ECO-SMART PROJECT

INTELLECTUAL OUTPUT 1

Eco-Smart School Framework and Action Plan

IO1.1: Environmental Literacy Framework

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Introduction

At no other time in Earth's history have humans had as great an impact on the planet's systems. Disagreements about how best to approach the issues raised by the interactions between humans and Earth's life-support systems will continue to challenge social and political systems, and it is clear that only an environmentally literate public will be able to find workable, evidence-based solutions for these challenges[1]

The fact that nature is getting damaged day by day due to human activities and this situation poses a serious threat to the life of all living things. Moreover, pollution of the environment causes global warming by disrupting the balance of the ecosystem. As other living beings are affected in a negative manner, also human society is being harmed because of its own consuming behaviour that causes global warming.

Since the industrial revolution, the increase in the use of fossil fuels is at the top of the damage caused by humanity to the environment. The increasing concentration of greenhouse gases released into the atmosphere with the use of fossil fuels causes the planet to warm more, while the increase in global temperature brings along climate change, which is very dangerous for living species.

Now we are facing with unprecedented problems caused by unconscious one-sided misuse of natural resources has led such Covid-19, climate change, melting polar ice caps six times faster than in the 1990s, water scarcity, drought, extreme weather, rising sea levels, many plant and animal species to extinction, higher levels of air pollution, carbon emissions and so on. This reminds us that we are part of the nature and the destruction of nature harms people directly. We as Eco-Smart project partners decided to act and conceived ECO-SMART project with the great support of EU Commission (Erasmus+ programme).

Defining the domain of environmental literacy

To design an assessment of environmental literacy it is necessary to begin with a working description of what "environmental literacy" is. International definitions of literacy, historical definitions of environmental education, national and state descriptions of environmental education programs, and pertinent research all provide useful constructs, but the differences among them suggest that defining environmental literacy is a dynamic undertaking. As environmental and educational conditions shift, environmental education programs and practices improve, and new research emerges, the domain to be assessed will evolve and definitions – and this document – will need to be reviewed and updated.

Defining environmental literacy in terms of Eco-Smart Schools

EU Energy Efficiency Directive 2012/27 / EU requires member states to prepare their national energy efficiency action plans and periodically review and renew them every three years. Therefore, schools need to establish a common understanding to ensure their own energy

[1] https://cdn.naaee.org/

efficiency. Within the Eco-Smart project, our aim is to activate and encourage schools, students and school staff to be more energy-conscious, aware of the carbon emission and tackle the environmental and climate crisis of our planet.

Basically, in each area we have defined the more general environmental competencies that can be useful for in K12 education and the corresponding environmental values or morals.

With this framework, it will be possible to define the necessary actions to take at a behavioural level and engage schools, students and school staff in being literate environmentally. These frameworks to integrate environmental education into the curriculum will give teachers and students new opportunities to analyse issues; learn about connections between our economy, society, and environment; support economic growth; be more energy and environment conscious and become engaged citizens.

Why do we need environmental literacy?

"An environmentally literate person is someone who, both individually and together with others, makes informed decisions concerning the environment; is willing to act on these decisions to improve the wellbeing of other individuals, societies, and global environment; and participates in civic life."

The growth of the human population and the increasing power of our technology means that we are no longer just one of several million species inhabiting this planet. We are now an active agent of physical, chemical, biological and geological change. Our burning of fossil fuels has changed the capacity of the atmosphere to trap heat and so changed the climate [IPCC 2001].

As the population increases, the need for food, clean water, fuel, and space will increase and this means that inevitable increase in the demand on the world's natural resources that causes resource depletion and more consumption. The purpose of improving environmental literacy is to prepare people to understand and address such issues. Only an environmentally literate public will be able to find workable, evidence-based solutions for these challenges.

