Change is the defining issue of our time, and we are at a defining moment. From shifting weather patterns that threaten food production to rising sea levels that increase the risk of catastrophic flooding, the impacts of climate change are global in scope and unprecedented in scale. Without drastic action today, adapting to these impacts in the future will be more difficult and costly" (United Nations, n.d.). Climate change is one of the most contentious global issues, and environmental education has proven challenging to implement in real life. Some barriers to effective environmental education include insufficient political leadership, low eco-literacy levels, academic expertise, skepticism of scientific evidence, misinformation, and disinformation about climate change (Oranga et al., 2023).

Firstly, being aware of challenges allows us to set goals based on those challenges. This helps policymakers and university administrators create goals and make long-term plans for offering appropriate climate change and sustainability courses. Both policymakers and university administrators must fully understand the situation to estimate the financial budget required for environmental and sustainability education. This is crucial because finance plays a key role in preparing, maintaining, and enhancing the quality of the courses and curriculum. For example, according to Oranga et al. (2023), the African governments are more willing to tackle pressing

poverty challenges than climate change. Secondly, recognizing challenges also helps us understand what needs to be changed or updated in the existing higher education curriculum. Climate change is not a new problem; the climate is constantly changing. Therefore, the curriculum must be updated on time to ensure people are fully aware of the current issues.

"Education is the most powerful weapon which you can use to change the world." - Nelson Mandela. Higher education has always played a significant role in the development of society. All universities have some responsibilities regarding adaptation and mitigation, both to themselves as institutions with their communities and to communities in the broader community (McCowan, 2020). Environmental education has been essential to the international education agenda since the 1972 United Nations Conference on the Human Environment. While disaster risk reduction and resilience education are relatively new fields, they have gained prominence through the efforts of the United Nations since the 1994 World Conference on Natural Disaster Reduction.

Furthermore, we can create interdisciplinary teams at the university because the teachers and students come from different scientific backgrounds and can generate new Ideas, Methods, and paths to solve problems related to the Challenges and Impacts of Climate Change. Such research groups will have considerable potential for a sustainable and green economy.

This is about SDG 13 (Climate Change) and integrating all SDGs. Although each SDG has its social focus, sustainable development only makes sense if the interaction of all SDGs is considered as a whole and implemented accordingly in an interdisciplinary manner in practical activities. Particularly in the context of climate change and its manifold effects and problems, it is essential to teach in an interdisciplinary and transdisciplinary manner, as this creates a broad perspective on the diverse phenomena related to climate change. A broad perspective on future challenges enables various solutions to make nature and humanity more resilient. Interdisciplinary teaching should convey positive messages and hopes to students to motivate them to act actively. The students should pass on the knowledge they have acquired and the experiences filled with feelings to others and actively involve them in the change process, removing their fears. The aim is to promote professional work. Working in an interdisciplinary manner with the SGDs in class will undoubtedly help humanity to develop to a higher level.

Current challenges

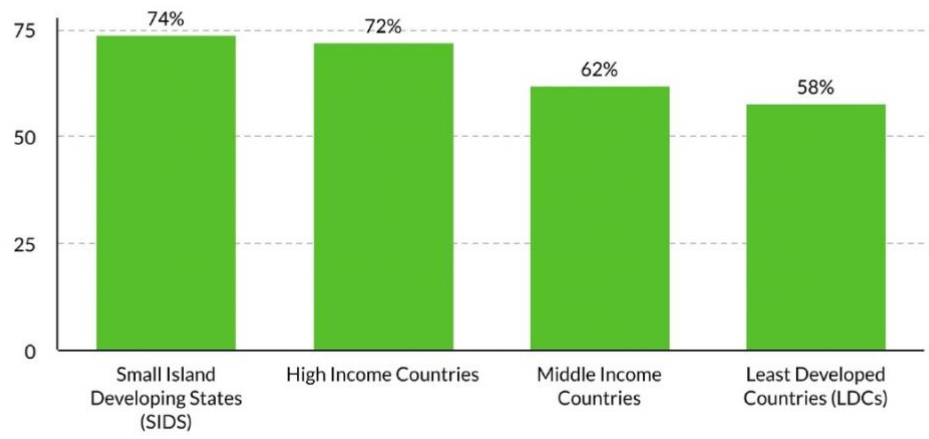
Climate education is a pressing matter for the world. Understanding the climate's impact on our lives is no longer a question of choice; it is a matter of survivorship, especially for some vulnerable populations who live in risk areas. The challenges we face today are related to climate education.

