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The SDGs Game: A transformative pedagogical tool for engaging students with the complexity of sustainability challenges

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Abstract

As sustainability competencies gain increasing prominence in higher education, educators face the challenge of facilitating learning that integrates cognitive, emotional, and relational dimensions. The complexity and interconnected nature of sustainability concepts lend it to being especially difficult for students to grasp through traditional teaching alone. Here we present the use of the SDGs Game as a core pedagogical tool within the Arctic Sustainability Lab's sustainability science master's course and elaborate on our experiences facilitating Imacocollabo's 2030 SDGs Game to create embodied and experiential learning experience for our students. The game strengthens group cohesion by providing students from diverse disciplinary backgrounds with a shared, immersive entry point into systems thinking and helps students engage more deeply with the nuanced dynamics of sustainability challenges. Moreover, it creates a safe and shared space for continued reflective learning, acting as their own 'world' sandbox. We find that students that have participated in the 2030 SDG game return to the game throughout the course as a model system to reflect, explore and examine various sustainability concepts. Our experience underscores that serious games, like the 2030 SDG's game, are not "just games," but powerful tools for transformative sustainability education.

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Introduction

Although the UN Sustainable Development Goals (SDGs) are widely recognized as a blueprint for a sustainable future, their complexity and interconnectedness are often difficult for students to grasp through traditional teaching methods. This paper explores how the SDGs Game can provide an embodied, experiential learning experience that helps students engage more deeply with the dynamics of sustainability challenges.

Sustainability competencies in higher education have been receiving increasing attention in recent years (e.g. UNESCO 2017, GreenComp, 2022, Wickson et al, 2025). Sustainability educators are presented with the pedagogic challenge of effectively facilitating embodied learning that enables students to develop not only the knowledge and skills necessary to address future sustainability challenges, but also the interpersonal and reflective capacities required for resilience when contributing to sustainability transformations in the face of adversities (Wickson et al, 2025; Eriksson et al., 2022; Ives et al, 2023; Wamsler, 2018; Woiwode; 2020). These include the ability to recognise, manage and constructively respond to complex emotions and ethical tensions that often accompany sustainability challenges (Wickson et al., 2025). Such competencies are often not easily acquired through traditional lecture-based approaches alone. Understanding the complex and interconnected nature of sustainability challenges requires teaching approaches that provide students with opportunities for embodied, experiential leaning, integrating cognitive, emotional and relational dimensions. This article presents our experience using Imacocollabo's 2030 Sustainable Development Goals (SDGs) game for engaging university sustainability science students with the complexity of sustainability challenges.

The 2030 SDGs game as a pedagogical tool

The 2015 United Nations report *Transforming Our World: The 2030 Agenda for Sustainable Development* outlines 17 goals with the purpose of eradicating poverty, safeguard the environment and biodiversity, and promoting prosperity for all. [The 2030 Sustainable Development Goals (SDGs) Game](#) is an experiential in-person serious game designed to convey the core essence of the SDGs through an immersive playing experience. The SDG 2030 game was first developed in 2016 in Japan by the Imacocollabo team and has since been played by diverse groups of people globally, from children through high level EU decision makers. At UiT-The Arctic University of Norway, we have been using this game as a pedagogical tool to engage a wide variety of university students and academics with the complexity of sustainability challenges.
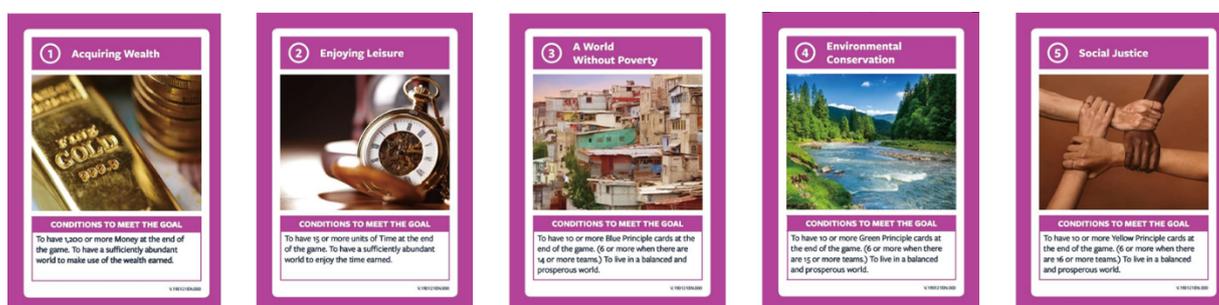
Course context and learning objectives

[The Arctic Sustainability Lab's](#) sustainability science master's course has been developed around three sustainability education competencies: normative thinking, systems thinking and futures thinking (Wiek et al., 2011). The SDGs game is played in the early stages of the semester, drawing together these three competencies that are used as the scaffolding throughout the course. Introducing this serious game into the course intends to create an experience for students from mixed disciplinary backgrounds to experience first-hand the dynamic and interconnected nature of global sustainability challenges. The intention of using this game is to enable students to experience and reflect on sustainability complexities and to encourage creative thinking, critical dialogue and collective insight.