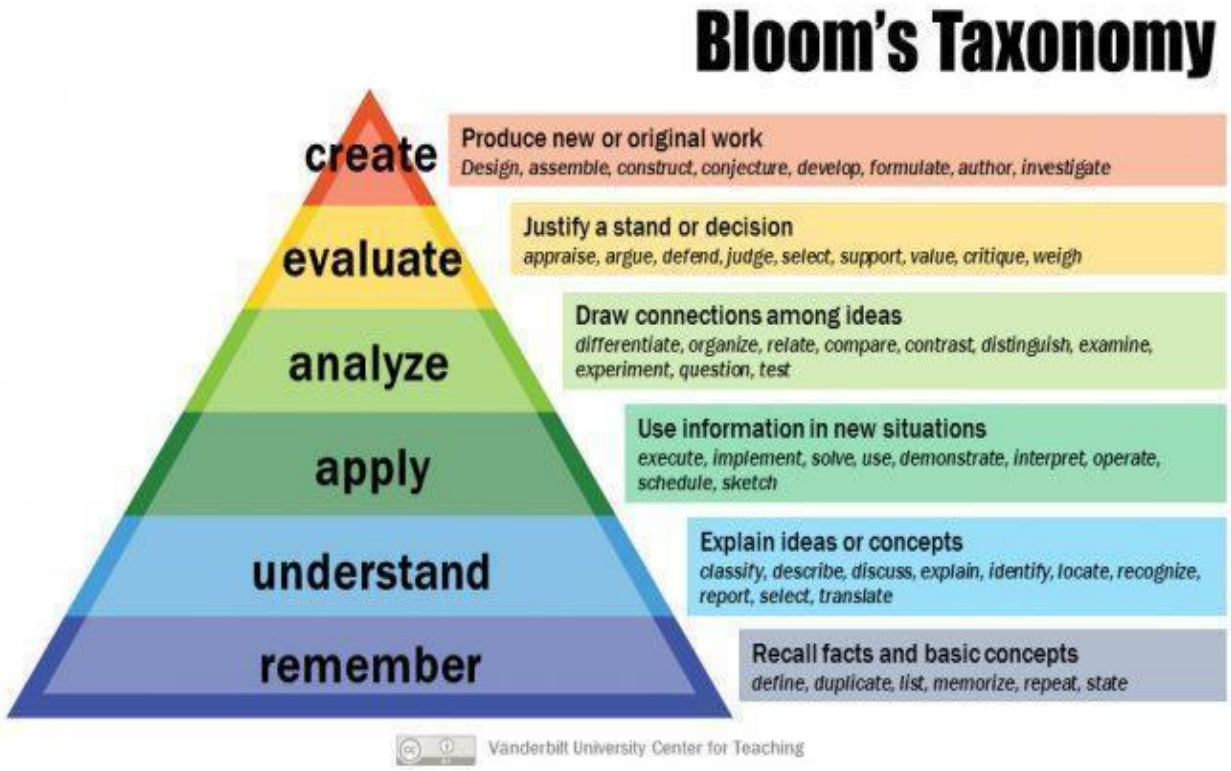
With this immense need, integrating environmental education into schools across Europe and developing an environmentally literate population that is able to solve the environmental and social challenges we will face this century is one of the best solutions to activate the society by leading young individuals to be environmentally literate and environment conscious. Recognizing the importance of environmental literacy, the Eco-Smart project aims to advance the integration of environmental education in schools throughout the Europe. Frameworks for environment literacy include affective, knowledge, cognitive skills, and behavioural components that supports further learning and new behaviours.

Guidelines to Prepare IO1 Environment Literacy Framework

This section provides details of the structure and content of each competence and learning outcomes. Each competence will include:

- Competence area
- Competence statement
- Learning outcome divided into
  - Knowledge
  - Skills
  - Attitude

Familiarly known as Bloom's Taxonomy, this framework elaborated by Bloom and his collaborators consisted of six major categories: Knowledge, Comprehension, Application, Analysis, Synthesis, and Evaluation. While generating the framework Bloom's Taxonomy steps and the verbs the given can be considered as a reference.



