GreenEDU

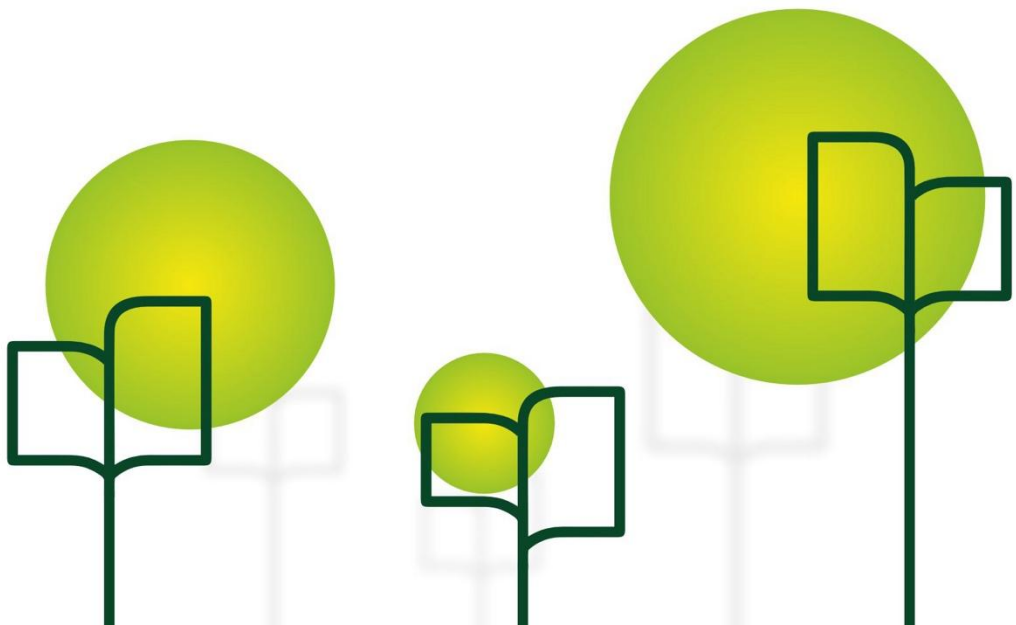
Closing the gaps between HE and the green economy

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Inspiration guide for the GreenEDU Curriculum: Comprehensive Framework for Green Skills in Higher Education (WP3)

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GENERAL INTRODUCTION

Abstract: Main Idea of the Inspiration Guide

The GreenEDU curriculum is an interactive journey through the 12 GreenComp skills, enhanced with other applicable frameworks for green skills enhancement within Higher Education Institutions: the SDGs, the EntreComp4Transition, and the Green Business framework.

During this journey we progress from values to actions, from analysis to innovation, and from individual reflection to collective impact. Augmented Reality (AR) supports these transitions as an augmented and experience-oriented learning environment.

With this guide, we want to inspire educators to implement the GreenEDU curriculum by offering three types of practical tasks:

- **1-Day Tasks (Reflection):** Quick, intensive "bursts" of awareness to build a foundation of sustainability values.
- **1-Week Tasks (Analysis):** Research-driven projects that utilize systems thinking and futures literacy to understand complex problems.
- **Semester Tasks (Impact):** Long-term, iterative projects involving stakeholder engagement, prototyping, and policy advocacy.

How to Use This Guide

- As you progress through these tasks, you are encouraged to embrace the **GreenEDU mindset**: be critical of "greenwashing," think in systems rather than silos, and always consider the fairness and social justice implications of environmental solutions. Whether you are conducting a one-day "Greenwashing Audit" or launching a semester-long "Campus Living Lab," you are contributing to a larger transition toward a regenerative society.
- The goal is not perfection, but **agency**. By engaging with these practical tasks, you are transforming from a student of sustainability into an architect of a green future.
- The domains chosen in the examples are just examples and are not exclusive for these types of tasks.

Bridging the Gap: The Pedagogical Philosophy

The tasks outlined in this guide are rooted in two primary didactical frameworks: **Merrill's First Principles of Instruction** and **Design Thinking**.

