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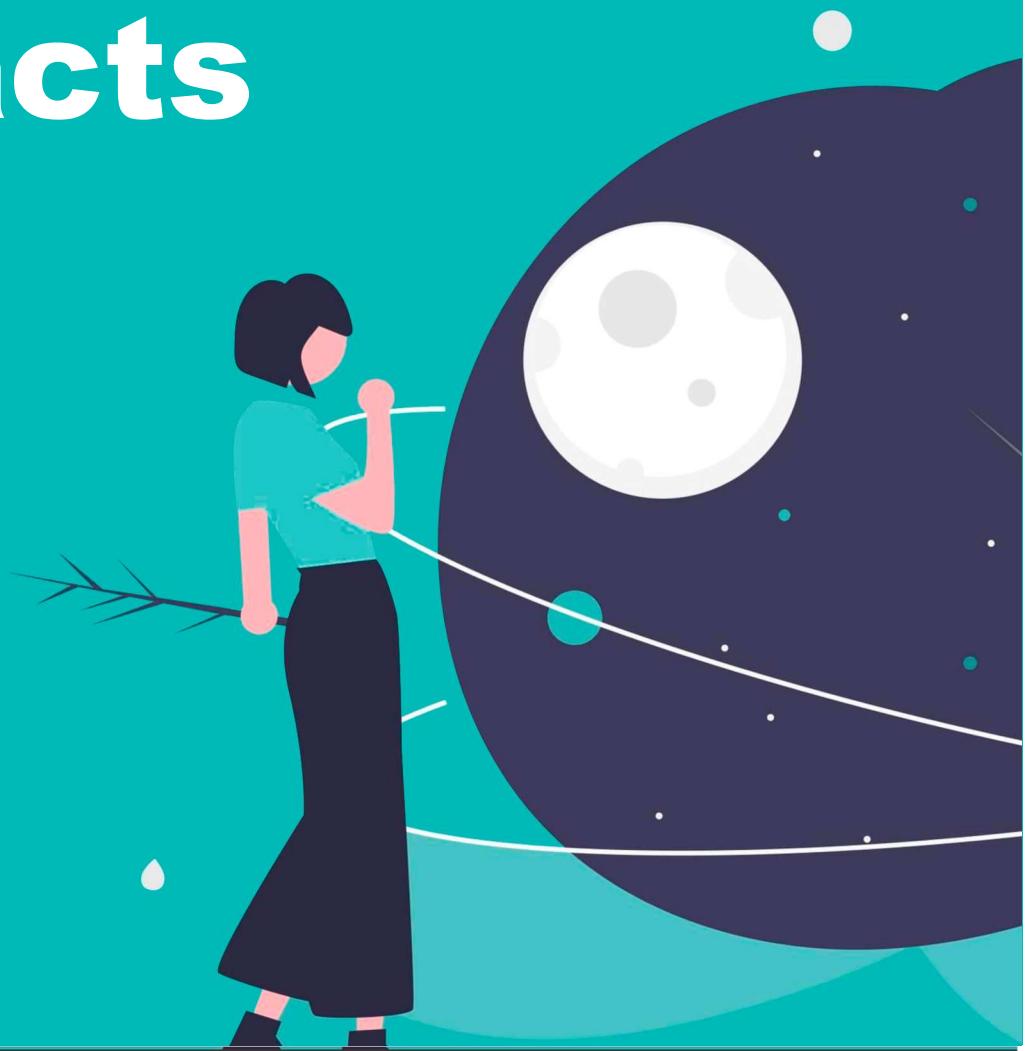
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27th – 28th

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27th and 28th February 2025

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TIME2ACT@SD: ADVANCING SUSTAINABLE DEVELOPMENT IN HIGHER EDUCATION THROUGH INNOVATIVE TOOLS

