GREENING GAMES
SUSTAINABILITY KIT

A set of educational tools, resources and recommendations developed in the Greening Games project

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Introduction

The Greening Games Sustainability Kit is a toolset for teaching topics related to environmental sustainability in game design and game studies university courses. It is the final outcome of the three-year-long research project "Greening Games Building Higher Education Resources for Sustainable Video Game Production, Design & Critical Game Studies" (2021-2024). The Kit contains an overview of didactic resources that may help teachers integrate green gaming into their curricula and expand on the materials developed within the project so far. It also offers a consolidated and enriched version of the Greening Games Education Report, Teaching Guide and the Pedagogical Framework. Our hope is that the research carried out during this project will inform future studies and facilitate the development of both new pedagogical resources and other forms of transnational cooperation.

Our target audience are primarily university-level educators: both, those who already teach eco-critical game studies and development as well as those who are looking for inspiration to start their didactic journey in this field. Our goal is to facilitate a positive impact on higher education institutions and more generally on educational systems by providing recommendations on teaching green gaming.

The Sustainability Kit is divided into five parts: Teaching Roadmap, Teaching Reflections, Resources Created by Students, Our Scientific Publications, and Conclusions & Recommendations. In the first section, we will share our teaching philosophy, didactic resources and provide an overview of how others have taught green gaming. While the second part focuses on the teaching reflections made by the educators in our project's partner institutions, the third section showcases the students' involvement in the project. Lastly, we will share our latest scientific publications and offer recommendations for future research.

Teaching Roadmap

Four thematic pillars

What we believe is most needed at this point are best practices in teaching and a thematic interpretation of all the complex issues arising at the crossover between digital games and the natural environment. Therefore, we have been working with four approaches which, to the best of our knowledge, map out the existing themes and research questions in green game studies and game development. We hope that by interpreting environmental sustainability in games via these four leading paths, we can help newcomers to the field in grasping its interdisciplinary complexity.

- **Games Infrastructures**: games as objects of nature, relying on material resources and practices

- **Games Cultures**: games as objects of culture, carrying societal values and providing spaces for activism

- **Games Production**: games as digital products developed according to workflow processes and practices

- **Games Content**: games as systems designed with embedded ecological messages and aesthetics

The first two engage with humanities-led topics related to eco-critical game studies, and the latter two fall under the banner of applied approaches to eco-critical game development.

By eco-critical game studies, we refer to approaches towards the study of games that engage with ethical, political and cultural dimensions of the medium. The question of the environmental sustainability of video games is embedded in the existing socio-economic power structures.

The eco-critical game development perspectives focus on sustainable game production and development as well as on environmentally considerate game design. The first aspect takes into consideration topics such as energy demands of game dev elopment, heating office spaces, flying to conferences, or the use of cloud services. These, amongst others, contribute to the industry's overall carbon footprint. The second aspect focuses on designing games representing and simulating ecological dynamics.

Thematic pillars in university courses

At Cologne Game Lab of TH Köln, across the span of two years (2022-2024), we were able to implement teaching sessions representing all the above thematic pillars, both at the B.A. as well as M.A. levels. Our teaching pilot started early on in the first year of the Greening Games project with a two-month-long course "**Experimental Games for Climate**" focused on designing ecological games aimed at students of the fourth semester in the B.A. Digital Games programme (see: **Greening Games_Course package 3** in our Repository). The students designed and developed experimental video games within the context of the climate crisis, evaluating game mechanics, visual and system aesthetics as well as narrative components that best fit the message they wanted to communicate through their games.

Additionally, the students had a chance to exchange their ideas with **external mentors** from the International Game Developers Association's Climate Special Interest Group *(IGDA Climate SIG)*. **The Environmental Game Design Playbook** published in January 2022 served as support material before embarking on the quest of designing the experimental games. Cologne Game Lab was the first game education institution to implement the Environmental Game Design Playbook in the university course.

Lessons learned from the pilot project were shared in a joint presentation with the IGDA Climate SIG representatives during the Educator's Summit at the Game Developers Conference 2023 in San Francisco.
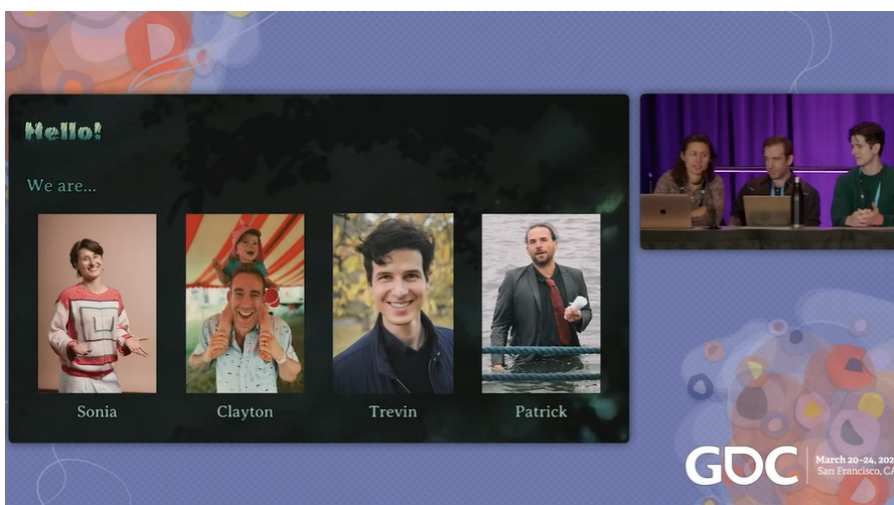

Figure 1. A screen capture from the joint presentation by Sonia Fizek, Clayton Whittle, Trevin York and Patrick Prax (2023) https://www.gdcvault.com/play/1029041/Educators-Summit-Teaching-Sustainability-and

When: Summer Semester 2022 (mid May to mid July 2022), four three-hour sessions with additional team mentorship in arts, design and programming

Where: TH Köln, Cologne Game Lab. Institute for Game Development & Research

How: Within the framework of the Collaborative Projects module regular course Game development seminar, which consists (amongst other things) of a series of discussion seminars on the current issues of the gaming industry

Who: Led by Sonia Fizek, co-led by Katharina Tillmanns, Jonas Zimmer and Peter Bickhofe with support of three external mentors from the Advisory Board of the Greening Games project: Trevin York, Hugo Bille and Paula Angela Escuadra (IGDA Climate SIG, (International Game Developers Association's Climate Special Interest Group)

Target group: 39 students of the fourth semester in the B.A. Digital Games program at CGL. The students represented three cohorts specialising in game arts, game design and game programming.