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Game design and gameplay

In the 2030 SDGs Game students are not only participants in a simulated game world, but they are also co-creators of it. Rather than representing the world at a global scale, the "world" within the game is intentionally localized: it is constituted by the participants present in the room. Each player represents an actor within this shared system, and together they collectively shape social, economic, and environmental outcomes through their decisions and interactions. This dynamic framing allows participants to experience how individual priorities and actions aggregate into broader systemic consequences, mirroring real-world sustainability challenges.

At the start of the game players are each assigned one of five distinct goal types, each reflecting different value orientations present in society. These include goals centered on acquiring wealth, maximizing leisure time, achieving a world without poverty, promoting environmental conservation, and advancing social justice (Figure 1). The outcome of the game depends not only on achieving their individual goals, but on how these diverse priorities interact and influence the collective condition of the shared world.

Figure 1. The five types of goal cards used in the 2030 SDGs game. Reproduced with permission from Imacocollabo.

Each player begins with three types of cards: Money cards, Time cards, and Project cards (Figure 2). Money and Time represent finite resources, while Project cards describe possible activities or initiatives that participants may choose to undertake. Progress toward individual goals occurs through the running of projects, which require the use of time and money resources and can generate various outcomes in return. When a project is completed, participants may receive combinations of additional money, time, new project cards, or Principal cards (Figure 3). Principle cards represent the intangible outcomes that come from different experiences, such as personal fulfillment, values, lived experience, or knowledge. Furthermore, each time a project is completed it influences the state of world they are creating. The World Condition Meter is used to represent the continually evolving state of the world throughout gameplay (Figure 4). Similarly to how in real-world sustainability discourse, the state of sustainability is often examined through various indicators and metrics, the game abstracts this logic into three dimensions: Economy, Environment, and Society. These dimensions are displayed on a whiteboard with corresponding magnets to indicate increases or decreases in each domain (Figure 4). Each project that is run by individuals produces measurable effects on one or more dimensions of the World Condition Meter (Figure 3). As a result, the state of the world is continuously reshaped by cumulative individual actions.
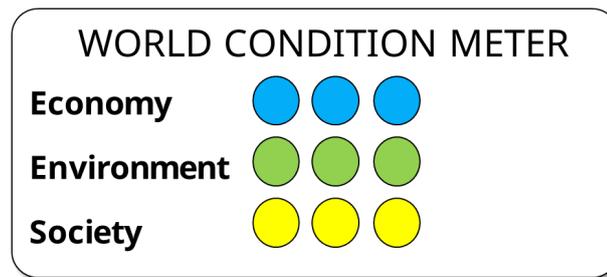
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Spend Money and Time

Run Projects

Achieve Goal

Figure 2. Overview of streamlined game play. Spend money and time to run projects to help you achieve your goal. On the left is a depiction of the Money and Time cards, In the center is an example of one Project card. Reproduced with permission from Imacocollabo.
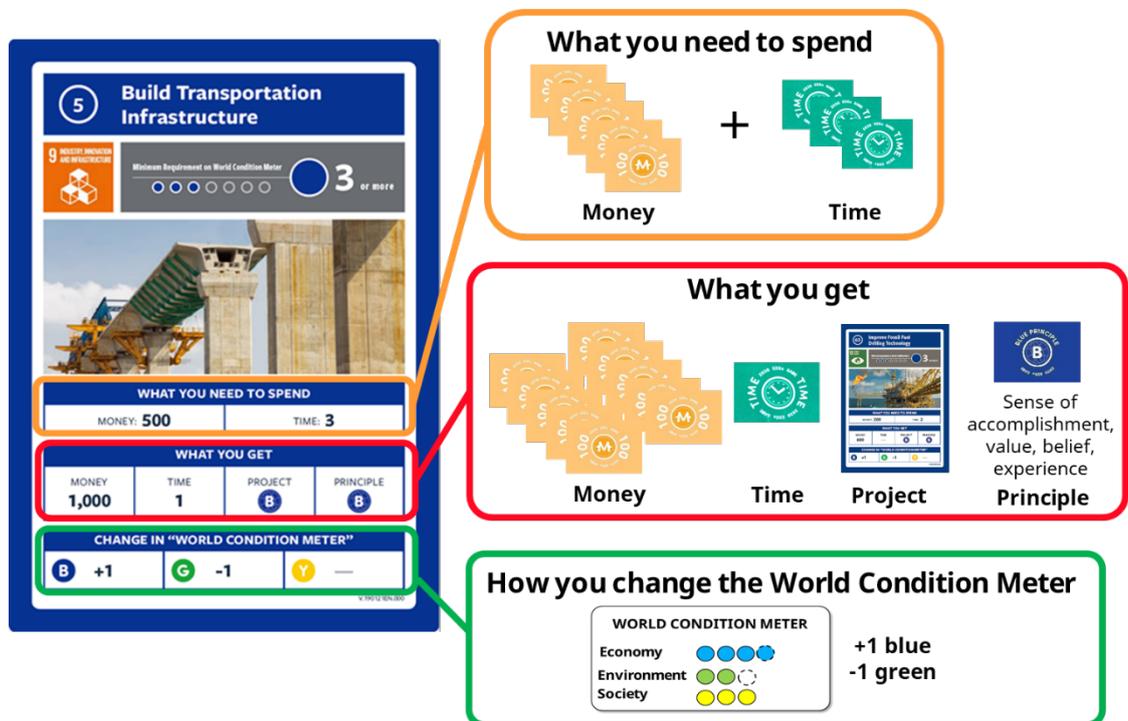
Figure 3. Schematic demonstrating what you need to spend to run this specific Project card, what you get in return, and how running the Project effects the World Condition Meter. Reproduced and adapted with permission from Imacocollabo.