According to UNESCO (2021), after analyzing the national curriculum frameworks of 100 countries, they found that nearly half of them did not mention climate change and the ones who addressed the issue, were with the minimum depth. In the same document, an analysis of climate change communication and education initiatives

in 20 countries revealed that most efforts (90%) are targeted at primary and secondary education and only 70% at higher education.

Furthermore, according to the UNDP's People's Climate Vote (2021), with more than a million respondents from 50 different countries, many people still don't believe in a global climate emergency, especially in the least developed countries, as the data shows.

Figure 1. Public Belief in the Climate Emergency, by Country Group



Source: UNDP & University of Oxford, 2021

Another number that impacts education about climate change is the number of teachers who don't feel prepared to deal with the subject with their students. According to the same UNESCO (2021) paper, While 95% of teachers (from elementary and high school) agree on the importance of teaching climate change, less than 30% felt prepared to incorporate it into their teaching.

According to these statistics, an effort must be made to incorporate climate change into the higher education curricula. By educating and empowering students and teachers in this subject, they will be able to understand the issue, discuss it, and teach others.

Many forms of systems are at play in different societies. However, they are influenced by experience and subjected to standard systems familiar to one society, which may differ from another society's standard. Introducing climate change into a higher institutional curriculum may be challenging, for instance, due to the requirement for funding and capacity resources to support the curriculum (Sousa Santos, 2007).

The most applicable approach may be to implement the course on climate and sustainability in the undergraduate class for all new students under the umbrella of interdisciplinarity.

Education is one of the strategic entries in responding to climate change and the central pillar of climate change adaptation for the younger generation (Marwati, 2010 in Prasad et al., 2023). The science of climate should be integrated into the national education curriculum. This will enable students to study climate change's causes, threats, and consequences and how it impacts life. However, implementing a climate science curriculum often encounters real-time challenges. Challenges may vary based on climate stressors and development barriers, as exemplified in the case of Small Islands Developing States (SIDS) such as in the Solomon Islands (Leal Filho et al., 2020). Based on this, we have outlined practical challenges that emanate from the tiny island nation, and they would be the same for any other SIDS. Barriers to climate change mitigation at universities and higher institutions in the South Pacific include lack of funds, insufficient time, information expertise, resources/ participation, and seriousness towards climate change mitigation practices (Prasad et al., 2022).

Lack of funds, insufficient time and information

Healthy financial backing is required to support the program's operationalization. Limitations such as lack of money, time, and information (Kollmuss & Agyeman, 2002) hinder the effective delivery of such programs to the young generation. Lack of funds for programs, for instance, limits the frequency and magnitude of climate change-related activities. As the student organizations depend purely on the university for their finances, the latter prioritizes structural developments over student activities.

Lack of expertise, tools, and participation

Expertise in climate science is required to deliver programs that are in the best interest of learners. Shortage of well-trained and qualified teaching staff (as stated above), especially for those who are required in the practical field of climate study and practice, often results in poor and ineffective deliverance of learning and resourceful material to students. In addition, the lack of technology (tools) needed to deliver the programs not only limits the course's resources but also reduces students' motivation and interest to participate in the program. In the context of SIDS, there are always limited capacities and resources.

Regarding participation, members lack interest in environmental protection and climate change adaptation and mitigation activities outside the campus periphery. Prasad et al. (2022) showed in their study that those students prioritize academics over extra-curricular activities. The result of their interview shows the relationship between lack of support, enthusiasm, and participation. Interestingly, one of the most effortlessly identifiable barriers to commitment to participate is a lack of basic knowledge about causes, impacts, and resolutions to climate change. While there is existing evidence, it is not automatically taken up or transformed into knowledge or action. The contributing factors are a lack of awareness about where to find information, lack of craving to seek information, apparent information overload, misunderstanding about contradictory information, limited evidence, and lack of locally pertinent information. For example, presenting information about the effects

and solutions to climate change is inaccessible to non-experts. The information source is often unreliable or untrustworthy, particularly mass media, misperception about links between environmental issues and their corresponding solutions and information clashes with ethics or encounter and is therefore disregarded (Lorenzoni et al., 2007)

Good practices

According to UNESCO, only 38% of countries have implemented national laws, policies, or strategies explicitly targeting climate change education. Examples from various continents—including Albania, Argentina, Australia, Cameroon, and India—demonstrate both the global scope and the diverse application of these initiatives (UNESCO, n.d.). In addition, over the last 30 years, the Ministry of Education and Environment in different Iberoamerican countries has collectively improved environmental education in the respective countries (Declaración de Lima, 2014).

