Asian Framework of Teacher Education for Climate Action

Dissemination Guide

Organised by Asian Teacher Educators for Climate Change Education Network (ATECCE)
in cooperation with UNESCO Bangkok, UNESCO Beijing, Asia-Pacific Cultural Centre for UNESCO (ACCU), and with the support of Japan Society for the Promotion of Science (JSPS)

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Forewords

As the Research Coordinator and Director at Okayama University ESD (Education for Sustainable Development) Promotion Centre, I am honoured to present the dissemination guide of the Asian Framework of Teacher Education for Climate Action. This project, spearheaded by the Asian Teacher Educators for Climate Change Education Network (ATECCE) in collaboration with UNESCO Bangkok, UNESCO Beijing, and the Asia-Pacific Cultural Centre for UNESCO (ACCU), and supported by the Japan Society for the Promotion of Science (JSPS), epitomises our global collective efforts to tackle climate change through education. The document is a culmination of extensive research and international cooperation, aimed at enhancing teacher education across Asia. We extend our deepest appreciation to all the project members from nine Asian countries and the supporting organisations for their invaluable contributions to this endeavour. This effort represents a critical step in incorporating climate change education into teacher training programmes across Asia, signalling a substantial commitment to sustainable development.

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Asian Framework of Teacher Education for Climate Action: Dissemination Guide
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Asian Framework of Teacher Education for Climate Action

Why is climate change education crucial in teacher training?

The "*Reimagining our Futures Together: A New Social Contract for Education*"[1] document (UNESCO, 2021) have called for schools to become exemplars of sustainability and carbon neutrality and the "*Greening Education Partnership*"[2] initiative (UNESCO, 2022) have emphasised the importance of integrating climate change education (CCE) in teacher training. This approach aims to equip educators with the skills to convey the complexities of climate change, fostering critical thinking, civic engagement, and an understanding of the environmental, social, and economic interconnections. These efforts highlight the transformative role of education in promoting sustainable development and climate resilience, preparing learners to actively engage with climate change challenges.

How was the Asian Framework of Teacher Education for Climate Action developed?

In November 2023, the Asian Teacher Educators for Climate Change Education Network (ATECCE) convened in Surabaya, Indonesia, gathering representatives from nine countries: China, India, Indonesia, Japan, Kazakhstan, Malaysia, Mongolia, the Philippines, and Thailand. A key result of this meeting was the creation of the Asian Framework of Teacher Education for Climate Action. This framework (**Figure 1**) aims to steer the inclusion of CCE into teacher training programmes across these nations, equipping teachers to effectively teach and motivate climate action.