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ABSTRACT

This paper presents the Time2Act@SD project, an Erasmus+-funded initiative that aims to promote sustainable development (SD) knowledge, skills and behaviour change among higher education (HE) students and educators across Europe. The project takes an innovative, multimodal approach to sustainability education, integrating gamification, digital tools and experiential learning (Loureiro et al., 2024). Key deliverables include a MOOC platform offering courses on environmental, social and economic sustainability, interactive virtual reality games such as 'SDG Quest' (Nisiotis et al., 2024; Piki et al., 2025), and mobile apps promoting practical sustainability competencies. The project also includes international sustainability bootcamps that engage educators and students in real-life applications of SD principles. Results from empirical studies show significant improvements in SD knowledge, attitudes and behaviours among participants (Leal et al., 2024), as well as identified gaps in sustainability education that Time2Act@SD addresses. With open access resources and participation from four universities across Europe, the project contributes to improving sustainability education globally and provides replicable models for transformative learning in higher education. This paper discusses project outcomes, lessons learned and the implications of innovative methods for advancing the SDGs in academia and beyond.

Keywords: Sustainability; Higher Education; Innovative Tools; Education for sustainable development.

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3rd INTERNATIONAL CONGRESS
INNOVATION AND SUSTAINABILITY FOR A QUALITY FUTURE

TIME2ACT@SD: Advancing Sustainable Development in Higher Education Through Innovative Tools

Susana Leal*, Sandra Oliveira, Luís Cláudio Barradas, Andriani Piki, Joke Simons, Ana Loureiro, Inês Messias, Tito Mongelli, Adem Tekerek, Alper Güzel, Veronica Gelfgren, Nuno Monteiro

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TIME2ACT@SD
TIME TO ACT THROUGH SUSTAINABLE EXPERIENCES
FOR HIGHER EDUCATION STUDENTS

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Time2Act@SD Project



TIME2ACT@SD aims to contribute to the **development of knowledge, skills, and attitudes, as well as changing of behaviours** among European higher education (HE) students, in the field of **sustainable development (SD)** and **SD Goals (SDG)**, through the development of interactive content, digital tools, and innovative teaching methodologies, based on the use of the gamification, for HE teachers' use in formal and non-formal education.



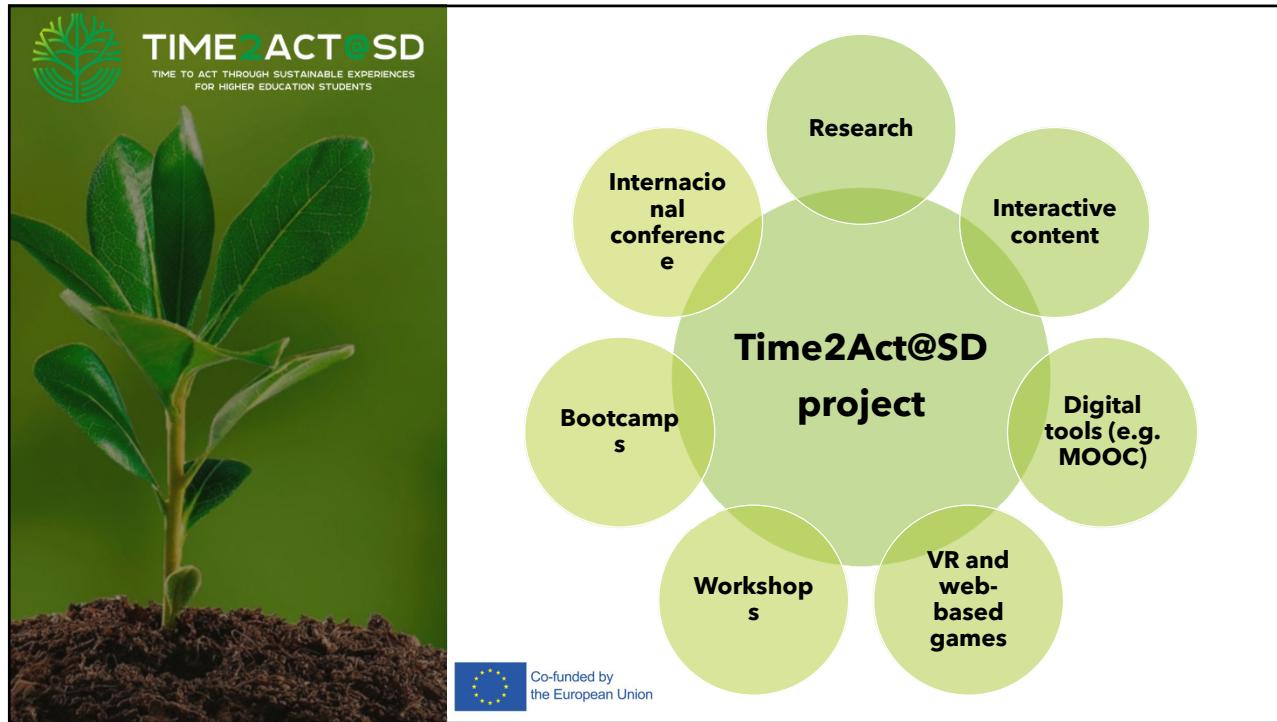
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<https://time2act.ipsantarem.pt/>

