

Project result 2: Professional development training for scientists

Training materials for scientists & science communicators

1. General description of the module

Partner institution:	UNIBO - University of Bologna
Target group:	Students of a master degree in Didactics and History of Physics (pre-service teachers) or in Science Communication
Expertise needed per target group:	Basic understanding of Earth system Physics, Thermodynamics, complex systems
Overview of the module:	Climate change concepts and science dimensions (social, historical, cultural and ethical) learning module
Duration:	4 hours
Objectives:	Learning of climate change concepts and acquiring of analysis skills on resources and complex situation
Assessment:	Final debate and feedbacks

2. Description of the individual activities

Title of activity 1:	Introduction to climate change
Duration:	60-90 minutes
Core ideas – Content:	Introduction to the theme of climate change as a border interdisciplinary theme, which is placed among multiple disciplines and as a topic at the centre of the debate between science and society.
Objectives:	Acquisition of content skills related to climate change and in part to complex systems; acquisition of teaching and communication skills on climate change.
Detailed description of the activity's implementation (word limit 300 words max)	<p>The lesson will be structured in such a way as to touch upon the following points:</p> <ul style="list-style-type: none"> ● Climate variability as a complex system ● What are climate change and climate crisis ● Global warming ● The causes of climate change ● The consequences of climate change

	<ul style="list-style-type: none"> Difficulties in communicating climate change to the general public and difficulties in the understanding of the multiple factors concerning climate change. Presentation of the project STAGE <p>The lecture will focus in particular on the last two points, since the target is made up of students of master degree who are pre-service teachers or communicators. They are therefore supposed to have basic knowledge of complex systems and climate change, and that they want to deepen their knowledge of how to communicate complex issues to a group of students or to a particular audience.</p> <p>The analysis will show that climate change is a complex, multidisciplinary and multidimensional theme, since, in addition to the scientific dimension, it also concerns political, economic, social, psychological-behavioural, ethical and emotional-affective aspects. In particular, it is a future-oriented and future-relevant issue, as it represents a widely debated social challenge for its implications in the future. Therefore, it represents a stimulus to imagine ourselves in the future and to think about different types of future (probable, possible desirable).</p>	
Type of activity (<i>select & comment</i>):	Lecture	
Tools (<i>select & comment</i>):	Infographics	STAGE climate change infographics (3.1, 3.2)
Links of the activity sheets:		
Resources (<i>links to the toolkit & infographics</i>):		

Title of activity 2:	Coping with an emergency
Duration:	120 minutes
Core ideas – Content:	Structured activity in the form of a group role-play
Objectives:	Acquisition of teamwork skills, application of content skills in a practical activity, acquisition of citizenship and citizen science skills.
Detailed description of the activity's implementation	Students are divided into four groups and each group is assigned a different role: one group is composed of researchers/scientific advisors, one by politicians and

(word limit 300 words max)	<p>stakeholders, one by army and civil protection and another by communicators of science.</p> <p>Each group has the STAGE toolkit as a tool to consult and take inspiration for the development of the activity.</p> <p>Imagining themselves in an emergency situation in their city due to the climate crisis, groups will have to think about how to react to the crisis, based on their social role, and find effective ways to communicate the problem and resolution strategies to citizens.</p> <p>The emergency situation may be established by the professors or chosen by the students, but it must be the same for all groups. Groups can discuss with each other the elaboration of a strategic plan, but will then have to prepare individual presentations (per group) explaining their role in the attempt to tackle the emergency.</p> <p>The aim of the proposed activity is to allow students to get involved and think about how to act effectively in an emergency situation.</p> <p>The presence of different roles is aimed at highlighting the fact that this is a complex situation that requires the action of several people with different expertise and that touches the different dimensions of science. The game is also aimed at the development of some knowledge of citizen science and allows students to reflect on the different concepts of the future.</p>	
Type of activity (select & comment):	Role - play	
Tools (select & comment):	Toolkit	
Links of the activity sheets:		
Resources (links to the toolkit & infographics):	https://docs.google.com/document/d/1_fmKDSDXUaRuPltcNg8q3XMd-Cn-UJdW/edit?usp=share_link&ouid=113578649580425277672&rtpof=true&sd=true	

Title of activity 3:	Presentations and conclusions
Duration:	30-60 minutes
Core ideas – Content:	Final discussion and brainstorming

Objectives:	Acquisition of oral skills, collection of ideas and student feedback.	
Detailed description of the activity's implementation (word limit 300 words max)	<p>Each group presents its work and discusses it. The work can be exposed in a multimedia presentation, in a poster or in another format.</p> <p>A final discussion will follow the group presentations: students will be asked their feedback and opinions about the activities, positive and negative impressions and suggestions. This will be useful both for students, in order to collect ideas, elaborate the acquired skills and discuss with their classmates, and to professors for the assessment of the activities.</p>	
Type of activity (select & comment):	Group discussion	
Tools (select & comment):	Presentations	
Links of the activity sheets:		
Resources (links to the toolkit & infographics):		