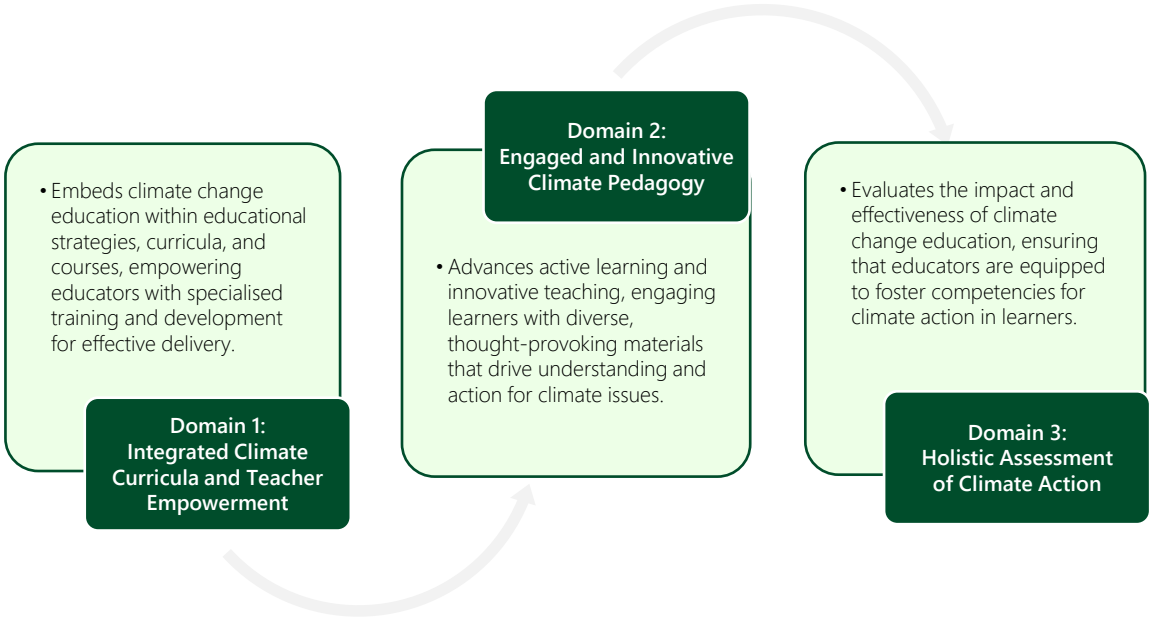

Figure 1. Asian Framework of Teacher Education for Climate Action

1) UNESCO. (2021). Reimagining our Futures Together: A New Social Contract for Education. Available at: https://unesdoc.unesco.org/notice?id=p::usmarcdef_0000379707
2) UNESCO. (2022). Greening Education Partnership. Available at: https://www.unesco.org/en/education-sustainable-development/greening-future

Recommendations based on the Framework

Domain 1: Integrated Climate Curriculum and Teacher Empowerment

The first domain emphasises the crucial need for aligning educational policies with global climate change initiatives. This recommendation forms the cornerstone of the framework, ensuring that climate change education is seamlessly integrated into the fabric of teacher training programmes. It addresses various critical aspects, from curriculum design to teacher certification standards, aiming to establish a robust base for climate change education within the education system. **Table 1** below outlines the key sub-domains within this initial domain, detailing their specific focus areas and objectives for a comprehensive approach.

Table 1. Integrated Climate Curriculum and Teacher Empowerment

Sub-domain	Description	Key Focus Area
1. Policy alignment with climate change education	Aligning educational strategies with global climate initiatives and national policies	- National curriculum integration - Teacher certification standard
2. Curriculum integration and interdisciplinarity	Developing interdisciplinary curricula that weave climate change education across subjects	- Comprehensive understanding - Inclusion of ethical, social, and economic aspects
3. Teacher training for climate competencies	Specialised pre- and in-service training to equip teachers with necessary climate change knowledge and pedagogy	- Content knowledge - Pedagogical skills
4. Professional development and support	Ongoing opportunities for educators to update and share their knowledge and teaching methods	- Workshops and seminars - Collaborative projects
5. Practical application and experiential learning	Hands-on learning opportunities connecting theoretical knowledge with real-world applications	- Fieldwork - Community engagement activities
6. Teacher well-being and motivation	Strategies to manage workloads and provide mental health support, with recognition and rewards	- Workload management - Inventive systems
7. Empowerment through recognition and certification	Formal recognition of teachers' climate change education expertise	- Certification programmes - Professional endorsement

As depicted in the table, the first domain provides a detailed and strategic approach to embedding climate change themes into teacher education. This domain, following the recommendation, begins with policy alignment and extends to encompass interdisciplinary curriculum development. The focus on both theoretical integration and practical application highlights the need for a multifaceted approach to teacher training. By equipping educators with the necessary knowledge and skills, the framework aims to empower them to effectively teach about climate change, thus preparing a future generation that is knowledgeable and capable of addressing environmental challenges.

Domain 2: Engaged and Innovative Climate Pedagogy

The second domain is dedicated to revolutionizing the methods and materials used in teaching climate change, with a focus on active learner engagement and pedagogical innovation. This domain is structured into distinct sub-domains (**Table 2**), each addressing a key aspect of climate pedagogy.

