Teacher Academy Project
TEACHING SUSTAINABILITY

Climate Crisis Resilience

Learning and Teaching Package 4

Overview of LTP 4 Units

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Contents

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CREDIT: Cover Photo from **Stop Disasters!** website.

Overview

This LTP explores an innovative approach to teaching for sustainability and resilience through educational games. It emphasises the transformative potential of gamification in enhancing both teaching and learning experiences related to sustainability, just transition and climate crises. It introduces the concept of gamification as a tool to understand the sustainability and what students can do to become resilient and contribute to the prevention of climate-related disasters. By using gamification and game-based learning, learners are provided with an opportunity to be actively engaged while learning about disaster risks and resilience. At the same time, they are encouraged to enhance their collaborative, problem-solving and creative thinking skills. The LTP is designed to encourage and support teachers and teacher-students to use serous games in their teaching of climate crisis, resilience and other aspects of sustainability. It is structured so that the playful, task-focussed and collaborative learning aspects of learning through gaming are modelled in and through the units – so as to increase pedagogical confidence and ability.

Unit 1 USING *SERIOUS GAMES* TO TEACH SUSTAINABILITY & RESILIENCE offers an introduction to key pedagogies and the learning possibilities of using 'serious games' for education and engagement around sustainability. 'Serious games' can be understood as games that focus toward problem-solving and awareness raising rather than entertainment and use features and characteristics of games and game-play to encourage learning and engage the learner in ways that open up challenging and complex issues in a meaningful and non-threatening way. Key elements of engagement such as meaning, ownership, social influence, achievability, challenge, and credibility enhance the success of gamification platforms. The unit explores how these can be incorporated into classroom game designs and activities and so strengthen participants' learning engagement. Uses explored in the Unit include awareness raising, encouraging action and resilience, and promoting pro-sustainability behaviours.

Unit 2 *STOP DISASTERS!* USING THE *UNDRR* GAME AS A LEARNING TOOL FOR DISASTER RISK REDUCTION & RESILIENCE is based around a digital game. The United Nations Office for Disaster Risk Reduction (UNDRR) has the mission of providing leadership and support to governments and organisations around the world who work in disaster risk reduction, with the goal of creating a world where natural disasters do not threaten the wellbeing of people or the future of the planet. As part of their outreach programme, UNDRR worked with game developer *PlayerThree* to create the ***Stop Disasters!*** game, which helps players learn about the effects of various natural disasters and how these might be prepared for and to some degree mitigated. This Unit focuses on the **Stop Disasters!** flood scenario, which takes place in a fictitious small village of a few hundred people in Eastern/Central Europe. The village is built on a large river which will flood after 20 minutes of game-play (in the Easy scenario) or when manually triggered by the player. The basic idea is that the player – or players working in teams – 'invest' a given sum of money in preparing the village for the expected flood. By repeating the scenario a number of times the player or team can learn to improve the outcomes for the village. Further details are provided in the Unit handbook accompanying this Unit.

Unit 3 TEACHING SUSTAINABILITY WITH SCENARIO-BASED LEARNING uses the framework of a scenario with the students engaging in role play. The main narrative behind this activity is the possible building of a holiday resort on an island with a small population and well-preserved nature. The local people discuss this proposal of the authorities and investors. As the decision will have a fundamental impact on the future of young people on the island, the locals would like to have some exchange with young Europeans, and this will be the role of the participants in the game. They students will hear the different views of stakeholders involved or impacted. They will also reflect on scientific resources. At the end of the scenario the participants will do a pitch with the advice they will give about the potential development of the project.

Unit 4 DESIGNING BOARD GAME TO TEACH CLIMATE CRISIS RESILIENCE & SUSTAINABILITY is focused on the design of a board game centred around climate crisis resilience. Through a gamified approach, this unit aims to equip learners with practical skills and knowledge to critically address challenges posed by the climate crisis in their local community or in a setting they know well or can easily relate to and to think about creative ways to solve these challenges. Students are encouraged to find problems in their immediate surroundings related to the climate crisis and to recognize potential solutions that can be implemented to mitigate climate change and build resilience through play and through the building of board games.

Pedagogical Approach

This LTP is designed to encourage and support teachers and teacher-students to use serous games in their teaching relating to climate resilience and other aspects of sustainability. The Units are structured so that aspects can be used either in-person as part of a seminar/workshop or at-distance in the form of a wholly online teacher learning event – depending on the needs of the professional learning context.

