Case Studies on Environmental Education in China, Japan, and Korea
For Mutual Learning and Networking (2020-2024)

Comparative Research Report on

EE for climate change mitigation and adaptation: focused on participation

in China, Japan, and Korea

2023

TEEN
Tripartite Environmental Education Network

Contents

Countries are listed in alphabetical order

Preface

We are collectively witnessing a profound awakening to the need for concrete actions and collaborative endeavors from nations globally to respond to the escalating severity of the climate crisis and environmental challenges. Within this framework, the value of this report, a product of the collaborative synergy among South Korea, Japan, and China, is more paramount than ever.

The cooperation among South Korea, Japan, and China has grown over 24 years, based on productive and meaningful communication, as well as experts' dedicated efforts and participation. Since 2000, the three countries have alternated in forming the 'Tripartite Environmental Education Network (TEEN),' conducting joint research, and publishing reports. This year, guided by South Korea's leadership, we embarked on a collaborative research journey with esteemed experts from all three nations. Our collective insights were unveiled at the TEEN annual meeting (November 28-30, 2023), fostering a platform for environmental education stakeholders across the region to engage in meaningful dialogue.

The 2023 Joint Report by South Korea, Japan, and China delves into the critical theme of 'Environmental Education for Climate Change Mitigation and Adaptation' as part of a broader strategic plan spanning 2020-2024. This initiative aims at fostering mutual learning and networking between these nations. The report thoughtfully compiles four South Korean, five Japanese, and six Chinese case studies in environmental education, all centered on the concept of 'participation.' Our approach broadens the scope of environmental education, extending beyond youth to include adults while intertwining aspects of citizen science, policy-making, and social collaboration.

This report aspires to ignite a worldwide participation towards addressing the climate emergency, aiding in formulating influential, impactful collaborative actions to be implemented collectively by these three nations. It is envisioned to invigorate and propel forward the TEEN network, cementing a foundation for significant cooperation among the three countries.

In closing, I sincerely thank the dedicated researchers and officials from China and Japan who have joined us in this dynamic endeavor to shape a better future.

Kim In-ho, Director of National Environmental Education Center (NEEC), Korea

China Report

Emission Reduction Practitioner —Low Carbon Exploratory Activities Guided by Household Energy Conservation

I. Background

Keywords: Low Carbon Emission Reduction; Exploratory Activity; Household Electricity Conservation

(i) Prominent issue: Low-carbon development has become a global consensus.

(ii) Easy to know but difficult to act: Students need the "environmental behavior driven by self-awareness".

For the students aged 10-15 who participate in this project, they are developing abstract logical thinking and have the ability to conduct scientific exploration, while in terms of self-awareness, they are in adolescence and are prone to demonstrating their own existence by violating norms. Therefore, with scientific exploration and project-based learning as means and controllable and evaluable energy-saving behaviors as cognitive goals, this activity can meet the psychological needs of students.

II. Project Goal(s) and Objective(s)

(i) Scientific Concepts

1. Human activities and the environment: Students should recognize that greenhouse gases (mainly carbon dioxide) emitted by humans are the main factors leading to global climate change and ocean acidification.

2. Energy conversion and conservation: Students should understand that the heat energy generated by electric lamps is derived from the conversion of electrical energy and it is the heat loss of wasting electrical energy; the standby electric power consumption of electrical appliances is the same.

3. Technology, engineering and society: Students may experience the mutual influence between energy technology iteration (fossil energy and new energy) and society.

(ii) Scientific Thinking

1. Model construction: Students should complete the establishment of models for carbon emissions, carbon cycling and household electricity conservation.
2. Reasoning and argumentation: Students should be able to demonstrate the greenhouse effect of carbon dioxide based on experimental results and conduct a demonstration of energy planning in various regions based on China's natural resources.

(iii) Attitude and Responsibility

It is required to strengthen students' sense of responsibility for energy conservation and emission reduction, and nourish their attitude towards energy conservation and low-carbon living. Moreover, they should fulfill their social responsibility through household electricity-saving actions.

III. Project Overview

The targeted participants are 16 students, Grades 5 to 7, from the Environmental Association of the Youth Science & Technology Center of Beijing Xicheng. They have not received any environmental education activities with the theme of electricity conservation before, but have received education activities with themes such as water and air environment. They have a deeper understanding and better acceptance on environmental protection than their peers.

The activity consists of 20 class hours and covers 10 themes. The activity is designed as follows.

Unit	Activity	Core concept	Highlights
Explore the causes of low carbon	Where is there high-level carbon dioxide?	Human activities lead to the increase in the concentration of carbon dioxide in air	1. Detect the concentrations of the carbon dioxide in activity classrooms, roadsides, greenbelts, etc. 2. Attempt to draw a carbon cycle diagram
	Carbon dioxide and climate change	Carbon dioxide has a greenhouse effect and causes climate change.	1. Conduct carbon dioxide warming experiments 2. Review recent high-temperature events and their impacts in various regions
	Carbon dioxide and ocean acidification	Carbon dioxide increases ocean acidity and affects marine ecology.	1. Prepare carbon dioxide aqueous solution and detect its acidity 2. Review the impact of ocean acidification on marine ecology

Unit	Activity	Core concept	Highlights
Explore responsibilities	Where is electricity from?	Through power generation devices, humans convert kinetic energy into electrical energy. Thermal power, wind power, hydropower, nuclear energy and other power generation technologies all utilize this principle.	1. Disassemble the flashlight with power generated by hand pressing. 2. Deconstruct the hand-pressed power generation device and understand the principle of magnetic power generation.
	Thermoelectric power generation	Semiconductor technology allows power generation in the environment with temperature difference.	1. Conduct thermoelectric power generation experiments to understand the principle of thermoelectric power generation. 2. Explore the application scenarios of thermoelectric power generation in daily life.
	Cleaner electricity	Solar photovoltaic converts solar energy into electricity	1. Make solar-powered cars. 2. Participate in solar-powered car races to explore the limitations of solar-powered cars
	New energy overall planning	Considering China's environmental and resource conditions, fossil energy is still indispensable.	1. Discuss what new energy with low-carbon emissions can be developed throughout China, and conduct simulation planning.
Explore the ways to save electricity	How much electricity is consumed?	Test the power consumption of home appliances	1. Check and count the nameplate of home appliances and record their rated power. 2. Test the working power of home appliances by experiment. 3. Conduct a one-week household electricity consumption audit.
	Lighting electricity conservation	Energy conservation is the development path of incandescent lamps, fluorescent lamps and LED lamps, and using LED lamps can obtain better energy conservation effect.	1. Explore the luminous principle of incandescent lamps, fluorescent lamps and LED lamps. 2. Test the luminous efficiency of incandescent lamps, fluorescent lamps and LED lamps by experiment.
	Household electricity conversation challenges	Promote electricity conservation behavior and have low carbon life at home.	1. Conduct group discussion on feasible power-saving methods at home. 2. Record electricity meter data for a month.

IV. Activities

1-1 Where there is high concentration of carbon dioxide?

Introduction: Is there a difference in the concentration of carbon dioxide in different locations?

Focus: How to test the carbon dioxide in air?

Exploration: Students choose sampling sites based on the surrounding environment to test the carbon dioxide concentration.

Expansion: Conduct online researches and draw carbon cycle process diagrams.

1-2 Carbon dioxide and climate change

Introduction: What are the problems with the increase of carbon dioxide in the atmosphere? How to prove them?

Focus: How to demonstrate the greenhouse effect of carbon dioxide through experiments?

Exploration: Design experiments to demonstrate the greenhouse effect of carbon dioxide and conduct experiments.

Figure 1: Students are Exploring the Greenhouse Effect of Carbon Dioxide

Expansion: Conduct online searches, select an extreme high temperature event in recent years, and analyze its impact on human survival and development.

1-3 Carbon dioxide and ocean acidification

Introduction: Does the increase of carbon dioxide in the atmosphere have an impact on the ocean?

Focus: How to demonstrate through experiments that carbon dioxide can acidify seawater?

Exploration: Design experiments to demonstrate that carbon dioxide is acidic when dissolved in water.

Figure 2: Students are Exploring the Acidity and Alkalinity of Carbon Dioxide in Water

Expansion: Try analyzing the impact of ocean acidification on humans through online searches and by inference.

2-1 Where is electricity from?

Introduction: Where does the electricity we use come from?

Focus: Observe the pictures and summarize that hydraulic power, wind power, and thermal power all have turbine structures. What principles are used by them?

Exploration: Disassemble the flashlight with power generated by hand pressing and understand the structure and principle of kinetic energy generation technology based on its internal structure.

Expansion: Carry out online searches and draw a power generation structure diagram.

2-2 Thermoelectric power generation

Introduction: Observe the self-stirring coffee cup that utilizes thermoelectric power generation. Do you know where the power comes from?

Focus: Explain the principle of thermoelectric power generation.

Exploration: Construct a structure that can be used for thermoelectric power generation based on the principle of thermoelectric power generation.

Expansion: Design a small invention that can be used in daily life and utilize thermoelectric power generation, and draw a brief design diagram.

2-3 Cleaner electricity

Introduction: In your life, where has solar power been used?

Focus: Why haven't solar-powered vehicles been put into practical use?

Exploration: Set up a solar-powered car for use.

Expansion: Calculate the required area of photovoltaic panels for the car with inbuilt photovoltaic power generation.

2-4 New energy overall planning

Introduction: Display the carbon dioxide emission factors of the power grids all over China, and guess how their differences are generated?

Focus: Why is the proportion of thermal power in North China much higher than that in other regions?

Exploration: Provide multiple natural resource maps for students to draw a map of China's energy development.

Expansion: Refer to the relevant materials and see which of your designs align with the actual work of China's energy transition.

3-1 How much electricity is consumed?

Introduction: What can residents do to reduce their carbon emissions?

Focus: Reducing household electricity consumption is feasible. How do we know how much electricity an appliance consumes?

Exploration: With a power metering socket, test the actual power of appliances in standby and working conditions.

Figure 3: Students are Measuring the Power of Electrical Appliances

Expansion: Conduct audits over the electricity consumed by appliances at home.

3-2 Lighting electricity conservation

Introduction: What are the lighting methods for habitable rooms and what are their advantages and disadvantages?

Focus: Three generations of household lighting: incandescent lamps, fluorescent lamps, and LED lamps. What are their main differences?

Exploration: Test the working power, illuminance, and working temperature of incandescent lamps, fluorescent lamps and LED lamps, and analyze their energy conversion efficiency.

Figure 4: Students are Testing Lamps

Expansion: Based on the research results and personal experience, discuss and come up with energy-saving methods for household lighting.

3-3 Household electricity conservation challenges

Introduction: What actions can individuals take to reduce carbon emissions?

Focus: What energy-saving behaviors can we have at home?

Exploration: In groups, discuss energy-saving methods at home.

Expansion: Use feasible energy-saving methods at home and record one month's electricity meter data on the study sheet.

V. Main Features

(1) Topic selection from the perspective of subjective initiative

Low-carbon behaviors at home include reducing energy consumption in transportation, heating, and home appliances. The energy consumption of transportation is largely affected by the commuting situation of family members. The heating of houses in the North China is mainly centralized heating, and the energy consumption for heating is relatively fixed. Both are more affected by objective conditions than subjective conditions, and are not suitable for research in this project. Household electricity consumption is greatly impacted by living habits, and changes in subjective consciousness and behavior can bring significant effects. Therefore, the topic of household electricity conservation is chosen.

(2) Emphasize the design of independent learning in the entire process

In exploratory activities, there are generally links such as setting difficult scenarios, identifying problems, proposing hypotheses, conducting explorations, analyzing and discussing, and expanding. In most activities, the teacher has a high degree of leadership in the first and last links of setting difficult scenarios and expanding. In order to more closely link with students' actual life, this activity pays special attention to setting difficult scenarios with open questions, and strengthening the proportion of independent learning in these two links via after-school investigation assignments as expansion.

（3）Innovation points of the activity

Concept innovation: This activity guides students to conduct a comprehensive analysis of the advantages, disadvantages, suitable regions and scenarios of new energies. While cultivating students' independent thinking, it establishes their concept that low-carbon life is impossible if all are just waiting for the energy revolution, and also enhances their sense of low-carbon responsibility.

Evaluation innovation: Based on traditional evaluation methods such as group self-evaluation, parent feedback, study sheet, homework evaluation, etc., this activity introduces household electricity consumption data from the State Grid APP to evaluate household energy-saving behaviors. This evaluation method is scientifically effective, and by comparing it with the data of the control group, it can truly reflect the effect of the activity on actual energy-saving behaviors.

Reference

[1] Michael Ro. Making Cool Choices for sustainability: Testing the effectiveness of a game-based approach to promoting pro-environmental behaviors [J]. Journal of Environmental Psychology, 53 (2017) 20-30

[2] Monroe M C. Two avenues for encouraging conservation behaviors [J]. Human Ecology Review, 2003, 10(2): 113-125.

[3] Sun Jiabin. Research on Environmental Awareness and Environmental Behavior Education for Primary School Students [J]. Journal of Jiangsu Institute of Education, 2006, (2): 107-111.

Organization Introduction

Youth Science & Technology Center of Beijing Xicheng was established in 1981 and is in the charge of Xicheng District Education Commission. It has been successively awarded the following titles: National Science Popularization Education Base, National "Environmentally Friendly and Children Friendly" Youth and Children Ecological Civilization Education Activity Member Unit, Capital Civilized Unit, Beijing Student Jinpeng Science and Technology Team, Beijing Science Popularization Base, and Beijing "City of Science and Technology Museums" Science and Technology Education Experience Base.

Youth Science & Technology Center of Beijing Xicheng always takes technology education as the core, and takes cultivating the scientific spirit, scientific thinking, scientific methods, and

practical abilities of teenagers as the fundamental goal of carrying out educational and teaching work. It regularly organizes technology interest groups for teenagers in the fields such as robotics, biology, environmental protection, electronics, models, astronomy, etc., actively guiding them to increase their knowledge in scientific and technological activities, exercise their abilities in practice, and enhance their competency through exploration.

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Enhancing the Climate Awareness and Competency of Teenagers through Science Communication

I. Background

Keywords: Binfeng Science Communication Studio; Science Popularization Education; Addressing Climate Change

In order to enhance the comprehensive capabilities for meteorological disaster prevention and reduction, as well as adapting to climate change by seeking benefits and avoiding harm, improve the knowledge and action ability of teenagers to scientifically respond to natural disasters, and enable more teenagers to understand the severe challenges faced by mankind in the face of climate crisis, the National Climate Centre established "Binfeng Climate Change Science Communication Studio" and has carried out a series of science popularization education and communication activities under the climate change theme for teenager students across China.

II. Project Goal(s) and Objective(s)

Goal 1: To cultivate the interest of teenagers in science popularization education activities, and develop their awareness and habits of loving the environment, protecting the environment and living a low-carbon life.

Figure 1: The "First Lesson of the School Year" Activity at Wenjiang, Chengdu in 2023

Goal 2: To enable teenagers to understand the impact of human beings on the earth environment, and understand the mitigation and adaptation of climate change.

Figure 2: Climate Change Course at the High School Attached to Beijing Jiaotong University

Goal 3: To promote the development of science popularization and carry out emergency science popularization for major weather and climate events.

III. Project Overview

Initiated by the National Climate Center, the Project mainly takes the form of Science Popularization Lectures conducted by professionals of Binfeng Science Communication Studio. The target audience of the project are divided into three age groups: 1) primary school Grade 4 to junior middle school lower grade, 2) junior middle school higher grade to senior middle school Grade 2, and 3) senior middle school Grade 3 to undergraduate. The lecture duration ranges from 40 minutes to 70 minutes.

The Project team also developed the teaching material *Climate Change and Human Society*, which covers an overview, facts and causes of climate change, climate change simulation and impact and adaptation, climate change mitigation measures, etc.

Since 2020, the Project has been focusing on improving the scientific quality of teenagers, enhancing their meteorological disaster prevention and reduction capabilities, promoting their

awareness and action towards addressing climate change. More than 20 science popularization lectures for teenagers are held each year, and they are introduced into both urban and rural classrooms, directly affecting a wide range of student groups, communities and families, with an average of 500,000 people involved per year.

IV. Activities

1. Science popularization planning and activity design.

Chinese Meteorological Society and National Climate Centre combine major events such as World Meteorological Day, Disaster Prevention and Reduction Day, National (Meteorological) Science and Technology Week, National Science Popularization Day, etc. to promote meteorological disaster prevention and reduction and climate change science popularization, targeting cities and taking into account ethnic minority settlements and rural primary and middle schools.

Figure 3: Binfeng Climate Change Science Popularization Lecture at Inner Mongolia University

2. Implement “the First Lesson of the School Year” Activity.

The activity named “the First Lesson of the School Year” focuses on meteorological disaster prevention and mitigation, promoting the spirit of scientists, telling the scientific story of extreme weather and global warming, and enhancing public awareness of disaster prevention and mitigation and emergency response capabilities. Lectures are provided by science popularization team of the Binfeng Science Communication Studio. Cities such as Nanjing, Chengdu, Linzhi and Lhasa have hosted the activity.

Figure 4: Online Live Activity themed "Dual Carbon"

3. Create science popularization short videos.

The videos intend to let teenagers understand the status quo of climate change, the domino effect threat from climate crises, and the challenges to human beings, and stimulate more teenagers to participate in climate governance. The *"Exploring Climate Change" Series of Science Popularization Videos* has won the Best Series of Science Popularization Videos and Top 10 Excellent Works Award at the First "Famous Scientists' Lectures on Science Popularization" held by China Meteorological Administration. *Talking about Plum Rain* and *Super Violent Plum* have respectively won the first prize at China Meteorological Administration Short Video Festival and Wanfenglin Micro Film Festival. *El Nino* by the Project has received unanimous praise from government authorities such as China Meteorological Administration and the State Flood Control and Drought Relief Headquarters. *Illustrated El Nino* has won the first prize of China Meteorological Society and the second prize of the "Bright Cup" of Chinese Society For Science and Technology Journalism; the popular science video *La Niña* has won many awards, such as the bronze medal of China Dragon Award in the Chinese Academy of Sciences, the Chinese Meteorological Society, and the 13th China International Science and Education Film and Television Exhibition, etc..

4. Course development.

As a regular elective course for senior high schools, the teaching material named *Climate Change and Human Society* were published, which includes content such as global warming and extreme weather, scientific foundations of climate change, climate critical points and impacts, mitigation and adaptation to climate change, and teenagers' climate change actions, etc.

Figure 5: Cover of Impact of Climate Change on Human Society by China Meteorological Press

V. Main Features

(1) Scientific. The science popularization lectures enables teenagers to broaden their horizons and improve their quality through formative science education, learn about scientific knowledge beyond textbooks, and understand the frontier progress of climate change research and the challenges of climate governance.

(2) Targeted. By using narrative and experience sharing methods, and based on the characteristics of different occasions, the outline of the science popularization lecture is designed in a targeted manner for teenagers of different age groups and regions, covering the aspects from

daily weather to extreme weather, from meteorological disasters to global warming, grasping the transition from sensory to abstract climate change, and balancing the depth and breadth of knowledge.

(3) Popular. Instead of using awkward professional terminology, the lecturers use more colloquial language or network words, and uses scientific numbers to deliver many uncertainties in climate change, thus enhancing the attention of teenagers to science popularization speeches.

Organization Introduction

The National Climate Centre was established in February 1994 with the approval of the State Council and is in the charge of China Meteorological Administration. It is an independent department and bureau-level legal person public institution and a national-level scientific and technological business unit. Adhering to the needs of China and the forefront of the world science and technology, the National Climate Centre shoulders the mission of accurately monitoring and predicting climate, scientifically assessing climate impacts, effectively managing disaster risks, and actively responding to climate change. Moreover, it provides comprehensive, multi-level and refined high-quality services for meteorological disaster prevention and reduction, climate change response and ecological civilization construction. At present, it is also the World Meteorological Organization's Beijing Climate Center (BCC), East Asian Monsoon Activity Center (EAMAC/WMO), Global Producing Centre for Long-Range Forecast (GPC/WMO), Center for Extreme Events Monitoring in Asia (CEEMA/WMO), and the Third Pole Regional Climate Center (TPRCC/WMO). BCC plays an important role in the global climate prediction information exchange and the Global Climate Service Framework (GFCS), and provides major reference for the "Belt and Road" regional climate forecast in East Asia.

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Future-oriented Climate Change Education — China Climate Change Education Project

I. Background

Keywords: Climate Change Education; Primary and Middle Schools; Social Organizations; National Education System

Teenagers are both bearers and important drivers of climate change. Climate change education has not been included in the formal teaching system by the Ministry of Education of China. Lacking in comprehensive and creative textbooks suitable for China's national conditions in their climate change education, school teachers feel difficult to effectively carry out climate change teaching; and the opportunities for climate change interaction and cooperation between schools are limited. Under the above background, China Association for NGO Cooperation has launched China Climate Change Education Project, aiming to promote the integration of climate change contents into school education through the use of innovative teaching materials and teacher training activities.

II. Project Goal(s) and Objective(s)

1. The Project is to enhance the understanding of climate change issues among teachers and students, thereby promoting changes in their daily behavior;
2. The Project is also to promote the integration of climate change contents into school education.

III. Project Overview

China Climate Change Education Project was initiated by China Association for NGO Cooperation in 2012, with three years as a cycle. As of December 2022, it has had completed three cycles. As a project executing agency, China Association for NGO Cooperation is responsible for project design and overall coordination. Its local partners are responsible for contacting pilot schools, teacher training, and other project activities in the local area as well as project follow-up, and can actively participate in the subsequent promotion activities of the Project.

In the period of 10 years, the Project has collaborated with and empowered local social organizations to connect schools, communities, and relevant government authorities through

activities such as textbook development, teacher training, climate change education salons, climate change education competitions, and international exchanges, and has affected a wide range of student groups and families, jointly promoting the integration of climate change education into the national education system of China.