The main didactic goal of the pilot project was to explore video games as playable forms of critical ecological thought. To achieve this, we set-up the following learning objectives:

- **Objective 1**: to provide the students with critical impulses and creative space to develop experimental games within the context of climate crisis,
- **Objective 2**: to enhance the students' capacity to experiment within the context of game design, game programming, and game arts,
- **Objective 3**: to familiarise the students with the collaborative environmental game design work by the IGDA Climate Special Interest Group, and to apply this work into their own environmental design,
- **Objective 4**: to give the students an opportunity to present their games to and learn from external mentors from the IGDA Climate SIG.

As a result of the course, ten ecological video game prototypes were made and played by the students:

Hold my Hand, I'm Scared - a narrative 2D side-scroller game with an experimental controller: a hand made from paper scraps and powered by Arduino.

What about Fish - a narrative game in which the player leads a group of fish through polluted waters.

100 Days of Wind - an augmented reality mobile experience featuring an island with wind turbines modelled on an existing island El Hierro powered by 100% renewable energy (mechanic: blowing in order to propel the wind turbines).

EcOS - a simulation of a desktop application published by the fictional company POLAR in which the player tests the beta version of a new operating system and, in doing so, plays environmental mini-games. The games serve as ironic commentaries on greenwashing PR by software companies.

Planet B - a single-player economy simulator in which the player manages a planet by manipulating its political system, use of technology, and the lifestyles of the in-game characters.

Beeware - a local mixed reality game with educational content about wild bees. For the full experience, the player needs to travel to a real-life location, in this case, Gut Leidenhausen, a wild bee informational area outside of Cologne.

Mini Marbles - a mobile puzzle game in which the player balances the planet's ecosystem in different eras between the year 1650 and 2000.

Greenwashing - a first-person 3D narrative game about greenwashing. The player explores the scene and collects information on a fictional car-producing company in order to expose their greenwashing practices.

ClimateCore - a 3D environment in which the player explores locations representing abandoned early-2000s websites devoted to environmental movements and climate change.

Garbage Sorting - a mobile game in which the player sorts out four types of garbage: general, plastic, paper, and drop-off within a timeframe of 30 seconds.

Our teaching philosophy

The teaching materials have been designed for three different scenarios, with extensive options for mixing-and-matching between the offerings:

- Module-based education
- Drop-in teaching content (one-off sessions)
- Project- and role-based education

Module-based education

In module-based education, students will be taught a topic across a range of weeks or months, culminating in some form of assessment. This is a traditional method for education across many European and international high-education institutions.

Suggested teaching materials for module-based education:

- **Curricula**: Green Game Studies Course Package 1 - "Eco-Critical Game Studies. Video Games as Objects of Culture & Nature"
- **Lecture decks**: "Analysis of Video Games: How to make sense of (ecological) games?" "Games Cultures: on digital games as spaces of eco-activism"
- **Podcasts**: "Programmer's perspective on games production"

Drop-in teaching content

Many game education institutions may not prioritise sustainability in their offer, particularly if they take an industry-oriented applied approach. The more important it is to share resources and methods in the wider academic community, so that lecturers have a chance to include sustainability content within their teaching programmes. In our Greening Games Repository, educators can find a variety of materials that they integrate into the already existing courses and modules.

Suggested teaching materials for one-off sessions:

- **Lecture decks**: we developed ten different exemplary presentation decks with lecture material discussing the four thematic pillars of our project (games infrastructures, games cultures, games production and games content).

- **Workshop activities**: our thirteen project-based activities provide ideas and methods for hands-on seminars and workshops.

The above resources are supported by additional multimodal materials: podcasts, videos, an educational card deck developed by Master students at Cologne Game Lab, as well as a rich literature library.

Project- and role-based education

Some universities, particularly those teaching hands-on game development, teach by giving students projects to complete. In approaching these projects, students are given external and internal (creative) motivation to engage with pre-set concepts and themes. Students are required to adopt the necessary team roles to complete the project (hence this also being called 'role-based learning') and so they gain both practical skills and intellectual insight into the complexity of a project.

This approach of using projects begins with giving students a project brief and then supporting their knowledge and skills over a period of weeks (typically 2-6 months, but times vary).

In project-based learning, teachers play a mentor-like role, allowing students to develop insight and expertise through their desire for progress, rather than because the teacher has dictated it is necessary.

At Cologne Game Lab, project-based sessions were implemented across all the courses. In the design pilot course "Experimental Games for Climate", 39 B.A. students in ten teams were facilitated by six mentors in the six-week-long process of developing ecologically themed video games. In humanities-led courses in the Media & Game Studies module, the traditional teaching methods such as text interpretation and discussion were interwoven by student-led exercises, such as Talk & Play sessions. Those sessions usually last up to 90 minutes and their main point is for students to work closely in groups on problem-based questions. Below, we are presenting a description of the Talk & Play session that took place in the M.A. course on "Video Games and Nature. Eco-Critical Game Studies and Game Development" in the winter semester 2023/2024 (see: Green Game Studies_Course Package 5 in the Repository).