- **Problem-Centered Learning:** We do not start with a textbook; we start with a challenge—whether it is the carbon footprint of your morning coffee or the systemic waste in a university laboratory.

- **Authentic Contexts:** By utilizing the campus as a "Living Lab," these tasks ensure that students are not passive recipients of knowledge but active "constructors" of sustainable solutions.
- **Tiered Implementation:** Sustainability is a journey that requires different levels of commitment. We have structured this guide into three temporal tiers to reflect this:

First Principles of Instruction (Merrill, 2002; 2012)

Merrill's framework focuses on how people learn. It is based on the idea that learning is most effective when it is problem-centred and when learners are actively engaged in solving real challenges.

Five Key Principles:

- **Activation of prior knowledge** - Connect new content to existing knowledge
- **Demonstration** - Show examples and present information
- **Application** - Engage learners in solving problems and practicing
- **Integration** - Support the integration of learning into life
- **Problem-centred learning** - Organize all instruction around solving relevant problems

This model provides a logical, evidence-based sequence that helps learners connect new knowledge to what they already know, practice skills, and transfer them to authentic contexts.

Design Thinking (Brown, 2008; Razzouk & Shute, 2012)

Design Thinking brings a non-linear, creative, and human-centred approach to educational design. It follows phases such as:

- **Empathize** - Understand users' needs and contexts
- **Define** - Clearly articulate the problem
- **Ideate** - Generate creative solutions
- **Prototype** - Create tangible representations
- **Test** - Gather feedback and iterate

This process encourages educators and learners to deeply understand users' needs, explore ideas collaboratively, and experiment with possible solutions. It values iteration, reflection, and empathy; qualities essential in complex, real-world learning environments.

Integration of Both Frameworks with AR

First principles	Design Thinking	AR Curriculum
Activation of prior knowledge	Empathize	Students explore real contexts via AR, matched with the SDGs
Demonstration	Define / Ideate	AR visualizations concretize abstract concepts
Application	Prototype	Students create sustainable solutions in AR

Integration	Test	Students reflect and present to stakeholders or companies

TYPES OF TASKS

Based on the **GreenEDU Curriculum**, the implementation of green skills in Higher Education requires a move away from passive learning toward **active, problem-centered methodologies**. The curriculum suggests that tasks should not just be "assignments" but "interventions" within a **Living Lab** environment.

The following summary categorizes the types of tasks most effective for implementing the four core areas of the curriculum:

Reflective and Value-Based Tasks (Area 1: Embodying Values)

These tasks focus on internalizing the ethical dimensions of sustainability. They aim to shift a student's perspective from abstract global issues to personal and professional responsibility.

- **Sustainability Audits:** Personal or institutional assessments of carbon footprints, waste streams, or water usage to ground data in reality.
- **Ethical Inquiries:** Examining supply chains or corporate mission statements to identify the balance between "Prosperity" and "Planet/People."
- **Nature Immersion:** Fieldwork designed to restore a connection with local ecosystems, identifying biodiversity and human impact firsthand.

Analytical and Systems-Thinking Tasks (Area 2: Analytical Capacity)

These tasks move beyond symptoms to look at root causes. They require students to handle complexity and challenge simplistic "green" narratives.

- **System Mapping:** Using tools like Causal Loop Diagrams to visualize how different campus or industrial elements (e.g., energy, transport, food) interact.
- **Critical "Greenwashing" Audits:** Analyzing marketing claims versus scientific evidence to develop a critical eye for corporate transparency.
- **Life Cycle Analysis (LCA):** Tracing a single product from raw material extraction to disposal to understand hidden social and environmental costs.

Visionary and Futures-Oriented Tasks (Area 3: Visionary Thinking)

These tasks bridge the gap between "what is" and "what could be." They leverage creativity and technology to explore non-linear progress.

- **Backcasting Workshops:** Starting with a sustainable vision for 2050 and working backward to identify the legislative and technical milestones needed today.