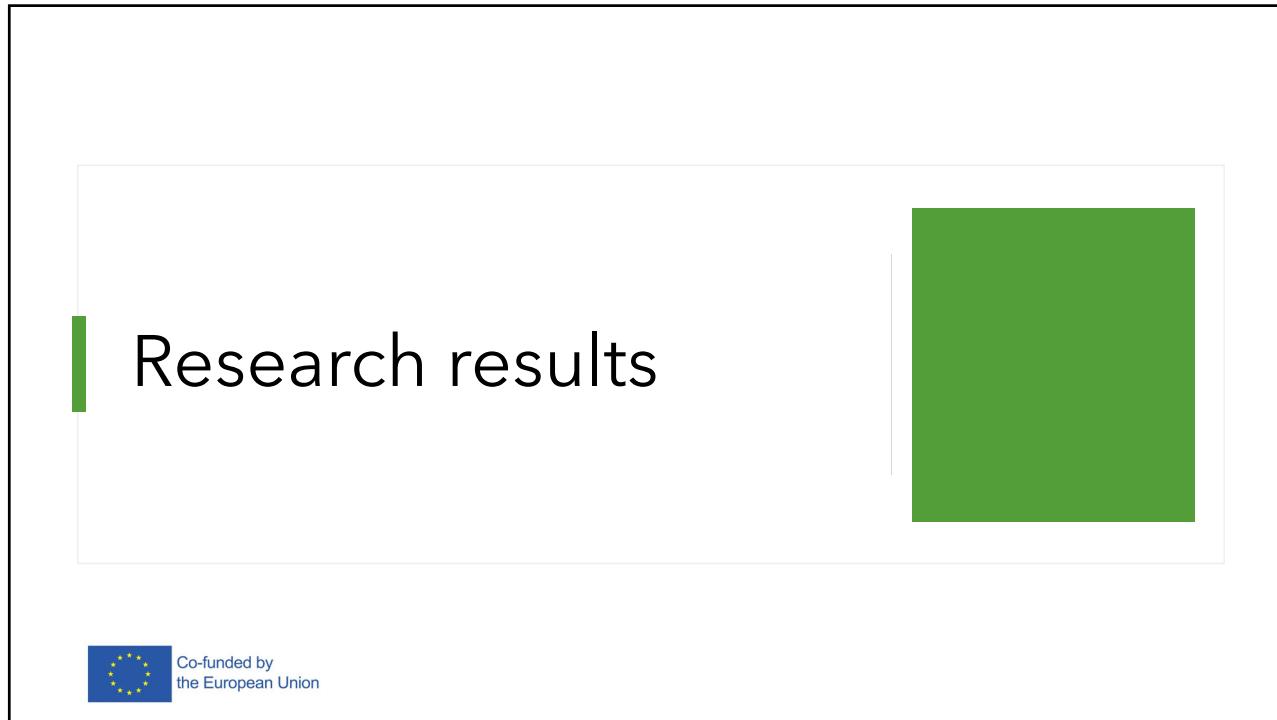


TIME2ACT@SD
TIME TO ACT THROUGH SUSTAINABLE EXPERIENCES
FOR HIGHER EDUCATION STUDENTS

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Cleaner and Responsible Consumption 14 (2024) 100223

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Cleaner and Responsible Consumption

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Diagnosis, involving higher education students, to identify gaps in knowledge and skills related to sustainability and the SDGs.

