

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

Susana Leal<sup>1</sup>, Sandra Oliveira<sup>2</sup>, Luís Cláudio Barradas<sup>2</sup>, Andriani Piki<sup>3</sup>, Joke Simons<sup>4</sup>, Ana Loureiro<sup>1</sup>, Inês Messias<sup>1</sup>, Tito Mongellis, Adem Tekerek<sup>6</sup>, Alper Güzel<sup>6</sup>, Veronica Gelfgren<sup>7</sup>, Nuno Monteiro<sup>7</sup>

<sup>1</sup> Santarém Polytechnic University and Life Quality Research Centre (CIEQV)

<sup>2</sup> Santarém Polytechnic University

<sup>3</sup> University of Central Lancashire Cyprus

<sup>4</sup> Thomas More

<sup>5</sup> Galileo.it

<sup>6</sup> Gazi University

<sup>7</sup> Learnmera Oy

### 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.

### References

- Leal, S., Nascimento, J., Piki, A., Tekerek, A., Güzel, A., Loureiro, ..., Oliveira, S. (2024). Exploring sustainable development perceptions among higher education students: An empirical study on knowledge, attitudes, and behaviours. *Cleaner and Responsible Consumption*, 14, 100223. <https://doi.org/10.1016/j.clrc.2024.100223>
- Loureiro, A., Leal, S., Oliveira, S., Messias, I., Barradas, C., Tekerek, A., Guzel, A., Piki, A., Gonçalves, C., Simons, J., Mongelli, T., Gelfgren, V., Michiels, X. (2024, Novembro 11-13). Fostering Sustainability Competencies in Higher Education: A Multimodal Approach Through Time2act@Sd MOOC. *Proceedings of the iCERI 2024 – 17th annual International Conference of Education, Research and Innovation* (pp.6920-6926), Seville, Spain. <https://doi.org/10.21125/iceri.2024.1669>
- Nisiotis, L., Piki, A., Theodorou, P., Leal, S., Barradas, L., & Nascimento, J. (2024, June 5-7). Evaluation of a Serious VR Game Designed to Promote the Sustainable Development Goals. *IEEE GEM 2024 - IEEE CTSoc International Conference on Gaming, Entertainment & Media*, June 5- 7, 2024, Turin, Italy. <https://doi.org/10.1109/GEM61861.2024.10585543>
- Piki, A., Tchanturia, I., Kasenides, N., Paspallis, N., Leal, S. (2025). SDG Quest: Leveraging Mobile Game-Based Learning to Foster Environmental, Social, and Economic Sustainable Development Goals. In: Chen, J.Y.C., Fragomeni, G., Streitz, N.A., Konomi, S., Fang, X. (Eds) *HCI International 2024 – Late Breaking Papers. HCII 2024. Lecture Notes in Computer Science*, vol 15377. Springer, Cham. [https://doi.org/10.1007/978-3-031-76812-5\\_25](https://doi.org/10.1007/978-3-031-76812-5_25)