IV. Activities

The Project promotes knowledge production, empowerment, and multi-stakeholder dialogue via activities such as textbook development, teacher training, climate change education salons, climate change education competitions, international exchanges, etc., thereby promoting the inclusion of climate change content in primary and middle school curricula, enhancing the understanding of climate change issues among teachers and students, and promoting changes in their daily behaviors. Moreover, the Project also encourages families and communities to participate in addressing climate change.

1. Development of Textbooks and Teaching Aids

A replicable and scalable toolkit has been developed under the Project, including Education Book on Climate Change, Operational Guidebook on Climate Change for Teenagers, electronic courseware for climate change education and teacher training aids.

Picture 1: Cover of *Education Book on Climate Change*

Picture 2: Cover of *Operational Guidebook on Climate Change for Teenagers*

2. Teacher Training and Small Funding

Totally 29 teacher training activities have been held under the Project, with teacher training divided into primary class, advanced class and professional guidance workshop. Small grants have been provided to nearly 30 pilot schools. With the support of teacher training, Qinghe Middle School of Heilongjiang Farm 853 has been offering climate change education courses since 2015, with one lesson per week. By 2022, a total of 1,530 students have been benefited. Xi'an Hi-tech Zone No.1 High School is developing school-based textbooks with the support of the Project.

来自灌云高级中学城西分校的政治老师王超告诉我们，在培训讨论过的知识环节中，这是他最想运用到教学活动中的，让孩子在游戏中学到碳排放的知识。

Picture 3: Teacher Training

3. Creative Competition

The Project has conducted three rounds of competitions targeting pilot cities and schools across China, and has received a lot of exciting works, including posters, photos, microfilms, environmental protection dramas, and handicrafts on waste utilization. Through a combination of training and creative practice, students have achieved a transition from cognition to action. The posters of the students from China have been made into postcards and displayed at the United Nations Climate Change Conference, receiving positive praise from the international community.

Picture 4: Student's Works

4. International Exchange

In May 2018, a total of 7 delegates from the Project team of China Association for NGO Cooperation, local project partners and pilot schools went to Korea to participate in international exchange activities on climate change education, including exhibition, textbook discussion and workshop. The Project has held sharing and exchange sessions at the United Nations Climate Change Conference, the United Nations Human Rights Council and Incheon International Education Forum.

Picture 5: International Exchange

V. Main Features

1. Various forms of activities.

China Climate Change Education Project brings together various activities including training, small amount funding, works competition, cross regional and international exchange, and textbook development.

2. Visible progress has been made in the textbook development and the training.

The Education Book on Climate Change written under the Project has a total of 2,000 copies printed, and the Operational Guidebook on Climate Change for Teenagers has a total of 8,000 copies printed. These books have been provided free of charge for local partners participating in the Project, teachers and students participating in the training. The Project is implemented in 24 cities across China, and through cooperation with more than 20 local social organizations, it has reached approximately 200,000 students in nearly 1,000 schools. The Project connects schools, communities, and relevant government authorities through cooperation and empowerment of local social organizations, and it affects a wide range of students and families through teacher training, jointly promoting local climate change teacher training and climate change education into classrooms. The Project also supports teachers and local social organizations to carry out nearly 30 follow-up small funded programs, with the participation of teachers and students as well as parents, communities, and social organizations. After the training, many teachers have spontaneously carried out various low-carbon and climate change education activities for students with a participatory and interactive teaching philosophy, and a group of teachers dedicated to promoting low-carbon and climate change concepts have emerged.

3. The Project has received widespread attention from the press and the public domestically.

The Project was reported by mainstream media such as China Daily, Beijing Weekly, China.com.cn, etc. The magazines Environmental Education and World Environment have also provided in-depth reports on the Project.

The cases of the Project have been included in the report Progress through Retreat: Exploration and Practice of China Foundation in Children's Education written by China Global Philanthropy Institute (CGPI), Chinese Folk Stories on Climate Change written by China Association for NGO Cooperation, and the Collection of Cases on Climate Communication in China, the key project

achievement of the National Social Science Fund of Guangxi University.

4. Promote dialogue among multiple stakeholders

China Climate Change Education Project, together with government officials, representatives of social organizations, experts, media reporters, teachers and students, participates in the action to address climate change, shares the experience in climate change education activities and explores the future trends of climate change education. It plays a typical demonstration project role nationwide.

Under the Project, climate change education policy recommendations have been drafted for the basic education stage. Through the efforts of project experts, climate change education has been incorporated into the newly revised Geography course Standards for General Senior Middle Schools. The Project has organized climate change education experience exchange conferences to promote the exchange of experiences among experts, representatives of social organizations, and teachers from countries such as China, Japan, Korea and Singapore.

Organization Introduction

China Association for NGO Cooperation (referred to as "CANGO") is a national, non-profit, joint, and voluntarily formed independent corporation aggregate. CANGO is established in 1992 with the approval of the former Ministry of Foreign Trade and Economic Cooperation of China (now the Ministry of Commerce). It holds the special consultative status with non-governmental organizations of the United Nations Economic and Social Council, consultative status with the United Nations Conference on Sustainable Development, observer status with the United Nations Framework Convention on Climate Change and the United Nations Convention on Biological Diversity.

As of the end of 2022, CANGO had a total of 175 domestic group and individual members, and established relationships with 198 foreign non-governmental organizations and international multilateral and bilateral institutions, and it had cooperated with 109 international partners from 23 countries or regions in public welfare projects. The Project covered public welfare industry development, cooperation between social institutions and enterprises, climate and environment, gender equality, rural revitalization, health and hygiene in 31 provinces, cities, and autonomous regions across the country, and 9.68 million people benefited from them.

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Youth Climate Action Pioneer Project

I. Background

Keywords: Youth, Climate Action, Climate Education, Climate Pioneer

Climate change is a global challenge, and the relationship between humans and nature has become one of the hottest topics worldwide. In 2020, China proposed the 3060 Goal (to peak carbon dioxide emissions by 2030 and carbon neutrality by 2060). In recent years, the Chinese youth has been increasingly actively participating in the global climate governance process, playing a positive role at both international and domestic levels. Youth are the backbone of promoting low-carbon transition. The Youth Climate Action Pioneer Project has emerged to empower youth climate action through climate education, and inject momentum into improving national climate competency.

II. Project Goal(s) and Objective(s)

1. To develop climate education partnerships with governments, universities, social organizations, and enterprises, and explore collaborative models of climate education involving multiple parties;
2. To train no less than 100 youth climate action pioneers annually, and achieve no less than 600 online course registrations per year.

III. Project Overview

Initiated by the Carbon Neutrality and Green Development Research Center of China Jiliang University in June 2023, the Youth Climate Action Pioneer Project covers climate courses, field research, and communication and promotion, etc. The Project is open to young college and university students. It imparts climate knowledge to the students via climate courses and provides knowledge application scenarios via field research to enable young people to improve their awareness of climate change and ability to respond to climate change in practice. It aims to organize young people with interdisciplinary backgrounds to carry out practical research and public communication on climate change issues, cultivate youth climate action pioneers, and spread climate knowledge to people around them by relying on youth climate action pioneers, explore collaborative

pathways for climate education involving multiple parties. The Project plans to cultivate at least 100 climate action pioneers annually in a cycle of five years.

IV. Activities

The Youth Climate Action Pioneer Project interprets current international and domestic climate policies in a diverse and dynamic manner. It explores multi-party participation models for addressing climate change, promotes youth leadership in addressing climate change, and supports climate friendly actions through practical research and public communication on addressing climate change issues. The implementation steps include:

- Online courses planning. 7 lecturers were invited to the 2023 Project including Katja Biedenkopf, Associate Professor of Sustainable Politics at Catholic University of Leuven in Belgium, Huw Slater, Manager for the China-Europe Environmental Cooperation Project at Client Earth, and Dr. Casper Van der Tak, a Dutch Economist, Nicole Loeser, Director of German Institute of Arts and Innovation, Asih Budiati, Asia Project Leader of Global Covenant of Mayors for Climate and Energy (GCoM), Jia Feng, Researcher and Former Director General of the Center for Environmental Education and Communications of Ministry of Ecology and Environment of China, and Dr. Wang Xin, Deputy Dean of the School of Environment and Sustainable Development of the United Nations Environment Programme-Tongji University. The course contents covered climate policy, climate justice, International and national perspectives, local perspectives, public participation, climate security, climate communication, and low-carbon planning. Open registration to the public through the class platform is available.
- Registration for online courses. The organizer designed exquisite activity posters. Online course information was promoted through the WeChat official accounts of the organizer and university and social organization partners as well as China Environment News and other media. Moreover, student brochures were shared and spread through social networks. The 2023 Project had more than 80 universities/institutions from home and abroad, and more than 600 online students participating.
- Offline course selection. The organizer selected 20 students from the students who completed online course credits and corresponding assignments to participate in offline courses, from 18 universities/institutions including Tsinghua University, Xiamen University, University of Chinese Academy of Sciences, Nankai University, China Jiliang University, London School of Economics and Political Science, Paris Institute of Political Studies and University of Prince Edward Island, and involving 17 majors.

- Implementation of offline courses. The Project held an offline course in Beilun District, Ningbo City, Zhejiang Province, inviting four Chinese teachers to give lectures. The offline students were divided into four groups: low-carbon transportation, low-carbon life, low-carbon industry and urban-rural planning. They conducted research in rural communities, ports and docks, industrial and mining enterprises, etc., and exchanged ideas with rural (community) cadres, frontline production employees, and management teams to explore ways to address climate change in their respective fields, explore the unique highlights of urban climate change mitigation and adaptation.

- Communication and promotion. The Project expanded its influence through media communication. The Project promoted the establishment of the Nature Ambassador Association (China Jiliang University) and expanded the network of university clubs. Through regular activities of clubs, climate themed practices and communication activities were carried out both on and off campus.

Figure 1: China-Europe Climate Experimental Course (Offline), Teacher-Student Classroom Interaction, October 2, 2023.

Figure 2: The Students from China-Europe Climate Experimental Course Visited a Public Transport Company in Beilun District, Ningbo City to Conduct Research on Low Carbon Transportation, October 4, 2023

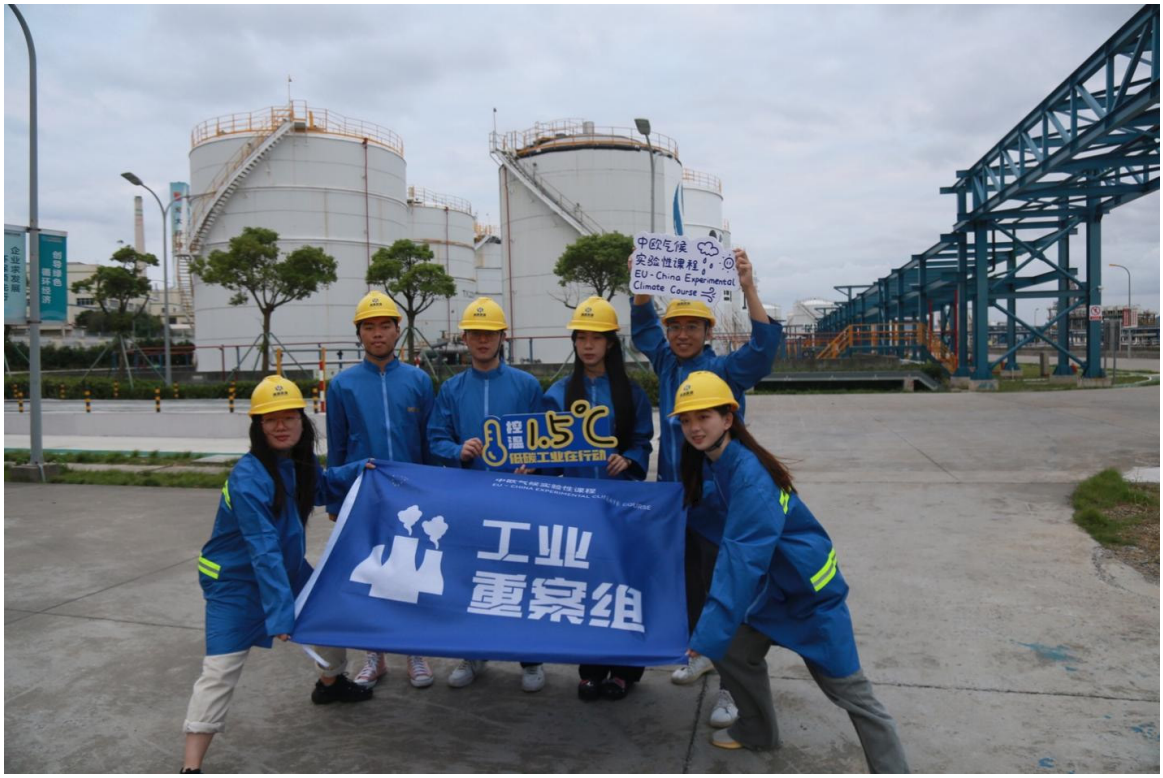

Figure 3: The Students from the China-Europe Climate Experimental Course Visited Ningbo Haijing Environmental Protection Technology Co., Ltd. to Conduct Researches on Low-carbon Industry, October 4, 2023.

V. Main Features

1. Flexible teaching methods.

By means of combining online and offline courses, the content of online courses is open to the public, emphasizing inclusiveness; the selection of offline courses is based on merit, ensuring the quality of students and cultivating a group of young climate action pioneers with enhanced climate leadership. According to feedback from the students participating in the Project, the course helps to increase their understanding of the causes of and response strategies for climate change.

2. Easily quantitative project performance.

The performance of the Project is evaluated based on indicators such as the number of participants in the course, media coverage, content reading, and number of activities.

Organization Introduction

Established in 2022, the Carbon Neutrality and Green Development Research Center of China Jiliang University has the mission of serving China's low-carbon transition and green development. At present, there are 7 researchers, all of whom hold doctoral degrees or senior professional titles, mainly engaged in policy consultation, legislative research, planning, standard research, public education and communication, etc. on climate change and green development. It has successively carried out exchanges and cooperation with University of Glasgow, University of Munich, Hanns Seidel Stiftung and other institutions in terms of carbon inclusion and climate law, has cooperated with China -Europe partnership projects to carry out climate education for youths, has supported the exploration of cooperative models of climate education in primary and middle schools in Zhejiang and Tibet, and has carried out a biodiversity-friendly township standardization demonstration project in Ningbo, Zhejiang Province, China. The research results and academic viewpoints of the Project are published in main media and professional magazines such as People's Daily (Overseas Edition), Xinhua News Agency, Guangming Daily, China Youth Daily, China Environment Daily, Zhejiang Daily and Environmental Protection.

Contact Information

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Understanding Climate Change by Doing——Futian Practice of Teenager Climate Change Education

I. Background

Keywords: Climate Change Education; Action; Teenager; Futian Practice

China is actively addressing the challenges of climate change, and Shenzhen is no exception. One of the goals of Shenzhen is to become a pioneer in sustainable development. However, the competency of the citizens on climate is uneven, and phenomena such as wasting water and electricity often occur. Futian is the central urban area of Shenzhen. How can more citizens pay attention to climate change and be willing to take action to mitigate it? Starting from youth education, Futian District has developed and designed an education course system for teenagers and has implemented a series of actions on climate change education to enable teenagers to understand the importance of climate change through actions. Moreover, through school-family-community collaboration, Futian District has fully improved the competency of the citizens on climate.

II. Project Goal(s) and Objective(s)

1. The Project is to take action to mitigate climate change through competency-oriented climate change courses.
2. Through the actions of teenagers, the Project is to promote families to develop low-carbon lifestyle and enhance the competency of citizens on addressing climate change.

III. Project Overview

Futian Practice of Teenager Climate Change Education was initiated by Futian District Education Science Research Institute, Shenzhen in 2012. By designing and implementing trainings, competitions, field trips and parent-child activities, it guides schools and teachers to carry out climate change education for teenagers.

Over the past 11 years, the Project has mobilized schools, families and society to engage teenagers

to actively participate in climate themed activities, developed competency-oriented climate change courses featured "explanatory learning, five-sense experience, manual creation, field practice, and expansion game", and has kept improving them in practice and experience. Moreover, the Project has built a climate change education course system featuring "four layers and three modules" and has promoted the development of low-carbon lifestyle habits among teenagers and their families in the whole district through the "Hand in Hand" Project.

IV. Activities

Futian District Education Science Research Institute, Shenzhen is responsible for developing courses, drafting action plans, training teachers, etc. Each school of Futian District then selects and implements climate change education based on the action plans.

1. Develop and design a competency-oriented climate change course group.

The climate change course group covers a series of project-based thematic courses. There are currently five main types of courses:

(1) Explanatory learning type courses: This type guides teenagers to understand what climate change is and the causes of climate change, know the measures to mitigate climate change, listen to others' explanation first and then try to explain to others, such as Common Fuels, Power Generation and Energy Conservation, etc..

(2) Five-sense experience type courses: This type guides teenagers to apply their senses to experience and gain direct experience in simulated climate change environments, such as Hot Island, Sea Level Rise, etc..

(3) Manual creation type courses: This type guides students to explore impacts of climate change by conducting research and designing manual works, such as Sponge Campus, Water for Multiple Purposes, etc..

(4) Field practice type courses: This type mainly guides students to explore and experience in real or virtual environments, such as "Clean Your Plate" Campaign, Zero Waste, etc.

(5) Expansion type courses: This type guides students to participate in designing games around the theme of climate change and engage in gamified activities, such as Journey of Water, Traces of Carbon Dioxide, etc..

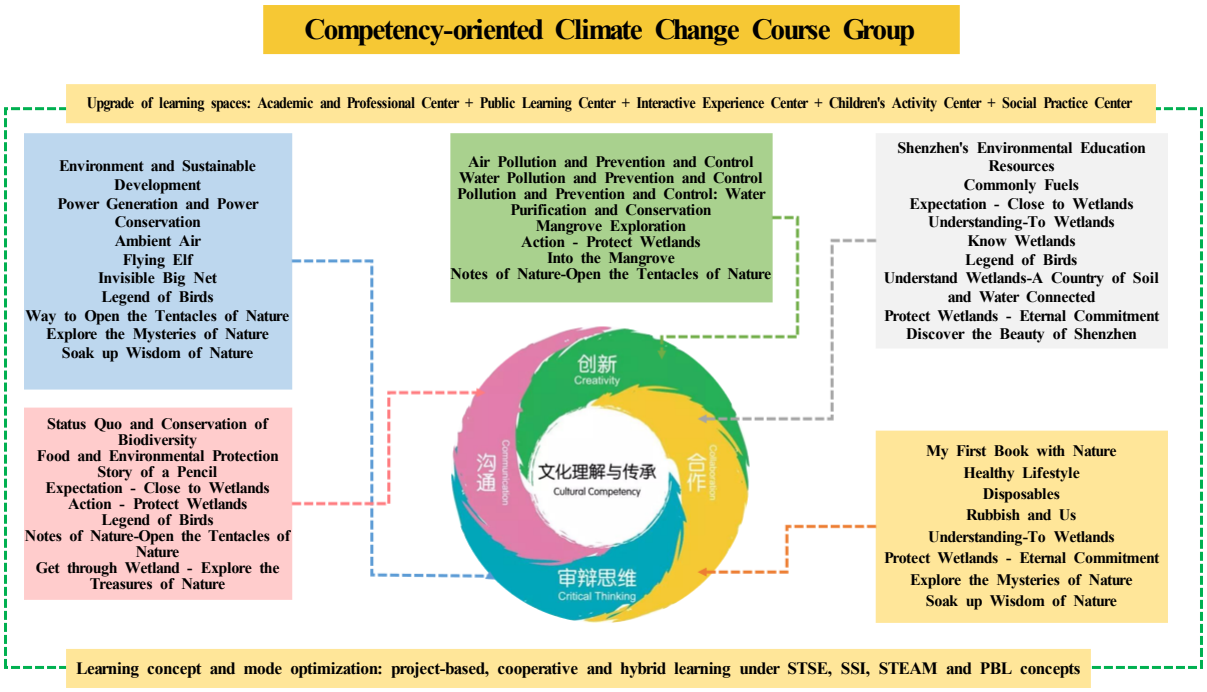

Figure 1: Atlas of the Characteristic Competency-oriented Course Group of Futian Climate Change Education

2. Carry out a series of actions to address climate change according to school characteristics

Every year, Futian District Education Science Research Institute initiates the "Low Carbon Action" Initiative, and each school carries out a series of actions to address climate change based on its education characteristics.

Lianhua Primary School in Futian District implements "Zero Waste" garbage classification. There are garbage classification bins in the classrooms and centralized disposal points on campus. Students participate in self-management, and garbage classification has become a conscious behavior. Over the past six years, approximately 4,316kg waste paper has been recycled. At Futian District, the Kindergarten Affiliated to Huaxin Primary School, Huafu Primary School, Xinsha Primary School, Yuanling Primary School, etc. vigorously promote the "Clean Your Plate" Campaign to eliminate food waste and make their own efforts for carbon reduction. The Second Experimental School, Futian Primary School, Funan Primary School and Shangbu Middle Schoolt, characterized by "Low-Carbon Travel", directly contribute to reducing carbon emissions. Mingde Experimental School takes the study of "Sponge City" as an example to carry out multi-stage STEM course design, focusing on the six words of "infiltration, stagnation, storage, purification, use, discharge", guiding students to design a "Sponge Campus". The students from Wentianxiang Primary School has formed a project-based learning group and discovered that microalgae are carbon fixing

microorganisms capable of photosynthesis; and they have also achieved large cultivation of microalgae by building a photo bioreactor.

Figure 2: Primary School Students are Accumulating "Environmental Coins" in the Smart Garbage Recycling House

3. Carry out action exchanges and competitions to address climate change

With the guidance and support of educational science research in Shenzhen, it cooperates with institutions such as OCT Wetland Nature School and Mangrove Conservation Foundation to support course development and implementation. It carries out various activities in protected areas to promote communication between schools and external institutions, as well as between schools. Moreover, it also organizes students to participate in competitions such as climate change surveys, reuse of waste materials, low-carbon actions, etc.. The core members of the Project have been invited to give keynote speeches at AEIF, the East Asian Teenagers Wetland Protection Conference, and the National Forum on Ecological Civilization on Campus.

