



Co-funded by
the European Union



ECODISCOVERY

"Play And Discover The Future"



PROJECT RESULT 3 • TRAINING & WORKSHOP MATERIALS

Training Modules

A Handbook for Creating Environmental Educational Games

Project: EcoDiscovery – Play And Discover The Future

Project No: 2024-1-CZ01-KA210-SCH-000245194

Website: www.ecodiscovery.eu



License. This project was created under the Creative Commons license: Attribution-Non-Commercial-Share Alike (CC BY-NC-SA). All or part of this project may be used, copied, and disclosed provided that the origin is mentioned, it is not used commercially, and its license is not modified.

<https://creativecommons.org/licenses/by-nc-sa/4.0/>

Disclaimer & Funding Acknowledgement. Funded by the European Union. Views and opinions expressed are however those of the author(s) only and do not necessarily reflect those of the European Union or the European Education and Culture Executive Agency (EACEA). Neither the European Union nor EACEA can be held responsible for them.

About This Handbook

This handbook compiles the training content delivered during the three Learning, Teaching and Training (LTT) activities of the EcoDiscovery project. It is a practical reference for teachers and educators who wish to replicate the workshops and methodology used to create the ECOTOPIA educational game. The three modules follow the project journey and are designed so that each builds on the previous one.

The Four Themes of ECOTOPIA

Each theme becomes a chapter of interactive, mission-based learning

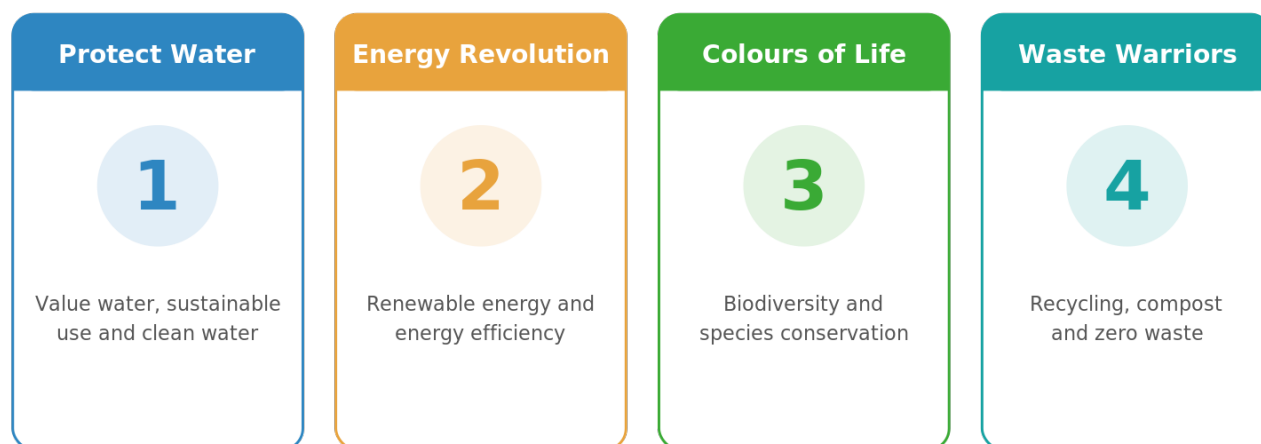


Figure 1. ECOTOPIA turns four environmental themes into four playable chapters.

ECOTOPIA is a scenario-based, mission-oriented game for learners aged 10–14, built in Unity and available on web, Android, APK and Windows in four languages. Players join an Eco-Team and solve real problems across water, energy, biodiversity and waste, supported by information cards, a scoring system and an in-game AI assistant.

Target groups

- Teachers of science, geography, citizenship, ICT, art and English (CLIL).
- Educators and NGO facilitators running game-based or project-based learning.
- Learners aged 10–14 taking part as designers and testers.

The Three LTT Activities

Each mobility built on the outputs of the previous one



Figure 2. The three LTT activities, each building on the outputs of the previous one.

Module 1 corresponds to LTT-1 (Balıkesir, Türkiye), Module 2 to LTT-2 (Varnsdorf, Czechia) and Module 3 to LTT-3 (Paris, France).

Methodological Framework

The training is built on five connected principles. Together they turn environmental content into an active, creative and collaborative experience rather than passive information transfer.