In a parliamentary announcement from 2017 in Norway, called "Humanities in Norway" (Ministry of Education and Research, 2017), the importance of Humanities in education. One of the reasons is the need for a better understanding of climate change and the sustainable transition from a broader range of disciplines. In recent years, more parliamentary announcements in Norway have come out with further messages regarding the importance of environmental education and education for sustainability in higher education to prepare the future generation (Ministry of Education and Research, 2023).

The Department of Health in Australia has been on the verge of funding climate research and health whereby a study was done to explore the opportunity to teach climate change in medical education where three reasons for the need to integrate climate change issues in medical education were established including, to prepare the clinical student to practice in the climate-changing environment, to promote public health and eco-health literacy and finally to deepen the existing learning and strengthening the graduates' attributes (Maxwell & Blashki, 2016).

According to UNESCO, 63% of countries have teacher training plans focusing on climate change (UNESCO, n.d.). Numerous Higher Education Institutions (HEIs) worldwide are integrating climate change and sustainability courses within and beyond their campuses to actively prepare students to combat climate change. The extent and manner in which universities adopt and implement these practices and initiatives vary across nations and institutions. While some develop specialized courses, others incorporate these themes into curricula and structures (Leal Filho et al., 2023 a; b). While extensive, the following overview of global climate change education initiatives only covers some regions or captures the full scope of educational responses.

North America

Initiatives in North America include the Climate Interactive think tank affiliated with the Massachusetts Institute of Technology (MIT), which has developed the online "Climate Leader" course which educates students in systems thinking, to inspire a global response to climate change (Rhodes & Wang, 2021). The University of Toronto, through its School of Continuing Studies—a component of its lifelong learning program—provides another example. They offer the course 'Climate Change Policy and Practice,' which includes comprehensive training on methodologies for calculating greenhouse gas (GHG) emissions, GHG reporting, and risk management (Leal Filho et al., 2021). The Nottingham Business School designed and distributed the 'Carbon Literacy Training for Business Schools' for more than 100 business schools in 42 countries (Leal Filho et al., 2021).

Asia

By the end of 2017, Taiwan had offered an estimated 360 climate-related courses in general education programs in Asia (Taiwan Ministry of Education, 2018 in Li & Liu, 2022). The University of Colombo in Sri Lanka has established various climate change courses and hosted significant international conferences, further embedding climate change education into its academic framework (Leal Filho et al., 2021).

Europe

Numerous universities across Europe have committed to comprehensive climate initiatives: Sweden's KTH Royal Institute of Technology has established university-wide climate goals; the University of Latvia has actively participated in drafting climate policy; and institutions like Hamburg University of Applied Sciences and Nottingham Trent University have implemented significant training programs for their academic staff (Leal Filho et al., 2021).

Africa

In South Africa, the University of Fort Hare has made notable efforts to address climate change through its Risk & Vulnerability Science Centre. Established to enhance the adaptability of rural communities to climate change, the center has increasingly focused on developing technologies and conducting research funded by both local and international sources. It has also engaged in community-based training programs to foster resilience against climate-related catastrophes within the region (Leal Filhoi et al., 2021).

Recommendations

1. **Climate change and sustainability as an integrated part of undergraduate courses and curricula**

   To increase students' knowledge of climate change and sustainable transition, we recommend that all undergraduates take courses where climate change and sustainability are integrated into the curricula. The

curricula should be updated regularly to ensure that they reflect the latest research on climate change and sustainability.

2. **Work towards Interdisciplinary collaborations**

   To address climate challenges effectively, it is recommended to establish interdisciplinary teams including individuals with diverse academic backgrounds. This approach fosters collaboration across departments and enhances the development of innovative solutions.

3. **Uplift teacher training for a higher quality education on such complex issues**

   To guarantee a high-quality education, comprehensive training programs for educators on climate science and sustainability are important. These programs will help teachers feel more confident and equipped to integrate climate topics into their teaching.

4. **Invest in technology and use the resources available**

   There should be particular emphasis on subsidization of modern technology to enhance the delivery of climate education and sustainability programs. Investment in innovative tools and resources should be needed for effective climate science education and research.

5. **Prioritizes environmental education through an increased financial investment**

   Securing adequate funding for climate education programs and financial resources to support student and faculty climate action projects is vital to prioritizing environmental education.

6. **Implement policy and governance reforms that support environmental education and evaluate the progress.**

   The government should advocate for national and institutional policies that prioritize climate education and sustainability, creating a collaborative environment between the education sector and policymakers. It's also important to establish metrics to assess the impact of climate education programs and regularly review and adjust strategies to ensure effective climate action outcomes.

7. **Global collaboration**

   The government should foster international partnerships in climate education, share best practices, and collaborate on joint climate action projects with global HEIs.

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