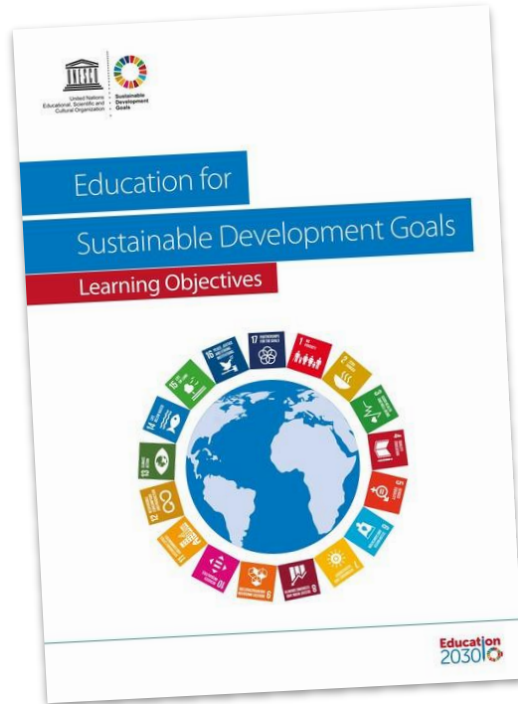


PBL4SDGs

Project-Based Learning for the Sustainable Development Goals

Dr. Eduard Vallory, Chairman of CATESCO
EASG - HLPF 2025

Education for Sustainable Development Goals: Learning Objectives (UNESCO, 2017)



*“To create a more sustainable world and to engage with sustainability-related issues as described in the SDGs, **individuals must become sustainability change-makers**. They require the knowledge, skills, values and attitudes that empower them to contribute to sustainable development. Education, therefore, is crucial for the achievement of sustainable development”*

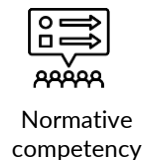
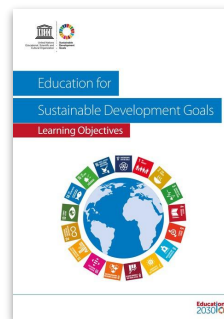
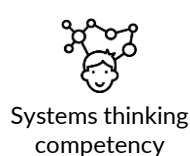
*“What ESD requires is **a shift from teaching to learning**. It asks for an action-oriented, transformative pedagogy, which supports self-directed learning, participation and collaboration, problem-orientation, inter- and transdisciplinarity, and the linking of formal and non-formal learning”.*

UNESCO (Education for SDG, 2017)

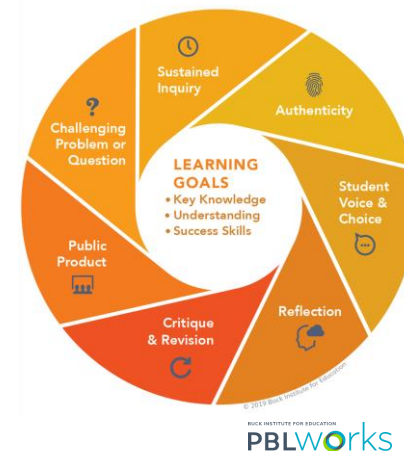
The core concepts of the initiative **PBL4SDGs**