 Co-funded by the European Union

Exploring sustainable development perceptions among higher education students: An empirical study on knowledge, attitudes, and behaviours

Susana Leal ^{a,*}, João Nascimento ^b, Andriani Piki ^c, Adem Tekerek ^d, Alper Güzel ^d, Ana Loureiro ^a, Catarina Gonçalves ^e, Inês Messias ^b, Joke Simons ^f, Lorenz Teunen ^f, Luís C.S. Barradas ^b, Naomi Palmer ^g, Tito Livo Mongelli ^h, Zlatko Nedelko ⁱ, Sandra Oliveira ^b

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ABSTRACT

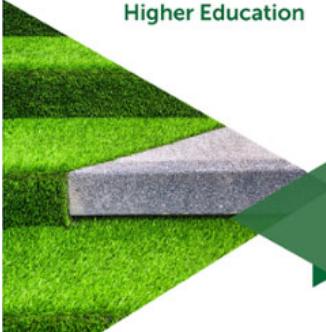
Higher education institutions have a role to play in developing sustainability skills and changing students' attitudes and behaviour towards sustainability issues and the Sustainable Development Goals (SDGs). This article aims to explore the knowledge, attitudes and behaviours of higher education students towards sustainability and understand how these vary in line with gender, age, level of education, the field of study and familiarity with the SDGs. A questionnaire survey was carried out among higher education students. A sample of 716 students from different European countries and Türkiye was obtained. The results show that the relationship between students' knowledge of sustainability and their behaviour towards sustainability issues is partly mediated by their attitudes towards sustainability. The practical implications of this study are that it highlights the need to strengthen education on sustainable development and the SDGs in all areas and at all levels of higher education and to provide sound training in this field from the moment students enter higher education. Although knowledge and attitudes towards sustainability are well developed, higher education institutions must train students to change their behaviour.

Diagnosis, involving higher education teachers, to identify gaps in the teaching-learning process on the topic of sustainability and SDG

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 ISSN 1467-6170
 Volume 09 Number 09 2018

International Journal of Sustainability in Higher Education



Identification of gaps in sustainable development education among higher education teachers

Título da Apresentação

Report identifying the gaps in the teaching-learning process in higher education on the topic of Sustainability and SDG

Co-funded by the European Union

Identification of Knowledge and Skills Gaps related to Sustainable Development: Two Exploratory Studies with Higher Education Students and Teachers in Europe

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Book series

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Abstract
 This paper presents the preliminary findings from the Time2Act@SD Erasmus-project, focusing on identifying gaps in knowledge and skills related to sustainable development (SD) and the Sustainable Development Goals (SDGs) in higher education (HE). The study has two main objectives. Firstly, to identify gaps in knowledge and skills related to the SDGs and the SDGs in HE. This is done by analyzing the perceptions, understanding, attitudes and behaviors to highlight specific weaknesses, providing a basis for formulating targeted improvements. Secondly, to explore prominent gaps in the teaching-learning process within HE, namely the challenges faced by educators trying to incorporate SD and SDGs into their teaching activities. By understanding what underpins these challenges, this study aims to develop tools and solutions to enhance sustainability-focused education. Two questionnaires were administered, for HE teachers and students, respectively, involving participants from several European countries using a convenience sample. The results will inform the development of innovative tools to improve the teaching-learning process in HE. By engaging both groups of stakeholders, this research aims to provide valuable insights that will guide the development of tools and pedagogical strategies to improve education for sustainability, thereby promoting a deeper integration of sustainability principles into academic curricula.