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Bloom's Digital Taxonomy

FRACTUS LEARNING

Bloom's taxonomy	Bloom's modified taxonomy	Bloom's extended digital taxonomy	Functional Levels	Activities with digital tools
		Sharing	Publicly sharing, publishing, broadcasting	Contributing to open social networks, publishing, broadcasting, networking
Evaluation	Creating	Creating	Designing, constructing, planning, producing, inventing, devising, making	Programming, filming, animating, blogging, video blogging, mixing, re-mixing, wiki-ing, videocasting, podcasting, directing
Synthesis	Evaluating	Evaluating	Checking, hypothesising, critiquing, experimenting, judging, testing, detecting, monitoring	Blog commenting, reviewing, posting, moderating, collaborating, refactoring, testing
Analysis	Analyzing	Conceptualizing	Comparing, organising, deconstructing, attributing, outlining, finding, structuring, integrating	Hacking, mashing, linking, validating, reverse engineering, cracking
Application	Applying	Applying	Implementing, carrying out, using, executing	Running, loading, playing, operating, uploading, sharing with group, editing
Comprehension	Understanding	Connecting	Interpreting, summarizing, inferring, paraphrasing, classifying, comparing, explaining, exemplifying	Boolean searches, advanced searches, blog journaling, tweeting, categorizing, tagging, commenting, annotating, subscribing
Knowledge	Remembering	Doing	Recognizing, listing, describing, identifying, retrieving, naming, locating, finding	Bullet pointing, highlighting, bookmarking, group networking, shared bookmarking, searching

Higher Order Thinking Skills

Lower Order Thinking Skills

Competence Area	#1 Environmental and Social Knowledge
Competence Statement	Environmental sensitivity or appreciation, in terms of responsible attitudes toward pollution, technology, economics, conservation, and environmental action, and a willingness to recognize and choose among differing value perspectives associated with problems and issues. Motivation to actively participate in environmental improvement and protection, desire to clarify one's own values, and confidence to make decisions and judgments about environmental issues according to one's sense of morality
Knowledge	1.1 Recognises the significance of environmental literacy 1.2 Explains environmental processes and systems 1.3 Understands the current climate change as an anthropogenic phenomenon resulting from the increased green gas and carbon emissions 1.4 Knows about the main ecological, social, cultural, economic consequences of climate change locally, nationally and globally
Skills	1.5 Explains ecosystem dynamics and the environmental, social, economic and ethical impact of climate change 1.6 Encourages others to act and protect climate 1.7 Collaborates with others and to develop commonly agreed up-on strategies to deal with climate change
Responsibility and Autonomy	1.8 Evaluates whether his/her actions are climate and environment-friendly and – if not- creates new patterns of behaviour as a whole towards the environment 1.9 Promotes climate-protecting and energy-conscious public policies 1.10 Supports personal and civic environment responsibility

Competence Area	#2 Electricity and School Heating
Competence Statement	To recognize the combination of responsible electricity and heating consumption awareness, knowledge, skills, responsibility and attitude needed to make electricity and heating consumption related decisions and ultimately take actions to reduce the adverse effect of electricity and heating consumption. To understand and apply the correct and sustainable mindset required to reduce the individual and institutional electricity and heating consumption.
Knowledge	2.1 To have understanding regarding the impact of electricity and heating consumption in the environment 2.2 Understands the components that affect electricity and heating consumption 2.3 Asks relevant questions about electricity and heating consumption conditions and issues 2.4 Knows about the importance of electricity and heating footprint 2.5 Understands the concept of responsible electricity and heating consumption and the consequences of individual and institutional irresponsible electricity and heating consumption. 2.6 Understands how electricity and heat is created, differentiate between sustainable sources and depletable fossil sources.
Skills	2.7 Calculates and evaluates one's electricity and heating footprint 2.8 Identify and analyse electricity and heating consumption related environmental issues 2.9 Encourages others to act towards responsible electricity and heating consumption 2.10 Collaborates with his/her peers to define action plans to increase responsible electricity and heating consumption in their families, friend circles and schools 2.11 Obtains some awareness about fundamental principles of building design and construction to save electricity and heating eg. isolation, efficient windows, airtight constructions, intelligent building control etc.
Responsibility and Autonomy	2.12 Advocates to reduce the electricity and heating consumption in his/her inner circle 2.13 Evaluates and make personal judgements about electricity and heating consumption related environmental issues 2.14 Promotes and implements ideas which tackle irresponsible electricity and heating consumption and its' consequences