UNESCO key competences for sustainability

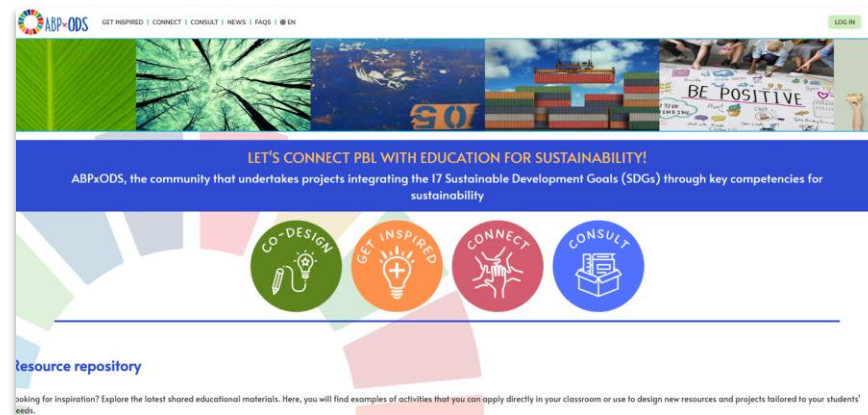
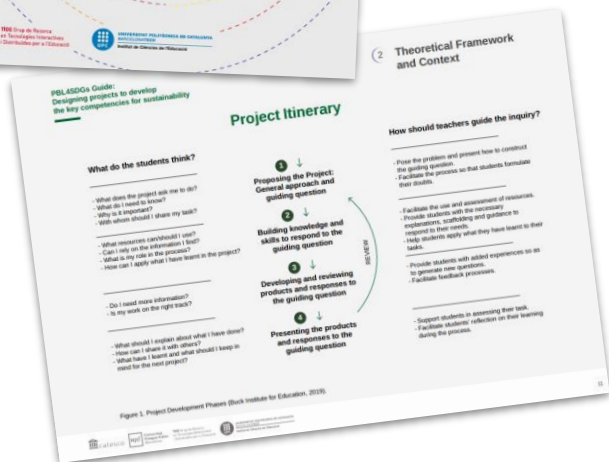
Sustainable Development Goals



Gold Standard PBL



PBL4SDGs guide & online platform



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PBL4SDGs guide & online platform

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Marti Zamora Juan
CO-DESIGN

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GREENCHECK: AI-ENHANCED ENVIRONMENTAL FACT CHECKER

Contact to collaborate
Add to favorites

Stage: **University (over 18 years)** | Learning areas: **Natural, social and cultural environment** | Duration: **more than two weeks**

AUTHORS
Ariel Ortiz Beltrán

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Selected SDGs

4 EDUCACIÓ DE QUALITAT
11 CIUTATS I COMUNITATS SOSTENIBLES
12 PRODUCCIÓ I CONSUM RESPONSABLES
13 ACCIÓ PEL CLIMA

General outline
In this two-week project, students will develop an AI-powered tool called **GreenCheck**. This tool will verify the accuracy of environmental claims by analyzing input statements and providing fact-checked responses from trusted sources. The project aims to enhance environmental literacy by debunking common myths and providing reliable information on environmental topics.

Guiding question
How can we use AI to improve environmental literacy by providing accurate, reliable fact-checking of common environmental claims?

Phase 1	Phase 2	Phase 3	Phase 4
Anticipació: Permanència sistemàtica: Permanència crítica:	Permanència sistemàtica: Col·laboració	Resolució integrada de problemes: Col·laboració	Valors i creences: Ecològica
Learning activities Phase 1 - Students will explore common environmental claims and myths to understand the type of information they will be working with. - Students will study how AI is used in fact-checking tools, analyzing case studies or existing AI tools (e.g., misinformation detection, AI chatbots). - Students will draft a written project proposal outlining the goal of GreenCheck, the environmental issues it addresses, the AI's role, and the expected learning outcomes for users.	Phase 2 - Students investigate which LLM APIs could be more appropriate for this level of solution and explore the Documentation for the implementation. - Students build a database of reliable information to be used as RAG input for the Large Language Model. - Students create a database of predefined questions that will be used to assess the quality of the system. - Based on external feedback, students revise and improve their digital solution.	Phase 3 - Students will develop an MVP connecting to a pre-existing LLM using the verified data collected as RAG content. - Students will test the connection with the predefined question bank. - Students will test the system with real users asking them to interact freely with the platform. - Based on external feedback, students revise and improve their digital solution.	Phase 4 - Each group presents their digital solution, explaining how it helps to identify and reduce the risk of misinformation in their particular topic. - Students reflect on their experience, focusing on the competencies they have developed (e.g., systems thinking, strategic thinking, collaboration).