The pedagogical approach of integrating serious games and role plays in an educational activity is rooted in the principles of experiential learning and active engagement. By incorporating serious games, learners are immersed in a dynamic and interactive environment that stimulates critical thinking and problem-solving skills. The use of role plays adds a layer of realism, allowing participants to apply theoretical knowledge in practical scenarios. The teaching content is presented in a way that makes abstract and complex concepts more relatable to students, which contributes to better understanding and retention of knowledge.

The need to build resilience and understanding for climate action

Encouraging young people to study issues like resilience and climate action is crucial gives them insights into sustainable living and promotes critical thinking and problem-solving skills. Understanding the interconnected nature of these challenges provides a holistic perspective for making informed decisions. Education on these issues empowers youth people, preparing them for the future with adaptability and sustainability in mind. It also fosters environmental and social responsibility, so shaping a more informed and proactive global citizenry. In summary, engaging with these topics early on equips young individuals to contribute to a sustainable and more resilient world.

Piloting of the materials within TAP-TS

Unit 1: The central ideas and approach were designed in cooperation with a group of UCD student teachers on the PME (Professional Master's in Education) secondary teacher education programme in autumn 2022. Draft materials and activities were tested with another PME group in autumn 2023. A final validation check took place in Oct 2024 when the materials for this Unit were explored by a group of participants at an ECPR Teaching Methods School in Maastricht, The Netherlands.

Unit 2: Draft materials and activities were tested with UCD student teachers on secondary teacher education programmes in 2022 and 2023. In addition, in association with SCoTENS (the Standing Conference on Teacher Education North and South, Ireland) refined versions were used in North/ South online webinars in Jan 2022 and Feb 2023. Versions of the unit were used off-line as part of ALEs 1 and 2 and it is intended to validate the final packages in the TAP-TS ALEs and Summer Schools in 2024.

Unit 3: This unit has been piloted both in an online and face-to-face setting. The first Online Workshop lasted for one week. The participants worked individually but also collaboratively, both asynchronously and synchronously during the 2 webinars that made part of the Online Workshop. A similar online course will be organized in the autumn of 2024 open to a wide public. The face-to-face version of the unit was piloted twice during the first

Summer School in Cyprus. The online course is available as open access with registration to view on this page - Teacher Academies Project: All courses | Teacher Academies Project

Unit 4: The materials of Unit 4 were presented during ALE 1 Santarem, Portugal as a one hour and a half workshop for practising teachers, student teachers and teacher educators. Participants made a number of suggestions and recommendations that were incorporated into the final version of the Unit. Additionally, elements of the unit were validated at the TAP-TS Autumn School in Pirna, September 2024.

ECTS Distribution

UNITS	**Hours***	**ECTS**
UNIT 1. INTRODUCTION	10	0.5
UNIT 2. STOP DISASTERS! USING THE *UNDRR* GAME AS A LEARNING TOOL FOR DISASTER RISK REDUCTION & RESILIENCE	10	0.5
UNIT 3. TEACHING SUSTAINABILITY WITH SCENARIO-BASED LEARNING	10	0.5
UNIT 4. DESIGN BOARD GAMES TO TEACH CLIMATE CRISIS RESILIENCE & SUSTAINABILITY	20-25	1
Total ECTS Value		2.5

*Taught plus personal learning follow-out

UNIT 1. USING SERIOUS GAMES TO TEACH SUSTAINABILITY & RESILIENCE

Main Topic	Target Group	Duration	Knowledge Area/ Subjects in School	Activities	Possible assessment
Approaching teaching & learning for sustainability through serious games; an introduction.	Teachers / student teachers with an interest in educational gaming as a pedagogical strategy.	Class time: 2 x 45 mins. Learner preparation & follow-out: 8-9 hours	1: Sustainability and climate action. 2: Politics & Society	Activity 1. Defining sustainability Activity 2. Characteristics of a teaching game Activity 3. Game Design Activity 4. Gamemaking *Activity 5. Reflection on teacher practice*	Teacher determined- could include an action project / game making on (un)sustainable development or climate change.