Methodological Framework

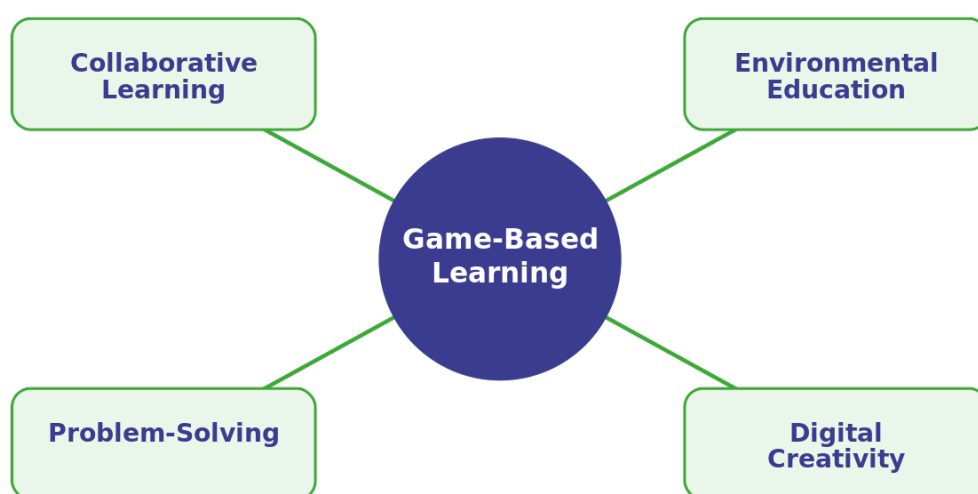


Figure 3. Game-based learning at the centre of the ECOTOPIA methodology.

Game-based learning

Learners build knowledge by designing and playing games. Environmental content is embedded in missions, choices and feedback so concepts are experienced rather than only memorised. Immediate feedback – information cards for weak choices and data for good ones – is a core mechanism.

Collaborative learning

Mixed-ability, and where possible mixed-nationality, teams work together. Peer support and shared ownership drive motivation, as demonstrated across the three EcoDiscovery mobilities where cultural diversity became a genuine creative asset.

Environmental education

Every activity connects to real environmental systems – water, energy, biodiversity and waste – and to concrete actions learners can take in daily life, closing the gap between knowledge and behaviour.

Problem-solving

Participants identify a problem, weigh options and design a solution, developing critical thinking. Missions place learners in decision-making roles and show the consequences of their choices.

Digital creativity

Learners express ideas through digital tools such as the Unity game engine, building digital literacy, visual thinking and confidence with technology.

The Design Process

Across the three modules, the game was developed within a spiral educational game-design model. The four phases are not independent: each builds on the outputs of the previous one and the cycle repeats as the product improves.

Spiral Educational Game Design Model

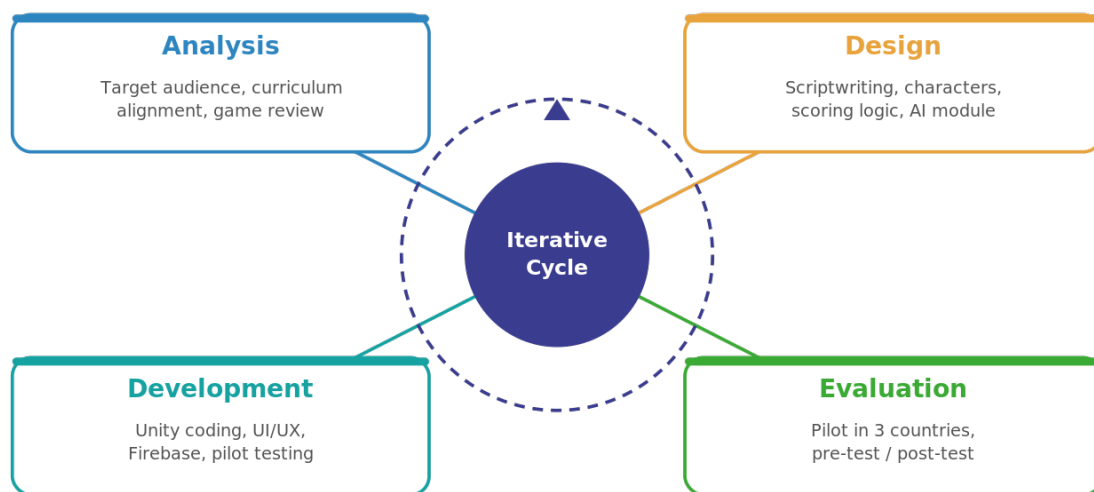


Figure 4. The spiral model: analysis, design, development and evaluation, repeated iteratively.