Competence Area	#3 Water Consumption
Competence Statement	To recognize the combination of responsible water consumption awareness, knowledge, skills, responsibility and attitude needed to make water consumption related decisions and ultimately take actions to reduce the adverse effect of water consumption. To understand and apply the correct and sustainable mindset required to reduce the individual and institutional water consumption.
Knowledge	3.1 To have understanding regarding the impact of water consumption in the environment 3.2 Understands the components that effects water consumption 3.3 Asks relevant questions about water consumption conditions and issues 3.4 Knows about the importance of water footprint 3.5 Understands the concept of responsible water consumption 3.6 Understand the consequences of individual and institutional irresponsible water consumption locally, nationally and globally.
Skills	3.7 Calculates and evaluates one's water footprint 3.8 Identify and analyse water consumption related environmental issues 3.9 Encourages others to act towards responsible water consumption 3.10 Collaborates with his/her peers to define action plans to increase responsible water consumption in their families, friend circles and schools
Responsibility and Autonomy	3.11 Advocates to reduce the water consumption in his/her inner circle 3.12 Evaluates and make personal judgements about water consumption related environmental issues 3.13 Promotes and implements ideas which tackle irresponsible water consumption and its' consequences

Competence Area	#4 Carbon Footprint
Competence Statement	To enhance awareness on the impact and usefulness of carbon footprint in the environment, and to acquire knowledge, skills, responsibility and motivation needed to make less carbon emissions related decisions and ultimately take actions to reduce the adverse effect of carbon. To understand and apply the correct and sustainable mindset required to reduce the individual and school carbon by means of carbon footprints. In this way, students start discovering and learning about the interaction among human activities footprints, the environment and human well-being.
Knowledge	4.1 Learners will be able to define the concept of carbon footprint. 4.2 Learners will be able to list strategies (at least 6) to reduce their own, peers' and/or school's carbon footprints. 4.3 Learners will be able to describe why it is important to have as small a footprint as possible. 4.4 Learners will be able to examine the offset procedure of the carbon footprint.
Skills	4.5 Learners will be able to calculate and evaluate their carbon footprints. 4.6 Learners will be able to appraise the sources and assumptions behind the footprint calculations. 4.7 Learners will be able to collaborate with peers to share and establish action plans regarding carbon offset to reduce carbon footprints in their daily life.
Responsibility and Autonomy	4.8 Learners will be able to autonomously reflect upon their habits and the varying impact on the environment regarding carbon footprint. 4.9 Learners should identify the most useful areas and practices for themselves and for reducing carbon emissions.

Competence Area	#5 Climate Change
Competence Statement	To enhance awareness on the impact of climate change and its interaction with environment and human health, and to acquire knowledge, skills and responsibility and motivation needed to take actions to reduce the adverse effect of climate change.
Knowledge	5.1. Define the climatic conditions that are changing in response to the global warming 5.2. Describe and define the impacts of the changing climatic conditions 5.3. Understand of the complexities of the climate change and its' effect to the health 5.4. Describe the health co-benefits of climate change mitigation. 5.5. Define and describe adaptation strategies that are protective for human health.
Skills	5.6 Can develop a project to address a climate threat that pertains to a specific health outcome relevant to their local community, state or region of the country 5.7. To prepare visuals (poster, brochure, infographic, video, etc) that is an adaptation strategy from an economic, social and environmental perspective
Responsibility and Autonomy	5.8 Being aware of the effects of climate change on human health 5.9 To know what needs to be done in their school first to reduce climate change

Competence Area	#6 Waste Management
Competence Statement	To raise awareness in students, teachers and staff for waste management and how they can responsibly manage waste. To acquire the knowledge, skills, mindset, motivation and sense of commitment to work individually or collaboratively to solve environmental problems and to prevent them through effective waste management.
Knowledge	6.1 Introduction to the problems of waste and its pollution 6.2 To understand the consequences for the environment 6.3 To understand waste segregation. 6.4 Why it is important to REDUCING, RECYCLING, REFUSING and REUSING waste. 6.5 Sustainable waste 6.6 Behaviour and consequences towards waste management: What can you do at home?
Skills	6.7 Ability to identify environmental problems related to different types of waste in your school or community. 6.8 Analyse segregated waste quantities 6.9 Waste warrior 6.10 Communication skills to transfer the knowledge acquired. 6.11 Educating community on collective responsibility of waste management in the school
Responsibility and Autonomy	6.12 Change the outlook and bring about behaviour change in regard to waste management. 6.13 Self-reflection about waste management 6.14 Encourage their peers to reduce the volume of waste at school.