Table 2. Engaged and Innovative Climate Pedagogy

Sub-domain	Description	Key Focus Area
1. Diverse delivery and resource utilization	Multiple modes of content delivery for diverse learning styles	- Online, offline, on-air platforms - Global and local perspectives in materials
2. Community and institutional engagement	Encourages learning in community and institutional settings	- Informal learning settings - Community-based projects
3. Belief in learner potential	Fostering environments that value and nurture individual potential	- Collaborative learning - Self-directed methodologies
4. Respect for diversity of learners	Tailoring learning approaches to diverse student needs and backgrounds	- Differentiated learning - Inclusive education strategies
5. Real-context learning	Connecting educational content with real-world scenarios and applications	- Experiential learning - Field-based activities
6. Learner as change agent	Empowering learners to be proactive in community and environmental change	- Transformative methodologies - Entrepreneurship education

This domain focuses on student engagement and innovative teaching techniques. It introduces a variety of content delivery methods, including digital and interactive platforms, to suit different learning preferences. This approach ensures that educational materials are not only informative but also adaptable and engaging, combining global climate issues with local contexts. The domain extends education beyond conventional settings, advocating for practical involvement and partnerships with communities and institutions. Such initiatives link academic learning with real-world applications, providing students with hands-on experiences in understanding and addressing climate change.

A key element of this domain is fostering an environment that values each student's potential. It encourages self-driven and collaborative learning, helping students develop critical thinking and problem-solving skills crucial for navigating climate-related challenges. The domain also prioritises recognizing and catering to the diverse backgrounds and experiences of learners. By adopting flexible and inclusive teaching methods, it ensures that climate change education is accessible and meaningful for every student. Moreover, the domain positions students as active contributors to climate solutions, promoting a sense of agency and responsibility in climate action. This transformative approach aims to inspire students to apply their learning practically, empowering them to become advocates and change-makers in their communities.

Domain 3: Holistic Assessment of Climate Action

The third domain focuses on evaluating and assessing the effectiveness of climate change education within teacher training programmes. This domain (**Table 3**) ensures that educators are adequately prepared to teach about climate change and to inspire action among their students.

Table 3. Holistic Assessment of Climate Action

Sub-domain	Description	Key Focus Area
1. Teacher education institutions	Evaluates institutional support for CCE. This includes governance, curriculum, culture and facility adequacy	- Governance and policy for CCE - School culture and green campus - Community partnerships
2. Teacher trainers	Assesses the competencies of teacher trainers in CCE within educational institutions	- Developing engaging CCE learning experience - Innovating CCE pedagogy - Research and development in CCE
3. Learners (Pre- and in-service teachers)	Focuses on the professional development of teachers in CCE	- Creating effective learning environments - Engagement with educators and stakeholders - Continuous professional development

The evaluation starts with the institutional frameworks at teacher education institutions. It scrutinises how these institutions govern and develop supportive policies for climate change education, striving to cultivate a school culture that embraces sustainability. The assessment extends to evaluating facilities and operations for their alignment with green campus ideologies and respect for diversity. A crucial aspect is the promotion of active institutional involvement and strong community partnerships, enriching climate change education and extending its reach. The domain then assesses the pivotal role of teacher trainers in shaping future educators. It evaluates their competencies in developing engaging and innovative learning experiences in climate change education, along with their contribution to research and development in this field.

Crucially, this sub-domain also focuses on building and sustaining networks and communities of practice, fostering collective growth and collaborative action in climate change education. Finally, attention turns to the learners - pre-service and in-service teachers - evaluating their ability to create meaningful learning environments and engage with ongoing professional development. This includes assessing their capability to collaborate effectively with other educators and stakeholders in climate change education. The aim is to ensure teachers possess up-to-date knowledge, effective teaching methods, and a comprehensive understanding of climate issues.

Way Forward to Implement the Framework

What are the levels of implementation?

The Asian Framework of Teacher Education for Climate Action recommends a multi-tiered strategy for weaving CCE into the fabric of teacher education systems at institutional, national, and regional levels. The 'Way Forward' in **Figure 2** provides a detailed course of action, recommending the development of comprehensive CCE training programmes at the institutional level, alongside expert engagement and the integration of CCE into broader educational frameworks.