Phase 1	Phase 2	Phase 3	Phase 4
Description of scaffolding and other supporting resources - Teacher to provide main objectives of the project and deadlines. - Teacher encourages students to think different topics that usually are being affected by fake news and misinformation. - Instructor support	- Students seek for the information and compare the possible implementations of the system. - Students brainstorm to define possible useful questions that should be addressed by the system. - Instructor support	- Regular check-ins with the instructor to ensure progress and address challenges. - Organize structured feedback sessions where students test their prototypes with real users.	- Provide guidelines on effective digital presentations, storytelling, and visual communication.
Learning outcomes Phase 1 - Students will be able to identify and differentiate between factual, environmental information and common myths, developing a deeper understanding of the key environmental issues that the project will address. - Students will demonstrate an understanding of how AI can be applied in fact-checking processes by analyzing the functionality of existing tools, such as AI-powered chatbots and misinformation detectors. - Students will be able to articulate a clear project objective for GreenCheck, defining the environmental problems it aims to solve, the role of AI in addressing these issues, and the	Phase 2 - Students will be able to evaluate and select an appropriate Large Language Model (LLM) API for the GreenCheck project by reviewing documentation and comparing available features. - Students will demonstrate the ability to curate and organize a database of verified, reliable, environmental sources. They will understand how to structure the data in a retrieval-augmented generation (RAG) for the LLM, ensuring the AI provides accurate and evidence-based fact-checks. - Students will be able to design a set of test	Phase 3 - Students will be able to design and implement a Minimum Viable Product (MVP) that connects to a pre-existing LLM, utilizing the verified data for retrieval-augmented generation (RAG). - Students will assess the quality and accuracy of the AI's responses, ensuring that the system provides fact-based, reliable answers to environmental queries. - Students will be able to conduct usability testing by inviting real users to interact freely with the platform. They will learn how to gather user feedback on system performance, user experience, and the relevance of the AI-generated responses.	Phase 4 Students will be able to effectively communicate and demonstrate how their digital solution, GreenCheck, helps to identify and reduce misinformation on environmental topics. They will be able to clearly explain the role of AI in fact-checking, the specific environmental issues addressed, and how the solution contributes to promoting environmental literacy. - Students will be able to participate in constructive discussions, providing and receiving feedback on their project presentations. They will demonstrate the ability to evaluate the strengths and weaknesses of their solution and propose future

PBL4SDGs: Kick-off with the presentation of *Education for SDGs* (2018)



1

Presentation of the Catalan edition of *Education for SDGs*

2

Creation of the alliance CATESCO-UPF

3

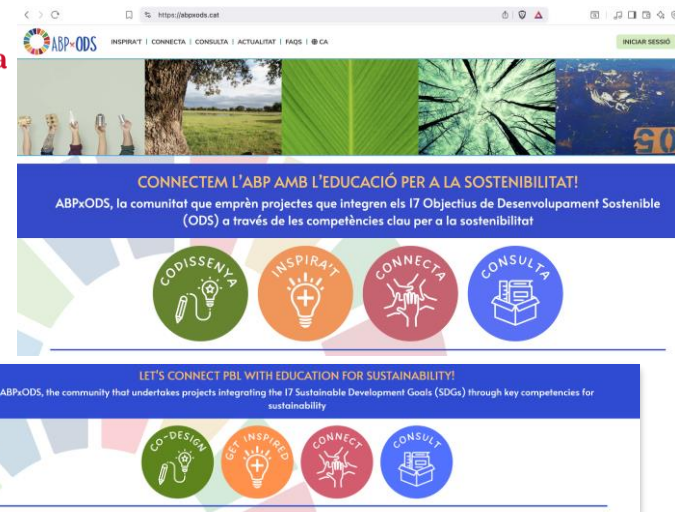
First output: digital platform



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PBL4SDGs: Working Group on the UNESCO's competencies for sustainability (2021-22)