Figure 3: Photo of Students and Parents Participating in Futian District Environmental Day Tata Forest Friends Association Activity

V. Main Features

The highlights and achievements of the Project mainly include:

1. "Four layers and three modules" climate change education course system.

Course Development Team:

No.	Name	Unit	Position
1	Sun Liqiu	Futian District Education Science Research Institute, Shenzhen	Responsible Person for Futian District Ecological Civilization Education Project, Host of Guangdong Provincial Famous Teachers' Studio, and Off-campus Supervisor of Master Postgraduates of South China Normal University
2	Pan Xiwu	Shenzhen Institute of Educational Sciences	Vice Dean and Off-campus Supervisor of Doctor Postgraduates of South China Normal University
3	Zhang Yubin	Futian District Education Science Research Institute, Shenzhen	Head of the Course and Teaching Research Department, Senior Title, and Special-grade Teacher
4	Meng Xiangwei	OCT Wetland Nature School	President
5	Hu Huizhe	Mangrove Conservation Foundation (MCF)	Chief Education Researcher
6	Liao Wen	South China Normal University	Director and PhD of the Future Learning Space Research Center of the Department of Teacher Pedagogy
7	Huang Jian	Shenzhen Futian District Second Experimental School	Science Teacher, Special-grade Teacher

The Project has constructed four focused areas: "micro, meso, macro and outer layers", and has sorted up the relationship among the three modules: "regional education management upgrading, ecological civilization education course construction, and education community construction". In the "four layers and three modules" climate change education course system, people are the center, and teenagers are placed at the core of climate change education, forming a relationship of multi-party collaboration, resource sharing and multi-dimensional interaction with all layers. After practical validation, the design of the Project is scientifically reasonable, and the series of activities in the course group are highly operable and are in the deep favor of students.

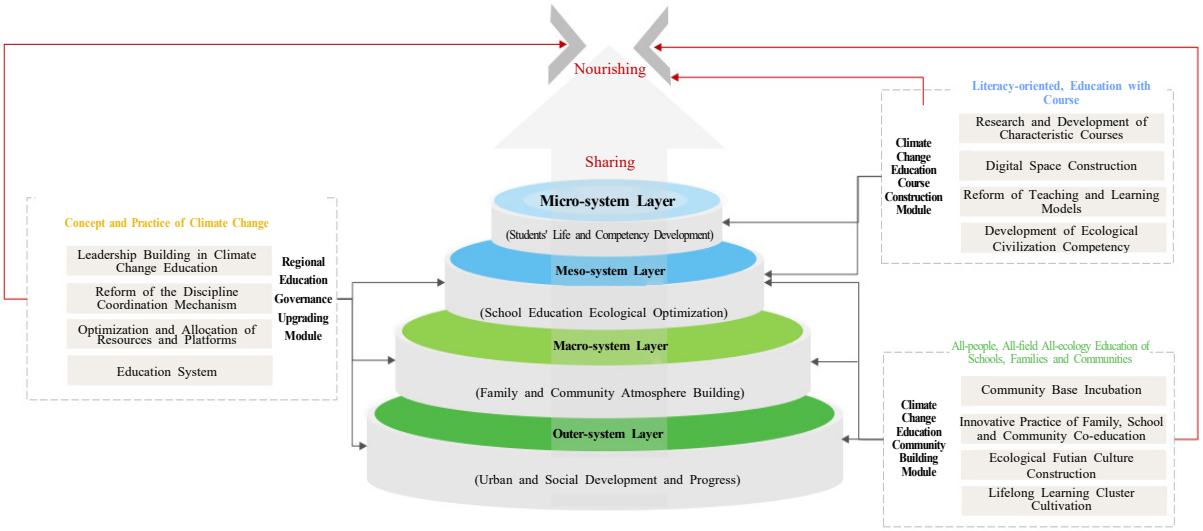

Figure 4: Schematic Diagram of "Four Layers and Three Modules" Climate Change Education System

2. The Project has achieved significant effect and it is replicable.

By implementing the Project and with the concept of “one student influences one family, and one family activates one community”, the climate competency of citizens has been significantly improved, and more and more citizens are paying attention to the causes of climate change and are willing to take action to mitigate it. The Project has been promoted in Shenzhen and can be successfully replicated.

3. The Project has received praise from all sectors of society.

The Project has won the first prize of Guangdong Province Basic Education Teaching Achievement Award and the second prize of the National Basic Education Teaching Achievement Award. Shenzhen Futian District Education Bureau has been awarded the title of "Advanced Organization for Green School Construction in Guangdong Province". Multiple media such as CCTV's Focus Interview, Xinhua News Agency, and Asia Environmental Innovation Forum (AEIF) have reported on it many times. The core members of the Project have been invited to give keynote speeches at AEIF, the East Asian Teenagers Wetland Protection Conference, and the National Forum on Ecological Civilization on Campus.

Figure 5: Multi-party Cooperation in Promoting Climate Change Education Courses Nationwide

Organization Introduction

Futian District Education Science Research Institute, Shenzhen is a public institution under Futian District Education Bureau, Shenzhen. The scope of work includes providing educational decision consulting services to education administrative departments, and providing research and guidance services for school education and teaching practices (including course and teaching, educational research and teacher training). The specific scope of work of Futian District Education Science Research Institute, Shenzhen is to conduct comprehensive research on educational policies and reforms, as well as research on countermeasures for major issues; to conduct researches on the internationalization of education development; to carry out educational science planning and program management; and to conduct course and teaching researches, evaluations and quality monitoring in basic education. It is responsible for research and guidance on moral education, PE, hygiene, art, mental health, and family education in primary and middle schools; responsible for carrying out professional seminars for school principals and teachers in public (private) primary and middle schools (kindergartens) throughout the district; and responsible for conducting researches on the construction of educational informatization and the application of educational technologies.

Contact Information

Name: Sun Liqiu

Affiliation and Position: Leader of Futian District Environmental Education Project, Futian District Education Science Research Institute, Shenzhen

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The Huanding Youth Innovation and Environment Challenge (HDC)

I. Background

Key Words: Climate Change, Primary Education, Sustainable Development, Future

Addressing climate change has become a pressing global mission in present times. China and over 100 other nations have pledged to achieve carbon neutrality and have created their strategies and plans to transition towards a decarbonized future. The journey towards net zero emissions of carbon neutrality is a daunting and long-term task, and it is the responsibility of all individuals, including adults and youth. It is imperative to acknowledge that the younger generation is not only impacted by climate change but also holds a significant role in driving climate action. They are the catalysts of change, trailblazers, and pioneers who employ their expertise and knowledge to combat climate change. They amplify their efforts to hasten progress toward a sustainable future by leveraging education, science, and technology.

Primary education shapes youth's perspective towards the world and their future. With approximately 740 million primary school students worldwide, China alone accounts for one-seventh. These students are the key to addressing climate change and achieving net-zero emissions in the coming decades. Encouraging the younger generation to prioritize sustainable and low-carbon development is crucial to global progress. By instilling these values early on, we can empower them to become advocates for an eco-friendly society. However, the ideas of sustainable development and decarbonization have not been mainstreamed in primary education in China, and the pupils in schools have limited opportunities to think about and participate in sustainable development practices and tackling climate change.

II. Project Goal(s) and Objective(s)

1) To educate primary school students about low-carbon environmental protection and sustainable development. By instilling the values of environmental protection and low-carbon living in young students, we aim to promote progress in society and raise awareness about low-carbon urban life among the public.

2) To provide an inclusive platform for pupils to learn, understand, participate, and create for

sustainable development and tackling climate change.

3) To provide opportunities for Chinese students to connect with their peers from different countries, exchange knowledge, discuss ideas and solutions for addressing sustainable development challenges, and foster a spirit of cooperation and collaboration.

III. Project Overview

Since 2018, Beijing Huanding Foundation (Huanding) has made efforts over the past 6 years to establish a platform, the Huanding Youth Innovation and Environment Challenge (HDC), to enhance teenagers' comprehension of ecological environment protection and climate change, foster a deep appreciation for sustainable and low-carbon development, and facilitate attaining carbon peaking and neutrality goals.

The Huanding Youth Innovation and Environment Challenge (HDC) is a one-year project from September to next Augst, includes many ecological and environmental protection activities, such as talent works collection and selection, professional lectures, and thematic study tours, the principals' forum, offline touring exhibition, etc. Huanding makes efforts to strengthen and expand the platform to encourage and help more pupils build up awareness of sustainable development and combating climate change and be interested and creative in building a sustainable low carbon future. Specifically, the HDC disseminates the innovative works of the youth, broadly scales up the impact, and encourages meaningful communication and exchange between Chinese and foreign children.

IV. Activities

1) **School visits and interviews:** School enrollment and selection by visiting schools and interviewing the principals and relevant teachers to ensure their understanding of the HDC and willingness to provide support as suggested. We also provide equal opportunities to special schools (such as disabled schools) and encourage participation.

2) **Low-carbon related education integrated into schools' operations and students' education:** We found that the interviewed primary schools were interested in issues related to low-carbon and sustainable development, but both heads of primary schools and teachers had insufficient support and resources (e.g., knowledge, know-how, funding, professional staff, etc.) for low-carbon education. So, we helped primary schools (both schools' heads and teachers) better

understand sustainable and low-carbon development. We also supported them in incorporating environmental and climate considerations into schools' operations and students' education. For instance:

- Tsinghua University Primary School is the co-sponsor of HDC and has well incorporated low-carbon considerations into school development and education. In addition to supporting the HDCs organizations, it has set up Huanding Environmental Education Studio in partnership with Huanding Foundation in April 2023, aiming to attract students to learn and research low-carbon development, climate change, and sustainable development. It set up a series of low-carbon lectures in the Science course. It also developed a net-zero campus plan and invested around 1M RMB for low-carbon teaching aids (such as PEDP, rainwater harvesting and treatment, and recycled forest waste) in 2023.

Rainwater harvesting and treatment

- Taizhou Baiyun Primary School has welcomed low-carbon concepts to upgrade its campus and teaching system since it participated in HDCs. For instance, Teachers now use recycled materials in modeling classes, and parents have adopted greener and low-carbon modes of transportation.

- Huanding independently developed the Huanding zero-carbon pavilion for low-carbon education in schools. The Huanding zero-carbon pavilion does not require external power and can provide power for its operation through wind and photovoltaic power generation, achieving zero emissions. Huanding has donated zero-carbon pavilions to ten schools across the country.

The donation ceremony of Huanding zero-carbon pavilion was held at Taizhou Baiyun Primary School

3) **Professional lectures:** To help pupils and schools understand the latest developments in tackling climate change and other sustainable issues through professional lectures. During the lectures, students enjoyed the professional knowledge, raised various questions, and proactively interacted with experts to understand why it is crucial to tackle climate change and how they can build up a low-carbon future.

A carbon neutrality-themed lecture was held in primary schools in Henan Province

4) **Talent works collection and selection:** We encourage pupils to create works on environmental protection, climate change, and low-carbon development, sustainable development to stimulate students' thinking on environmental protection and climate change. And we collected talent works organized a fair and impartial selection for the best talent works.

Selection for the best talent works

the best talent work in 2019 – The Melting Arctic

5) **Thematic study tours:** Organizing thematic study tours for the HDC winners (the best talent works) to allow them to see and experience environmental protection, low carbon development, and technology innovation in person and stimulate their interest further in participating in sustainable and low carbon practices.

Thematic study tour in Singapore

6) **Huanding Laurel Club (The winners gathering):** Gathering the HD Talent Youth (winners) at the winners gathering to encourage them to continue thinking about participating in low-carbon and sustainable development, learn from each other, and encourage them to share with and mobilize more peers to participate in low-carbon practices.

Gathering the HD Talent Youth at the winners gathering

7) **The Principals' Forum:** Organizing the Principals' Forum to gather partner schools' principals and teachers to share their experiences and lessons for building a sustainable campus and enhancing environmental education for students.

The first Principals' Forum was held at Tsinghua University Primary School

8) **Offline touring exhibition:** To share the children's talent works and to promote awareness of low-carbon development to people widely, we have successfully hosted and organized many on-site exhibitions at home and abroad, which received great attention.

Offline touring exhibition in Beijing APM Shopping Mall

Offline touring exhibition in Dubai COP28

9) Climate Change Science Comics: To make children more concerned about climate change, Huanding combined The Twenty-Four Solar Terms, ancient China's earliest climate change observations, to create easy-to-understand comics and posted on HDC WeChat Official Accounts. To better draw everyone's attention to climate change, we edited these comics into the Huanding Storybook and distributed them free to children and schools.

V. Main Features

1) Provides strong incentives to encourage pupils in primary schools to be interested in learning and thinking about issues related to sustainable development and climate change and to be creative in innovating solutions to address challenges of sustainable development.

2) Create a communication mechanism for participating schools, such as the Principals' Forum, to gather principals and teachers to share their experiences and lessons for building a sustainable and low-carbon campus and enhancing low-carbon education for students.

3) Increase awareness of low carbon and sustainable development using the "Three Ones" approach - One student, One family, and One school. Conscientious students can inspire their families and schools to adopt a more eco-friendly, low-carbon lifestyle.

4) Diversify the types of schools and try to engage different locations schools and students from both domestically and abroad.

Organization Introduction

Beijing Huanding Foundation ("HD Foundation") is committed to fostering advancements in ecological capacity building through funding environmental public welfare initiatives, thereby contributing to developing China's ecological civilization. The main activities of the Beijing Huanding Foundation include the following:

- Support research projects and practical applications that leverage new technologies in environmental environments. This encourages the development of original products and technology, drives the upgrading of relevant industries, and promotes pollution control and energy conservation.
- Provide support for innovative, content-rich, and wide-reaching awareness campaigns and activities. These efforts are to help various groups and individuals cultivate a sound ecological perspective and embrace eco-friendly behaviors, ultimately fostering overall societal progress.
- Create a communication platform for Huanding Youth Innovation and Environment Challenge (HDC) to guide the younger generation and society in converting their enthusiasm for environmental protection into specific and practical action to keep ecological protection in pace with society.

Contact info.

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Japan Report

Next Generation Energy Workshop "Energy Choices 30 Years From Now and Working Toward a Carbon Neutral Society"

I. Keywords

Energy choices, creating a decarbonized society, energy simulation, backcasting, cross-industry exchange

II. Purpose & Objective of Activity

The goal of this workshop is for youth participants to develop an interest in long-term energy choices and the creation of a decarbonized society as well as to acquire the following three abilities:

i. The ability to systematically understand complex energy and climate change issues
ii. Communication skills to contend in discussions with others holding diverse values and differing opinions
iii. The ability to deliberate to derive original and convincing ideas

Here, "energy choice" refers to selecting a desirable form of energy given the overall framework of society's energy needs, forms of energy demand, and energy supply structure.

III. Overview of Activity

Activity duration: Basic format: 2 days
In 2022, pre-learning (2 hours) + half-day (5 hours) × 3 sessions (1/11, 1/25, 2/15)

Target: Young professionals in their 20s and 30s, about 40-50 participants
(Participants from various sectors including energy companies, manufacturing, services, think tanks, NPOs, local government, researchers, graduate students, media, etc.)

Teaching Method: In this workshop, participants share basic information, engage in discussions, deliberate, and aim to discover their own opinions. The workshop methodology takes inspiration from the participation-based Technology

Assessment (TA) method of responsive participation and dialogue between experts and citizens involved in social issues, as well as between citizens. The workshop features the use of energy simulations for quantitative verification based on objective data, on the basic structure of "acquire knowledge → dialogue with others → deliberate".

Multiple researchers relevant to the theme participate as experts in the workshop. Lectures and guidance provided as needed by these experts are extremely important. The workshop is conducted by facilitators who are well-versed in the methodology and have a wealth of experience.

IV. Content of Activity

■ Background

The Next Generation Energy Workshop was developed in 2013 by a team of researchers and practitioners at Sophia University, prompted by the increasing importance of discussions about Japan's energy choices following the Fukushima Daiichi nuclear power plant accident and the Paris Agreement and the recognition of the importance of participation among the next generation. Institute for Dialogue of Environmental Policy, which was established later, built a prototype in 2015 and has implemented it to this day, updating its methods and content. Since 2020, an online version has been adopted in response to the COVID-19 pandemic.

■ Basic structure

The basic format of the program is as shown in Figure 1-1.

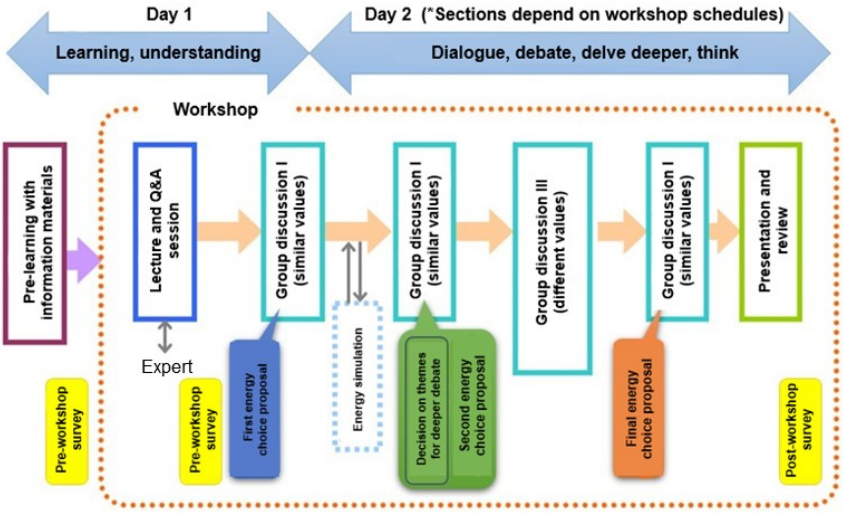


Figure 1-1 Structure of the Next Generation Energy Workshop (Basic Model)

■ Implementation program

① Form a common information base among participants on energy and climate change

Pre-learning using “textbook” is conducted to form as much of a common knowledge base among participants as possible. This document was created by IDEP to help college students understand energy and climate change issues including the latest information and trends, such as national statistics, white papers, and publicly available materials, and has been expanded to include high school students in 2022. The latest edition is "Creating a Carbon Neutral Society – A Reader for Learning, Discussing, and Taking Action Together,” 3rd Edition, published in June 2023.

Expert lectures are conducted by multiple experts (researchers, practitioners, etc.) specializing in energy, climate change, and policy theory. Participants clarify questions and gain a deeper understanding through Q&A sessions.

② Similar value group discussion

- Group Discussion I

Qualitative discussions on energy choices are conducted on the following points:

i. Considering visions of the future society of Japan in 2050... Choose from 1 of 5 Future Visions of Society
ii. Discuss key points and acceptable disadvantages for the choice... Select from 8 Choices
iii. Examine energy and power demand in 2050... Consider how much progress is possible in energy saving and whether it should be promoted in the industrial, transportation, and domestic sectors
iv. Power structure in 2050... Examine which energy sources or combinations thereof should supply the energy demand assumed in iii. Here, power structure is examined with a focus on electricity.
v. Assess the results of the energy choice discussions... Assess based on key points from ii
vi. Feedback (reconsideration)... Review assessment results as needed

- Energy simulation

The qualitative consideration results from Group Discussion I (i–iv) are quantified for quantitative verification. The energy simulation utilizes the 2050 Low Carbon Navigator. Through energy simulations, individual participants or groups can quantitatively consider

how Japan's energy society should be in 2050, energy demand structure, energy supply composition by energy type, greenhouse gas emissions, etc.

● Group Discussion II

In addition to reflecting on the simulation results, the results of Group Discussion I are reviewed from a quantitative perspective and the energy choices for the future society reached by the group are confirmed. Then, based on the consideration results above, new insights and problems are identified.

The structure of energy choice discussions is as shown in Figure 1-2.

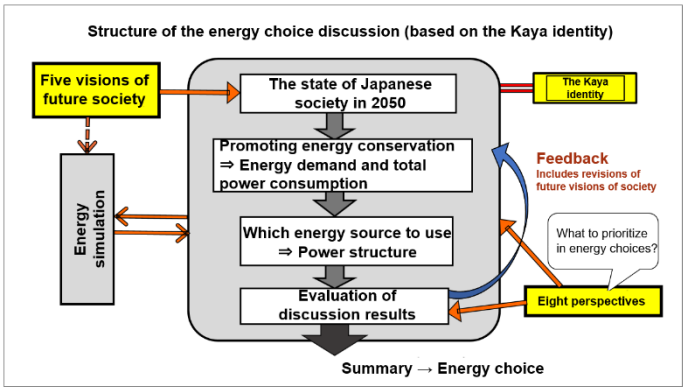


Figure 1-2 Flow of similar value group discussions (first half)

* Kaya identity

$$\text{CO2 emissions} = \text{Population} \times \frac{\text{GDP}}{\text{Population}} \times \frac{\text{Energy service demand}}{\text{GDP}} \times \frac{\text{Amount of energy}}{\text{Energy service demand}} \times \frac{\text{CO2 emissions}}{\text{Amount of energy}}$$

① ② ③ ④

* Five Visions of Future Society

Research and Development Society / Made-in Japan-society /
Service brand society / Resource Independent Society / Share society

③ Different value group discussion

The previous similar value groups are disbanded and reorganized with members from different groups to delve deeper into the theme. Through this process, participants are expected not only to gain new perspectives through encounters with different values but also to identify flaws or contradictions in their thinking for sounder ideas.

The experience of group discussions among members with different values is expected to help participants learn methods for contending in discussions with others who have different

positions, interests, and differing views.