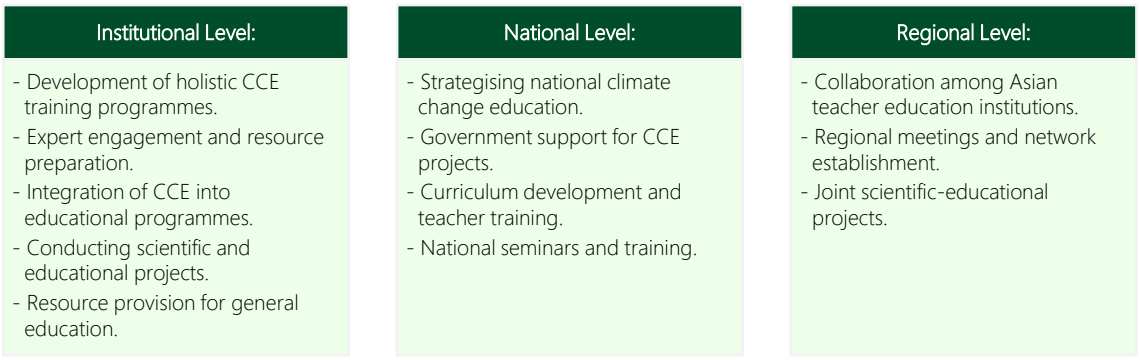

Figure 2. Way forward to the Asian Framework of Teacher Education for Climate Action

Nationally, it suggests strategic planning for CCE, advocating for government backing, curricula development, and teacher training enhancements, coupled with extensive seminars and training. Regionally, the framework recommends fostering partnerships among Asian teacher education institutions, setting up a network for collaboration, and initiating joint scientific and educational projects, thereby unifying climate action education efforts across Asia.

What are the expected outcomes and future prospects for expansion of the framework?

The framework is poised to make impactful advances at institutional, national, and regional levels. Expectations include enhancing teacher expertise and curricula at institutions, aligning national educational policies with global climate goals, and fostering regional collaboration for shared resources. In the future, it's anticipated that the framework will integrate advanced technologies and community programmes, encourage inter-ministerial collaborations, and potentially expand to establish regional centres of excellence. This expansion is likely to spur the development of global networks and partnerships, promoting an international exchange of knowledge and resources in climate change education.

Case Study (1): Asia-Pacific ESD Institute, China

Teacher education for climate action is a comprehensive and strategic systematic project, which is the best way to ensure that teachers are always energetic and constantly striving. Focused on four aspects during training process in our institution: Firstly, the main task of in-service teacher education for climate action is to focus on the relevant professional knowledge of climate change and their ability to grasp how to explore and integrate climate knowledge in the curriculum and textbooks. Secondly, the main comprehensive training approach for in-service teachers on climate action is "programmed theoretical training + fieldtrip + discussion and summary." Thirdly, through teacher education on climate action, their skills, development ability for local sustainable development resources and courses, writing ability of research paper and related activity plans, research ability on climate change topics, and the ability on leading students to carry out climate action through the application in the real life and practicing method are improved. Fourthly, the content of teacher education for climate action combines with the SDGs tightly. After training, teachers lead students to participate in climate change actions and have achieved significant results.

Figure 3. Teacher training for climate action

Figure 4. Teaching case on climate change

Case Study (2): Centre for Environment Education, India

In a comprehensive initiative by the Centre of Environmental Education (CEE) in India, a training module framework was developed to equip middle school teachers across diverse subjects with the skills and knowledge to teach climate change effectively. Targeting teachers from the 6th to 8th standards, the programme aimed at enhancing understanding, critical thinking, and problem-solving related to climate change, utilizing a multi-disciplinary, participatory approach. Piloted between January and September 2023 across various levels—from national programmes like GenCAN to district initiatives like the Climate Resilient School Programme—the initiative reached over 11,000 teachers, fostering climate leadership and innovative pedagogies. Despite challenges in curriculum development and resource constraints, the programme achieved significant outreach, evidenced in student engagement and the documentation of success stories. Future plans involve developing training resources, the national rollout, and integration of the module into teacher training curricula, with finalization and evaluation scheduled for early 2024.