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Figure 4. The World Condition Meter with its three dimensions of the worlds condition being: Economy, Environment, and Society. The state of each dimension is represented with blue, green or yellow magnets respectively. The World Condition Meter is initially set with three magnets under each dimension, however, as the game is played the number of magnets fluctuate dramatically. Reproduced with permission from Imacocollabo.

The 2030 SDGs Game allows for open negotiation and interaction among participants. Players are free to collaborate, exchange resources, form alliances, or negotiate trade-offs, provided there is mutual agreement. Rather than prescribing optimal strategies, the game invites participants to draw on their own reasoning and lived experience when making decisions. When uncertainty arises, participants are encouraged to reflect on how they might act in comparable real-world situations. Through this process, the game functions not only as a simulation of sustainability and complex adaptive system dynamics, but also as a reflective space in which learners can critically examine their assumptions about value, responsibility, and collective action. At the end of the game, we review how many individual goals were met, discuss how different projects impacted their world, and if they were able to create a sustainable world.

Leaning outcomes and pedagogical reflections

In the post-game debrief, students are invited to reflect critically on real-world sustainability trade-offs and their own roles within systems. Moments of resistance, cooperation, and surprise reveal how experiential learning can ignite deeper reflection and personal transformation, aligning with constructivist and pragmatic pedagogical approaches in higher education. Throughout the gameplay, we commonly experience the students shifting from acting and playing as individuals, to students working together in in collaborative problem solving. Through our facilitation experiences with diverse student groups, common reflections reinforce the suitability of this game in exposing plural values and assumptions (normative thinking), embodied experience of complex systems including trade-offs and interactions (systems thinking), and futures thinking.

   The collective experience of this game exposes multiple viewpoints and supports self-awareness (kizuki), collaborative learning, and the surfacing of tacit assumptions and normative biases. The game encourages students to build parallels and connections with other concepts in the sustainability science master course, such as tipping points, resilience, and trade-offs. The game experience acts as both a pedagogic scaffolding and sandbox after the gameplay. We find students continue to refer back to the embodied experience as a grounding for understanding abstract concepts like complex adaptive systems and is frequently used as an example to better understand and explore the

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complexities of sustainability.

Additionally, we have found running the game in the early stages of our Masters course contributes to group cohesion and creating of a safe, reflective learning space where students and facilitators alike encounter unexpected insights. In sharing our experience, we demonstrate that such pedagogic tools are not "just games," but powerful gateways into transformative teaching practices, particularly well-suited for interdisciplinary sustainability education.

About the Authors

Emma Vogel is an interdisciplinary postdoctoral researcher at the Arctic Sustainability Lab at UiT, with a background in spatial ecology, animal movement, serious games and sustainable marine ecosystems. Her research is motivated by the urgent need to understand the mechanisms underlying animal movement and how behaviours are shifting in response to increasing anthropogenic pressures. Her overarching goal is to contribute big-picture insights into the processes shaping animal behaviour and movement, supporting management and conservation decisions for a more sustainable future. She also leads the Sustainability Science course at UiT, where she integrates experiential and systems-based approaches to help students engage with the complexity of socio-ecological change.

Alexandra Kate Abrahams is an interdisciplinary PhD at the Arctic Sustainability Lab at UiT. Her background with natural sciences and lifelong interest in human-nature relationships led her to a PhD in transformative change towards sustainable blue food systems. Abrahams believes the stories we tell about the world around us are powerful agents of change towards a just and sustainable world, and she is currently excited by her research on regenerative aquaculture and the transformative potential of regenerative food systems. She is also the coordinator of and teacher on the Sustainability Science course at UiT.

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