④ Finalization, presentation, and expert review of the final proposal in similar value groups
After dialogues in the different value groups, participants return to their similar value groups to share results and arrive at final conclusions through further discussion.
Each group presents their final energy choice proposal. After this, experts give additional feedback.
* Actual output image: For 2021, the process was altered slightly, meaning this is the output for the second day; refer to Pages 21-27 of the report

⑤ Participant survey
Participant surveys are conducted in three stages - before the workshop, before discussions, and after the workshop - to clarify the process of knowledge acquisition, discussion, deliberation, and the formation of individual ideas, which is the goal of the workshop.

■ Assessment

In the pre-workshop survey for 2021, the highest expectation for the workshop was "systematic understanding of energy and acquisition of the latest knowledge" (66.7%), followed by "discussion and exchange of opinions with peers on climate change issues and energy choices" (60.6%), and "networking and expanding connections with peers from different industries and fields" (57.6%).

In the post-workshop survey, 80% of respondents indicated that they were satisfied with the workshop, suggesting that the content met these needs.

However, given the current need to accelerate and intensify the transition to a decarbonized society, it may not be enough to focus solely on individual capacity building and networking. It is necessary to evolve into a space where entities with diverse potential come together, formulate strategies to actually transform society, and put these into action.

V. Activity Features

1. Participation of young professionals with diverse backgrounds
2. Multifaceted lectures and Q&A sessions by frontline experts
3. Discussions based on quantitative data from energy simulations
4. Examination of future visions of a decarbonized society through discussions in small groups

(similar values/different value groups)

5. Use of a textbook covering comprehensive learning on climate change issues and creating a decarbonized society

Reference Information

· Participation/deliberation-based energy education program (publishes Next Generation Energy Workshop reports, etc.)

· Japan 2050 Low Carbon Navigator (National Institute for Environmental Studies)
http://www.2050-low-carbon-navi.jp/pathways/11111111111111111111111111111111111111111111111/three_e_s

Organization/Group Information

Organization Name: Institute for Dialogue of Environmental Policy (IDEP)

Established: 2015

Address: 103 SK Heights, 3-12-11 Kamiasao, Asao-ku, Kawasaki-shi, Kanagawa

Staff Size: 4 permanent members

Main target: High school students, university students, young professionals, general public

Introduction:

Established with the aim of helping build a sustainable society through a variety of efforts to stimulate discussions on environmental and energy issues. Core projects include the Next Generation Energy Workshop (renamed the Decarbonization Workshop) and the Citizens Convention for Climate.

Citizens Convention for Climate forms mini-publics through random selection of citizens, carefully conducting learning and dialogue then proposing climate policies to national and local governments for a new democratic approach. Starting in 2019, IDEP has collaborated with the Institute for Global Environmental Strategies to study European initiatives and implement the Kawasaki Citizens' Assembly on Decarbonization in 2021 as a full-scale implementation in Japan. In 2022, IDEP supported the Citizens Convention for Climate hosted by Tokorozawa City, and in 2023, as part of a commissioned project by Kanagawa Prefecture, planned and operated the

Citizens Convention for Climate in Atsugi, Zushi-Hayama, and Aoba in Yokohama, and also participated in the planning and operation working group of Citizens Convention for Climate Tsukuba 2023.

The Next Generation Decarbonization Workshop is currently being expanded, including course offerings at Nagoya City University and Shibaura Institute of Technology, and adapted for young professionals and prefectural high schools in Kanagawa Prefecture.

Information on Representative(s)

Representative Name(s): Representative Director Masaharu Yagishita,
Director Chisato Murakami
Affiliation: Institute for Dialogue of Environmental Policy (IDEP)
Email:office@inst-dep.com

* This report was created based on "2021 Next Generation Energy Workshop (Young Professionals Edition) – Energy Choices 30 Years From Now and Working Toward a Carbon Neutral Society" dated April 2022.

Climate Change Adaptation Mystery

I. Keywords

Climate change adaptation, Systems thinking competency, Capacity building, Proactive, interactive, and deep learning

II. Purpose & Objective of Activity

1) Understand the complex factors behind climate change and the relationships between them.
2) Learn about adaptation and mitigation measures based on case studies from Japan and around the world.
3) Understand mitigation and adaptation measures suited to the region and connect these to practice in the region.

III. Overview of Activity

Activity Duration: Two 50-minute classes, or approximately 100 minutes

Audience: High school students and older, working adults, etc.

An activity using the mystery learning method created by a group of geography teachers in the UK. The goal is for learners to use existing knowledge and work together to understand and structure complex facts (develop systems thinking).

Instructor first present learners with three stories and questions that feel mysterious (complex phenomena). They then distribute about 30 mystery cards to the groups and encourage them to solve the complex mystery by finding connections between the cards.

Once learners have arranged the mystery cards and written down their connections and reasons for connections, have them present on how they solved the mystery (why they arranged them in that way).

Finally, the instructor presents an example of the connection between mystery cards (arrangement) they initially envisioned and gives a summary. It is recommended that the instructor tailor this summary to the audience, including storytelling of the content of the mystery cards, explanations

of cards that were hard to find connections with, and talks on climate change adaptation.

IV. Content of Activity

Preparation: Set desks up so they are facing each other and divide into groups of four. Put nothing on the desks to create an environment that allows participants to focus on the conversation. When audiences meet each other for the first time, it might be good to have self-introductions or other icebreakers to ease tension before starting the mystery.

Program Flow:

1) Read the Mystery narration (for three mystery cards) and the following questions to the learners.

1. Say, "We will now start a mystery. What do you imagine when you hear the word-'Mystery'?" to build anticipation before starting the learning process.
2. Then, say "Now, let's start the Mystery. I will tell you three stories. After these stories, I will ask a question, so listen carefully," then read the narration.

Desk when not using a Japanese vellum

2) Distribute one set of Mystery Cards to each group

Say "Now, solve the mystery using the cards I give you," then distribute one set of Mystery cards per group.

* About 30 of the 33 Mystery cards are normally used. For cards with similar content such as flood damage, hazard maps and Tokyo Metro flood countermeasures, choose one of the three cards to use. The ski resort card is an optional card that may be used if desired.

3) Solve the Mystery

While arranging the Mystery cards, instruct learners to figure out the connection (mystery) between the 3 stories that are told at the start. When doing so, you may wish to tell them the following:

- That you will have them explain the connections between the cards (the reason for connecting the cards) at the end.
- Have them use arrows or sticky notes to clearly show connections.
- Have them discuss in groups and brainstorm freely, as there is no one correct answer.
- This activity is not about grouping similar items.

* There are two methods, one using a Japanese vellum to arrange cards and deduce their connections, and one using arrow cards to rearrange cards on the desk to find connections. Both methods are documented in the guidebook and appendix for the instructor to choose freely.

Example using a Japanese vellum

Example using arrow cards

*** Tips for Instruction**

Arrangement of cards in a straight line (linear), as in the diagram on the right, indicates a lack of understanding of complex relationships; encourage more complex thinking.

Example of linear

4) Presentation

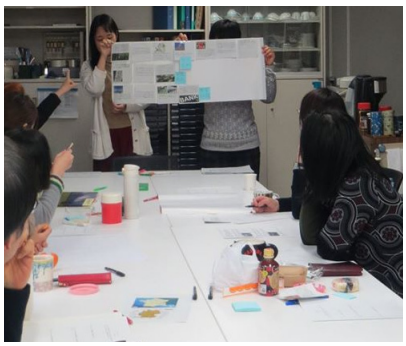
Have learners present how they solved the mystery.

- Have learners explain the relationships between each card.

5) Critique and Feedback

Share comments and questions about each group's presentation.

- Present an example of arrangement at the end.
- Help learners understand that climate change issues are intricately complex, that some facts are uncertain, and there is no one correct answer.
- Finally, you may wish to think of a solution everyone can agree on.



Example of a presentation

V. Activity Features

1. Creating a Safe and Fun Learning Environment:

At the start of the learning process, explaining that there is not one correct way to arrange the Mystery cards helps create a space where learners can share their opinions with peace of mind. Instead of instructors providing knowledge, learners deepen their understanding through collaborative and game-like activities.

2. Knowledge-Building Learning:

Even without prior knowledge of climate change, learners can understand and present complex relationships involved in climate change by reading the cards and utilizing the knowledge and information they exchange with other learners.

3. Perspective and Evaluation of Capacity Development:

The mystery method, which focuses on enhancing systems thinking competency, and known to be effective for its development, is used to help learn about complex relationships between different phenomena, the essence of climate change issues. Group work also requires proactivity, communication skills, and persuasion, and thus helps to strengthen such competencies as collaboration, critical thinking, and self-awareness. Post-learn development can also be used to strengthen other competencies. To assess the learning effects of the Mystery, refer to the case studies.

4. ESD and Capacity Development Perspective:

The Mystery cards incorporate environmental, economic, social, regional, and global perspectives as well as past, present, and future perspectives. Considering the relationships between the cards is expected to broaden learner perspectives. Including cards unrelated to climate change also helps foster critical thinking competency. Instructors can modify card content to include region-specific information, making the climate change phenomenon more relevant to them.

5. Broadening Instructor Base and Offering Expansive Learning Potential:

The guidebook containing Mystery materials and detailed implementation methods can be downloaded freely. Materials and guidebooks for inquiry based learning are published as example

lessons using Mystery Cards based on interviews with teachers. These creative ideas have led to a variety of lessons implemented throughout Japan.

This has been implemented by school teachers based on the guidebook, implemented for high school students by a university student as a graduation thesis, used in teacher training (the period of integrated study, science, social studies, etc.), implemented for participants of various age groups in local communities at community center courses and training, and expanded in the field of geography and developed as mysteries in a variety of prefectures.

Reference Information

Materials and Guidebook:

· Climate Change Adaptation Mystery
https://adaptation-platform.nies.go.jp/everyone/study/mystery/index.html

· Instructor Guidebook on Inquiry Based Learning Using the Climate Change Adaptation Mystery
https://adaptation-platform.nies.go.jp/everyone/study/mystery/file/mystery_program_guidebook.pdf

Example Cases for Evaluation:

· Can Systems Thinking Competency Be Improved? -Potential of “Mystery” Learning Method for Climate Change Education in Japan-
https://www.jstage.jst.go.jp/article/jsoee/29/2/29_2_14/_pdf

· Potential of an Education Program Using the ‘Climate Change Mystery’ of Fukui Prefecture - From the Perspective of Intrinsic Motivation and Competencies in Citizenship Education –
https://www.jstage.jst.go.jp/article/jsoee/31/1/31_1_23/_pdf/-char/ja

Organization/Group Information

Facility Name: Center for Climate Change Adaptation, National Institute for Environmental Studies

Established: December 2018

Location: 16-2 Onogawa, Tsukuba-shi, Ibaraki Prefecture

Staff Size: 92 members

Main Target: Local governments, businesses, individuals, and other entities

Introduction:

Center for Climate Change Adaptation of National Institute for Environmental Studies was established in December 2018 following the enforcement of the Climate Change Adaptation Act. The center collects, organizes, analyzes, and provides information on the impacts of climate change and adaptation as well as offers technical advice on climate change adaptation initiatives to local governments and regional climate change adaptation centers.

Information on Representative(s)

Contact us:
A-PLAT（Climate change Adaptation Information Platform）
https://adaptation-platform.nies.go.jp/about/contact.html

ESD for FUTURE
https://en.esd4future.com/

"Community-led collaborative" climate change education aimed at achieving regional decarbonization

I. Keywords

Climate change measures, regional decarbonization, social implementation, and process consultation

II. Purpose & Objective of Activity

- Promote collaborative efforts between a variety of regional organizations to achieve regional decarbonization and foster local human resources
- Create practical initiatives that integrate climate change education and citizen education from an ESD perspective

III. Overview of Activity

Activity period: Ongoing since October 2010

Target: Local Centers for Climate Change Actions, companies and organizations, elementary, middle, and high school teachers, Climate Change Action Officers, and local leaders

IV. Content of Activity

◆ Climate Change Education Society to create a education model to achieve a decarbonized society

Educational activities themed on SDGs in elementary, middle, and high schools are gaining traction. However, the progress of "climate change education" initiatives, especially those addressing a decarbonized society, has not enough

The main reason why climate education is not adopted in school education is that it is less tangible and difficult to measure reduction, as well as decarbonization education, which includes

scientific elements such as energy.

Therefore, many schools currently engaged in environmental education/ESD have broadened their scope to the 17 SDG goals, with a tendency to focus on goals that are relatively easier for children and students to grasp, such as food and recycling.

This fiscal year, Japan Center for Climate Change Actions (JCCCA) has launched a Climate Change Education Society involving school teachers and external experts, Local Centers for Climate Change Actions (“Local Centers”). This society will explore models of inquiry-based learning in elementary, middle, and high schools over this and the next fiscal year.

◆ “Social implementation-based education" led by Local Centers and Activity Promoter

JCCCA has developed and offered educational material such as activity programs to support organizations and companies working on environmental education and awareness nationwide. These materials are features to make climate change as own issues and participatory learning programs that make global warming issues personally relevant. These educational materials were developed for leaders such as Local Center staff and Climate Change Activity Promoters to use in their areas of activity, JCCCA also support to use these materials. Each Local Center already possesses the expertise to adapt materials for solving regional issues for decarbonization. In order to promote local efforts toward a decarbonized society, it will be necessary to provide more tailored social implementation-based educational support suited to each region's reality in the future.

◆ Implement with various organizations in the region, aiming for regional decarbonization

Not only Local Center but by involving local governments, local citizen groups and businesses in school education, we can achieve social implementation.

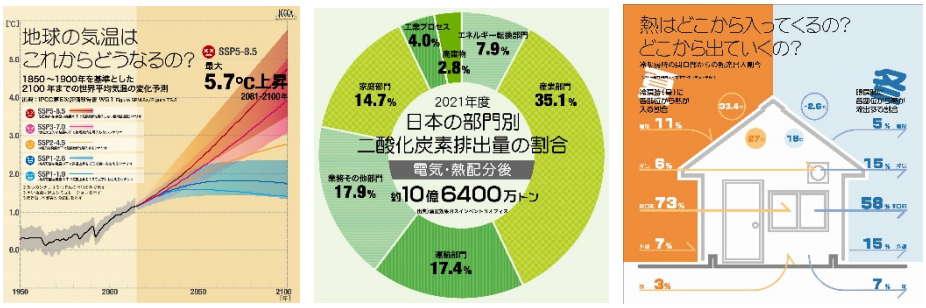
To promote climate change education with these various stakeholder JCCCA offers free downloadable diagrams, photos, and other content on climate change mitigation and adaptation on the "Useful Materials Collection" section of the JCCCA website.

These contents were developed, designed, produced, and updated insourcing, focusing on communicating complex information in an easy-to-understand manner and staying up to date with the ever-changing information and circumstances of climate change issues. New content is developed and provided in response to local usage and current trends.

Useful Materials Collection

· Ready-to-use diagram collection/photo gallery for global warming

Officers, government agencies, NGOs/NPOs, and other stakeholders can freely download diagrams and photos for use in public relations and awareness activities on global warming, such as classes, training, courses, and materials.



Examples from the ready-to-use diagram collection

· Global Warming Prevention Handbook/Ready-to-use slides

The handbook is created using the aforementioned diagrams and photos. It is also created and provided in Microsoft PowerPoint format for use in classes and lectures. The content is suitable for use in upper elementary school grades and higher. Information can be customized according to local circumstances and target audience, and individual slides may be used as well.

Handbook (cover)

Ready-to-use slides (image)

· "Decarbonization Support Seminar Tool" for company employees

The global warming protection law has been revised, and starting in 2021, local center begin their mission to support small and medium-size enterprises to reduce GHG emissions.

The tool was created in response to requests for small and medium-sized enterprises owners for seminars for company employees.

Their problem consciousness was, “I want to run a decarbonized business, but there is a lack of understanding within the company," “I want to hold employee study sessions on decarbonized

operations," and "I would like company-wide understanding as the next step."

By using this tool, Local centers can support, facilitate concrete support and implementation aimed at creating decarbonized regions with local small and medium-sized enterprises.

Seminar tool (image)

- Online teaching tools

  These are tools that can be used in breakout sessions in courses and training or at events. These tools are complemented by extensive additional information with the goal of translating awareness into behavioral change.

◆ Human resource development in regions through process consultation

In addition to the enrichment of the content above, curricula that can be easily integrated by teachers and instructors into subjects according to their level of understanding are needed in the field.

Going forward, regions as a whole will need to foster human resources who are equipped with the thinking, ability to innovate, and pioneer social implementation to decarbonize the region, become carbon neutral, and large-scale social transformation. The goal is to develop and share curricula, content, and cases of praxis nationwide through study groups.

V. Activity Features

1. Planning of the study group for creating a "climate change education" model for achieving a decarbonized society
2. Praxis with various local organizations for regional decarbonization
3. Local human resource development through process consultation

Reference Information

The Japan Center for Climate Change Actions website https://www.jccca.org/

Organization/Group Information

Facility Name: Japan Center for Climate Change Actions (JCCCA)

Operating Organization: Japan Network for Climate Change Actions

Established: 2010

Location: 7F Kudan Nikkana Building, 3-9-12 Kudanminami, Chiyoda-ku, Tokyo

Staff Size: 16 members

Main target: Local Centers, companies and organizations, Activity Promoter, etc.

Introduction:

· Ministry of the Environment: Development of the Japan Center for Climate Change Actions project

Designated as the Japan Center for Climate Change Actions (JCCCA) by the Minister of the Environment based on the Act on Promotion of Global Warming Countermeasures, we are engaged primarily in the following activities.

1) Collaboration, cooperation, and support with 60 Local Centers nationwide[1)]
2) Investigation and research related to the actual state of greenhouse gas emissions in daily life as well as emission reduction measures
3) Gathering and providing information on global warming and action against it

1) as of November 2023

4) Production and support for production of environmental teaching materials for climate change action

Implementing activities in partnership with Regional Centers nationwide

· Ministry of the Environment: Household Energy Saving Program

Operating the Ministry of the Environment's Household Energy Saving Program “Uchi-eco”. Household Energy Saving Program supports household to reduce greenhouse gas emissions from homes and creating a decarbonized lifestyle.

· Host of the Zero Carbon Challenge Cup

Through this platform, different stakeholders across the nations such as schools, households, citizen groups, NPOs, and companies can report on, learn from each other, and expand their networks of collaboration on regional climate change action conducted by diverse organizations. This event is held annually in February and is attended by people from all over Japan.

· Development and sales of the Environmental Labels Program

These teaching materials let children in after-school center, Girl Scouts, Boy Scouts, and other places where children gather to learn continuously throughout their lives. The goal is to promote the purchase of environmentally friendly products in every household through children's learning.

Information on Representative(s)

Representative Name(s): Business Group

Affiliation: Japan Network for Climate Change Actions

Email: https://www.jccca.org/otoiawase

ESD for 2030 Learning Together Project: Tohoku Model Program

I. Keywords

Mutual exchange, personal relevance, localization, collaborative learning, deeper understanding

II. Purpose & Objective of Activity

(1) Reinterpret SDGs and climate change that are often perceived as distant global events as personally relevant issues, understand that individual actions are connected to global issues, and consider what you can do.

(2) Promote project implementation through collaboration and cooperation with local entities and aim to expand networks. Aim for deeper learning through exchanges between students and adults outside of school.

(3) Provide opportunities for experts and stakeholders working on ESD to learn from one another, organize important elements and areas for improvement in ESD lessons, and share expertise.

III. Overview of Activity

A project implemented over three years starting from the FY 2021, with the target and approach changing each year.

(1) The Potential of ESD/SDGs Education Based on Local Resources

Activity Period: August 2021 to December 2021

Target: Teachers, ESD practitioners, NPOs, companies, UNESCO associations

Teaching Method: Online study sessions, a total of 4 times

Study sessions were conducted in which case studies of implementation at schools and local communities were presented, followed by expert comments from the perspective of ESD to reaffirm the significance and value of activities.

(2) World Climate Studies ESD/SDGs

Activity Period: July 2022 to December 2022

Target: Teachers, ESD practitioners, junior high school students (1st to 3rd year)

Teaching Method: Face-to-face and online study sessions, a total of 4 times

Implementation of ESD classes at junior high schools and study sessions by ESD practitioners were conducted in turns to brush up classes and share expertise with practitioners.

The approach for students was to combine lectures and workshops to deepen learning and have students consider what they themselves can do.

(3) Climate Change Education from a Local Perspective

Activity Period: June 2023 to February 2023

Target: Teachers, elementary school students

Teaching Method: 4 study sessions, 1 online exchange session, 1 discussion session

Study sessions were conducted by local adults, such as apple farmers and scallop fishers. After conducting study sessions for teachers, online exchange lessons were conducted with three elementary schools, giving them the opportunity to present what they had learned and their own ideas.

VI. Content of Activity

(1) The Potential of ESD/SDGs Education Based on Local Resources (Yamagata)

The ESD/UNESCO School Tohoku Consortium (Secretariat: Miyagi University of Education), which provides support to UNESCO schools in Tohoku, was asked to serve as a coordinator, and four online study sessions were held. All sessions included time for experts to comment on what was good and what could be improved, followed by an exchange of opinions after sharing the significance and value of the activities.

1) Study Session① For Teachers

An exchange of opinions about ESD lesson plans for the Yamagata SDGs & ESD Study Group was conducted. The study group was joined by elementary school, high school, and special education school teachers, who discussed ideas for lessons linking SDGs to curriculum using cultural

perspectives including rice planting dances and archaeological sites as well as industrial perspectives such as timber processing and fisheries.

2) Study Session② For the Community

Organizations in Yamagata Prefecture presented case studies and themes for initiatives to stimulate interest and participation among children and parents using local resources, and an exchange of opinions on methods and ideas was held. Experts commented that “collaboration in local activities leads to sustainability, and there is value in using local activities for education."

(1) Case studies presented: NPOs, neighborhood associations

(2) Provision of topics: Companies, UNESCO associations

3) Study Session③ For Schools

Three teachers who attended the first study session presented on practical case studies in schools. There were ideas on ways to encourage proactive action beyond school lessons, such as asking local experts, and participants said that they found these case studies helpful for structuring and conceptualizing lessons. Survey responses indicated an increase in motivation, with comments such as "I want to provide ESD programs with a sense of achievement and foresight to help students improve their self-esteem".