Figure 5. CCE training in India

Case Study (3): UPI and UNESA, Indonesia

Figure 6. "The 40 days challenge for sustainability" leaflet and students from a participating school

In Indonesia, a collaboration between Universitas Pendidikan Indonesia (UPI) and Universitas Negeri Surabaya (UNESA) has led to the development of a series of impactful programmes focused on climate change education. These initiatives include preparing teachers to teach climate change through a framework that enhances science teacher competencies in Environmental and Sustainability Education, and exploring teaching strategies to increase student awareness and action on climate change, emphasizing the need for prolonged intervention to improve literacy, awareness, and engagement. A notable aspect of their efforts is a school-to-school competition named the "40 Days Challenge for Sustainability," which specifically engaged 37 junior high schools, 16 senior high schools, 657 students, and 84 teachers from 37 districts across 11 provinces. This competition successfully fostered sustainability practices and climate action awareness among schools. Additionally, the initiative extends its reach to the public, inviting membership from all individuals and collaborations with other organizations and companies, supported by a dedicated website and social media presence at esdindonesia.id. The programmes collectively have made a significant impact, with majority participants in the third programme reporting an improvement in their knowledge about climate change, increased awareness, and a heightened willingness to take action.

Case Study (4): Miyagi National University of Education, Japan

The case study from Miyagi National University of Education in Japan explores the integration of CCE into Disaster Risk Reduction (DRR) Education in schools. Emphasizing the interconnected nature of disasters, development, and climate change, the study utilised the Sendai Framework for Disaster Risk Reduction 2015 and systems thinking in teacher training to overcome conceptual barriers. This led to the successful incorporation of CCE into both pre-service and in-service teacher training programmes, with courses covering environment education, disaster risk reduction, international understanding, and multicultural education. Students reported a broadened understanding of disasters, extending beyond natural phenomena to global issues. Despite these successes, challenges persist in elementary education, where the curriculum focuses primarily on natural disasters. The study concludes with recommendations to integrate CCE more comprehensively into various academic subjects, particularly in natural sciences and social studies, to enhance students' awareness and preparedness for a wide range of disasters.

Figure 7. Implementation of CCE into DRR

Case Study (5): Okayama University, Japan



Figure 8. CCE at Okayama University

At Okayama University, the integration of CCE into the teacher training programme is a comprehensive approach that combines innovative curriculum design with practical application. The programme includes diverse courses in Physics, Chemistry, Biology, and Earth Science, all incorporating CCE elements. Notably, the 'Secondary Science Teaching Method (Advanced)' course covers extensive CCE-related content, employing a mix of lectures, experiments, and study tours, such as visits to biomass towns, to enhance experiential learning. Continuous assessment through reflective journals and a final project where students design a CCE lesson plan for schools ensures that future educators are not only well-versed in climate change concepts but also adept at integrating these into educational contexts. This multifaceted approach underscores Okayama University's commitment to preparing future science teachers to effectively educate and inspire pre-service teachers about climate change. Furthermore, the programme's emphasis on reflective and participatory teaching methods, along with its focus on real-world applications, equips prospective teachers with the necessary skills and insights to foster a generation of environmentally conscious and proactive learners.

Case Study (6): Abai Kazakh National Pedagogical University

Abai Kazakh National Pedagogical University (Abai KNPU) initiated a comprehensive initiative to integrate Climate Change Education (CCE) into its teacher training programmes, focusing on the Sustainable Development Goals (SDGs) and sustainable development practices in geography education. This initiative encompassed developing a conceptual framework for sustainable development in Zhambyl region's small towns, enriching school geography textbooks with the SDG and climate change content, and conducting a national seminar-training for geography teachers. The programme's multifaceted approach, involving research, sociological surveys, and international collaboration, demonstrated the university's dedication to empowering educators to address climate change through informed teaching strategies. This endeavour not only enhanced educational resources but also aimed to cultivate a more environmentally aware and proactive generation of students. The long-term goal was to foster a broader understanding of climate change impacts and solutions among both educators and learners, shaping a more sustainable future.