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Mobile Game-Based Learning

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SDG Quest: Leveraging Mobile Game-Based Learning to Foster Environmental, Social, and Economic Sustainable Development Goals

Conference paper | First Online: 15 December 2024
 pp 373–392 | [Cite this conference paper](#)

Andriani Piki Iraklis Tchanturia, Nicos Kasenides, Nearchos Paspallis & Susana Leal

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2024 IEEE Gaming, Entertainment, and Media Conference (GEM)

Evaluation of a Serious VR Game Designed to Promote the Sustainable Development Goals

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Abstract—This paper presents an evaluation of a serious Virtual Reality (VR) game designed to promote awareness and understanding of the Sustainable Development Goals (SDGs) for Education students. The evaluation assesses user experience in terms of usability/playability, play engagement, enjoyment and visual aesthetics. It also evaluates the reduction of the incidence of VR Sickness symptoms among users after their experience with the VR game. Players positively evaluated the game's usability, its playability, and its enjoyment. The results concerning the incidence of VR Sickness symptoms among users after their experience with the VR game. Players positively evaluated the game's usability, its playability, and its enjoyment and visual aesthetics. The results concerning VR sickness indicate that the game was generally well-received, while also highlighting the need for further improvements. The game was able to mitigate the reported symptoms and further improve the user experience. The findings can inform future game-based endeavours supporting education for sustainable development.

Index Terms—Usability, User Experience, Serious VR Games, VR Sickness, Education for Sustainable Development

I. INTRODUCTION

The Sustainable Development Goals (SDGs), formulated as part of the universal 2030 Agenda for Sustainable Development (SD), constitute a comprehensive and integrated framework that aims to address a wide range of pervasive and global challenges [1]. The SDGs are divided into three dimensions of sustainability: social, economic, and environmental [1]. Addressing these challenges requires making collective efforts and taking “bold and transformative steps [...] to shift the world on to a sustainable and resilient path” [2]. One of the main challenges that is left to the various sectors of such efforts requires the coordination and multilateral cooperation [2] of several sectors, education being one of them.

The central role of Education for Sustainable Development (ESD) is to empower learners to reflect on their actions [3], make informed and responsible decisions about social and environmental integrity [4], and act in a sustainable manner [5]. To attain this goal, Higher Education Institutions (HEIs)

enbrace innovative pedagogies and digital technologies to help learners develop key sustainability competencies and become responsible citizens. In this regard, serious VR games and digital game-based learning (DGBL) approaches offer unique opportunities for knowledge acquisition, skills development, self-reflection, and behavioural change. However, despite recent developments, sustainability-oriented games are still a long-way from attaining a deeper level of applicability to education and games. Furthermore, recent studies reveal that current efforts focus primarily on environmental sustainability [7], [8]. This presents a gap in serious games that address all dimensions of SD: environmental, social, and economic [9]. A gap that the proposed serious VR game presents in the field of education. At the same time, a significant constraint hindering the adoption and applicability of VR games in educational contexts involves negative effects such as VR Sickness (VRS) [9]. The aim of this study is to evaluate the “Seriousness” of a serious VR game through playtesting, for assessing the users' VRS symptoms and their overall gaming experience in terms of usability/playability, play engagement, enjoyment and visual aesthetics.