Activity: Talk & Play session based on playing a game from the source list

Task 1: Divide students into groups of 3-5 and ask each of the groups to play through the assigned ecological game, e.g., *Beecarbonize* (2023). During the playthrough session, students should take notes, paying attention to how the ecological message is communicated through the game via e.g., game rules (game loop), visual aesthetics, narrative elements (if present), and meta-gaming elements. Discuss the usefulness of "procedural rhetoric", a term coined by Ian Bogost to describe the way video games persuade via algorithmic procedures. Also, support your discussion with the Climate Game Toolkit for Content Creators developed by Arnaud Fayolle from Ubisoft (*60 minutes*)

Task 2: Ask each of the groups to share their impressions and findings. (*5-10 minutes per group; 30 minutes*)

Figure 2. Climate Game Toolkit for Content Creators by Arnaud Fayolle (Ubisoft Positive Play)

How others teach green gaming

In the initial stage of the Greening Games project, we explored the state-of-the-art in current teaching and research in green gaming. We conducted ten in-depth interviews with selected European academics representing a wide range of disciplines, higher education institutions and university programs. Below, we are presenting two examples from both humanities and game development study programs. To find out more about the interviews, lecturers' motivations and student reactions, see the **Greening Games Education Report.**

Examples from the humanities study programs:

Utrecht University, Digital Media and Game Studies (The Netherlands)

Stefan Werning, an associate professor for Digital Media and Game Studies in Utrecht University, together with other lecturers in his department tried to embed sustainability topics into already existing courses, whenever possible. Environmental games content was embedded to a number of courses on bachelor, master and doctoral levels, e.g., in serious games and playful media cultures. Additionally, in the last few years the department organised an Ecogames Summer School, where international Master and Doctoral students were invited to a week of lectures, seminars and workshops revolving around the topic of ecology and games.

University of Potsdam and University of Applied Sciences Potsdam, European Media Studies (Germany)

Sebastian Möring, who until 2023 was an assistant professor in media and game studies at the University of Potsdam, recognised that ecological content could become a constituent part of all kinds of already existing modules. In European Media Studies, a joint study program between University of Potsdam (Arts and Media Department) and University of Applied Sciences Potsdam (Design Department). In his teaching, Möring incorporated ecological topics in a number of courses on BA-level. For example, a course on *Approaches to the Ecology of Computer Games* offered critical analyses of foundational texts in green

game studies. In an experimental seminar on Nature Writing in Games and Reality students explored ecological themes through creative writing with an aim to explore the relationship to mediated nature in video game worlds. As a result, the students curated and edited their own collected volume titled *Nature Writing in Reality and Games* which may be accessed here: https://emw.eu/downloads/WEB_Nature_Writing_in_Reality_and_Games.pdf.

Examples from game development study programs:

Macromedia University, Game Design (Germany)

Gerald Farca, a professor in Game Design at the Macromedia University (Germany), integrated environmental considerations into existing modules with focus points on world building and character design. His didactic approach to teaching environmental topics centred around three main perspectives:
a. World Building and Level Design - with a focus on simulated environments and mechanics,
b. Sustainability of Digital Media - with a focus on the materiality of media,
c. Ecological Aesthetics - with a focus on close readings of environmental themes and motifs in games.

ITU Copenhagen, Master of Science in Games (Denmark)

Hanna Wirman, an associate professor and head of program in Master of Science in Games in IT University of Copenhagen, pointed out that while there was no structure in place for environmentally focused courses at ITU (as of year 2022), many lecturers integrated the topic into already existing modules and courses. For example, within the framework of a Master course in *Playable Media*, focused on critical design, Wirman raised the questions of environmental responsibility of the designer.

Didactic resources

When we set out to develop teaching resources for game studies and game development, we had to take into consideration the diverse and interdisciplinary nature of existing higher educational programs across Europe. While most existing B.A. and M.A. programs related to video games focus on their applied aspects such as game design and game programming, there are only a handful of dedicated programs in humanities-led game studies. On the other hand, game studies are usually taught within other disciplines, such as cultural studies,media studies, film studies or literature studies, among many others.

This patchwork state-of-the-art in game studies and game development made us realise that we needed **a modular solution**. Instead of creating linear curricula for Greening Games education, we focused on providing the educators with a range of **diverse formats, methods, and materials** for activities ranging from self-study and reading groups to roundtable discussions, workshops and critically playing and designing ecological games. The resources provided are most effective when **mixed and matched** by the instructors to best fit their students' needs.

Within the capacity of the Greening Games project, we developed over fifty teaching resources in the following four main categories:

1. Course packages (full syllabi of B.A. and M.A. courses)
2. Lecture decks (introductory and focused lectures)
3. Project-based activities (hands-on activities which may be used during seminars and workshops)
4. Additional multimodal materials (podcasts, videos, a card deck, a comprehensive literature library)

All of our resources are open access and available online in the Repository on our project's website as well as on the official Erasmus+ Project Results Platform.

Course package examples

Greening Games course packages include full syllabi with session-to-session descriptions, which may be particularly helpful to educators who want to design multi-session courses, seminars, or workshops. As opposed to slide decks, which take their audience through a specific problem or topic, course packages provide larger didactic frameworks. Our packages offer examples of courses designed for bachelor's as well as master's levels. Some are devoted to topics relevant for humanities-led game studies content while others to project-based courses in game development.

- Green Game Studies: Course Package 1: "*Eco-Critical Game Studies. Video Games as Objects of Culture & Nature*"
- Green Game Studies: Course Package 7: *"Greening Games - Games, gaming and sustainability"*
- Green Game Design: Course Package 3: *"Experimental Games for Climate"*

Lecture deck examples

Our lecture decs cover a variety of topics with different audiences in mind.The introductory lecture deck provides a compact interpretation of greening games research and the context necessary to dive into more specific topics offered in focused lecture decks. The focused decks cover material designed specifically in our four thematic areas: Games Infrastructures, Games Cultures, Games Production, and Games Content. While the lecture decks are designed to be 'dropped in' to existing curricula, we strongly recommend that educators mix and match concepts and update the slides with more recent examples, so that students are able to work with examples from their own experiences.

- Introductory lecture: *"Video Games & Nature: Introduction to ecocritical study of games & game making"*
- Games cultures: *"How players treat games as spaces of activism?"*
- Games Infrastructures: *"On the materiality of digital games"*
- Games content: *"Theming' and 'systemic' pro-environmental messaging in video games"*
- Games production: *"Introduction to the video game industry's environmental impact"*

Project-based activities examples

Our teaching materials include a wide range of workshop activities for both game development students and for students with a cultural and media studies approach. They include hands-on interactive activities, which are a perfect set of teaching topics and accompanying methods from gamified team research. Typically, they last 1-2 hours and are aimed at group sizes of 10-25 participants. The durations vary based on the particular activities and the maximum class sizes are different for more intensive interactive sessions. The goal of the project-based activities is to provide educators with exciting recipes for activities they may implement in their existing courses.