Figure 9. CCE initiatives at Abai KNPU

Case Study (7): Al-Bukhary International University, Malaysia

Figure 10. top: Social business approach, bottom: School as living lab

At Albukhary International University, the Climate Change Education (CCE) initiative encompasses the Lechadiss technique, the formation of the 3 Sero Club, and the establishment of 'Living Laboratories', integrating an emphasis on social business. The Lechadiss technique, involving lectures, hands-on activities, and discussions, has notably enhanced climate change understanding among preservice teachers in the Elementary Science course. The initiative also led to the creation of Team Enalife under the 3 Zero Club, which actively engages in social business education initiatives, including innovative projects like upcycling waste into Effective Microorganisms. Additionally, in partnership with a local primary school in Alor Star, a 'Living Laboratory' was established, providing a practical platform for Enalife members to apply and disseminate their climate change knowledge. This holistic approach not only advances climate education among future educators but also promotes a model of sustainable social entrepreneurship, empowering students to combine educational goals with community-oriented business practices. Through these endeavours, the university is nurturing a new generation of leaders equipped to address environmental challenges while fostering economic and social development.

Case Study (8): International Islamic University, Malaysia

At the International Islamic University Malaysia (IIUM), a noteworthy initiative in CCE was undertaken, emphasizing an action-oriented teaching and learning approach. This programme part of a broader effort to integrate climate awareness and sustainable practices into education, utilised the Regional Centre of Expertise's (RCE) Whole School Approach (WSA) and Inquiry-Based Learning (IBL) framework. IIUM students, functioning as agents of change, played a pivotal role in transferring knowledge and engaging with school communities. The initiative involved activities like student-led campaigns on litter and waste management, which included composting and other sustainable practices. This hands-on approach was aimed at increasing awareness and cultivating a deeper understanding of climate change issues among students. However, challenges such as the need for teacher competencies in IBL and the integration of action-oriented activities into the curriculum were identified. The programme at IIUM showcases the importance of experiential learning and community engagement in fostering effective CCE.

Figure 11. Outreach activity by IIUM students at a high school

Case Study (9): Mongolian National University of Education

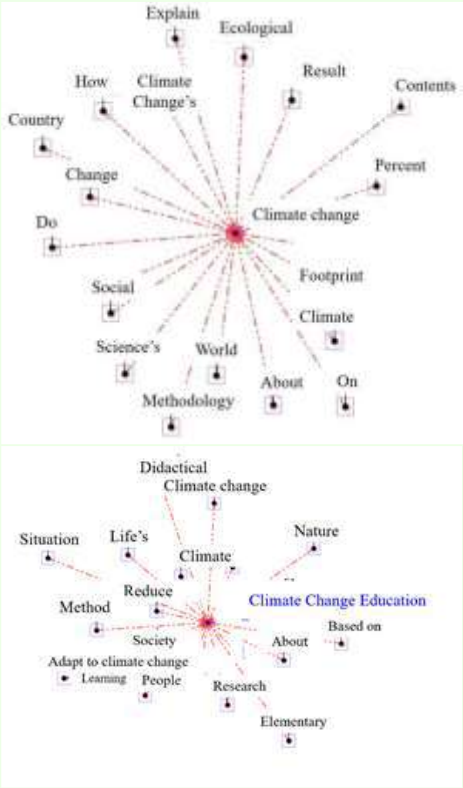

Figure 12. Curriculum analysis at MNUE

At the Mongolian National University of Education (MNUE), Climate Change Education (CCE) is still in its developmental phase, characterised by a partial integration of key environmental themes into the academic curriculum. While it includes critical issues such as climate change and human activities, the curriculum does not comprehensively cover important topics like the greenhouse effect, emissions, and biodiversity. The teaching methods primarily involve interactive approaches such as role-play, case studies, and project-based learning, but there is a notable absence of digital engagement and lifestyle-focused education on climate-friendly practices. This situation at MNUE highlights a broader educational challenge: the need for a more inclusive and thorough approach in embedding CCE into teacher education programmes. An expanded curriculum and innovative teaching methodologies are essential for preparing future educators to effectively communicate the complexities of climate change and promote sustainable living practices. This calls for a strategic overhaul in both content and pedagogy, aiming to bridge the current gaps and create a more robust, future-ready educational framework for climate change.

