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Congress

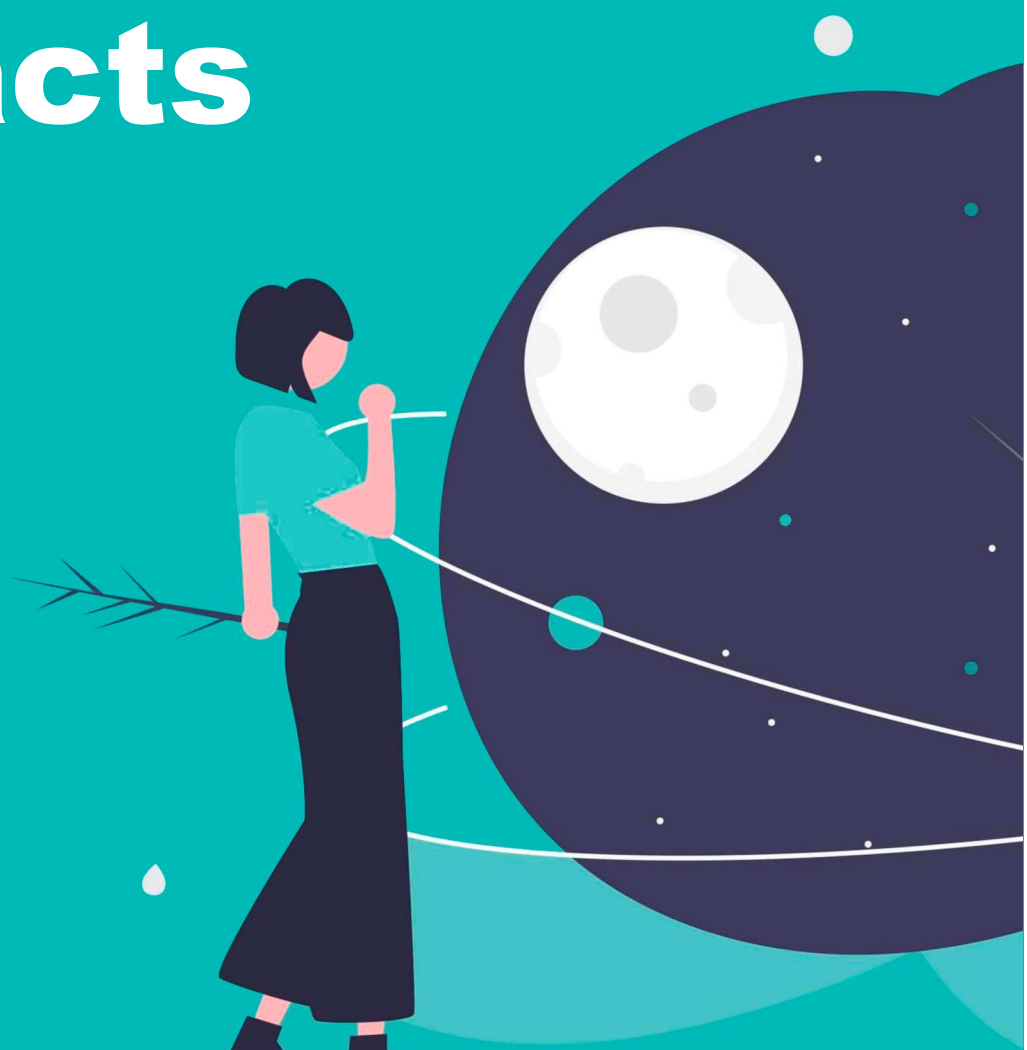
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Innovation and Sustainability for a Quality Future

Book of abstracts

27th – 28th
February 2025

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Title

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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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POLITÉCNICO DE SANTARÉM



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

1

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.