II. BACKGROUND

A. Digital Game-Based Learning and VR Games

DGBL involves integrating educational content, activities, and challenges into a game [10], allowing learners to engage in experiential learning by progressively solving the game's narrative. Playing games is associated with emotional, material, and cognitive benefits [6], such as activating learner motivation and engagement, facilitating skills development and knowledge acquisition, and enhancing sustainability competencies [3], [6], [7], [10]. Various studies have discussed the positive contribution of educational value of serious games toward raising awareness on SD and SDGs [6], [7], suggesting that

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Digital tools - MOOC

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Environmental Sustainability MOOC

English | Portuguese | Italian
Dutch | Greek | Turkish

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Available courses



Environmental Sustainability in Turkish



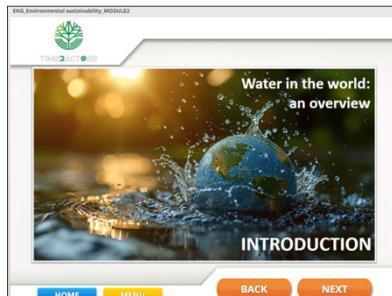
Environmental Sustainability in Portuguese



Environmental Sustainability in Dutch



THE BASICS OF CLIMATE CHANGE



INTRODUCTION

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Time2Act@SD MOOCs Platform: <https://mooc-time2act.ipsantarem.pt/>

Social Sustainability MOOC

English | Portuguese | Italian
Dutch | Greek | Turkish

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▼ INTRODUCTION: Making it work - a course on social sustainability

Dive into a transformative journey focused on health, equality, and global impact. This course offers you a unique opportunity to contribute to a sustainable future. Throughout the course, you will explore the interconnected realms of well-being, gender, and citizenship. You'll be inspired and empowered to help make the world a place that thrives on harmony, resilience, and meaningful change.

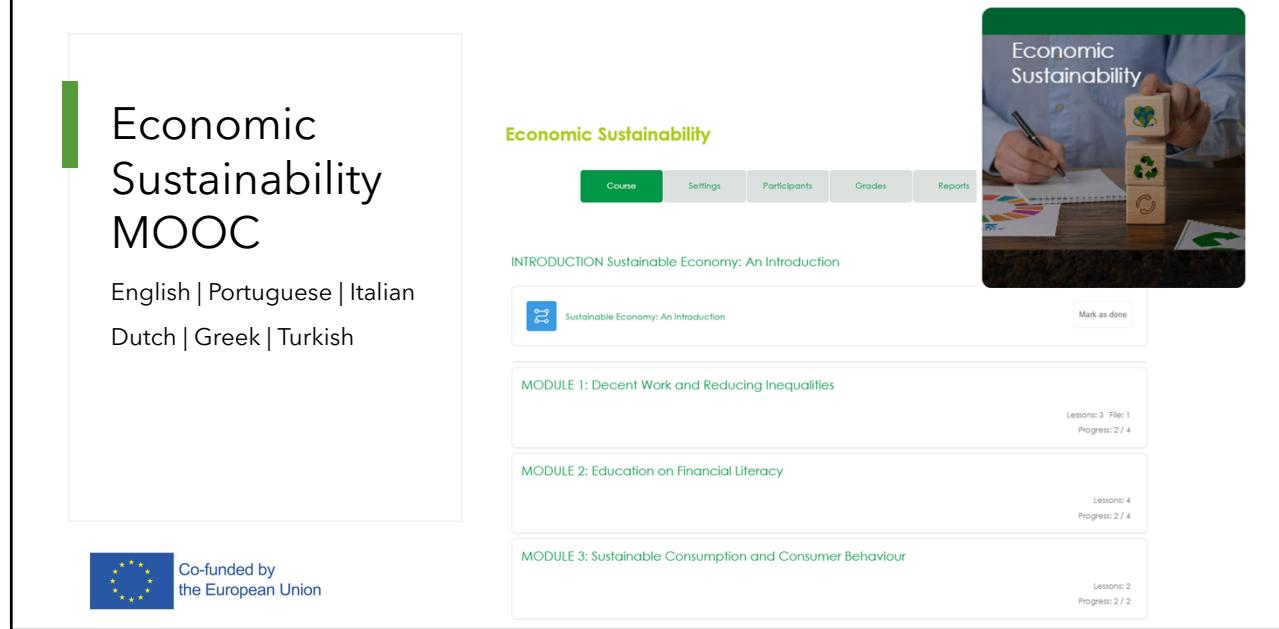
Introduction to this online course



IN OUR COURSE ON SOCIAL SUSTAINABILITY, WE'LL...