<Case Study Themes>

(1) Connecting with Locals to Rejuvenate the Forests of Yamagata Through Local Resources (Special Education School)
(2) Our Lives and Food Production (Elementary School)
(3) Chitose Traditions and Me (Elementary School)

4) Study Session④ Learning from Practical Case Studies in Tohoku

After presenting activities featuring collaboration between schools and local organizations, a discussion was held on the theme "The Meaning/Significance of ESD in Collaboration with the Community." Participants commented, "Rather than have schools and individual teachers act alone, we want initiatives we can use as references in which children learn in the process of solving local issues with the community."

<Case Studies>

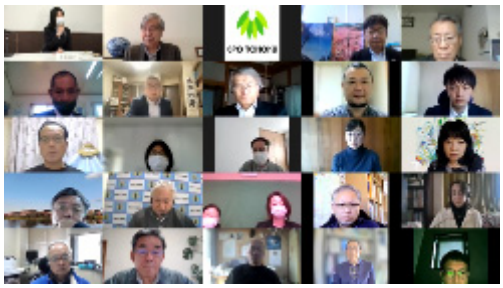
(1) Collaboration between the Sendai UNESCO Association and an elementary school (Miyagi Prefecture)
(2) Disaster prevention training in junior high schools done in partnership with the local

community (Miyagi Prefecture)

(3) Junior high school initiatives for learning and acting together with the community (Fukushima Prefecture)

(4) Activities in schools by Aomori Prefecture Climate Change Action Officers (Aomori Prefecture)

Study Session (3)



Study Session (4)

(2) World Climate Studies ESD/SDGs

Classroom practice and opinion exchanges with experts aimed at improving the program were hosted in alternation, and (1) model lesson practice,(2) analysis and assessment from an ESD standpoint, and (3) organization of how schools, ESD activity promotion centers, and the Tohoku ESD Resource Center should collaborate and provide support were conducted.

■ Study Session① Model Lesson (For Junior High Schools)

A lecture and workshop on climate change were conducted in partnership with the regional ESD activity promotion center. In the workshops, participants were given a task to consider concrete action on climate change using the theme "Think about what you would do (1) if you were the principal or (2) if you were the mayor when you grow up.

■ Study Session② Stakeholder Study Session

Model lessons were reviewed, then organized and assessed from an ESD perspective. An opinion exchange on improvements for a better program was also conducted.

■ Study Session③ Model Lesson (For Junior High Schools)

An online exchange lesson was conducted among junior high school students. Questions on initiatives in schools and climate change measures were posed, and an exchange was conducted

that exposed students to the ideas of their peers.

■ **Study Session④ Stakeholder Study Session**

An opinion exchange was conducted regarding review of model lessons, important elements of ESD, and effective learning.

Workshop

Stakeholder Study Session

(3) Climate Change Education from a Local Perspective

In an effort to reduce the burden on teachers and create a program that would tie into different subjects by introducing climate change perspectives into existing initiatives, regional ESD coordinators from the Tohoku ESD Resource Center worked to connect schools to local stakeholders to create a climate change education model for Aomori Prefecture in partnership with regional ESD activity promotion centers in the Tohoku region.

■ **Study Session (1) Elementary School A**

Apple farmers, scallop fishers, and sapling shop owners were invited as guest teachers to help learn about the effects of climate change already happening in Aomori Prefecture.

■ **Study Session (2) Elementary School A**

Members of the Aomori Local Meteorological Observatory were invited as guest teachers to help learn about climate change from data.

■ **Study Session (3) Elementary School B**

Workshop using Aomori SDGs cards

■ **Study Session (4) For Teachers**

A study session on climate change education and the SDGs was conducted for teachers of both Elementary Schools A and B.

■ **Online Exchange Meeting (Elementary School A & B)**

Participants presented activities and exchanged opinions on actions they could take.

■ **Stakeholder Opinion Exchange**

Participants reviewed the program, then organized and assessed its outcomes/effects.

Study Session to Hear From People on the Front Lines

Lessons to learn about climate change from data

V. Activity Features

1. Listening to the voices from the front lines while considering global and local issues helped students reframe these as personally relevant issues, creating motivation that went beyond what they could do to include ways to influence and spread ideas throughout the community.
2. Instead of passive lessons, lessons were designed for deeper thinking with a structure involving listening, speaking, and thinking through dialogue.
3. Creating spaces for teachers and ESD practitioners to learn from each one another helped build a network of stakeholders and vitalize ESD activities in the Tohoku region.
4. Activities focused on ties between schools and the local community were conducted in partnership and cooperation with diverse local organizations.
5. Assessment as an ESD program was conducted through opinion exchanges with experts and

stakeholders, and this reaffirmation of the significance of activities increased motivation and shared expertise.

Reference Information

- ESD/UNESCO School/Tohoku Consortium
  http://xs269206.xsrv.jp/touhoku/
- About Regional ESD Activity Promotion Centers
  https://esdcenter.jp/kyoten_annai/
- Aomori Pentan SDGs Cards
  An original set of cards incorporating the nature and culture of Aomori Prefecture. The reading cards were initially conceived by third graders at Sengari Elementary School in the city of Aomori and later refined by Aomori University students at TEAM Environment Cards for lower grade elementary school students. These cards may be borrowed at the Aomori Environmental Partnership Center.
  http://www.eco-aomori.jp/index.html

Organization/Group Information

Facility Name: Tohoku ESD Resource Center

Operating Organization: Miyagi Environmental Life Out-reach Network (MELON)

Established: 2017

Location: Sendai, Miyagi Prefecture

Staff Size: 7 members

Main Target: Organizations and groups engaged in ESD activities in the Tohoku region

Introduction (include the features and strengths of the activity)

To support ESD activities in Japan, the Ministry of Education, Culture, Sports, Science and Technology and the Ministry of the Environment established the ESD Resource Center of Japan in 2016, then eight regional ESD Resource Centers nationwide in 2017. The Tohoku ESD Resource Center supports ESD activities in the six prefectures of Aomori, Iwate, Miyagi, Akita, Yamagata, and Fukushima.

■ **The Four Functions of the Tohoku ESD Resource Center**

1. Information sharing to support ESD activities
2. Creating spaces for mutual learning
   Provides a space for those engaged in and interested in ESD activities to interact and learn from one another.
3. Support for ESD activities
   Offers consultation for ESD in practice, references for ESD event speakers, and support for planning and hosting events.
4. Development of human resources
   Works to foster and support ESD practitioners, coordinators, and youth in the region.

■ **A collaborative space in Tohoku where people and information come together**

People engaged in, hoping to engage in, or interested in ESD activities from all over Tohoku gather for the annual Tohoku ESD/SDGs Forum.

■ **Collaboration with Regional ESD Activity Promotion Centers**

The regional ESD Promotion Center system registers organizations and groups that support and promote ESD activities in their regions as "Regional ESD Promotion Centers." A diverse range of sectors are registered, including boards of education, social education institutions, academic research institutions, companies, NGOs/NPOs, and public corporations, for a total of 182 organizations as of August 8, 2023. The Tohoku ESD Resource Center collaborates with registered organizations in the Tohoku region (21 organizations as of November 1, 2023) on projects that leverage regional characteristics.

東北地方
ESD活動支援センター
Education for Sustainable Development

Tohoku ESD Resource Center Logo

Tohoku ESD/SDGs Forum

Information on Representative(s)

Representative Name(s): Inoue, Suzuki, Koizumi

Affiliation: Tohoku ESD Resource Center

Email:info@tohoku-esdcenter.jp

Praxis using the teaching material, Climate Change Development Education Activity Collection 3 (DEAR, 2020)

I. Keywords

Climate change, development education, active learning, action

II. Purpose & Objective of Activity

- To take an interest in climate change issues and reinterpret them as local issues
- To take a standpoint of people and creatures whose lives are threatened by climate change and consider the issues from multiple perspectives
- To create a program that helps participants understand a problem, its structure and complexity, and arouse their curiosity

III. Overview of Activity

- **Creation of Teaching Material**

Activity Period: April 11, 2019, to March 20, 2020

Target: Teachers, general public

- **Program implementation (instructor dispatch)**

Activity Period: January 11 to 12, 2020

Target: Teachers, general public

IV. Content of Activity

● About the Teaching Material

In this praxis, we used the *Climate Change Development Education Activity Collection 3 which we* created originally as a teaching tool. The aims of this book, published in 2020, are as follows:

- To have learners understand and take an interest in the impact, issues, and current state of climate change
- To learn about people affected by climate change, imagine their situation, and perceive it as a personally relevant issue
- To understand issues surrounding climate change in a structural manner and consider the connection to our lives as well as what we can do about it

This book comprises four activities that can be arranged freely according to purpose. It's suitable for 20 to 40 participants of junior high school age and older. In the case presented here, the activities in this book were interwoven into the program. It's been used in schools and municipalities nationwide.

Table of Contents

Photo 1: Original material: Climate Change Development Education Activity Collection 3

● About the Case of Praxis

Program: Instructor dispatch "2019 International Understanding and Development Education Instructor Training Course (Intermediate-Advanced) – Bringing SDGs Closer with Active Learning"

Theme: Climate change

Date and time: January 11 and 12, 2020, 10:00 AM – 4:00 PM

Instructor: Eno Nakamura (Secretary-General of DEAR)

Location: JICA Okinawa Center

Target: 30 teachers and citizens in Okinawa

Purpose:

- To take an interest in climate change issues and reinterpret them as local issues
- To take a standpoint of people and creatures whose lives are threatened by climate change and consider the issues from multiple perspectives
- To perceive climate change issues as personally relevant and consider what can be done about them

• To create learning programs themed on local and global issues
• To create a program that helps participants understand a problem, its structure and complexity, and arouse their curiosity.

Operation: Okinawa NGO Center (ONC)

● About the Praxis Program

1. Sort Issues Surrounding Climate Change (Activity 3)

Participants were divided into groups of 4-5 people, each of them wrote their thoughts about "what comes to mind when you think of climate change" on sticky notes, then shared these within the group. Many brought up current impact and issues, such as "forest fires in Australia" and "rising sea levels".

Photo 2: Groups sharing what comes to mind when they hear "climate change"

2. Climate Change Quiz (Activity 1)

• What are the causes, impacts, and damages of climate change?

• How many people have been displaced due to climate change?

We handed out the quiz sheets with such questions and did the quizzes.

3. Let's think about the Impact of Climate Change (Activity 2)

Participants read anecdotes of people affected by climate change and considered:

- The difficulties people are facing
- What you want to know more about
- What you think will happen in 10 years
- What could be done in this situation, etc.

The anecdotes of fishermen in Okinawa were also included to help participants consider the local impacts.

4. Let's create a skit!

Each group created and presented three-minute skits to gain a deeper understanding from the perspectives of those affected. Each group chose an anecdote from Activity 2 that resonated with them and used props (such as fabric and hats) for an effective performance, then presented their skit and held a Q&A session. Afterward, each team reflected on what they realized while playing their roles and what they wanted to know more about.

Photo 3: A variety of props prepared for the skit

Photo 4: The "Okinawan fisherman" team with bleached coral as the main character

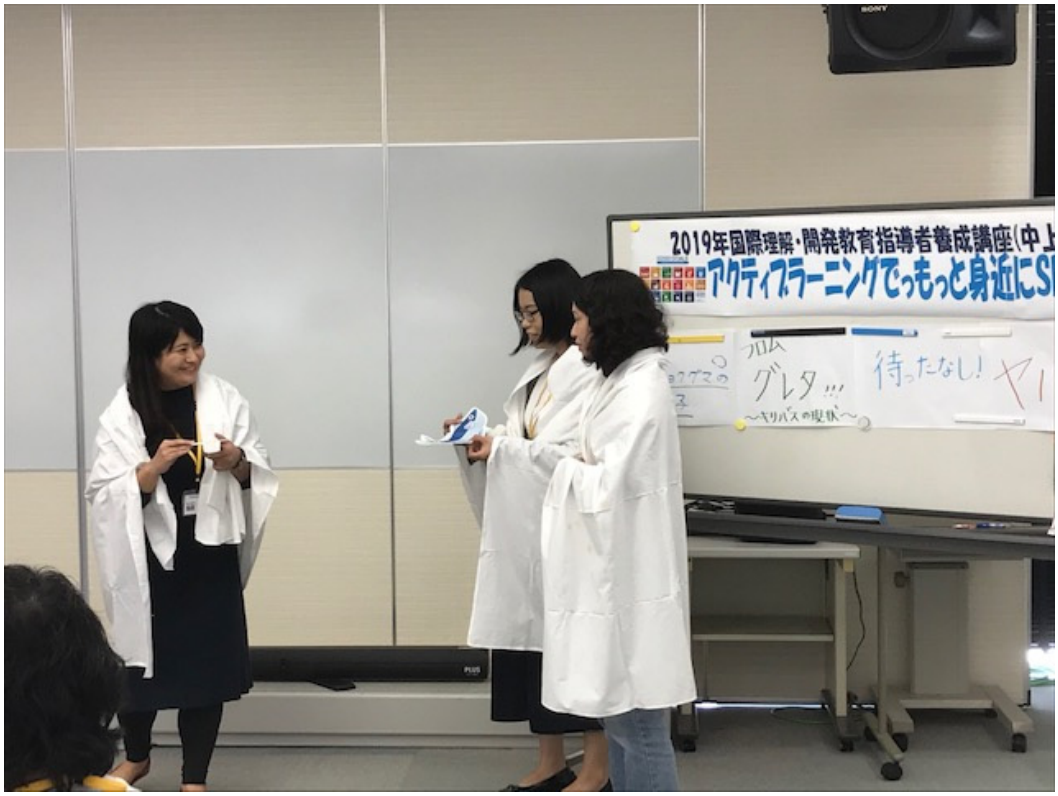


Photo 5: A polar bear family searching for food

Photo 6: A team playing the roles of elders and residents of Kiribati

5. Let's sort issues surrounding climate change (Activity 3)

Participants revisited "what comes to mind when you think of climate change" and wrote additional sticky notes about new insights, things they understood, questions, or topics they wanted to learn more about through participating in the workshop. They added not only effects but causes and measures as well, and even discussed the relationships between these.

6. Let's create a learning program on the theme of climate change

On the second day, we presented the "Tips for Creating a Learning Program" based on our years of praxis. Each group created and presented learning programs that took into account themes, goals, teaching plans, and methods. A variety of programs that provided insight into the interests and issues relevant to the participants were shared, including programs on "Animal Feelings" presented at the imaginary global village summit, and "Coral" themed program, a teacher training program themed on "The Strange Reality of Schools", a program on "Considering Everyday Behavior", and "Convenience Store Plastic Waste", which focused on a convenience store near a school.

Photo 7: A group presenting the teacher training program "The Strange Reality of Schools"

Photo 8: Reflecting on the past two days using coral tree leaves

Photo 9: A group photo of all participants

V. Activity Features

1. Using the original material to design the program
2. Valuing individual participation as one of its goals
3. Discussing, listening each other, having conversation and figuring out solutions while there is no correct answer
4. Having participants reflect and verbalize to help awareness and learning take root
5. Creating learning programs and connecting learning to praxis

Reference Information

· https://www.dear.or.jp/
Development Education Association & Resource Center website

· https://www.dear.or.jp/books/book01/4713/
Climate Change Development Education Activity Collection 3

Organization/Group Information

Operating Organization: Development Education Association & Resource Center (DEAR)

Established: 1982

Location: 3F Tomisaka Christian Center Building No. 2, 2-17-41 Koishikawa, Bunkyo-ku Tokyo 112-0002

Staff Size: 8 members

Main target: Teachers, general public

Introduction (include the features and strengths of the activity):

The Development Education Association, commonly known as DEAR (Development Education Association & Resource Center), is an NGO fostering global citizens under the motto "To know, think, and act". In the 41 years since its establishment in 1982, DEAR has worked under the vision of understanding issues surrounding development, considering better methods of development, and participating in creating a just, sustainable global society where people can live in harmony. It has nearly 600 individual members and about 40 organizational members nationwide.

DEAR perceives development issues such as climate change as emerging within a value system and structure that prioritizes the economy and promotes activities to question this social structure. Activities have focused on encouraging individuals to learn and think together with others as citizens and to participate in social development.

Main activities include:

- Networking projects (building networks and exchanging information with related organizations nationwide)
- Practical research projects (hosting study groups on development education, d-lab (National Research Meeting))
- Human resource development projects (dispatching instructors and hosting seminars)
- Information publishing projects (creating and publishing teaching materials)
- Policy recommendations (proposals for administration of aid and education)

Volunteer staff for d-lab (National Research Meeting) held in August 2023

Workshop

Information on Representative(s)

Representative Name(s): Eno Nakamura

Email: main@dear.or.jp

Korea Report

Introduction: Environmental Learning and Participation in the Era of Climate Crisis

Kim Namsoo (Korea Research Institute for Environment and Development)

1) "Climate Action, Now"

The report of the 6th IPCC Working Group 2, released in February 2022, was titled "Climate Change 2022: Impacts, Adaptation and Vulnerability." The main takeaways of this report are summarized as follows:

The effects of climate change are already widespread and more severe than expected. Worse impacts in the near term will make things more difficult. As temperatures rise, the resulting risks will increase rapidly, and the resulting changes will be difficult to reverse. Inequality, conflict, and development will place a greater burden on already heightened climate vulnerabilities. Adaptation is crucial, and more support should be provided to vulnerable groups and regions. There are already areas where adaptation is infeasible, incurring losses and damages as they become urgent areas for response. An important consideration is that climate change, human society, and ecosystems (biodiversity) are intertwined.[1)]

The report of the 6th IPCC Working Group 3, released in April 2022, was called "Climate Change 2022: Mitigation of Climate Change." Some of the contents of the 2,913-page report are summarized as follows:[2)]

From 1850 to 2019, human activities emitted 2,400 ± 240 GtCO2eq. of greenhouse gases, of which approximately 58% were emitted between 1850 and 1989, and 42% between 1990 and 2019. If an additional 500 GtCO2 is emitted, the temperature increase will exceed 1.5°C compared to preindustrial standards (for reference, emissions in 2019 were 59±6.6 GtCO2-eq). The sectors that emit the most greenhouse gases are energy and industry, while the cost of renewable energy technologies has decreased dramatically since 2010. Investments in climate mitigation and adaptation are increasing, and climate finance and investments such as ESG and green bonds are also on the increase. The effectiveness of climate-related policies and regulations, including carbon taxes, varies by region and country. If we assume that all nationally determined contributions (NDCs) submitted by each country are kept, there is a possibility that the temperature rise will exceed 1.5℃ (overshoot) within the 21st century and then decrease again around 2100. Climate-related risks and

1) https://www.ipcc.ch/report/sixth-assessment-report-working-group-ii/
2) https://www.ipcc.ch/report/sixth-assessment-report-working-group-3/

the resulting social and environmental risks will also be significant during the overshoot period. To keep the temperature increase from exceeding 1.5℃ without an overshoot, 2020 must be the peak year for greenhouse gas emissions. In other words, from now on, greenhouse gas emissions must be drastically reduced in all sectors. Fossil fuel use must be significantly reduced, energy efficiency increased, the transition to renewable energy sources must be made, electrification must be achieved including electric vehicles, while the use of carbon capture and storage (CCS) technology to remove carbon dioxide from the atmosphere, or carbon dioxide removal (CDR) from the atmosphere to reduce the impact of residual carbon, must consider ecological and other impacts. Considerations of industry reductions must consider the entire value chain, and forests and green spaces must expand. It is important to manage not only the supply side but also the demand side in all sectors by changing sociocultural factors, improving infrastructure, or utilizing appropriate technologies to help avoid demand, shift options, and improve service delivery methods.

Adaptation measures and climate mitigation measures to reduce the impact of climate change can be called “climate action” in their totality. The best adaptation strategy is climate mitigation, and caution is required as incorrectly chosen and implemented adaptation measures may be unhelpful for mitigation. Climate action is also the 13th goal among the 17 Sustainable Development Goals (SDGs) set by the United Nations as humanity's common development goals to be achieved by 2030. Urgent and equitable climate action for climate mitigation and adaptation is critical to sustainable development (IPCC, 2022, p. 63). In addition, choosing a development path that pursues sustainability can reduce the social and environmental costs of climate action and achieve synergies.

2) The Leading Global Risk: Failure to Take Climate Action

More and more people are creating and implementing new climate actions at the individual and community levels. However, despite the thousands of pages of periodic reports and the steady stream of climate disaster news, there are people who pay less attention to climate change than to cosmic background radiation. This is caused by the strong influence of the so-called “discourses of climate delay” (Lamb et al., 2020), voices to slow down climate action originating from the group most responsible for causing the entire climate crisis. In other words, the situation is escalating in gravity in keeping with the terms we use, such as climate change, climate emergency, and climate crisis, but climate action to solve it is not taking place as promised. Perhaps that is why, as discussed in the Global Risks Report published annually by the World Economic Forum, the leading risk that will affect the entire planet, much like the COVID-19 virus, is “climate action failure.”[3)]

If climate action fails, extreme weather events will become more severe, resulting in further

3) https://www.weforum.org/reports/global-risks-report-2022/

biodiversity loss, and everyone who makes a living and survives based on ecosystem services, which are nature's benefits to people, will suffer in a chain reaction. Threats to livelihoods and survival may intensify competition, conflict, and alienation. As was the case during COVID-19, problems may be made more severe by competition or conflict over cooperation between countries, and by fake news born out of a desire to solve problems by creating scapegoats. Adolescents and young adults can no longer trust the world or structure created by adults, resulting in anxiety, anger, and disillusionment. Such youth disillusionment can, in turn, become a social risk.[4)]

3) Capacity and Agency for Climate Crisis Response

What is the experience of climate change for young people with their future ahead of them? Some teenagers are watching this situation much more seriously than adults think. Some also raise their voices to be heard. In March 2019, 1.6 million young people took part in a climate strike in cities around the world. The youth in Gwanghwamun, Seoul asked the education sector to help them develop the strength to survive the climate crisis. How should education respond?