Every mission the learners design follows the same micro-cycle, mirroring the game's own feedback loop and reinforcing the method at task level.

How Every Mission Works

A repeating cycle that turns play into learning and action



Figure 5. The five-step mission cycle used throughout ECOTOPIA.

Module 1 | Idea Development & Script Design

Module 1 builds the creative and conceptual foundation of an environmental game. It corresponds to LTT-1 and turns environmental problems into stories, characters and missions. It works well as a one-day workshop or a series of shorter sessions.

1. Environmental problem identification

Participants explore an environmental theme (water, energy, biodiversity or waste), research real problems and choose one to address through a game. Reviewing existing sustainability games (for example SimCity, Eco, Terra Nil) helps anchor abstract concepts in playable ideas and reveals gaps to improve on.

2. Story development

Teams create a simple narrative: a setting, a challenge and a goal. In ECOTOPIA this is the story of an ordinary student who notices small problems – a dripping tap, lights left on, litter, a polluted pond – and becomes an Eco-Team hero by solving them.

3. Character creation

Participants design a hero and supporting characters that embody the environmental message, giving the player someone to identify with and a reason to care.

4. Mission design

Each story is broken into short missions with a clear task, interactive steps, information cards and a real-life action. Missions balance challenge, learning and fun, and follow the five-step cycle in Figure 5.

5. Group work & feedback

Teams present their concepts and give structured peer feedback, refining ideas collaboratively before moving to visual design. Archiving these concepts feeds directly into Module 2.

Learning outcomes – by the end, participants can:

- identify an environmental problem suitable for a game
- develop a story, characters and missions around it
- embed accurate environmental facts in gameplay
- give and receive constructive creative feedback

Module 2 | Visual Design & Game Mechanics

Module 2 translates ideas into visual and interactive assets. It corresponds to LTT-2 and focuses on how a game looks and how it plays.

1. Visual design principles

Participants learn about colour, contrast, layout and theme, using visual language to reflect environmental ideas – for example, colour palettes that express the climate crisis.

2. Child-friendly interfaces

Interfaces are kept clear and accessible for ages 10–14: large buttons, simple icons, readable text and helpful feedback for every action.

3. Basic game mechanics

Teams implement core mechanics – movement, clicking, dragging, sorting and choices – and connect them to scoring, stars and badges that motivate different player types (achievers, explorers and social players).

4. Prototype development

Using the Unity engine, participants build a playable prototype of one or two missions, integrating visuals with mechanics.

5. Testing

Prototypes are tested within the group; observations guide quick improvements to clarity, difficulty and engagement.

Learning outcomes – by the end, participants can:

- apply basic visual design principles to a game
- design a clear, child-friendly interface
- implement core mechanics in a prototype
- test and improve a prototype based on feedback

Module 3 | Game Development & Launch

Module 3 completes the game and prepares it for players. It corresponds to LTT-3 and covers finishing, testing, publishing and sharing.

1. Final development

Teams integrate all mission sections into one build, add final polish and fix bugs to make the game launch-ready across web, Android and Windows.

2. User testing

The game is tested with real learners. Structured observation and simple tasks reveal where players succeed, struggle or lose interest.

3. Feedback collection

Feedback is gathered through short forms and discussion, then prioritised and integrated into the final build.

4. Publishing

The game is prepared for release in web, Android (Google Play and APK) and Windows versions, with clear access information for schools and families.

5. Dissemination

Teams plan how to share the game – the project website, social media, school events and partner networks – so it reaches as many learners as possible.

Learning outcomes – by the end, participants can:



- finalise and debug a complete game build
- run structured user testing and integrate feedback
- prepare a game for web, mobile and desktop publishing
- plan and carry out a dissemination campaign