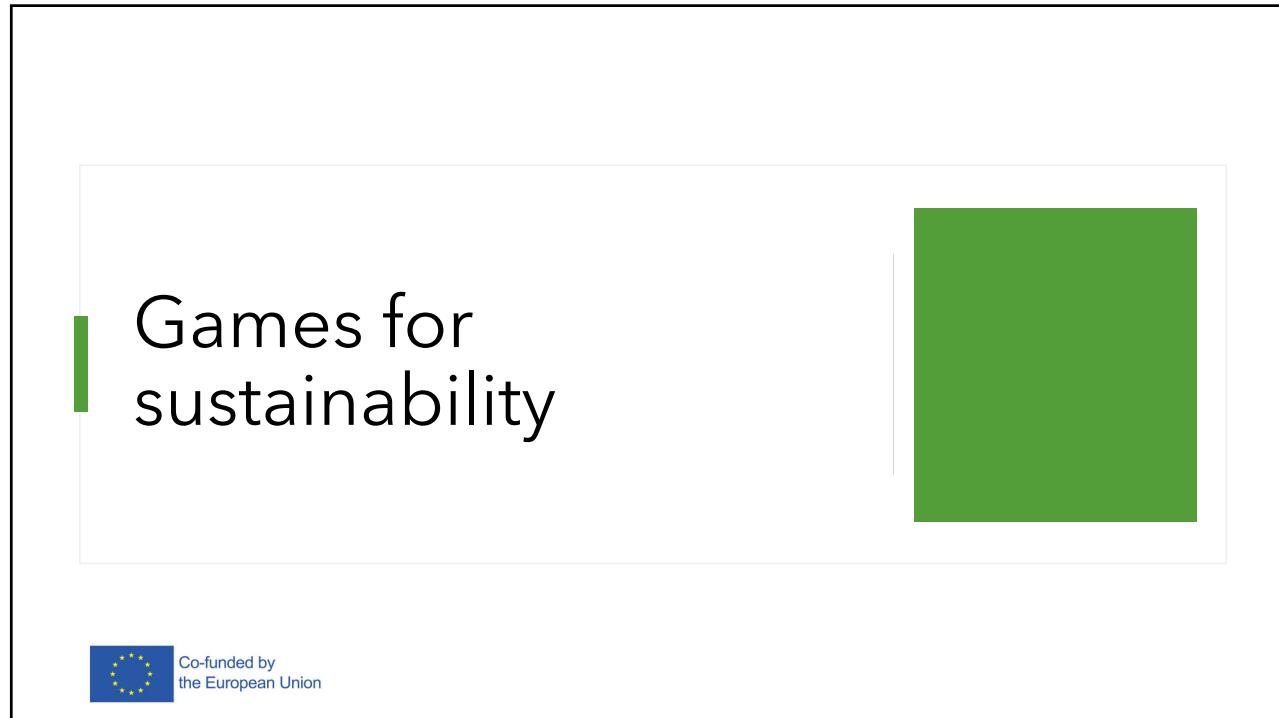
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Time2Act@SD MOOCs Platform: <https://mooc-time2act.ipsantarem.pt/>



The screenshot displays the 'Economic Sustainability MOOC' course on the platform. The course title is prominently displayed on the left. Below the title, language options are listed: English, Portuguese, Italian, Dutch, Greek, and Turkish. A 'Co-funded by the European Union' logo is present. The main interface shows a navigation bar with 'Course' (highlighted in green), 'Settings', 'Participants', 'Grades', and 'Reports'. The 'Course' section is expanded, showing the 'INTRODUCTION Sustainable Economy: An Introduction' module, which contains a single lesson titled 'Sustainable Economy: An Introduction'. Below this are three more modules: 'MODULE 1: Decent Work and Reducing Inequalities', 'MODULE 2: Education on Financial Literacy', and 'MODULE 3: Sustainable Consumption and Consumer Behaviour'. Each module shows its progress: Module 1 is at 2/4, Module 2 is at 2/4, and Module 3 is at 2/2. A thumbnail image for the course shows a person writing in a notebook with three wooden blocks stacked next to it, each featuring a recycling symbol.