What knowledge, skills, attitudes, and values are needed to survive the current world and participate in its making? Can the education system effectively develop such knowledge, skills, attitudes, and values? A report published by the OECD in 2018 considered this question. The authors looked ahead to the next 10 years, that is, until 2030, and proposed that the education goal for 2030 should be set as both the “individual and collective well-being,” emphasizing that “collective” means not only friends, family, and local communities, but the planet itself. The report proposed the Learning Compass 2030 as a tool to achieve individual and collective well-being.[5)]

It is significant here that the proposal is for a learning “compass” rather than a learning “roadmap” or curriculum framework. With multiple disaster risks such as climate change and biodiversity loss being predicted, and digitalization and AI becoming part of daily life through the so-called Fourth Industrial Revolution, the future will unfold more dynamically with more complexity than expected. It is difficult to pinpoint from these projections that dictate this or that a knowledge system to learn. Rather, learners must equip themselves with basic knowledge, skills, and attitudes, and learn to explore situations in the unfamiliar real world, discover problems, find ways to improve upon or solve them, plan and implement solutions, find their own directions through reflections, and change the world. Transformative competencies that create new value, respond to tensions and dilemmas, and take responsibility are emphasized in this process.

The learning compass must be put on the learner's hand. Ultimately, what is needed is student

4) https://climateaction.re.kr/index.php?mid=news04&document_srl=1691927

5) https://www.oecd.org/education/2030-project/teaching-and-learning/learning/learning-compass-2030/OECD_Learning_Compass_2030_concept_note.pdf

agency, which refers to the ability to set one's own learning or project goals, reflect on the process, and lead responsible change.

4) The Significance of Social Learning and Participation

As individual learners develop and exercise their agency within social situations, it is crucial that they create change toward common well-being alongside their peers, teachers, families, and communities who interact with and influence them. This is the concept of co-agency. In the end, in order to maintain our common well-being in a future that is unlikely in many ways to be a peaceful one for reasons including the climate crisis, we must experience the process of making steady changes through planning-execution-reflection cycles undertaken with colleagues in the real world. A climate (culture) must be established in which all societies (the entire planet, countries, local governments, institutions, cities, and schools) become deliberative communities and living labs, and the pursuit of strong sustainability is taken as a baseline.

In this regard, it is paramount to consider and integrate climate action in all possible aspects within units where multiple members use and share the commons, such as in institution-wide, school-wide, or city-wide approaches. Each member is a stakeholder in this process, and dialogue, consultation, and agreement to create a common understanding take on primary importance. In other words, the aim is social learning, which is defined as a process of consensus formation and joint action planning through dialogue within the community. As Paul Hawken, the founder of Project Drawdown, argues, changes in the climate system and responses to them are not something that can only be done by a few experts, and decision-making authority must be transferred from the center to the periphery, allowing people to share their experience and knowledge as they are afforded space to adjust based on their needs, letting them talk to each other and hold each other accountable.

The public space or area where discourses related to the environment, including climate response, are created may be termed the public sphere. The public sphere is a realm of mutual influence that arises when individuals communicate with each other. Citizens have the right to make their own decisions on issues that have an important impact on them, consult with their peers, and act in solidarity. The public sphere is the forum where these rights may be exercised. It is crucial to transparently provide and share information, provide opportunities, and develop capacities for participation in the public sphere. In this regard, the United Nations Framework Convention on Climate Change (UNFCCC) referred to capacity-building measures to solve climate problems as the Action for Climate Empowerment (ACE) and emphasized education, awareness promotion, training, citizen participation, access to information, and international cooperation. It emphasized not only education but also citizen participation and access to information because they are the

basic prerequisites for communication, dialogue, and deliberation.

Talanoa is an expression used in Fiji and the Pacific Islands, which means an inclusive, participatory, and transparent dialogue process. They engage in *talanoa* to listen to each other, empathize, and make wise decisions on common interests. *Talanoa* dialogue has been attempted since 2017 in international climate change negotiations. The conversation revolves around three questions: “Where are we? Where do we want to go? How can we get there?” The process of solving this question together, from individuals to families, schools, villages, cities, countries, and the entire planet, is the necessary learning at this moment. The keywords for such education are participation, dialogue, and agency.

5) Environmental Education and Climate Change Response in Korea

Climate, environment, and ecology-related topics have not been treated as top priority topics in Korea’s school education system as they should be, but certain developments have spurred the growth of institutional interest and support for environmental education in schools.

Starting in 2018, the youth in Korea and around the world have made demands through climate absentee protests for responses to the climate crisis and also for enhanced environmental education in schools. The National Council of Governors of Education issued a School Environmental Education Emergency Declaration (July 2020), and the Seoul Metropolitan Office of Education initiated ecological transition education. Demand for climate response and environmental education in schools is rapidly increasing, and implementation is correspondingly on the increase.

Changes in legal and institutional aspects are also gaining visibility. Article 22 (2) of the Framework Act on Education (August 2021) provided for climate change and environmental education, while the Support Plan for Environmental Education in Schools, Including Carbon Neutrality and the Strategy to Raise Public Awareness of a Carbon Neutral Society were drafted at the end of 2021. The importance of education was also emphasized in the Framework Act on Sustainable Development (enacted on January 4, 2022) and the Framework Act on Carbon Neutrality and Green Growth for Coping with Climate Crisis (enacted on September 24, 2021).

Climate and environment ecological education was emphasized as a focus in the revision process for the 2022 national curriculum, and ecological transition education was presented as one of the three key topics that should be reflected in all educational subjects, with broad swathes of environmental content included in several subjects.

Starting in 2021, the Ministry of Environment and the Ministry of Education are pursuing carbon neutrality focus schools and carbon neutral pilot school projects with cooperation from six ministries, and projects at the school level are being carried out to promote environmental education

with a school-wide approach that emphasizes carbon neutrality (Kim Namsoo et al., 2023).[6)]

The four cases introduced below are examples of environmental education that took place before these institutional changes became visible, enhancing learner agency based on connection with and exploration of the real world, and building communal agency through participation and dialogue. It contains examples of contributions to or catalysts of changes in real-life situations.

6) Kim, N., Lee, S., Kim, C., Nam, M.., & Kang, J. (2023). *A case study of the model schools for carbon neutrality to develop formal environmental education in Korea*. Commissioned Research Report 2023-02, KEDI

Cultivating Local Environmental Leaders through Resident Participation: From Volunteerism to Zero-C

I. Keywords

Participation, change, local environmental leader, action, sustainability

II. Project Goals

- Knowledge sprouting from curiosity about the environment of Dobong is leveraged to develop an attachment to the local environment and the habit and ability to think broadly about the environment.
- To provide environmental education based on residents' participation, a virtuous cycle model is built for resident participation and praxis through regular and systematic educational support to foster environmental education leaders.
- Train facilitators who will become the main axis of action and participation to establish Dobong as an environmental city where Dobong-gu residents make carbon neutrality a reality.

III. Project Overview

- Target participants: Dobong-gu residents
- Period: 2003 to present
- Location: Dobong Environmental Education Center and Dobong-gu jurisdiction
- Main Points (Activity Details)
  We educate residents about Dobong's environment through participation and action.
  Local environmental leaders provide education on topics such as biodiversity, carbon neutrality, climate change, and the living environment (resource circulation).
  We are operating a course to train local environmental leaders for environmental education.

IV. Activities

Dobong Environmental Education Center (hereinafter referred to as the “Center”), which opened in 2003, currently operates three volunteer groups with different activity topics:

Kkulbee, a school farm that provides life education and food education centered on school gardens;

Sandollim, which teaches children through physical play; and

Dobong Environmental Classroom Nature Instruction Group, which was the start of Dobong-gu’s environmental education instructors.

The above three volunteer groups are in operation. We would like to discuss in more detail the Nature Instruction Group and Green School Instructors, which are the basis for the virtuous cycle of resident participation in the Dobong Environmental Classroom, and the Dobong-gu Zero-C instructor training course.

1. Joining through participation: Nature Instruction Group and Green School Instructors

The Nature Instruction Group is a group of environmental education instructors who have been with the Dobong Environmental Classroom, the predecessor of the Dobong Environmental Education Center, since its beginnings in 2003. About 50 volunteers are currently active.

The Nature Instruction Group is gradually expanding its expertise and scope by conducting activities such as climate change and biological monitoring surveys with a focus on ecological environment education.

They plan and operate their own programs every year, and are the volunteers who run the Dobong Environmental Education Center's program certified by the Ministry of Environment for excellence, the “Seasonal Soles Park,” and are also the main instructors at the Center.

The Nature Instruction Group operates a training course for environmental education volunteers once a year. After going through the training process, attendees undergo hands-on observation to obtain the skills of an educational volunteer. New volunteers then hold a post-training meeting to record necessary corrections or supplementation for the next training, information for other activity teams, etc. by writing a journal after the training.

Through this process, new volunteers gain a sense of training flow and also train their capabilities.

The Nature Instruction Group learns by forming study groups for its main activities, and the Dobong Environmental Education Center helps strengthen its capabilities by providing support in

the form of education by experts in the environmental field.

In this process, those with the capacity to become instructors will be able to work as professional instructors in Dobong-gu, raising awareness of the environment through in-depth education on living environment topics, including climate change in addition to ecology, and support is provided in linkage so they can reach local residents together with Dobong Environmental Education Center's networked partner organizations in the 14 districts of Dobong-gu.

		
Operation of the Seasonal Soles Park	**Environmental education volunteer study group**	**Climate change response and adaptation education**

2. Joining by participation, carbon neutrality expert instructor: Zero-C Dobong-gu

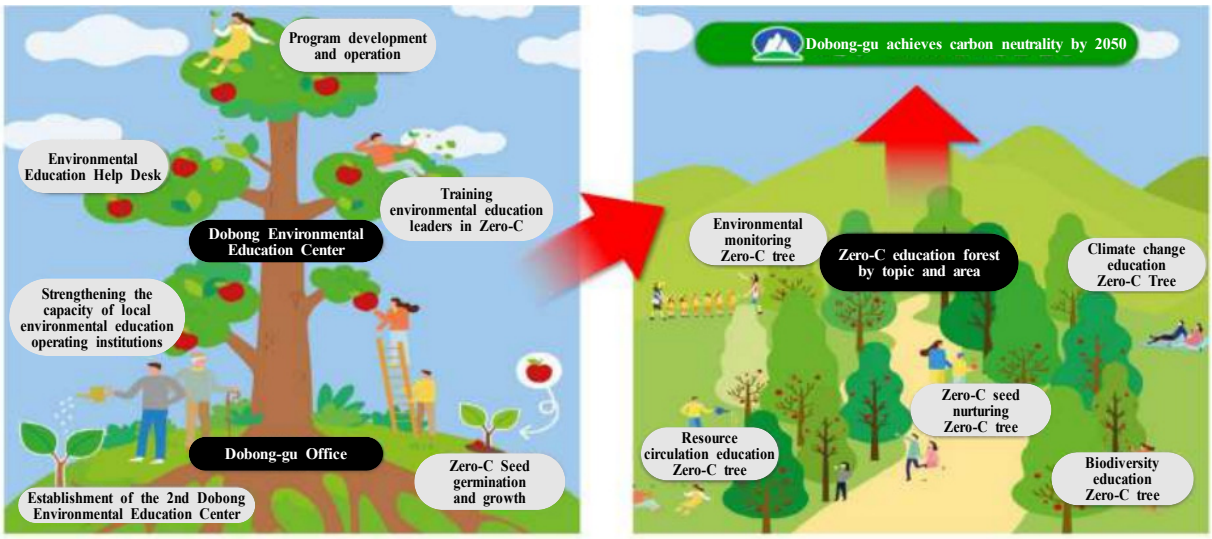
Zero-C Dobong-gu is, in a sense, a promoter of greenhouse gas reduction in daily life, with participants completing a creative training program created by Dobong-gu, practicing carbon neutrality in daily life, and spreading the word to family, friends, and neighbors.

Zero-C Dobong-gu covers carbon neutrality, resource circulation, and life diversity (biodiversity) for all residents, and focuses on developing environmental knowledge to train Dobong-gu citizen activists to continuously and actively participate in various environmental activities in Dobong-gu. These volunteers are trained into a group of lecturers who participate and serve as a catalyst for Dobong-gu's achievement of carbon neutrality by 2050.

Zero-C Dobong-gu education consists of three stages:

Beginner (Seed) Course – Intermediate Course – Advanced Course, which checks the qualifications and educational capabilities of the Zero-C trainees at each stage and strengthens their foundations as the central educators of the Dobong model of carbon neutrality.

Currently, Dobong Environmental Education Center is operating Zero-C Beginner (Seed) and Intermediate courses together with Dobong-gu.



<Dobong-gu Environmental Education Leader Zero-C Utopia>

● **Zero-C Beginner (Planting the seeds of carbon neutrality)**

Zero-C Dobong-gu, in operation since 2021, has provided education to elementary, middle school, high school, and general adult audiences to raise awareness of climate change and carbon neutrality, guiding them on how to put them into practice. Realizing the need to further expand practical education on carbon neutrality, operations have focused on educational activities for early and late adult years since 2022.

The encounters with a variety of residents, including the Dobong-gu Adult and Senior Welfare Center and Dobong-gu Facility Management Corporation staff, parents, Dobong-gu Residents' Self-Government Committee, and high school students taught them about what roles each of them could play wherever they are for the reduction of greenhouse gases in Dobong by 2050, gaining awareness of the Dobong model of carbon neutrality and putting it into practice.

Although training concluded in April 2023 by conveying action items in daily life and encouraging participation in the action items through training using the Dobong model of carbon neutrality practice application (Carbon Empathy Mileage), the program was reorganized so that students could use the practice app to learn through experience the action items learned in training.

		
Facility Management Corporation Zero-C Beginner Training	**Using the Carbon Empathy Mileage Practice App**	**Zero-C Beginner Education**

● **Dobong-gu Zero-C Intermediate Course: Becoming a resident instructor for local residents**

As shown in the picture above, students who take the seed course are qualified to take the intermediate course in Dobong-gu Zero-C, with the intermediate course being a process to train resident instructors who specialize in Dobong-gu carbon neutrality.

The application requirements for the Zero-C intermediate course call for students who have completed the Zero-C Seed course, Dobong-gu residents, community teachers, or people with environmental-related education experience.

A total of 10 training sessions were conducted on climate change, carbon neutrality, resource circulation, biodiversity, program planning, and instructor capacity training, and a total of 19 Zero-C intermediate-level instructors were selected through trial performances. Starting in 2024, we will take steps toward a Zero-C city in Dobong-gu with residents by establishing a virtuous cycle system where resident lecturers directly teach other residents as carbon neutrality practice instructors.

● **Participant reviews**

“What changes did you witness while directly educating residents as an environmental instructor in Dobong?”

1. Dobong Environmental Education Center Environmental Education Volunteer & Green School Environmental Instructor: Park Jong-im

   “I never thought I would do anything like this. I came to the Dobong Environmental Education Center

   because I was curious about the names of the plants and trees I saw all the time, and although it was all very new, it was nice to be able to share what I had learned with local children and adults.

   We started with an activity that taught the names of grass and trees, but if we compare the activities when we started and the activities now, interest in the environment in Dobong-gu and environmental topics, including climate change and resource circulation, has increased. The burden of practicing it in my daily life has also increased, but I am happily putting it into action.

   I also began to think about what role I could play in my own activities in working with local residents in Dobong-gu. I started out as a volunteer, but now I am working as an environmental lecturer in Dobong-gu, and I am working as a resident and environmental leader of Dobong, which is part of the process of creating this community called “Dobong” by encouraging the participation of residents, and solving their concerns together. It's great to be able to play the role of a local environmental leader. In addition, I like that there is

a Dobong Environmental Education Center in Dobong-gu that supports these activities.”

2. Zero-C Dobong-gu Intermediate Instructor: Ko Byeong-sook
   “I came to realize through the instructor training course that I had to do something. However, the process of putting learning into practice was quite difficult, first of all, because it was not easy for me. I think what differentiates me from other instructors is that my way of life had to change as I become an instructor. Although a lot of study is needed to motivate the small actions of residents and make them sustainable, I feel proud of participating in the work that brings about a big change. It is meaningful to participate as a resident instructor in Dobong's attempt to solve the problem of climate change that we are currently facing by working with residents to create change.”

And we still move forward

The weakness of the current virtuous cycle model that brings about change through resident participation is the uneven distribution of age groups. Among the ages of local environmental leaders currently active, there are no instructors targeting young people. Accordingly, we are planning a training course for youth that can work with youths in the region. Through this course, we seek to lay the foundation for young people who want to work as instructors in the region by utilizing their expertise and talents, and develop a sense of attachment to the region.

V. Key Features and Strengths

1. Residents came to play a more practical and proactive role in the environment of Dobong-gu.
2. While working as local environmental leaders, they were transformed into active participants in solving local problems by exploring and finding alternatives to problems closely related to daily life.
3. Trained residents who played the role of decision-makers were willing to actively participate in the local environment to solve local environmental problems while working as lecturers.
4. Building a virtuous cycle model of resident participation
   (The virtuous cycle of residents educating residents has been stabilized, and this has become the foundation for nurturing instructors for Zero-C, the focal point of carbon-neutral practical education in Dobong-gu.)

References

The First Study for the Formulation of a Dobong-gu Environmental Education Plan (2022–2026)

First Environmental Education City Forum: “Zero Carbon City, Brought to You by Zero-C [Dobong]”

About the Institution

- Organization Name: Dobong Environmental Education Center
- Date established: April 2003
- Area: 238.01 m2
- Full-time employees: 4 staff members
- Operation schedule: Tuesday-Saturday (9:00 a.m. – 6:00 p.m.)
- Local Environmental Leader Instructors: 60 instructors
- Location: (Banghak-dong), 33, Sirubong-ro 6-gil, Dobong-gu, Seoul
- Characteristics: The operation of the Dobong Environmental Education Center (Dobong Environmental Classroom), which started environmental education in Dobong-gu in 2003, is entrusted to the Korea Environmental Education Center. Toward the goal of shaping Dobong as a sustainable environmental education city through participation and action, environmental education is provided based on learning, praxis, and cooperation through Dobong-gu’s environmental education infrastructure, including training and supporting local residents to become expert environmental leaders in Dobong, thereby serving as a hub for revitalizing environmental education in the local district.

	
Dobong Environmental Education Center (Kkotgaram Hall)	**Dobong Environmental Education Center (Dodam Hall)**

Contact Information

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Voices of the Youth in the Age of Climate Crisis: For Our Better Future Climate

I. Keywords

Climate Crisis

Climate Action

Learning and Action

Solidarity

II. Project Goals

Gain awareness of the climate crisis and think about how it relates to my life.

Interrogate and act on climate justice in the age of climate crisis.

Join in solidarity with the citizens of the Earth who exist alongside us.

III. Project Overview

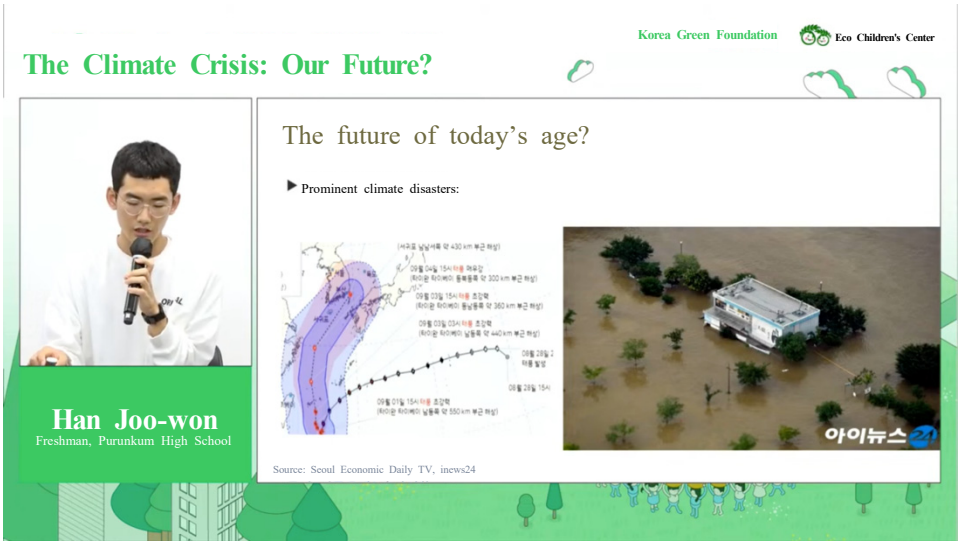
Period: September 19 (Monday) – 26 (Monday), 2022

Subjects: All students and personnel at Purunkum High School

Pedagogy: Conduct a program for one week, planning a school-wide participatory project alongside a curricular approach to the climate crisis caused by climate change to link learning to action. Based on the in-school program, we will join the nationwide Climate Justice March to express our learning in action.