- Modding as educational method: In this interactive workshop (Activity 1: Green re-theming, link), which is targeted for game development students in B.A. and M.A. levels, students work to add sustainability messages to existing games without changing the gameplay mechanics. They can do this for example by changing aesthetics of the game (visual, narrative, etc.) to encompass sustainability themes. The workshop provides the students with an improved understanding about the range of options available to include environmental theming in a larger game's scope.

- Greening your studio: This activity (Activity 1: Greening your studio, link) which is aimed for game development students in B.A. and M.A. levels, demonstrates various ways of reducing the carbon footprint of a video game studio. The students are expected to come up with different solutions to make a small game studio more environmentally sustainable and rank them based on their difficulty and impact. This activity provides the students with an understanding of how video game studios can directly influence their environmental impact by changing their production strategies. They will also be able to contextualise this in the framework of differently sized and differently structured studios.

- Ecocritical game analysis: This activity (Activity 3: Ecocritical game analysis) for M.A. level students encourages them to critically reflect on how video games can engage with environmental issues. The students first analyse fictional game concepts inspired by real-life examples of video games approaching environmental issues in a superficial and counterfactual ecological framing. Then, they problematise these messages and generate concepts that focus on the same issue but address it in a more critical way. The aim of the activity is to promote critical game literacy and eco-critical reflexivity as it is important for game researchers and designers alike to develop the critical skills for recognising and deconstructing problematic representations.

Additional multimodal material examples

Alongside the traditional teaching materials, the Greening Games project also offers a variety of other media. The set of additional materials include: podcasts, video interviews, a curated list of research sources, and an educational card deck. All these materials may be mixed and matched and implemented as stand-alone support materials into existing courses. They are also an inspiring way to dive into the topic of green gaming, so they may be the most attractive didactic material for students who find our Repository.

- Podcast: *"Programmer's perspective on games production"*
- Student podcast: *"Video games and their ability to raise awareness of environmental sustainability"*
- Video Interview: *"Greening Games: Interview with Charles Games"*
- A card deck for teaching a variety of topics about games and environmental sustainability: *"The Greening Games Deck"*
- The Greening Games Library (Zotero): Curated literature library, containing links to many sources that can inspire and support the study of sustainability and video games

Working with examples from the games industry

Beecarbonize by Charles Games

Figure 3. *Beecarbonize* video game (Charles Games 2023)

Beecarbonize is a video game about climate change developed by Charles Games together with climate experts from People in Need available for PC, Mac, Android and iOS.

It is a card-based real-time strategy game in which climate change is your opponent. In this game, you have to balance the power-generating industry, social reforms, ecological policies, and scientific endeavors in order to develop an effective strategy for how to decrease the carbon emissions. Game cards in Beecarbonize represent different inventions, laws, social advancements, or industries – each designed on the basis of real-world climate science. In addition, partially randomized world events occur, forcing you to adapt your strategy. The more carbon emissions you produce the more extreme events you will have to deal with. In total, There 235 unique game cards available for players to discover.

Figure 4. Gameplay screenshot in *Beecarbonize*

The world of Beecarbonize reacts to your actions. More emissions mean more floods or heatwaves, investing in nuclear power raises the risk of a nuclear incident, and so on. The game is highly replayable. Players learn more with each run and as they have to overcome different environmental catastrophes, social unrest, and even avert the end of life on earth. Will they prioritise transition from fossil fuels as fast as possible? Or will they focus on carbon capture technologies or ecosystem regeneration? It is up to players to decide which strategy they pursue in each run.

Figure 5. Gameplay screenshot in *Beecarbonize*

Beecarbonize was nominated for several international awards, for instance Apple Design Awards or Games for Change awards, and has approximately 500,000 players worldwide.

Teaching with Beecarbonize

Beecarbonize was developed together with climate experts from the Czech NGO People in Need. The game was created with the idea of combining entertaining mechanics with the opportunity for players to learn more about the subject. For players, the game serves as a playground to try out different approaches to tackling climate change. It forces players to think about the whole problem systematically and allows them to address it through a series of complex strategies that are based on our current scientific knowledge. With regard to increasing awareness of the topic of climate change, the game has the potential to be an educational tool in both formal and informal education.

Figure 6. Gameplay screenshot in *Beecarbonize*

In terms of informal education, players necessarily learn something about the topic just by playing the game. To succeed at the game, they must develop strategies that could realistically have a chance of succeeding in minimizing carbon emissions and their impacts. Beyond that, Beecarbonize contains an in-game encyclopedia describing each action in the game that is represented by a card. Based on community interactions, the game stimulates curiosity and interest in the topic. For instance, there are numerous discussions about the potential of implementing certain measures or actions in real life, how exactly the game represents different policies and so on.

For formal education, People in Need developed didactic materials on how to use the game as part of their educational program for schools "Učím o klimatu" (translated: "I am teaching about climate") available at https://ucimoklimatu.cz/vyukove-materialy/beecarbonize/.

The 45 minutes or alternatively 90 minutes lecture is composed of three phases. First, students receive a worksheet with three open questions about their knowledge of climate change. Then, they are introduced to how the game works using a data projector. Secondly, students individually play the game on their mobile devices. Afterward, they work with the same worksheet and can add any new knowledge to the open questions about climate change. Beyond that, they are asked to write down three words describing their game reflection after playing the game. When they are done, they all collectively discuss their answers, newly acquired knowledge and strategies they used in the game.