1

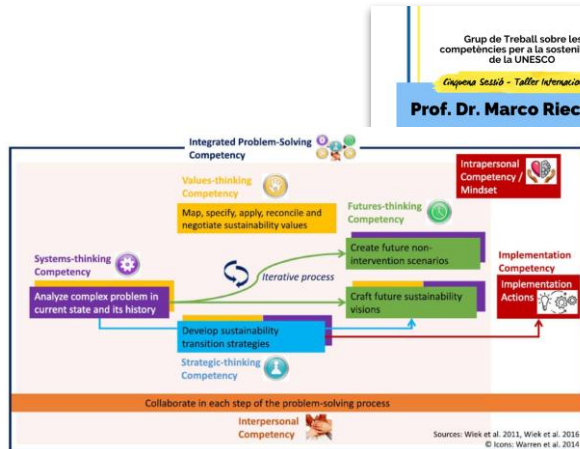
Working Group with practitioners and academics

2

International workshop with Dr. Marco Rieckmann (main author, UNESCO *Education for the SDGs*) and Dr. Felisa Tibbits (Education for HR)

3

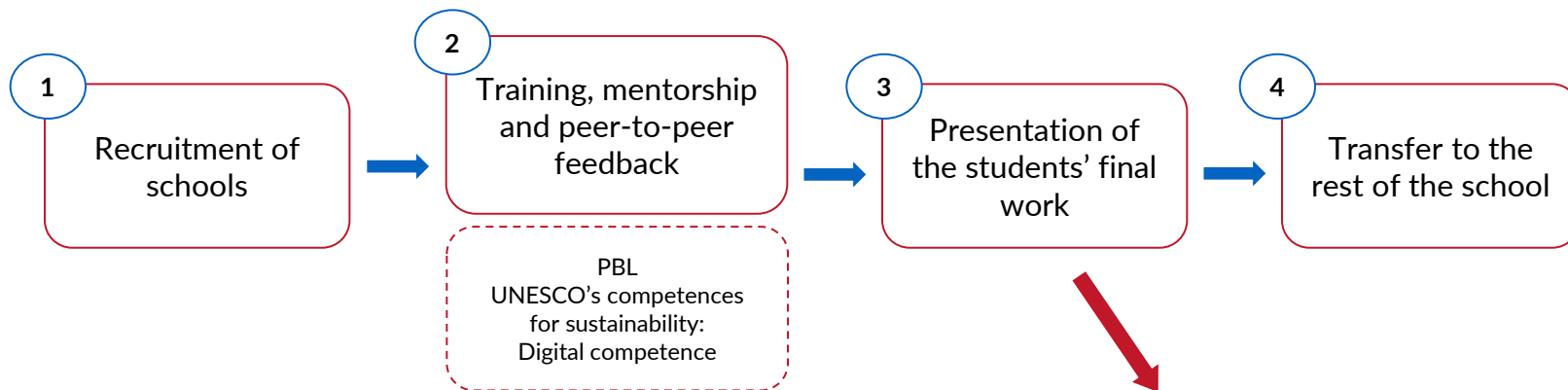
Output of the WG: PBL4SDGs Guide



Brundiers et al. 2021



PBL4SDGs: Development of the digital competence through PBL projects oriented towards sustainability (2023-24)



Initiative supported by European funds:
 Provided mentorship to a cohort of **7 schools** and **20 teachers** in the design and development of their PBL projects, culminating in a **major final event** showcasing the students' work.



PBL4SDGs: Development of PBL projects oriented towards sustainability



Initiative supported by European funds:
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and **20 teachers** in the design and development
of their PBL projects, culminating in a **major
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Gràcies! Thank you!

A decorative arc of 17 colored segments in the bottom-right corner, with colors including dark blue, red, green, blue, and orange.