Case Study (10): National University of Mongolia

A study on the incorporation of Climate Change Education (CCE) into the pre-service natural science teacher training curriculum was carried out at the National University of Mongolia (NUM). Regarding integration and supplementary potential, three categories are noted. At the NUM, subject- or major-specific integration of climate change topics into teacher education programmes and courses was implemented. There is little to no inclusion in the chemistry, physics, and mathematics curricula, despite being heavily involved in the biology and geography programmes.

We are therefore constructing our curriculum in consideration of this outcome. Like the long-standing international consensus that ESD should be "embedded in the whole curriculum, not as a separate subject," CCE should be embedded in the whole teacher education programme, especially in teacher education courses and major subject courses. We will explore systems thinking and climate challenges together in these courses. Developing engaging and useful activities is a key component of integrating CCE into science teacher training programmes.

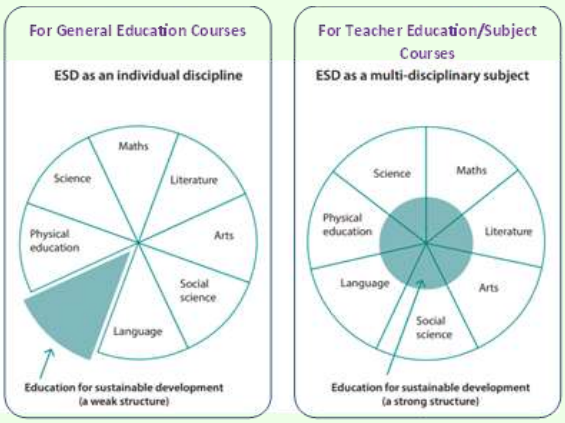

Figure 13. Principal concept of the programme at NUM

Case Study (11): Capitol University, the Philippines

Figure 14. CCE module and it's implementation

The Climate Change Education (CCE) module at Capitol University in the Philippines exemplifies innovative educational reform in response to environmental challenges. Focused on developing comprehensive climate change modules, the initiative trained 132 student teachers to become "Champions of Climate Change," preparing them to integrate this crucial subject into their future teaching roles. Through a rigorous evaluation process, these students developed action plans for applying and sharing their knowledge. Despite challenges like the need for wider endorsement and the dilemma of testing their training without real-world disasters, the programme marks a significant step in embedding sustainability and environmental awareness in education. The CCE module not only educated students but also aimed to extend its reach and impact across the ASEAN region, demonstrating a commitment to ongoing adaptation and expansion in the field of CCE.

Case Study (12): City College Cagayan de Oro, the Phillipines

The City College of Cagayan de Oro has implemented significant CCE initiatives as part of its commitment to ESD. These initiatives focus on integrating ESD and the SDGs into teaching and community engagement. Key programmes include the "Climate Change Education for Sustainable Development" project, conducted in collaboration with various educational and governmental organizations. This project emphasises training and workshops for teachers and faculty, aiming to embed ESD principles into educational practices and operations across different sectors. The college's efforts in CCE have been recognised on regional and international levels, underscoring its role in promoting environmental awareness and sustainable practices in education. These initiatives are part of a broader strategy to prepare graduates to effectively address and adapt to the challenges posed by climate change in their professional and personal lives.

Figure 15. CCE activities at City College Cagayan de Oro

Case Study (13): Chulalongkorn University, Thailand

At Chulalongkorn University, the key idea behind integrating CCE into Global Citizenship Education (GCED) revolves around creating a comprehensive and multidisciplinary approach to education. This integration aims to foster a deep understanding of global environmental challenges, particularly climate change, within the broader context of global citizenship. By incorporating CCE into various subjects such as social studies, science, arts, and languages, the university seeks to embed awareness and responsiveness to climate issues in the fabric of education. This approach emphasises not just knowledge acquisition, but also the development of skills and values necessary for students to become proactive global citizens who can contribute to climate action. The programme's implementation through workshops, training modules, and school-based activities further ensures that this integrated education is not confined to theoretical learning but is translated into practical, real-world applications and problem-solving strategies.

Figure 16. CCE integration in GCED events at Chulalongkorn University

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