Analysing industry guidelines & reports

Including industry-made content in the seminars can be a valuable source of knowledge as well as inspiration for the students. Often, in applied programs, the students are driven by the usefulness of their educational offer in their later professional lives. Getting acquainted with the games industry perspective may allow them to see the relevance of environmental sustainability in and of games. New potential professions are entering the market, such as sustainability officer or consultant, especially in the triple-A industry. However, including industry guidelines and reports should always come hand in hand with critical discourse and close-reading techniques. It is crucial to systematically read those documents and evaluate the sources and information provided in them; not to take them at their face value. Often, the information provided in industry reports differs substantially from, or even contradicts, the independent reports produced by Greenpeace. This is especially true with regards to estimations related to the making of electronic hardware (including gaming consoles) and using those by the players. The image below presents this disparity, which should be critically addressed in seminars working with industry material.

"Device use is estimated to be the biggest hotspot of energy use and carbon emissions in the lifecycle of games for games consoles and PCs."

Green Games Guide (2021, 9, 15)

"Increasing device complexity means greater amounts of energy are required to produce each device, with 70 to 80% of the energy footprint of personal electronic devices occurring during the manufacturing phase. The manufacturing of electronics remains largely powered by coal and other forms of dirty energy in China and Southeast Asia, where most companies have based their manufacturing supply chains."

(Cook and Jardim 2017, *Greenpeace, Guide to Greener Electronics*)

Figure 7. Contradictory information in Green Games Guide by ukie and Guide to Greener Electronics by Greenpeace

A good example of a critical analysis is provided in one of our open source publications below. Educators may use this chapter as an example of how to "do" critical hermeneutic analysis of the industry guidelines or use the chapter as a reading resource for the students. Based on the reading, the students may focus on other parts of the Green Games Guide, which are not scrutinised in the chapter itself.

Fizek, S. (2024). Material Infrastructures of Play: How the Games Industry Reimagines Itself in the Face of Climate Crisis. In Ecogames: Playful Perspectives on the Climate Crisis, Amsterdam: Amsterdam University Press, pp. 525-542: https://doi.org/10.2307/jj.10819591.28.

Summary: This text explores the materiality of digital play and its connection to environmental sustainability, investigating how the video game industry responds to the climate crisis. Through a hermeneutic analysis of segments from the Green Games Guide, the chapter raises questions about the industry's reaction. Fizek queries whether green game-making commitments and self-regulatory initiatives are genuine shifts or merely PR tactics within the context of neoliberal culture's focus on growth and planned obsolescence.

Other industry materials that may be used as the foundation for critical analysis are self-reported commitments, initiatives, strategies as well as sustainability reports. Below, we are presenting a list of exemplary sources that may be useful starting points. Most bigger video game companies display their sustainability reports and strategies on their websites.

Ubisoft	Ubisoft's Environmental Commitment – 2022 Update How Ubisoft Activates Green Initiatives In Games
Remedy Entertainment	Sustainability - Remedy Investors Sustainability strategy - Remedy Investors Sustainability topics - Remedy Investors
Rovio	Sustainability - Rovio
CD Project Red	Sustainability - CD PROJEKT CD PROJEKT GROUP SUSTAINABILITY REPORT FOR 2023

Teaching Reflections

This section includes an overview of teaching reflections from three of our project partner institutions: Breda University of Applied Sciences, Charles University and TH Köln - Cologne University of Applied Sciences. The reflections are based on the teaching sessions that were conducted between April 2022 and July 2024.

Breda University of Applied Sciences – Lecturer's Reflection

Study program	Master of Game Technology
Module	Block C content
Course	Part of a year-long series of special-focus lectures
Institution	Breda University of Applied Sciences
Timeframe	16/05/24 - 11/07/24
Lecturer	Thomas Buijtenweg

Course Summary

The course covers a variety of topics relevant to deeper understanding of the context, content, and creation of video games. Many of the topics are more focused on hands-on examples, such as ray-tracing, AI path calculation, etc. Research skills and academic writing are also taught as part of this series.

Student Engagement

Students were given two presentations from the Greening Games pre-prepared materials, checked and lightly customised to fit the BUas course. The overall response was positive - students said they were pleased with the topic being included, and found the perspective of sustainability (divided between thematic and mechanics) was a useful way of thinking about game design.

Lessons Learned

The topic was presented clearly, but there was a bit more emphasis on the commercial appeal of green games than was appropriate for this audience - they were more interested in the practicalities of the design and technical aspects of game creation than the economics of adding sustainability content to games. However, they did say this angle was relevant for bachelor's students, who are more likely to be pursuing entrepreneurship after their studies.

Charles University – Lecturer's Reflection 1

Study program	Visual Computing and Game Development - MA
Module	Introduction to the video game industry's environmental impact
Course	Seminar on Game Development
Institution	Charles University
Timeframe	Winter semester 2023/2024
Lecturers	Andrea Hubert, Dr. Lukáš Kolek

Course Summary

Seminar on Game Development is a course for MA students of Game development specialisation of the program Visual Computing and Game Development at Charles University. The course is taught every semester, and students can enrol in it repeatedly. Within the curriculum, the course serves as an elective course that introduces new topics from the game industry, increases game literacy and improves students' general understanding of how games are made. Students of the specialisation are mostly focused on technical aspects and partially on the game design aspects of game development. Format of this course (moderated discussions, game diaries, attending conferences etc.) is considered rather unusual for them in this regard.

Within the referenced period, the course was partly focused on greening games to evaluate the materials developed. The following descriptions refer to the implementation of the deck "Introduction to the video game industry's environmental impact" as one of the seminar´s mandatory discussions. It was attended by 12 people and there is no other course within their program dealing with the environmental dimension of the game industry.

The presentation provides a general overview of the industry's challenges concerning climate change. It provides an introduction to the discussion on how the video games industry is affecting our environment and how it can contribute to improve it.

Student Engagement

There were several students not in favour of any initiatives aimed at decreasing the environmental impact of the video game industry. The active debate forced us to delve deeper into the data and possible future developments in the industry than we had originally intended.

Lessons Learned

For future seminars, we would focus more on prioritising actions based on their potential impact. In other words, we would still provide a general overview, but we would place more emphasis on the actions with the greatest impact. Although I believed we had already done this, it got lost in the debate, and it is a perspective that resonates the most with students. The students were interested in the environmental impact of PCs, which is more difficult to measure than consoles, for which we have provided extensive data during the lecture. For future lectures, looking into any new developments regarding PC games energy consumption measurements would be ideal.