- **Scenario Building:** Creating "Best Case," "Worst Case," and "Status Quo" narratives for a local community to build adaptive capacity.
- **AR (Augmented Reality) Prototyping:** Using digital tools to visualize how a physical space (like a campus square) would look if it were redesigned for biodiversity or renewable energy.

Applied Action and Agency Tasks (Area 4: Action & Agency)

These are the "capstone" tasks where students act as change agents. They are designed to be iterative, following the **Design Thinking** process (Empathize → Define → Ideate → Prototype → Test).

- **Living Lab Projects:** Real-world experiments on campus where students test a solution (e.g., a new composting system or a car-pooling app) and measure the results.
- **Policy Advocacy & Pitching:** Developing formal policy briefs or "pitches" to university boards, local government, or businesses to advocate for systemic change.
- **Entrepreneurial "Micro-Mandates":** Small-scale initiatives where students manage a project from start to finish—handling budgets, stakeholder communication, and implementation.

Key Implementation Principles

To be successful, any task selected from the categories above should adhere to the **GreenEDU guiding principles**:

- **Problem-Centered:** Every task must solve a real-world sustainability challenge.
- **Authentic Context:** Tasks should happen in the "real world" (the campus, a local business, or a neighborhood), not just in the classroom.
- **Stakeholder Engagement:** Students should interact with real practitioners, from campus facility managers to local NGOs.
- **Reflection & Iteration:** Tasks should include structured time for students to reflect on what failed, why, and how to improve the next version.

EXAMPLES OF TASKS

1-Day Tasks

Example 1 Personal Footprint & Planetary Boundaries Audit

Domain	Domain 1: Valuing Sustainability
Learning goals	• Recognize the importance of sustainability for oneself and society through the "Five Ps" lens (People, Planet, Prosperity, Peace, Partnership).

	• Analyse ethical consumption and global footprints using concepts such as Doughnut Economics. • Reflect on personal consumption behavior and its specific ecological footprint.
Task	Students calculate their personal ecological footprint and compare it to the **"Ecological Ceiling"** and **"Social Foundation"** concepts from **Doughnut Economics**.
Activity	Use a carbon calculator to determine personal impact, then create a digital infographic reflecting on which "Planetary Boundaries" their lifestyle most impacts.
Output	A one-page "My Footprint vs. The Planet" infographic with three personal commitment points.

Example 2 The Greenwashing Detective

Domain	Domain 5: Critical Thinking
Learning goals	• Identify and deconstruct various forms of greenwashing in corporate communication and product labelling. • Evaluate the validity of sustainability reports and eco-labels using evidence-based criteria. • Analyze misinformation and media bias in common sustainability narratives.
Task	Students conduct a "safari" through the university campus or local retail area to identify three sustainability claims made by brands or the institution.
Activity	Evaluate the claims against the **Green Business Framework** to determine if they are authentic or represent **greenwashing**.
Output	A "Red-Flag Report" presenting evidence for or against the validity of the identified claims.

Example 3 Biodiversity Quick-Win Proposal

Domain	Domain 3: Promoting Nature
Learning goals	• Identify habitat requirements and human disturbances in a specific local ecosystem. • Apply species identification and fieldwork techniques to map local biodiversity. • Apply ecological principles to propose actionable strategies for nature restoration.
Task	Map the biodiversity of a 10x10 meter plot on campus using a species identification app.
Activity	Identify habitat requirements and human disturbances in that specific area.
Output	A "Quick-Win" proposal for a low-cost intervention to enhance local biodiversity, such as an insect hotel or native wildflower patch.

1-Week Tasks

Example 1 Supply Chain Fairness Investigation

Domain	Domain 2: Supporting Fairness
Learning goals	• Understand core principles of intergenerational and global equity. • Analyse "Just Transition" frameworks and their application to labor. • Identify and map global inequalities and power dynamics within industrial supply chains.
Task	Pick one common item from the university cafeteria (e.g., coffee, chocolate, or a sandwich) and trace its **life cycle**.
Activity	Research the social fairness of the supply chain, identifying who benefits, who bears the costs, and where inequities appear.
Output	A "Social Justice Scorecard" for the product, including recommendations for more ethical procurement.