IV. Activities

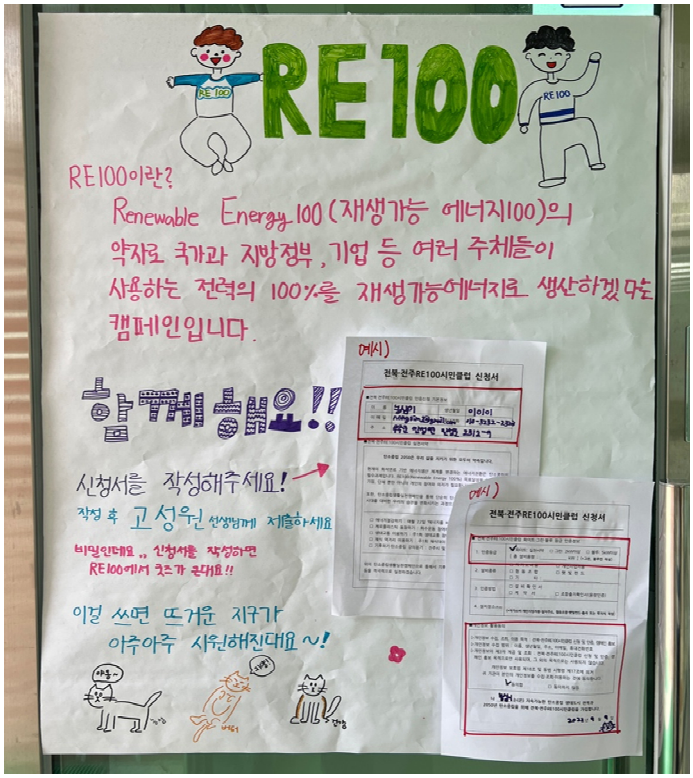
Exploring the climate crisis through a variety of classes



In this activity, we hold peer discussions on what we have learned about the climate crisis caused by climate change.

This photo is from the Youth Forum. We ran a school survey on youth participants on what they learned about the climate crisis caused by climate change and then discussed our concerns. The view of climate change is not one-sided but rather an exchange between peers who might have different ideas, recognizing the similarities and differences and talking about how they are different and how our standpoints change because of these differences. Climate change occurs all over the world from various causes, and the changes also appear in many different forms. Putting together one's thoughts about the climate crisis as experienced by each of us is a crucial experience for learning about different perspectives and attitudes.

Learning about the climate crisis and ESG in environment class, and running peer awareness-raising activities



We conducted a class on the climate crisis and ESG management during environment class. This was an opportunity to gain an awareness of the current climate crisis and learn about the roles of companies and consumers in the age of climate crisis. In particular, we shared the information we had researched and organized for our peers who did not know about RE100, and made posters promoting RE100-related activities in our local area that they could participate in.

Art class expressions of the climate crisis encounters

The students created artistic expressions of what they learned about the climate crisis from a range of studies, under the theme "Encounters with Climate Crisis." These pieces represent the

reality of a heated Earth under global climate crisis, the usage and oppression of the Earth to satisfy humans' selfish desires, personal and collective calls for help, and slogans in response to the global crisis. It is expressing. Lastly, satirical illustrations of the role and responsibility of companies for the climate crisis in connection with their business activities gave a diverse and novel perspective of students' understanding of the climate crisis as expressed by them. The message from youths living in this age of climate crisis to adults is clear: To accept the current situation as a crisis and take an action. This is a snapshot of teenagers worried about the age in which they will live, and acting accordingly. Students are engaging in activities to share and explore their learning about the distinctly downbeat reality of the climate crisis in fun and upbeat ways.

Project activities in preparation for the 924 Climate Justice March

After teaching classes in a range of subjects for a week, we began the project in earnest: We started preparing our action for the 924 Climate Justice March[7]. First, we watched a documentary, Red Earth, to gain awareness of and empathy for the current situation. We think we live on a blue Earth. The documentary informed us to the contrary, however, that the Earth is now a red Earth and will remain so into the future, and supported the argument by citing abundant facts. After watching this documentary, we engaged in an activity talking about our reasons for participating in the Climate Justice March, and what message we want to convey during the march to those who feel the same way as us about the climate crisis, or to those who are unaware of climate change and are skeptical of the climate crisis. Conveying a message, after all, is the biggest reason we are participating in the march.

7) The march for realizing climate justice held across the country, including Seoul and Busan, on September 24, 2022

Deciding on a climate action slogan for the school and each of us

First, we crafted Climate Justice March slogans. There were diverse target audiences for the messages: We decided on messages for citizens, politicians, our peer groups, teachers at school, and entrepreneurs who are the heads of businesses. We then shared these messages with the class and decided which message would represent our school. A message that spread from an individual to the team ultimately became the message of our school after presentations by each team.

Making placards for our school's slogan, "For Our Better Future Climate"

Our school's message, which emerged from the process of deciding on messages at the individual level, then teams and the entire school, was “For Our Better Future Climate” This message arose out of learning about and exploring the future and concluding that things cannot continue this way. We ask, how did our future turn out like this? It is also a lament that climate change is not being recognized as a climate crisis despite the urgency of the situation. Students and teachers worked together to create this message and make a poster. We tried to express the idea of the Red Earth and convey the meaning that we will not give up even though our future prospects right now are not bright. We wanted to embody hope as we wrote down each letter.

Creating our own Climate Justice March slogans

In addition to creating the school slogan together, we each worked to craft our individual messages. One slogan that left a deep impression was: ”Equitable environmental education now.” This student explained that environmental education taught them that the environment is connected to their lives. In learning this fact through environment class and connecting it to the climate crisis, they realized that our lives are in crisis. The student wrote the slogan in the hope that more students would learn and think together about the climate crisis they learned about. Currently, there are about 40 teachers in Korea who teach about the environment. There are a limited number of schools across the country that have such teachers on staff. Even in schools that have teachers who teach the subject, few students learn and think about the environment. The student hoped that they and their classmates would not be the only ones who think of climate as a crisis, and that their age-group peers would learn and think about the environment together.

Departure ceremony to prepare for the Climate Justice March!!

From individual slogans to the overall school slogan, the time spent with the students was a time of learning. Each student's slogan was crafted through an activity to connect their learning with their lives and give them meaning. The resulting slogan is not just a short phrase, but also becomes their rallying cry. Messages like "Set fire to our passions, not the Earth," "Why not act?" "Climate change? Climate crisis!" are the students' pledge and expression of action. With these individual slogans in hand, we held a departure ceremony before participating in the 924 Climate Justice March.

Purunkum High School students' climate justice open mic speeches

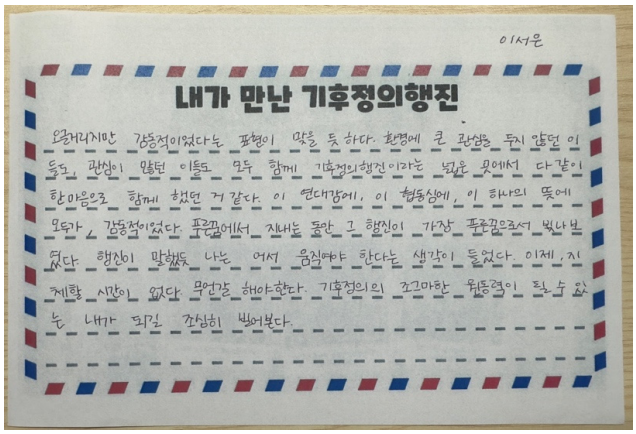
Something else we prepared through environment class during the week-long educational program was a class called Climate Change Speech Competition. In this class, we wrote and presented our thoughts on climate change in speeches from the perspective of the youth. An outpouring of students wrote and presented their speeches about climate change for the class, with one of them, selected through peer evaluation, to give an open mic speech at the 924 Climate Justice March. A freshman, whose speech was selected through the process, gave a speech about climate change and the environmental education they had received. The student discussed their awareness from class that climate change had become a climate crisis that could exceed the tipping point in about six years unless we act now. This was about their own life, the student realized, not something they could keep a comfortable distance from. It was also about the lives of not only the speaker but also their friends listening to the speech and the many people gathered there. When environmental problems become your own problem and you discover the connection, you can't help but take action. This student discovered the connection and acknowledged it.

We can't live with climate disaster. For Our Better Future Climate!!
Purunkum High School students shout it out

A diverse array of people participated in the 924 Climate Justice March. Although they were of different ages, religions, and regions, they had one thing in common: They knew what the climate crisis meant. We marched in front of Gwanghwamun holding placards that said, "We can't live with climate disaster," and "For Our Better Future Climate!" We realized that what we learned in the classroom was not just confined there but connected to our lives, and acted in solidarity with many people who shared our awareness of the climate crisis. We shouted in our own voices

on the streets, without relying on anyone else, to tell our peers and the older generation and ask them to join us.

Our future, Our present concern! Shouted before the gates of Gwanghwamun



There was so much we wanted to convey to fellow students while working on the Climate Justice March project. We wanted to impress the gravity of the climate crisis on them and tell them we need to take action right now. More than anything, we wanted all of us to learn together that the time to take action for climate justice is now, in this moment, and the people to do it are ourselves. Among the many reactions that students must have felt while working on the project, we would like to highlight one student's story:

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My experience with the Climate Justice March can best be called inspiring. Whether formerly apathetic about the environment or highly engaged, we all came together with one mind in the breadth of the Climate Justice March. The solidarity, spirit of cooperation, and single-minded focus —all were deeply moving. Of all my time in Purunkum, meaning the Blue Sky Dream, the march shone as the clearest sky of all. As the message of the march stated, I knew we had to move quickly. There is no more time to waste. Something has to be done. I fervently pray that I can become a force, however small, for climate justice.

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Through this experience, students made strong demands and acted as movers and shakers of the future. Amid the crisis, we saw hope in the students and teachers who brought their learning and teaching out of the classroom to connect the material to their lives and stand stronger together.

V. Key Features and Strengths

Our foremost focus while planning the Climate Justice March project was to help students find the connection between their lives and the climate crisis. A class on the environment could cover many different subjects; ultimately, though, the climate crisis is something future generations of students will experience in their lives and must be resolved. In particular, the climate crisis has a crucial role in determining their quality of life and survival. By taking classes on the topic of climate change in various subjects and participating in projects, students learn different perspectives and think about their own ways forward. Through the documentary we watched together while preparing for the Climate Justice March, coming up with individual slogans, and deciding on the school's slogan, the students found the connection between their concerns and the climate crisis, and once they found that point, large or small, it led to action. Additionally, participation in the Climate Justice March was another educational opportunity for students to think about the climate crisis and listen to the voices of people across various ages, occupations, and religions, whether disabled or non-disabled, as well as animals. It is invaluable for knowledge obtained in the classroom to become the basis for action and praxis rather than something just left in the classroom.

Many students commented how affected they were by the different people and voices they encountered on the streets. The experience validated what they had learned, and helped them realize the value of immediate action. The Climate Justice March project was all about ”thinking globally and acting locally.” It was a valuable opportunity to think globally about the climate crisis and act locally by shouting out together in the streets.

About the Institution

Region	School Name	Type of Establishment	Date Established
Jeollabuk-do	Purunkum High School	Purunkum Academy, an educational foundation	March 3, 1999

School Classification	Private	**Office of Education**	Jeonbuk Office of Education
Coeducational	Coeducational	**Faculty Office Phone/Fax**	+82-63-323-2058/+82-63-323-2059
Address	(568-844) 2312-9, Jinseong-ro, Anseong-myeon, Muju-gun, Jeollabuk-do		

Per Year Level	Number of Classes				Number of Students			
Class, Student Status	Freshman	Sophomore	Senior	Total	Freshman	Sophomore	Senior	Total
Class, Student Status	2	2	2	6	41	35	40	116

Theme of environmental education at Purunkum High School	A space for ecological education where students can learn and put into practice energy independence and harmony with nature
Main Keywords	Ecological education, energy independence, people at one with nature, everyday praxis, harmony, environmental education center

Contact Information

Purunkum High School Environmental Teacher, Ko Seong-won windko@jbe.go.kr

Environmental Education for Seonheul 1-ri Focused on Dongbaek Dongsan Gotjawal Wetland

I. Keywords

Gotjawal, Dongbaek Dongsan, resident participation in environmental education, wetlands, biodiversity, climate crisis response

II. Project Goals

1. Improving residents' environmental knowledge (improvements to local ecological information, effect, and practice)
2. Achievements through the synergy of village communities, school ecological education, and environmental conservation
3. Enhancing the capacity for resident-led ecological education

III. Project Overview

- Period: Ongoing since March 2010 (continuous education since the designation of Dongbaek Dongsan Wetland Protection Area)
- Subjects: Seonheul 1-ri village residents (about 900 people)
- Location: Dongbaek Dongsan Wetland Center, Dongbaek Dongsan, village hall, etc.
- Pedagogy

(1) Education to Enhance Environmental Literacy in the Village Community

(Details) Planning and operation of an educational program to enhance environmental literacy (information, effect, and practice) for residents of Seonheul 1-ri village, a community linked to the valuable ecology of Gotjawal in the wetland protection area of Dongbaek Dongsan;
Action plan training for resident participation in climate crisis response, etc.

(Method) Plan tailored educational content and methods to develop the capacity of each resident to participate in the monitoring and conservation of natural ecological sites in the village, and conduct educational programs using spaces within the village (village center training room and natural areas)

(Period) Short-term - consists of basic and advanced training for at least 20 hours
Mid-term - Planning and operation of tailored training programs ranging from a few months to a year
Long-term - Joining village communities in long-term projects ranging from 1 to 5 or 10 years to enhance environmental literacy.

(Goal) Continuous education and support to enable village communities to operate autonomously through community-led environmental conservation, practice, and wise use

(2) Village Teacher Composition and Capacity-Building Training

(Details) A community group of village teachers was organized and intensively trained for residents within the Seonheul 1-ri village community. The group was composed of members capable of providing environmental education, acting as village guides, as well as planning and operating ecotourism.

(Method) Identified the current capabilities of village teachers and shortcomings in the program operation to provide customized education, enabling village teachers to directly plan and operate community ecology-based educational programs for Seonheul Elementary School students, travelers, and general participants.

(Period) Short-term - consists of basic and advanced training for at least 20 hours

(Target)

① Leverage the professional capabilities of village teachers to promote the education of village ecology and environment; maintain and expand the village teacher group through autonomous, locally sourced mutual education among residents

② Establishment of the village's own environmental education and ecotourism program to provide environmental education and ecotourism services for students and travelers, including field trips.

■ **Curriculum (may vary depending on circumstances)**

1) Short-term Course

Theory /Practice	Subject	Example of the Topic and Content of the Lecture	Instructor	Preparation
Theory (Day 1)	Orientation	- Meet and greet - Introduction to environmental education planning - Finding environmental problems in their own neighborhood		
	Discovering the motivation for resident participation in natural environment conservation	- Group video screening, conversation with the production director		
Theory (Day 2)	Directions for the management of the natural environment (administrative policy, law, etc.)	- Management and conservation plan for Jeju Island's natural environment		
Theory (Day 3)	Definition of environmental terms, current natural status of Jeju Island, history, culture, and ecological value	- Complete information about nature on Jeju Island, current situation, future value, and more		
Theory (Day 4)	Nature in the neighborhood	On-site visits		
Theory (Day 5)	What can the village do for nature?	Workshop format - On traditional knowledge that utilized nature - On the preservation of the natural environment (landscape, ecology, etc.) - Records of nature and human culture - On the wise use of nature - Discover the role of local residents in relation to nature (e.g., picture book program for seniors) - On expanding the awareness of nature - On promotion		Post-it notes, large battery
Theory (Day 6)	Democratic citizenship education/water equality education/human rights and peace education	- Education on the human rights of global citizens who protect natural and cultural heritage, among others - Education on inequality - Connecting human rights and peace education on the theme of nature		
Practical skills (Day 1)	Designing a nature tour	- Draw a local village ecological map - Linkage to local history, culture, ecological resources, and more		

Theory /Practice	Subject	Example of the Topic and Content of the Lecture	Instructor	Preparation
Practical skills (Day 2)	Manual on village ecology commentary	- Village commentator training - Commentary manual		
Practical skills (Day 3)	Safety training	- Field trip safety training - First aid training		

2) Long-term Course

Year	Subject	Method		Details	Target	Instructor
Year 1	Understanding the natural ecosystem	Theory		Understanding natural environmental policies and resident capacity-building education 1. The Earth's ecosystem 2. The value and use of nature 3. Historical, cultural, and ecological characteristics of heritage 4. Reasons, importance, and role of resident participation 5. The importance and role of local communities 6. Definition and sustainability of ecotourism 7. Explanation of natural environmental institutions and resident capacity-building projects (including the composition and role of consultative bodies) 8. Case studies of resident capacity-building projects in other regions (focusing on field trips to areas with developed expertise and on cases of resident participation activities)	Enhancing awareness of natural ecology	Researchers or invited lecturers, intermediate support organizations
		Field trips		Exploration of natural areas by region	Get to know your local ecology	Community members
		Workshop	Mind map	Discovery of local resources focusing on the local natural ecosystem (history, culture, ecology, traditional knowledge, etc.)	Find resources in your area	Researchers or invited lecturers, intermediate support organizations
			Roundtable (Facilitation)	1. Mutual learning (conversations on nature and humans, and the natural and cultural heritage recalled by local residents)	Motivation for autonomous participation	Researchers or invited lecturers, intermediate

Year	Subject	Method		Details		Target	Instructor
				2. Finding strengths and problems 3. Share opinions for improvement and means of utilization (ecotourism, ecology and environmental education, experiences, etc.) 4. Setting common regional goals for the conservation and utilization of natural and cultural heritage			support organizations
			Proceedings	1. Drawing (map drawing, heritage drawing, recalled heritage, etc.) 2. Writing (calligraphy, three-line poetry, drafting sample commentary, etc.) 3. Speaking (teaching, commentary, etc.) 4. Other		Communication	Intermediary support group
		Execution		No action plans by the residents themselves and no field implementation in Year 1			
		Evaluation		Year 1 short-term assessment			
		Improvement		Improving on shortfalls from Year 1 and planning for Year 2			
Year 2	Resident-led planning	Theory		Drawing a map (entire village including natural ecological areas) Functions and value of nature Nature and humanities			
		Field trips		Tour of natural areas and villages in each region		Discovering connections between nature and humans	
		Workshop	Roundtable (Facilitation)	1. Spreading environmental awareness and sharing with local communities 2. Proposing and organizing desired programs		Sharing awareness of nature	
			Action plan	1. Write an action plan (including budget) 2. Create a business model according to the action plan		Assign roles and make plans for environmental conservation	
		Execution		Conservation	Monitoring records, restoration, data collection publication, campaigning, etc.		

Year	Subject	Method		Details		Target	Instructor
				Wise use	Ecological education, ecotourism, hands-on experience, healing, recovery, etc.		
		Evaluation		Year 2 short-term evaluation and full two-year evaluation			
		Improvement		Fixing problems from Year 2 and planning for Year 3			
Year 3	Implementation of village community environmental conservation and wise use	Theory		Drawing maps (natural ecosystem features and terrain) Networking with other regions		Recognition of the historical, cultural, and ecological value of nature	
		Field trips		Natural ecosystem monitoring Monitoring resources in other areas		Local community	
		Workshop	Roundtable (Facilitation)	Sharing action plans, allocation of roles and responsibilities Decisions on environmental conservation and utilization planning		Discovering roles for residents in the environment	
			Action plan	1. Write an action plan (including budget) 2. Create a conservation and utilization model according to the action plan			
		Execution		Conservation	Monitoring records, restoration, data collection publication, campaigning, etc.		
				Wise use	Ecological education, ecotourism, hands-on experiences, designed products, etc.		
		Evaluation		Year 3 short-term evaluation and full three-year evaluation			
		Improvement		1. Identification of and improvements on problems in Year 3 2. Plans going forward			

IV. Activities

Seonheul 1-ri Village is a farming community located in the northeast of Jeju Island. The current resident population of Seonheul 1-ri consists of 453 households and 930 people (KOSIS, Korean Statistical Information Service, 2021). Seonheul 1-ri village is home to an evergreen Gotjawal forest called Dongbaek Dongsan, which is a UNESCO-designated biosphere reserve, a UNESCO Global Geopark, and a Ramsar Convention-certified wetland site. The forest was called Dongbaek Dongsan because of the abundance of camellia trees ("dongbaek" in Korean). Until the 1970s, when local residents cut down trees, they left only camellia trees and cut down other trees for charcoal and fuel. Not only were camellia trees slow-growing, it made much better economic sense to harvest seeds and use them as camellia oil rather than lumber. Camellia flowers in Dongbaek Dongsan do not bloom in large numbers at once like floriculture species, but bloom one by one and continuously from December to April. Although the blooms are not large or showy, the small, charming red flowers remain throughout the winter.

Dongbaek Dongsan became an ecotourism site designated by the Ministry of Environment in December 2013 due to its geological, ecological, cultural, scenic, and educational value. The evaluation of Dongbaek Dongsan as a potential ecotourism site was positively affected by the Wetland Protection Area Resident Capacity-Building Project carried out in Seonheul 1-ri Village since 2010. Strictly speaking, the period from 2010 to 2013 was spent on preparation, and the resident-led ecological education and tourism programs were planned and carried out in earnest starting in 2014. In other words, when Seonheul 1-ri was registered as a Ramsar Wetland in 2011,

the Wetland Protection Area Resident Capacity-Building Project was carried out with the support of the National Wetlands Center. This process enhanced the residents' capacity and developed ecological education. Seonheul 1-ri Village's ecological education and ecotourism project is under implementation through the establishment of the “Social Cooperative Seonheulgot,” and the goals are the conservation of Dongbaek Dongsan, improvement of resident welfare, and resident satisfaction. Thanks to the well-conserved Dongbaek Dongsan, residents are able to engage in ecological education and tourism, and the income generated is not only returned to environmental conservation but also used to improve the welfare of all residents rather than paying individual dividends. Due to the effects of Seonheul 1-ri ecotourism, the Seonheul 1-ri Village community is achieving sustainable development while preserving the land as a rural village. Furthermore, the conservation of biodiversity in Dongbaek Dongsan and the maintenance of wetlands built up the groundwater and revitalized a satisfied rural community.

The Seonheul 1-ri ecotourism project leveraging Dongbaek Dongsan is operated by a consultative body in cooperation with the village council, Social Cooperative Seonheulgot, Jeju Special Self-Governing Province, Jeju City, and the Jeju Ecotourism Association; the Jeju Ecotourism Association once provided professional support, but the project has been operating independently without a support organization since 2019.