Charles University – Lecturer's Reflection 2

Study program	Visual Computing and Game Development - MA
Module	Design Workshop
Course	Introduction to Game Design
Institution	Charles University
Timeframe	Winter semester 2023/2024
Lecturer	Veronika Petrova

Course Summary

Introduction to Game Design is a compulsory course for MA students of Game development specialisation of the program Visual Computing and Game Development at Charles University. It consists of game design theory, modifying existing games and developing their own narrative game.

One of the lectures within this course was taught using the materials for the Design Workshop. It was attended by 13 students. First the students were introduced to related topics - mainly transformational games and climate impacts. The focus of this lecture was to take one of the climate impacts and use it as a design exercise. This version of the workshop focused on resource depletion. Students were divided into groups and each group was tasked with coming up with an example of a game with an infinite resource and how they would change it so that the resource is finite. Each group then presented their ideas and got feedback from the rest of the class and lecturers.

Student Engagement

Each student group came up with quite different ideas on how to make a given resource in a game limited. Not all students focused solely on strictly environmental themed resources to edit. One team for example, chose to make money more sparse in GTA, other has made air itself limited. This was likely because we opened the discussion with a short presentation on eco-design. Students were able to explore general ideas of sustainability through these examples.

In contrast, some students were resisting the idea to think about games this way, they perceived the eco-design change to be detrimental to what they perceived as fun. We tried to discuss these issues and their worries with their group. In this case, we were discussing Age of Empires II and making forests into a more limited resource for each player. Changing this would result in different dynamics of the game since fighting over resources is one of the common things players do in the game. While forest is treated almost as if it is "unlimited", there actually is an end to all resources in AOEII. However, there are no natural consequences to depleting these resources that would align with environmentally friendly values. We discussed options of forest reserves or forest regeneration systems. However, the group did not appear to be motivated to think about these issues further.

Lessons Learned

The chosen theme did not necessarily push students into using strictly environmental themes. However the thought process and skills required to change a game in such a way still leads to a more environmentally conscious way of designing.

As mentioned above some students were a bit more conservative about the ideas of environmental design. In such cases it proved to be beneficial to focus mostly on the game design aspect of the task and frame it in a way that still ensures following the general sustainability principles. As such, it might unblock their creativity and will to actively participate in the task.

Students managed to come up with reasonably detailed solutions in the time given. It would be good to allow more time for discussion of the selected game design edits and the student's reasoning.

Charles University – Lecturer's Reflection 3

Study program	Media Studies, Faculty of Social Sciences
Module	Introduction to the video game industry's environmental impact
Course	Video Game Production
Institution	Charles University
Timeframe	Winter semester 2023/2024
Lecturers	Andrea Hubert

Course Summary

This was a guest lecture at the elective course Game production, which served as an introduction into a Game Studies perspective on the game industry, working conditions, and further production-related issues. The guest lecture was a focused lecture on The Introduction to the environmental impact of the game industry. The presentation of the same name was used for this lecture.

Student Engagement

The audience were students of media, and were, surprisingly, not very much acquainted with games, as the name of the course would suggest. Their interests seemed to peak at those times when we discussed information regarding energy saving or energy consumption in general, which was applicable to their daily life. Such as computers, mobiles, repair costs, and saving money on energy.

Like in other talks of such format, a few people were interested and asked questions afterwards. Few also seemed disinterested. This is to be expected as it is an informational introductory lecture to the topic.

Lessons Learned

Classes on Green game production are naturally more environmentally impact-oriented while the green design classes offer more options to connect with the audience - be it a design exercise or a deep reading of a game. In the environmental impact class, it is much more difficult to connect with the entire audience. Based on this lesson, I believe one of the potential tactics to find an audience connection is to tie the topic to the student's own experience of the material realities of owning or using any digital device, including those that can play games. Smartphones seem to be the most appropriate for this. Furthermore, in isolated guest lectures, I believe it is important to include both the material and design aspects for different specialisations, as these aspects are fundamentally intertwined and are needed to create the whole picture of what sustainability in games means.

For audiences with limited game (studies/design) experience, perhaps it is up to consideration to create a new more general class for students of other digital media, which would stem from our knowledge in the game industry expanded towards other fields. A class more oriented towards discussion on consumer habits which would build on a student's experiences, might be another way to go.

TH Köln – Lecturer's Reflection 1

Study program	B.A. Digital Games Program (fourth semester)
Module	Collaborative Projects
Course	Developing Experimental Games for Climate
Institution	TH Köln, Cologne Game Lab, Germany
Timeframe	Summer Term 2022 (April 2022-July 2022)
Lecturer	Prof. Dr. Sonia Fizek

Course Summary

In the course "Experimental Games for Climate" undergraduate students from three specialisations (game arts, game programming, and game design) worked in small teams to develop prototypes for environmentally themed games. The pilot involved 39 students, who formed 10 teams, with each team designing their own game: a playable prototype with at least 5 minutes of gameplay. The goal was to explore digital games as playable forms of critical thought. To do this, the students were encouraged to consciously evaluate game mechanics, visual and system aesthetics as well as narrative components.

Three developers from the *International Game Developers Association's Climate Special Interest Group* (IGDA Climate SIG) were invited to participate as external mentors: Paula Angela Escuadra, Trevin York, and Hugo Bille. They participated remotely in the game pitching session and intermediate presentations before attending the final game presentations on site in Cologne. *The Environmental Game Design Playbook* (published in February 2022) served as support material. The students had a chance to work with freshly published material and apply proven design tactics to develop meaningful ecological games.

Student Engagement

All the students were very curious about the topic. None of them had any previous knowledge in developing for the climate crisis. They were especially excited about the opportunity to work with external mentors from the *International Game Developers Association's Climate Special Interest Group* (IGDA Climate SIG). The feedback provided by the external mentors encouraged the students to work harder. Also the fact that some of the developed video games were featured in a GDC presentation (delivered in March 2023 in San Francisco) was a huge honour for the students.

However, with all the positive energy and hard work, the topic turned out to be quite overwhelming. None of the students had any previous knowledge in environmental issues and so they felt unprepared to develop games that would be able to raise awareness or even potentially change the players' behaviour.