Example 2 Backcasting the 2050 Campus

Domain	Domain 7: Futures Literacy
Learning goals	• Deconstruct the assumptions that shape individual and cultural expectations of the future. • Create diverse future scenarios to expand strategic vision and adaptability. • Use the future as a tool to inform and transform present-day decisions.
Task	Define a "Zero-Emission University" goal for the year 2050.
Activity	Use the **Backcasting** method to work backward from 2050 to the present, identifying key milestones for 2040, 2030, and 2025.
Output	A visual **Roadmap** of the necessary steps in energy, mobility, and waste management to reach the goal.

Example 3 The "Butterfly Effect" System Map

Domain	Domain 4: Systems Thinking
Learning goals	• Understand the interconnections between elements within complex systems, such as energy, water, and waste. • Analyse complex systems using tools like causal loop diagrams to identify feedback loops. • Identify "leverage points" where small systemic changes can create large-scale impacts.
Task	Choose a complex sustainability issue on campus, such as food waste or energy use in labs.
Activity	Map the elements and relationships of this problem using a **Causal Loop Diagram** to identify a "leverage point" where a small change could have a large impact.
Output	A system map highlighting one specific intervention point for institutional change.

Semester Tasks

Example 1 The Campus Living Lab Challenge

Domain	Domain 6 & 9: Problem Framing & Exploratory Thinking
Learning goals	• Define sustainability challenges by considering multiple perspectives and uncovering root causes rather than symptoms. • Analyse stakeholder ecosystems to understand how different disciplines approach environmental issues. • Generate and prototype innovative, creative solutions to sustainability challenges using design processes.
Task	Identify a real-world sustainability challenge on campus and apply the 5 stages of **Design Thinking**: Empathize, Define, Ideate, Prototype, and Test.
Activity	Students must collaborate with campus management or local organizations to create a tangible solution.
Output	A tested, low-fidelity prototype (physical or an **AR visualization**) of their solution presented to university stakeholders.

Example 2 The Policy Advocacy Campaign

Domain	Domain 10: Political Agency
Learning goals	• Explain and navigate key policy and governance frameworks related to sustainability. • Analyse formal policy documents to identify barriers to sustainable transitions. • Propose actionable strategies to influence institutional decision-makers and engage in democratic processes.
Task	Analyze a specific university or municipal policy that hinders sustainability (e.g., travel policies or building access rules).
Activity	Research alternative policy models, engage with decision-makers, and develop a campaign to advocate for change.
Output	A formal **Policy Brief** and a pitch presented to the relevant board or council.

Example 3 My Green "Micro-Mandate"

Domain	Domain 12: Individual Initiative
Learning goals	• Explain individual initiative as a proactive action within a larger system. • Map one's personal sphere of influence to identify where individual agency is most effective. • Implement and manage a self-directed sustainability project from conception to reflection.
Task	Design and implement a personal or small-group sustainability initiative within the campus ecosystem.
Activity	Students map their own sphere of influence, set a specific goal (e.g., starting a "Repair Café" or a campus composting group), and manage the project throughout the semester.
Output	A project report documenting the initiative's impact, the barriers encountered, and a plan for its long-term sustainability.

REFERENCES

Bianchi, G., Pisiotis, U., Cabrera Giraldez, M. GreenComp – The European sustainability competence framework. Bacigalupo, M., Punie, Y. (editors), EUR 30955 EN, Publications Office of the European Union, Luxembourg, 2022; ISBN 978-92-76-46485-3, doi:10.2760/13286, JRC128040.

Brown, T. (2008). Design thinking. *Harvard Business Review*, *86*(6), 84–92, 141.

Merrill, M. D. (2002). First principles of instruction. *Educational Technology Research and Development*, *50*(3), 43–59.

Merrill, M. D. (2012). First principles of instruction. In *The SAGE Encyclopedia of Educational Technology*. SAGE Publications.

Razzouk, R., & Shute, V. (2012). What Is Design Thinking and Why Is It Important? Review of Educational Research, 82, 330-348.