The stage-by-stage activities of the Seonheul 1-ri ecotourism project are as follows: Stage 1 is a plan to understand the residents, and major projects include forming a stakeholder consultative body, training and meetings, and surveying local ecological resources. The consultative body consists of administrative agencies, local residents, and experts, among others. Stage 2 consists of resident capacity-building education and ecological education planning, where discussions begin about the form of the ecological education project group, the ecological education and tourism infrastructure is built, and plans are made for product development. Infrastructure building is also accompanied by human resource training for the operation of buildings, trails, ecological education, and tourism. Stage 3 is brand finalization, where thought is given to what symbols the ecological education and tourism village will display, and a logo and character are developed. At this stage, ecological education and tourism programs are also planned and undergo a pilot process, or planned programs are operated at a feasible scale. Stage 4 is monetization and promotion. Specific tasks are carried out to implement ecological education and make ecotourism a commercial success. The form of the project group discussed in Stages 2 and 3 is confirmed in Stage 3, and the expectation is to establish the project group in Stage 4. Ecological education and tourism programs are improved, while regional products from the village go into the packaging and planning stage for their sale. Collaboration is sought with the cooperative network at this stage, and promotional materials are actively produced and distributed. Stage 5 is about achieving self-reliance, where income from ecological education and tourism is distributed and returned to biodiversity

conservation. The reliance on professional support organizations by this time is phased out in Stage 5 as residents autonomously operate the project group, revitalizing the economy and actively involving residents. Although conditions vary from community to community, a firm basis for ecological education and ecotourism operation is established in Stage 5 to complete a concrete and systematic operation system. The most important aspect of this final step is deciding how to distribute the income, after fully taking residents' opinions on board and undergoing a democratic decision-making process. In the case of Seonheul 1-ri, it was decided to direct the funds toward the improvement of residents' public welfare without personal dividends in a general meeting after a roundtable.

This educational process improved community environmental awareness at Seonheul 1-ri, whose residents are taking the lead in the conservation of the Dongbaek Dongsan Wetland, which is operating through its entrustment to the Dongbaek Dongsan Wetland Center established by Jeju City and the Ministry of Environment. Dongbaek Dongsan Wetland Center hires full-time resident guides, and these guides provide ecological education in regular classes at Seonheul Elementary School. As a result of this ecological education, the number of residents in the Seonheul 1-ri village community increased by more than 900. As young people moved to the village with their children, Seonheul Elementary School was promoted from a branch school to a full elementary school. The number of students has increased from around 15 in 2010 to over 90.

V. Key Features and Strengths

1. Enhances environmental awareness through social education of the village community;
2. Understands the role of village communities in mitigating and responding to the climate crisis and leads to practical participation;
3. Enhances students' environmental literacy (information, effect, practice) through cooperation between community and school education; and
4. Enables collaborative education between nature, villages, and schools.

About the Institution

- Name of organization: Public Interest Corporation Jeju Ecotourism Association (Representative Go Je-ryang)
- Date of establishment: Founded in 2010
- Full-time employees: 1 representative, 1 secretary, 1 freelancer
- Operation schedule: Anytime
- Instructors: 3 environmental educators (2 full-time, 1 part-time, 9 village communities in partnership, 55 community teachers)
- Location: 54-5, Bukchon 4-gil, Jocheon-eup, Jeju-si, Jeju-do
- Features: An organization that plans and conducts capacity-building training for villages, individuals, and groups on Jeju Island that wish to engage in environmental education, ecotourism, and ecosystem service enhancement activities.
- Major projects
  1. Projects to achieve social and public interest, such as Jeju environmental conservation and environmental education;
  2. Projects for environmental campaigns, event agency, and wise use;
  3. Research and survey projects for ecotourism development; and
  4. Other projects necessary to achieve the purpose of the corporation.

Contact Information

- Manager: Go Je-ryang
- Affiliation: Jeju Ecotourism Association
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- Email: jeryang@hanmail.net

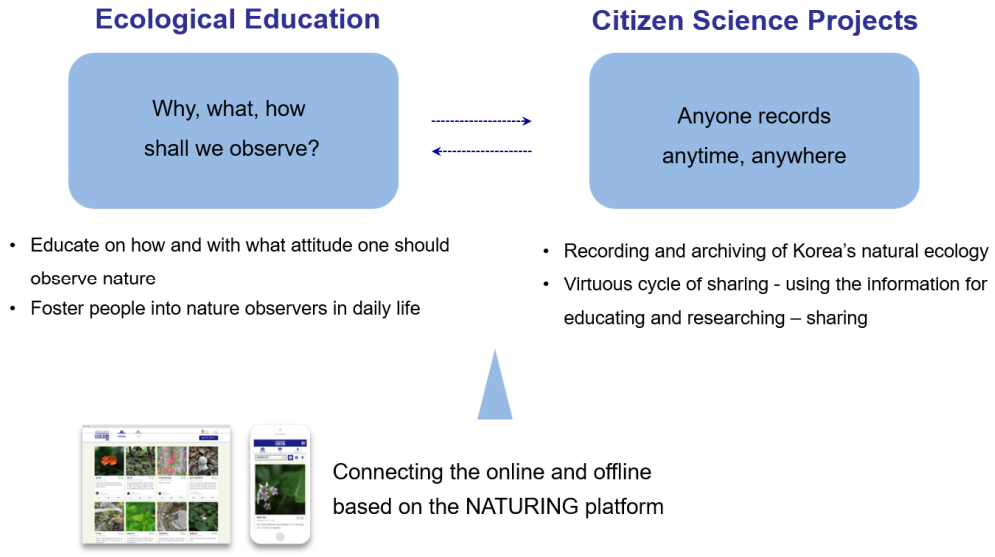
Ecological Education and Citizen Science Based on "Naturing" and the "School Naturing" Platform

I. Keywords

Citizen science, biodiversity, climate change, nature observation, ecological map

II. Project Goals

1. Guide students who have become distant from nature to various natural ecosystems to help them recognize that they are part of nature and lay the foundation for them to grow as citizens who contribute to preserving the ecosystem.
2. Expanding awareness of the senses of the mind and body, perspectives on nature, and ways of looking at the world, experiencing diversity through ecological observation and exploration connected to the school, village roads, and surrounding mountains and rivers.
3. Encouraging participation in various citizen science projects taking place on the Naturing platform based on experiences as citizen scientists through collective intelligence that discovers, observes, and records creatures living together in schools and the local area to cooperate in the completion of an interpretable ecological map.



<Cycle of Naturing Ecological Education and Citizen Science Projects>

III. Project Overview (Creating an ecological map of the local schools and communities)

1. Period: One to two semesters, at least once a week

2. Target participants: Elementary, middle, and high school students taking regular subject (science, social studies, etc.) classes, and club members

3. Pedagogy
   - Nature observation: The process of understanding the life cycles of various life forms that live among us by observing them closely and slowly, and performing activities that relate them to us.
   - Record: Record observations in detail on the Naturing (School Naturing) platform to create an ecological map.
   - Sharing: The process of thinking about the biodiversity around us and the environment we live in and the start of understanding the ecosystem and thinking about how to preserve it

IV. Activities

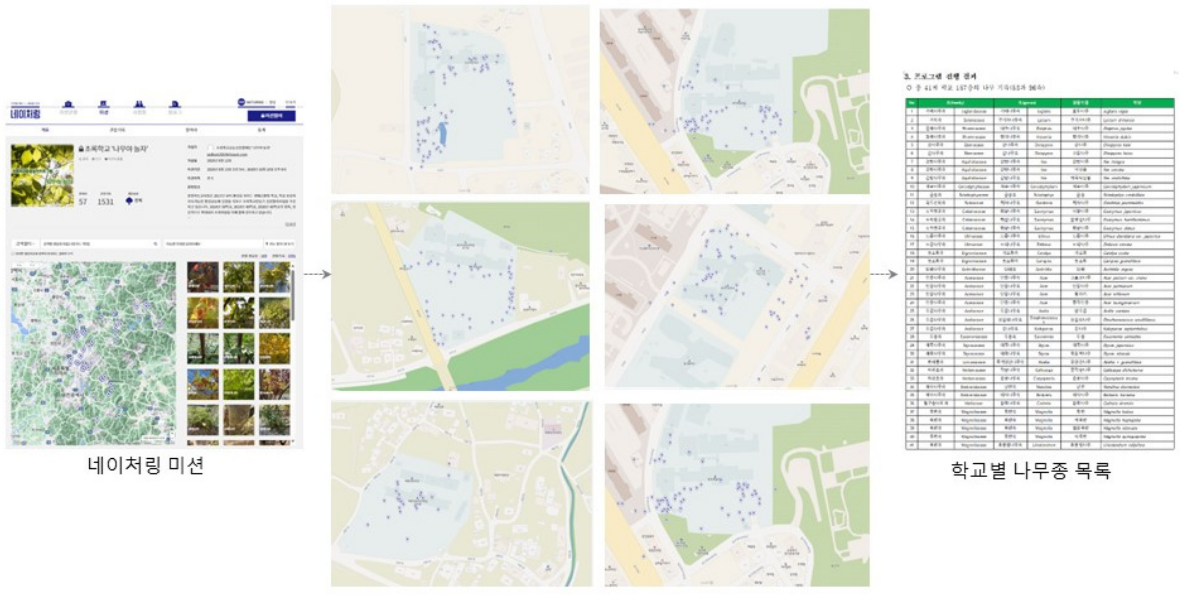
I. Platform Utilization

1. The Creation of an Ecological Map for Our School, Our Community program was conducted using the citizen science platform ”Naturing.”

2. Starting in 2023, it is evolving into the use of "School Naturing," an ecological transition education platform app and website developed with the Incheon Metropolitan Office of Education. To support the effective progress of ecological education, School Naturing is structured so that thematic missions such as creating an ecological map, observing trees, monitoring biological seasons, and bird-watching can be performed with guidance.

<School Naturing platform (left), Ecological map using the platform>

3. Through the online platform, junior students at individual schools can refer to and utilize the results of senior students, and flexible programs can be operated to understand local biodiversity and ecosystems by integrating the results of individual schools at the regional level.



<Creating a Local School Tree Map>

II. Basic Structure of the Program

1. Basic classes are conducted in the order of introduction, observation/recording, and sharing and wrapping up in each session.

2. The introduction of each class is carried out by sharing the purpose and method of the program in the first session, and from the second session onward by checking the details of the previous class and sharing the current class plan.

3. Observation records used the School Naturing platform mobile app and website (https://www.schoolnaturing.net). Candidates for teacher members of School Naturing must complete teacher training conducted by the Office of Education and Naturing (the teacher training provides guidance on the meaning and method of nature observation, how to use the School Naturing platform, etc.). Teacher members can create missions according to purpose and invite students to participate in the missions.

4. Outdoor observation and records must be checked indoors through the School Naturing platform. The activities of individual students and all participants are reviewed by recapping and summing up the day's records.

5. Comprehensive recaps at the end of the entire program are based on end-of-class recaps.

6. Recap time requires a participatory process that allows students to talk about their impressions and changes.

<Basic Program Structure>

III. Program Composition and Conduct

1. The program lasts at least one semester.
2. Instructors (local guides, experts in each field, etc.) are provided, if necessary, through a support program in consultation with the Office of Education. If the program is operated independently based on the capabilities of the teacher in charge, discuss forming a cooperation group that can provide feedback online.
3. Consider expanding from the school to the communities surrounding the school.
4. Establishing a venue for regional joint exploration/exchange with schools participating in the program (in the middle or latter half of the program), providing opportunities for in-depth observation and exchanges on the progress of each school.
5. After the program is completed, the results can be archived through integrated compilation by the school or education office.

<Nature Observation in Schools and Communities>

<Example of Program Composition>

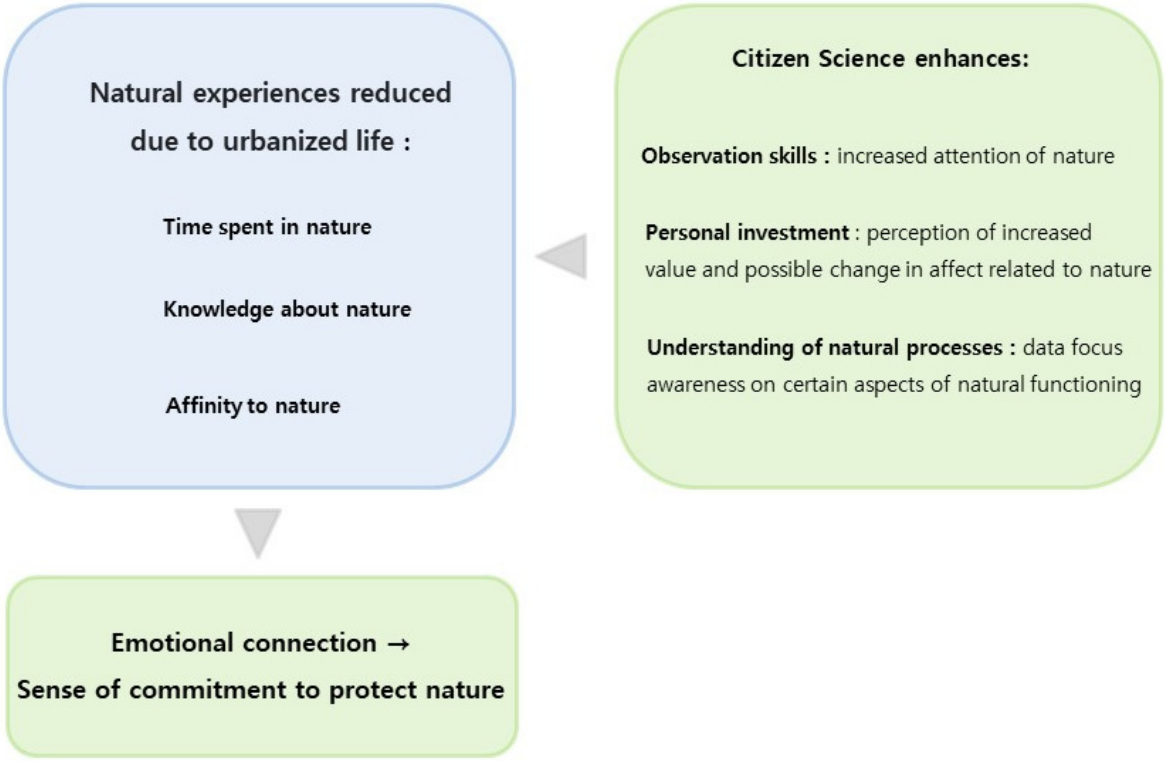
Session	Date		Activity Name	Activity Details	Note
	Month	Day			
1	4		Orientation	- Methods and attitudes for observing nature (living things) - How to use School Naturing, etc. - Practical plant recording practice in school	
2	5		School ecosystem observation I	School habitat species and distribution observation records	Teacher, instructor
3	6		School ecosystem observation II	Exploring the ecological connection between living organisms and the environment	Teacher, instructor
4	7		* Joint exploration and exchange	- Invite experts on plants, insects, birds, etc. - Exploration records through student placement by taxonomic group - Exchange on the class progress results by the school	Teacher, expert, instructor
5	8		Observation of community ecosystem I	Observation records of species and distribution of organisms living in communities around the school	Teacher, instructor
6	9		Observation of community ecosystem II	Exploring the ecological connection between living organisms and the environment	Teacher, instructor
7	10		Capture	Summary of topics such as sharing the significance of biodiversity recorded in School Naturing	Teacher

IV. Advances in Participation in Citizen Science Projects

1. Ability to participate in various citizen science projects (investigation of wild bird collisions with windshields, reporting on endangered wildlife, investigation of wildlife waste entanglement, climate change biological indicator monitoring, forest insect distribution monitoring, etc.) on the Naturing platform, based on the experience of observing and recording living things in schools and communities as well as creating ecological maps through the power of crowdsourcing

<Naturing Platform-Based Citizen Science Projects>

2. Participation in these projects not only strengthens the emotional connection with nature but also achieves educational outcomes for climate change and the adaptation to it through direct participation in natural (ecosystem) conservation activities.



<The Role of Citizen Science in Ecological Education>

V. Key Features and Strengths

1. Biodiversity education based on nature observation and tangible records: The primary problem of the climate crisis is biodiversity loss. To provide education on this issue, the starting point must be proper observation and understanding of the creatures that live with us, something this platform-based educational program is effective at.

2. Citizen science-based biodiversity education: Provides experience as a citizen scientist through collective intelligence, which discovers, observes, and records the creatures that live with us and completes an interpretable ecological map, and guarantees the sustainability of education in further direct participation and action in various citizen science projects.

3. Sustainable education: A program operation based on an online platform has the advantage of archiving. Based on this archive, education is continuous in comparing and supplementing educational data that accumulate year by year.

Reference

· Naturing (www.naturing.net)

· School Naturing (www.schoolnaturing.net)

· Bridging the nature gap: Can citizen science reverse the extinction of experience? (Stephanie G Schuttler et all, 2018)

About the Institution

네이처링

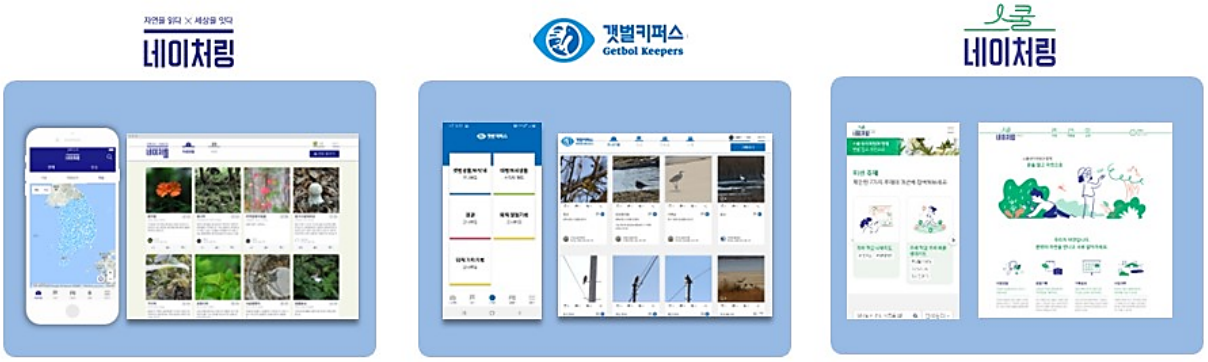
1. A social venture that shares the attitudes and methods of observing nature both online and offline and supports the recording and sharing of natural activities.
2. Developed and operated Korea's first citizen science platform, ”Naturing,” tidal flat citizen monitoring platform, ”Tidal Flat Keepers,” and ecological transformation education platform, ”School Naturing.”
3. Support for numerous citizen science projects and ecological education programs.
4. Grand Prize at Internet Mashup Camp (Ministry of Science, ICT and Future Planning), Grand Prize at Environmental Information Utilization Startup Contest (Ministry of Environment), Commendation from the Minister of Environment / Minister of Unification
5. Address: #408, 11, Achasan-ro 11-gil, Seongdong-gu, Seoul

We value **ecosystem conservation** through

observation-recording-sharing.

Conduct and support **citizen science projects** and

Ecological education



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Conclusion: Building Hope with Our Own Hands

Kim Namsoo (Korea Research Institute for Environment and Development)

We examined four cases that brought about real change by enhancing and promoting participation and learner initiative.

First is the case of Purunkum High School. In this example, students affirmed their own opinions, shared them with their peers, engaged in learning and discussion to raise their voices with greater clarity, connected themselves with climate change, created their own message, and shared their ideas with fellow students through joint learning. They created the message “That’s our future, what you doing?” They then went into the public forum of the Climate Justice March, where more citizens gathered, and gave an open speech. Throughout this entire process, students connected their learning to their lives, gave it meaning, and engaged in activities that had a real impact.

Next is the case of Dobong-gu. Dobong-gu is a foundational local government that boasts a fairly long tradition in the field of social and environmental education in Korea. Environmental groups and environmental education classes that engage in environmental activities, community-based environmental education, and local biodiversity conservation movements have been active for a long time, and hosted a sustainable education scene. They aim to become a sustainable development learning city and have experience in setting the direction and indicators of urban development based on the participation of Dobong-gu residents. The environmental program aimed at solving real-world problems based on the active participation of residents took place in the midst of this existing practice and infrastructure, as did the linked practical programs of the Nature Commentary Group, Green School Instructors, and Dobong-gu Zero-C Instructor Training Course. Citizens who participated in this process started from volunteers and learners to develop into environmental instructors and leaders who provide environmental education.

Third, the case of Seonheul-ri and Dongbaek Dongsan in Jeju Island is an example that shows how the sustainable development of a community may be pursued through ecological sustainability based on respect for community ecology, history, and culture. This process demonstrates the importance of mutual learning, education, and solidarity between the community and residents as well as between schools and the local community.

In these three cases, the students, the residents of Dobong-gu, and the elders of Dongbaek Dongsan grew more attached to their school and the region, confirming their will to respect and care for the wider society and the entire planet, thanks to the process of getting to know them better by looking into their lived communities in detail alongside their fellow community members.

For example, creating an ecological map for the school's surrounding areas proved effective as a student-led activity promoted by Purunkum High School.

The fourth example, Naturing, is a platform that actively aids and promotes this process. Naturing is expanding into a space where many citizen scientists in Korea are cultivated, grow, and engage with each other. School Naturing, tailored to school systems, has become an important foundation for ecological education and biodiversity conservation at the school level. Traditionally, community members might jointly draw up an analog village map or place stones or convenient markers on the map to diagnose community problems or conduct environmental audits. The effectiveness of this process was supercharged through apps and mobile phones, with the possibility of platform connectivity.

In summary, the educational commonality between the four Korean cases we examined is that citizens, called learners, connect the climate crisis with their own lives to directly participate and take the lead in solving this difficult problem together with their fellow citizens. Some factors that particularly stand out in this process are the roles of teachers and schools, the role of the platform, the importance of the curriculum planned by the education center, and the role of the facilitator who encourages fresh perspectives in their community. Through these four valuable cases, we confirm that in the midst of the climate and biodiversity crises, we are the ones who can diagnose any crisis and find ways to overcome it, leading to change and building hope with our own hands.

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