Lessons Learned

The students at Cologne Game Lab were very motivated at the outset of the task. As the development of their games progressed, however, they were facing more challenges. They embarked on the development process far too quickly. To develop meaningful ecological games, the students would need to spend more time reading the preparatory material (in our case The Environmental Game Design Playbook) and analysing selected environmental games with a specific focus on their design patterns, mechanics, themes, and aesthetics. Such a preparatory phase is crucial, so I would encourage lecturers who want to work with ecological game development to allocate at least three 90-minute sessions to prepare the students for the task.

During the development phase it became clear that further help from subject matter experts from environmental science would have been helpful. This would allow the students to make sure that their game ideas reflected real-life environmental processes and issues. Perhaps, if all the students were working with one pre-selected environmental issue, the collective effort would have been even more powerful. The teams could also reach out to one another for comments and help.

Last but not least, developing for the local context would have been an asset. Only one in ten teams in the course was developing a game with a local topic in mind. All the other teams went for ideas that were either based on other geographical locations or referred to very general environmental issues, such as micro-plastic in oceanic waters.

You can find more reflections related to this and other courses on developing ecological games in the following publication:

Fizek, S., Fiadotau, M., Wirman, H., & Garda, M. (2023, March 12). Teaching Environmentally Conscious Game Design: Lessons and Challenges. Games: Research and Practice, 1(1), 1–9. DOI: https://doi.org/10.1145/3583058

TH Köln – Lecturer's Reflection 2

Study program	B.A. Digital Games (third semester)
Module	Basic Media and Game Studies
Course	Eco-Critical Game Studies. Video Games as Objects of Culture & Nature
Institution	TH Köln, Cologne Game Lab, Germany
Timeframe	Winter Term 2023 (September 2023-February 2024)
Lecturer	Prof. Dr. Sonia Fizek

Course Summary

This short course was an invitation to rethink video games and gaming within the context of climate crisis and environmental sustainability. In two three-hour sessions (amounting to four 90-minute-long seminars), we looked at the two contrasting facets of video games: on the one hand, their capacity to empower communities and represent ecological issues, and on the other their reliance on earthly matter. The two sessions were delivered as "thematic plug-ins" in a larger course in Media & Game Studies. This structure was a test for a modular way of teaching green games-related topics.

The students had to read pre-selected material and actively join the discussions. They also worked in groups in the so-called "Talk & Play" sessions, during which they played and analysed a digital ecological game Beecarbonize (2023) developed by Charles Games from Prague.

Student Engagement

The students were curious about the topic. They had no or little previous knowledge in matters related to video games and the climate crisis. The two sessions were quite demanding in terms of the amount of reading material as well as the complexity of topics. The students especially appreciated the final submission format (academic podcasts) as well as the Talk & Play exercise.

Lessons Learned

Next time I would prolong the Talk & Play sessions, giving the students more time to play through the game and discuss it. I would also pair up the Talk & Play sessions with extra reading materials related to the art of ludic interpretation, so that the students better understand what in-game elements are crucial carriers of meaning and why. Only then, can we move on to the specific topic in a concrete game.

Resources Created by Students

Academic Podcasts

In our teaching experience we tried to integrate students in the flipped-classroom tradition. At Cologne Game Lab, forty B.A. students recorded 5-minute podcasts, in which they were addressing environmental issues in and around video games. They were free to choose specific topics that reflected their particular interests. The best podcasts are available in the Greening Game Repository and may serve as inspiring sources for educators and other students.

Silas Lesner (bachelor student at Cologne Game Lab, TH Köln)

In this podcast Silas Lesner explores how video games may raise students' awareness of environmental sustainability. Long-term engagement with sustainability-related issues is usually the domain of serious games. However, commercial games can and should also take responsibility in this regard. Games may have a positive cognitive and behavioural impact on their players. Gamification serves here as the key tool to encouraging learning through play.

Carlos Jost (bachelor student at Cologne Game Lab, TH Köln)

This podcast by Carlos Jost takes a closer look at the production side of the entertainment industry. With the focus on sustainability, it compares and showcases the consequences of big productions from movies to games. Are our practices sustainable? How can we improve? And is it all worth it for a single piece of entertainment?

Anastasiia Shara (bachelor student at Cologne Game Lab, TH Köln)

In her podcast Anastasiia Shara explores how digital media may influence the environmental awareness of its users, specifically within the context of Virtual Reality technology. Can VR help tackle climate change? Let us find out.

Lara Gülpen (bachelor student at Cologne Game Lab, TH Köln)

In this podcast episode of the Greening Games project, host Lara Gülpen explores the intersection of Moore's Law and the pursuit of sustainable gaming technology. The discussion delves into the historical context and contemporary relevance of Moore's Law, illustrating how this foundational principle of semiconductor development can enhance energy and resource efficiency in gaming hardware. Drawing insights from examples such as Apple's iPhone and Sony's PlayStation, the discussion not only emphasises strategies for reducing electronic waste but also aims to counteract the rapid obsolescence of electronic devices through sustainable technological advancement. By prioritising eco-efficiency over mere increases in computing power, this exploration outlines a promising path towards fostering a more sustainable future in the gaming industry and beyond.

Niels van Son (bachelor student at Cologne Game Lab, TH Köln)

In this tacky one-on-one conversational podcast, two very similar sounding speakers, both impersonated by Niels van Son, go over how videogames are used to reflect upon and/or directly impact environmental issues in the eyes of the general public. Both famous and independent works are mentioned within a cosy and comedic atmosphere.

Juan Reyes Ortiz (bachelor student at Cologne Game Lab, TH Köln)

Juan Reyes Ortiz explores the practice of planned obsolescence in the video game industry in this podcast, with a specific focus on consoles and design choices. If you are interested in the overall impact of the industry within the global ecological crisis, you will also find.

Card Deck

We also invited students into producing the **Greening Games Deck** as a playful and playable didactic material for the other students at Cologne Game Lab. CGL's third semester M.A. students Ashcon Hamedi Nejad and Sarper Aydog developed an educational card game, in which the players' goal is to manage the production of a video game from an environmentally friendly perspective.