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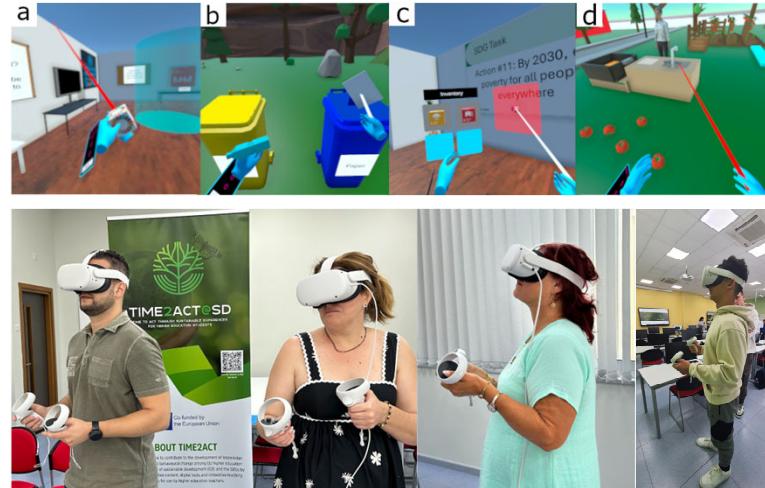


The screenshot shows the 'Games for sustainability' section of the MOOCs Platform. The title 'Games for sustainability' is displayed in a large, bold font. A 'Co-funded by the European Union' logo is present. A large green rectangular box is positioned on the right side of the screen.

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Virtual Reality Game

Sustainable Futures |
Journey through the SDGs

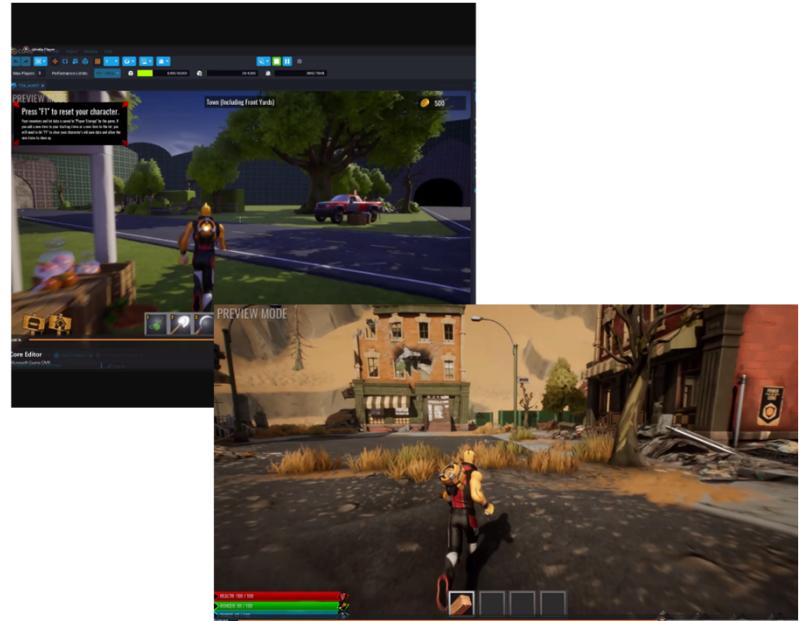


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Web-mobile games about sustainability

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Sustainability Bootcamps

Cyprus +
Belgium
Teachers +
students



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Cyprus Bootcamp (17-21 March 2025)



1. SDG Treasure Hunt, 18th of March 2025, UCLan Cyprus



2. TIME2Escape@SD, 18th of March 2025, UCLan Cyprus



3. Sustainability 'Makerspace', 19th of March 2025, Youth Makerspace Larnaka



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