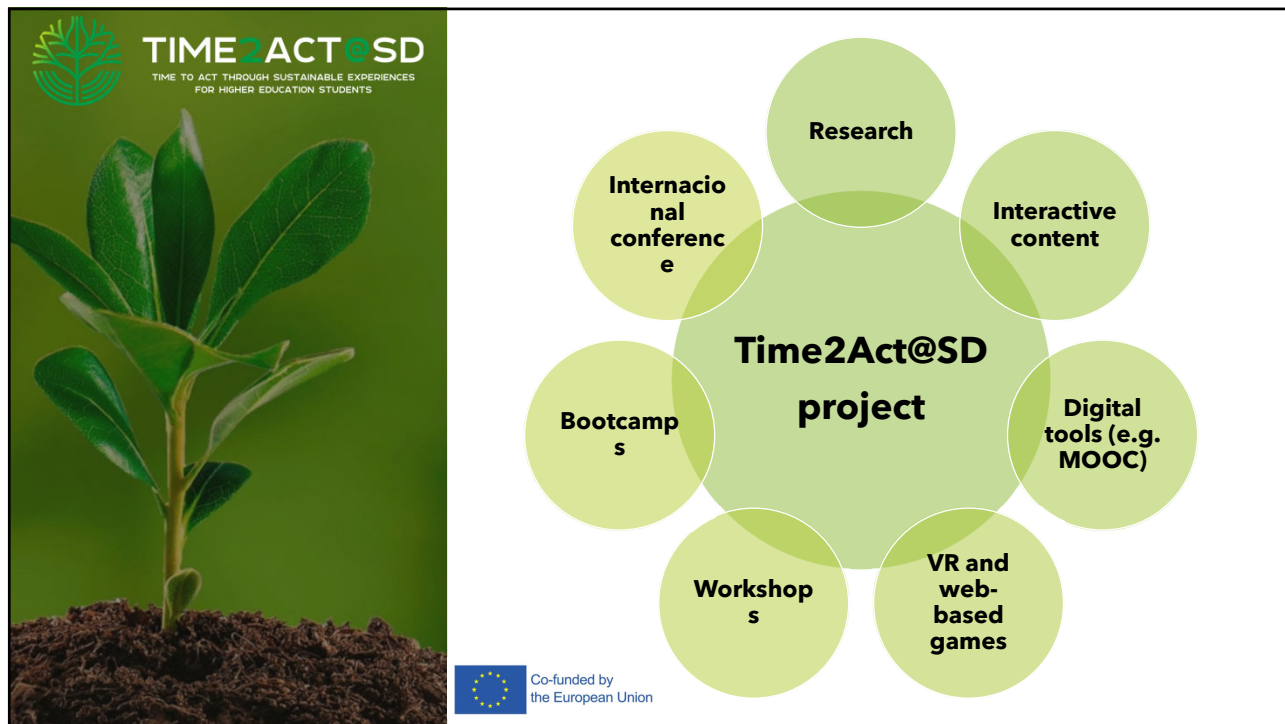


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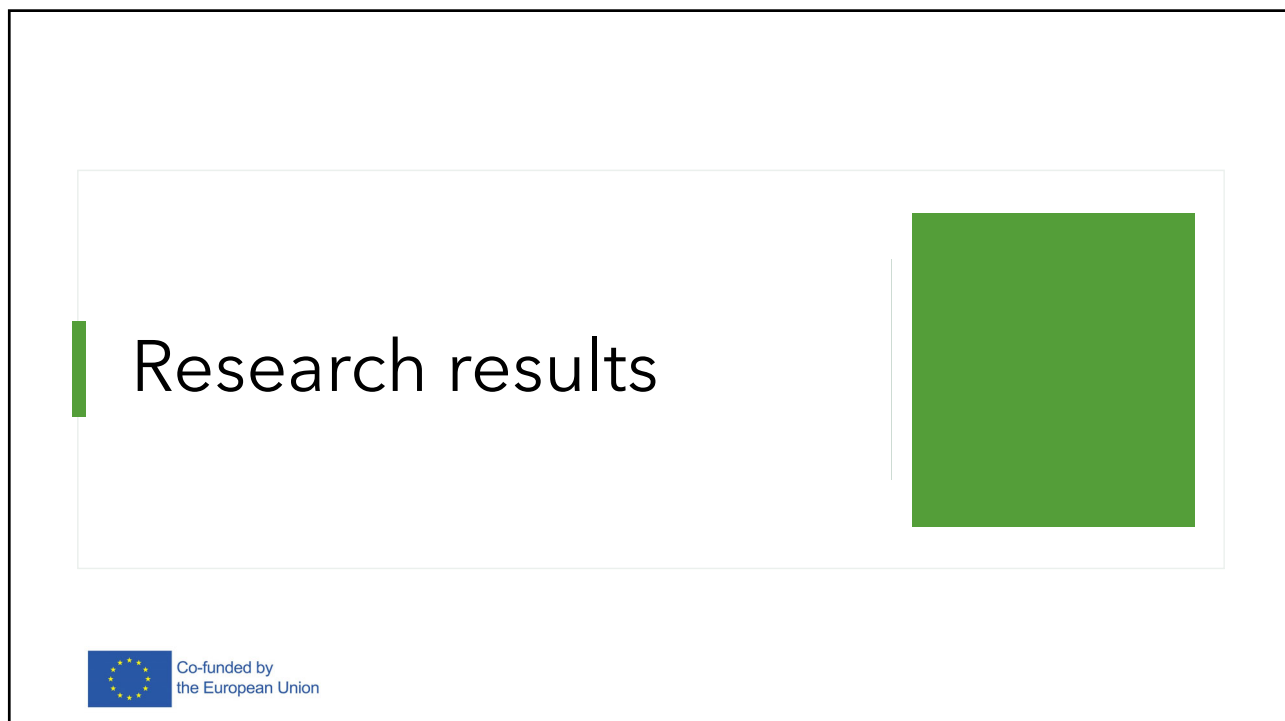
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Diagnosis,
involving higher
education
students, to
identify **gaps in
knowledge and
skills** related to
sustainability and
the SDGs.



