Chapter 2
Playing for the Planet: Gamification and Serious Games for Environmental Awareness

Fausto Mourato
https://orcid.org/0000-0003-4935-7206
Centro ALGORITMI, ESCE, Instituto Politécnico de Setúbal, Portugal

Helena Martins
ESCE, Instituto Politécnico de Setúbal, Portugal & CEOS, ISCAP, Polytechnic of Porto, Portugal & Nova School of Business and Economics, Portugal

Martinha Piteira
https://orcid.org/0000-0002-9180-2257
Instituto Politécnico de Setúbal, Portugal

Sandrina B. Moreira
https://orcid.org/0000-0003-2124-8366
Instituto Politécnico de Setúbal, Portugal

ABSTRACT

This review examines the role of gamification and serious games in promoting environmental awareness and encouraging sustainable behaviors. By integrating insights from game design, behavioral science, and environmental studies, it explores how game-based strategies can effectively engage audiences and drive pro-environmental actions. The paper presents key theoretical concepts, examines case studies, and highlights the potential of these tools to align with global sustainability objectives, particularly the United Nations' Sustainable Development Goals. In addition to analyzing successful implementations, this study outlines the challenges and opportunities of applying gamified systems and serious games in real-world contexts.

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Recommendations for future research are provided, emphasizing the need for tailored approaches, empirical evaluation, and the integration of emerging technologies to enhance their educational and motivational impact.

INTRODUCTION

Understanding and promoting the responsible use of natural resources is a critical goal in contemporary society. Traditional methods of raising awareness and educating the masses often fall short, frequently failing to meet expectations and lacking in fostering commitment in the medium to long term. The rapid growth of digital technologies in our daily lives opens numerous opportunities for innovative approaches that can address these shortcomings. These new methods provide fresh ways to engage the public and are particularly effective for reaching younger generations, who are more receptive to innovation and accustomed to interacting with digital media. Among these media, games stand out for their transformative potential as educational tools, capable of fostering deeper understanding and encouraging behavioral change.

As we will see with more detail, gamification and serious games are increasingly being integrated into education as tools to enhance engagement, motivation, and learning outcomes. However, challenges persist in overcoming the limitations of traditional education systems, which often rely on passive learning and fail to address individual learning styles. Barriers to adopting gamification include conceptual ambiguity, overemphasis on extrinsic rewards, and technological constraints, making it difficult for educators to implement these strategies effectively. Additionally, serious games must balance fun with educational goals, a challenge that becomes even more complex when aiming to promote topics like sustainability. Despite these challenges, emerging trends point towards more personalized and engaging learning experiences, leveraging advancements in technology and behavioral science. The integration of gamified systems in promoting sustainability shows promise in fostering real-world behavior changes. As education shifts towards more active, student-centered methods, the potential of gamification and serious games to create impactful, immersive learning environments continues to grow, with increasing focus on cross-disciplinary collaboration and the customization of learning experiences.

This review aims to systematize the existing knowledge on the effectiveness and efficiency of using gamification and serious games to raise awareness about the sustainable use of natural resources. The relevance of this study is underscored by its alignment with global sustainability objectives, particularly the United Nations' Sustainable Development Goals. Moreover, the literature review provides an interdisciplinary and multifaceted perspective, incorporating insights from game design,