Intended Learning Outcomes	**By working through the activities and materials, students will:** • D2.4/1/LO1: Explore the wholistic nature of strong learning for sustainability in school teaching & learning setting. • D2.4/1/LO2: Examine the characteristics of strong games for teaching & learning on sustainability and resilience; to include understanding the range of possibilities and the limitations of using games with young adult learners. • D2.4/1/LO3: Develop an understanding of how using and making games can be a valuable way to learn for sustainability and resilience in classroom settings.
Prior Competencies	**Obligatory:** • No prior competencies required. **Optional/ideal:** • Digitally capable of meaningful engagement with lesson materials and sources. • Collaboration and cooperation skills to support group activities and agreed solutions.
Required materials	• Access to online prompts for Activity 2 (or downloaded alternative). • Access to printouts / digital copies of unit worksheets and resources.
Cooperation/ Networking	The unit could facilitate contacts with agencies and organisations with an interest in developing / using educational/ serious games.
Practical Notes for Teachers	The learning materials and approaches presented in this unit are in four activity blocks directed at learners / participants; timewise, these can easily be adjusted depending on time available and the teaching needs of the group. For example, Activity 3 could easily be extended to fill a full teaching session and Activity 4 could be the source of an individual / collaborative after class challenge or homework assignment. Activity 5 relates to teacher reflection and is intended to facilitate and support teacher learning.
	Embodying sustainability values

Addressing GreenComp	X	1.1 Valuing sustainability	To reflect on personal values; identify and explain how values vary among people and over time, while critically evaluating how they align with sustainability values.
	X	1.2 Supporting fairness	To support equity and justice for current and future generations and learn from previous generations for sustainability.
	X	1.3 Promoting nature	To acknowledge that humans are part of nature; and to respect the needs and rights of other species and of nature itself in order to restore and regenerate healthy and resilient ecosystems.
	Embracing complexity in sustainability		
	X	2.1 Systems thinking	To approach a sustainability problem from all sides; to consider time, space and context in order to understand how elements interact within and between systems.
	X	2.2 Critical thinking	To assess information and arguments*, identify assumptions, challenge the status quo, and reflect on how personal, social and cultural backgrounds influence thinking and conclusions.
	X	2.3 Problem framing	To formulate current or potential challenges as a sustainability problem in terms of difficulty, people involved, time and geographical scope, in order to identify suitable approaches to anticipating and preventing problems, and to mitigating and adapting to already existing problems.
	Envisioning sustainable futures		
	X	3.1 Futures literacy	To envision alternative sustainable futures by imagining and developing alternative scenarios and identifying the steps needed to achieve a preferred sustainable future
	X	3.2 Adaptability	To manage transitions and challenges in complex sustainability situations and make decisions related to the future in the face of uncertainty, ambiguity and risk.
	X	3.3 Exploratory thinking	To adopt a relational way of thinking by exploring and linking different disciplines, using creativity and experimentation with novel ideas or methods.
	Acting for sustainability		
	X	4.1 Political agency	To navigate the political system, identify political responsibility and accountability for unsustainable behaviour, and demand effective policies for sustainability.
	X	4.2 Collective action	To act for change in collaboration with others.
	X	4.3 Individual initiative	To identify own potential for sustainability and to actively contribute to improving prospects for the community and the planet.

UNIT 2. STOP DISASTERS! USING THE *UNDRR* GAME AS A LEARNING TOOL FOR DISASTER RISK REDUCTION & RESILIENCE

Main Topic	Target Group	Duration	Knowledge Area/ Subjects in School	Activities	Possible assessment
Using *Stop Disasters!* to teach Disaster reduction & readiness, and Resilience.	Teachers / student teachers with an interest in educational gaming as a pedagogical strategy.	Class time: 2 or 3 x 45 mins. Learner preparation & follow-out: 8-9 hours	1: Sustainable development. 2: Politics & Society	Activity 1. Group Discussion Activity 2. Playing the Game Activity 3. Reflection Activity 4. Teaching and Learning Challenge *Activity5. Reflection on teacher practice*	Teacher determined
Intended Learning Outcomes	**Having worked through the activities and materials, students will be able to:** • D2.4/2/LO1: Plan, teach, and reflect on learning activities /opportunities provided for students by using *Stop Disasters!* in a teaching & learning setting. • D2.4/2/LO2: Use *Stop Disasters!* meaningfully within teaching & learning settings; to include understanding the range of possibilities and the limitations of using the game with young adult learners.				