Cleaner and Responsible Consumption 14 (2024) 100223

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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^b, Catarina Gonçalves^e, Inês Messias^b, Joke Simons^f, Lorenz Teunen^f, Luís C.S. Barradas^b, Naomi Palmer^g, Tito Livio Mongelli^h, Zlatko Nedelkoⁱ, 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.

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



Identification of
gaps in sustainable
development
education among
higher education
teachers

Título da Apresentação

6

6

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



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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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 SD and the SDGs among HE students. This includes analysing students' understanding, attitudes, and behaviours 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 the SDGs in their teaching activities. By understanding what underpins these challenges, this study aims to develop tailored 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**



Título da Apresentação

8

8



**Serious VR
Game to SDG**

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 among Higher Education students. The evaluation assesses user experiences in terms of usability/playability, play engagement, enjoyment and visual aesthetics of the VR environment. It also explores the onset of VR Sickness symptoms among users after their experience with the VR game. Players positively evaluated the game's usability, its ability to engross them in gameplay, and the environment's enjoyment and visuals. The results concerning VR sickness indicate that the game was generally well-received, while also highlighting areas where improvements could be implemented 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. The 17 SDGs are indivisible and bridge the 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” and ensuring that no one is left behind [1]. The success 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 societal and environmental integrity [4], and act in a sustainable manner [5]. To attain this goal, Higher Education Institutions (HEIs)

embrace innovative pedagogies and digital technologies to help learners develop key sustainability competencies and become responsible citizens. To this end, serious VR games and digital game-based learning (DGBL) approaches hold immense 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 diffusion level comparable to entertainment games [6]. 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 - a gap that the proposed serious VR game presented in this paper attempts to fill. 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 “Sustainable Futures” 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 progressing through the game narrative. Playing games is associated with emotional, social, 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 and educational value of serious games toward raising awareness on SD and SDGs [6], [7], suggesting that




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Digital tools – MOOC
Massive Open Online Courses



Subtítulo



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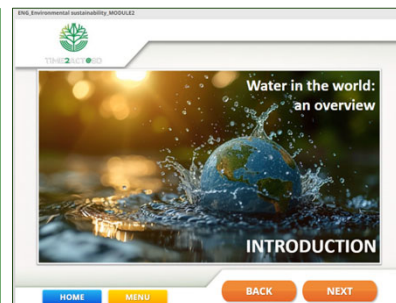
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Economic Sustainability

Course

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Participants

Grades

Reports

INTRODUCTION Sustainable Economy: An Introduction



Sustainable Economy: An Introduction

Mark as done

MODULE 1: Decent Work and Reducing Inequalities

Lessons: 3 File: 1
Progress: 2 / 4

MODULE 2: Education on Financial Literacy

Lessons: 4
Progress: 2 / 4

MODULE 3: Sustainable Consumption and Consumer Behaviour

Lessons: 2
Progress: 2 / 2



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Games for sustainability



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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 +
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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](#)



4. VR SDG Game 'Sustainable Futures', 20th of March 2025, [UCLan Cyprus](#)



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FOR HIGHER EDUCATION STUDENTS






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