	• D2.4/2/LO3: Develop context-specific extensions and supplementary materials to accommodate diverse learner-needs when teaching with *Stop Disasters!*
Prior Competencies	Obligatory: • No prior competencies required. Optional/ideal: • Digitally literate to a level that allows meaningful engagement with *Stop Disasters!* online support materials. • Collaboration and cooperation skills to support group activities and agreed solutions.
Required materials	Group-level access to the *Stop Disasters!* Game on the UNDRR platform: ***https://www.stopdisastersgame.org/*** • Digital projector / interactive board with good broadband connection. • Access to the **TAP-TS *Stop Disasters!* Handbook** and other resources.
Cooperation/ Networking	The unit could facilitate contacts with agencies and organisations with a brief in DRR and societal resilience such as UNDRR or DG-ECHO as well as more local bodies involved in flood preparation and education like Civil Defence / Civil Protection Organisations and NGOs.
Practical Notes for Teachers	The materials as presented below are in four blocks of approx. 60 minutes each, but this can easily be adjusted depending on time available at the discretion of the teacher. Examples of teachers' individual adjustments can be found relatively easily through online searches. These would include, for instance, the way that Amanda Rosen suggests to build home preparation and follow through into the use of the game [https://activelearningps.com/2012/08/02/online-educational-games-natural-disaster-preparation-with-stop-disasters/], or using the various worksheets and resources located through a search. Useful materials including worksheets by Mike Farley can be found here: http://mrsmoorekhs.weebly.com/uploads/2/2/4/6/22468214/2008-monograph-stop-disasters-simulation.pdf Note: many of these may have old timestamps and/ or older http-type URLs as ***Stop Disasters!*** has been around for a considerable amount of time.

Addressing GreenComp

Embodying sustainability values		
X	1.1 Valuing sustainability	To reflect on personal values; identify and explain how values vary among people and over time, while critically evaluating how they align with sustainability values.
X	1.2 Supporting fairness	To support equity and justice for current and future generations and learn from previous generations for sustainability.
X	1.3 Promoting nature	To acknowledge that humans are part of nature; and to respect the needs and rights of other species and of nature itself in order to restore and regenerate healthy and resilient ecosystems.
Embracing complexity in sustainability		
X	2.1 Systems thinking	To approach a sustainability problem from all sides; to consider time, space and context in order to understand how elements interact within and between systems.
X	2.2 Critical thinking	To assess information and arguments*, identify assumptions, challenge the status quo, and reflect on how personal, social and cultural backgrounds influence thinking and conclusions.
X	2.3 Problem framing	To formulate current or potential challenges as a sustainability problem in terms of difficulty, people involved, time and geographical scope, in order to identify suitable approaches to anticipating and preventing problems, and to mitigating and adapting to already existing problems.
Envisioning sustainable futures		
X	3.1 Futures literacy	To envision alternative sustainable futures by imagining and developing alternative scenarios and identifying the steps needed to achieve a preferred sustainable future
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X	3.3 Exploratory thinking	To adopt a relational way of thinking by exploring and linking different disciplines, using creativity and experimentation with novel ideas or methods.
Acting for sustainability		
X	4.1 Political agency	To navigate the political system, identify political responsibility and accountability for unsustainable behaviour, and demand effective policies for sustainability.
X	4.2 Collective action	To act for change in collaboration with others.

	X	4.3 Individual initiative	To identify own potential for sustainability and to actively contribute to improving prospects for the community and the planet.

UNIT 3. TEACHING SUSTAINABILITY WITH SCENARIO-BASED LEARNING

Main Topic	Target Group	Duration	Knowledge Area/ Subjects in School	Activities	Suggestions for assessment
Decision making; critical skills development; collaboration; advocacy for sustainability issues	For teachers working with secondary school students	Class time: 2 or 3 x 45 mins. Learner preparation & follow-out: 8-9 hours.	Language – Arts Science	**Start-up** Warm-Up **Development** **Activity 1: Transport** Getting to the island. **Activity 2: Meeting Hall** Getting to the Meeting Hall **Activity 3: Stakeholders** Empathise with stakeholders **Activity 4: Prepare advice** Create pitch **Consolidation: Final Pitches** Presentation of final advice **Follow-up** Reflection and Feedback	Assessment is part of the scenario

Intended Learning Outcomes	**Working through the activities and materials, students will:** • D2.4/3/LO1. Experience the complexity of decision making • D2.4/3/LO2. Give a motivated answer to a complex problem • D2.4/3/LO3. Create a consensus with other team members • D2.4/3/LO4. Reflect on personal behaviour regarding sustainability and environmental issues		
Prior Competencies	The reading and video materials are in English and require a basic to more advanced level of English.		
Required materials	• Smartphones and/or laptops • Drafting materials such as pens / markers/paper etc		
Cooperation/ Networking	• Students work in groups of 2 or 4; depending on stage and nature of learning tasks		
Addressing GreenComp		**Embodying sustainability values**	
	X	1.1 Valuing sustainability	To reflect on personal values; identify and explain how values vary among people and over time, while critically evaluating how they align with sustainability values.
		1.2 Supporting fairness	To support equity and justice for current and future generations and learn from previous generations for sustainability.
	X	1.3 Promoting nature	To acknowledge that humans are part of nature; and to respect the needs and rights of other species and of nature itself in order to restore and regenerate healthy and resilient ecosystems.
		Embracing complexity in sustainability	

	x	2.1 Systems thinking	To approach a sustainability problem from all sides; to consider time, space and context in order to understand how elements interact within and between systems.
	x	2.2 Critical thinking	To assess information and arguments*, identify assumptions, challenge the status quo, and reflect on how personal, social and cultural backgrounds influence thinking and conclusions.
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	Envisioning sustainable futures		
	x	3.1 Futures literacy	To envision alternative sustainable futures by imagining and developing alternative scenarios and identifying the steps needed to achieve a preferred sustainable future
		3.2 Adaptability	To manage transitions and challenges in complex sustainability situations and make decisions related to the future in the face of uncertainty, ambiguity and risk.
		3.3 Exploratory thinking	To adopt a relational way of thinking by exploring and linking different disciplines, using creativity and experimentation with novel ideas or methods.
	Acting for sustainability		
		4.1 Political agency	To navigate the political system, identify political responsibility and accountability for unsustainable behaviour, and demand effective policies for sustainability.
		4.2 Collective action	To act for change in collaboration with others.
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Unit 4. DESIGNING BOARD GAMES TO TEACH CLIMATE CRISIS RESILIENCE & SUSTAINABILITY

Main Topic	Target Group	Duration	Knowledge Area/ Subjects in School	Activities	Suggestions for assessment
Learning about climate crisis resilience through board game design	Pre-service and In-service teachers for students from secondary schools.	Flexible. Ideally, Class activities across: 3 or 4 x 45 mins. Learner follow-out: 10-12 hours. Game testing & showcasing: 10-12 hours	Biology Chemistry Ecology Language Arts	**Start-up** Your experience matters **Development** **Activity 1.** Introduction to Game Design **Activity 2.** Prototype Game Design **Activity 3.** Game Testing **Consolidation.** Feedback and Game Redesign **Follow-up.** Evaluation Reflection on practice	Peer feedback in the format 2 stars and a wish, rubrics for summative assessment, peer and self-assessment
Intended Learning Outcomes	**Having worked through the activities and materials, students will be able to:** • D2.4/4/LO1. Recognize different types of climate challenges in their surroundings. • D2.4/4/LO2. Define possible responses to climate challenges to build up resilience. • D2.4/4/LO3. Create a prototype of a board game and test it.				

Prior Competencies	Optional/ideal: Experience of LT4 Unit 1. Using serious games to teach sustainability & resilience.		
Required materials	Cardboard, markers, pen, paper, index cards, etc., further materials dependent on the board game design, e.g. dice, spinners, etc.		
Cooperation / Networking	Local recycling companies Recycling collection centres		
Addressing GreenComp	**Embodying sustainability values**		
	X	1.1 Valuing sustainability	To reflect on personal values; identify and explain how values vary among people and over time, while critically evaluating how they align with sustainability values.
	x	1.2 Supporting fairness	To support equity and justice for current and future generations and learn from previous generations for sustainability.
	x	1.3 Promoting nature	To acknowledge that humans are part of nature; and to respect the needs and rights of other species and of nature itself in order to restore and regenerate healthy and resilient ecosystems.
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	x	4.3 Individual initiative	To identify own potential for sustainability and to actively contribute to improving prospects for the community and the planet.

Project partners

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