The Greening Games Deck was tested by four B.A. student teams (40 players in total) during the last Multiplier Event at Cologne Game Lab, TH Köln, taking place on the 23rd of October 2024. Below, we are presenting a few images from the play testing sessions as well as selected student feedback snippets.

The Deck is available for download in our Repository.

Figure 8. The Greening Games Card Deck layout (image from a play testing session organised on the 23rd of October 2024 at Cologne Game Lab, TH Köln)

Figure 9. The Greening Games team members and BA students play testing the Deck (image from a play testing session organised on the 23rd of October 2024 at Cologne Game Lab, TH Köln)

Crucial points of critique provided by students during the gameplay

Based on informal exchange during and after the play testing session (duration 2 hours), the designers and the Greening Games team collected feedback for the first playable iteration of the game. We divided the feedback into two broad categories: a) visual aesthetics and readability b) game mechanics and meaning

Feedback related to visual aesthetics and readability:

- **Colours and categories**: the back sides of the cards in different categories needs to be marked so that it is easier to handle and understand the types of cards at hand
- **Shapes**: the icons need to be clearly marked to avoid confusion between those representing playable tokens and those representing a process
- **Rulebook**: images of the initial card set-up and different gameplay variants would be helpful

Critical feedback related to game mechanics and meaning:

- Procedural rhetorics: in its first playable iteration the game did not reward taking sustainable actions - instead, the players were encouraged to produce as many video games as possible within the system provided. This poses a problem in a game, which is supposed to make students and developers aware of green production practices.

  More attention needs to be paid to the "Research" cards, which provide players with scientifically proven information related to greener game making. Those cards need to be connected to a rewarding mechanism; otherwise they are a coincidental resource players do not engage with.

- Gameplay dynamics: the gameplay is repetitive, so the questions arose on how to make it more dynamic and engaging. In a bigger round, the gameplay takes a long time as well. The students playing the Deck wished they had more opportunities to interact with one another; even collaborating or exchanging cards.

Despite many useful points of critique, the overall reception of the game was very positive. The BA students at Cologne Game Lab were very eager to hermeneutically analyse the game by playing it and dismantling its system. For the MA student designers, the ability to play test their game for change with 40 fellow students was a great opportunity to learn how to iterate early in the design process and how to engage in unstructured feedback sessions by taking notes and asking open questions they previously prepared.

At the end of this ludic didactic task, the Greening Games team distributed a survey to all the play testing students to find out more about their reception of this form of hands-on education. Below, we are presenting the survey questions we distributed and some of the answers that the students provided. Our aim is not to provide an in-depth survey outcomes analysis but to hint towards the most inspiring and useful feedback points coming from game design students confronted with a game for change as an educational tool.

Greening Games Card Deck – Survey

The following questions were distributed in an anonymized survey to play testing students in the first semester of the BA in Digital Games at Cologne Game Lab, TH Köln:

Question 1: I agree to participate in the research being conducted by Prof. Dr. Sonia Fizek, Dr. Laura Frings, Prof. Dr. Mata Haggis-Burridge, Prof. Dr. Jaakko Suominen, Dr. Maria B. Garda, Dr. Lukáš Kolek and Andrea Hubert for the project "Greening Games. Building HE Resources for Sustainable Video Game Production, Design and Critical Game Studies".I understand that the purpose of this anonymous survey is to collect feedback on the Greening Games Card Deck. I understand that this research will be used to improve the card deck. I agree that the results of my anonymous input could be presented in a range of formats, including the project's report, professional academic journal articles, conference presentations, and teaching content.
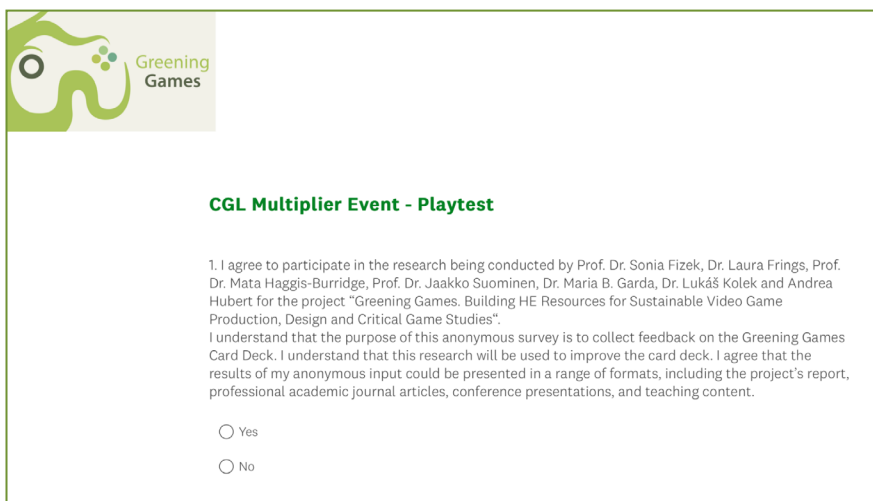
Question 2: Have you ever played an educational game before? (yes / no)
Question 3: Do you think games have the potential to educate? (yes / no) - if no, please explain why
Question 4: Do you think you have learned anything after playing the Greening Games Card Deck? (yes / no), if yes, what do you think you have learned?
Question 5: How would you describe the experience of playing the Greening Games Card Deck? a) informative and engaging b) confusing and boring c) not sure d) other (please specify)
Question 6: What would you improve? (open question)

Figure 10. The opening page of the survey used after play testing the Deck

Twenty two students completed the survey. Fifteen claimed to have played an educational game prior to engaging with the Greening Games Card Deck. Most of the students were also convinced that games have the potential to educate (twenty one out of twenty two). Questions four to six focused on the Card Deck specifically. The perceptions of the game's educational potential were divided. Only half of the students believed to have learned something through playing the deck. Eight students found the experience "informative and engaging", six were "not sure" while eight provided their own answers - some appreciating the mechanics of the game, others praising the deck for its engaging and fun capacities but not being convinced by its educational potential.
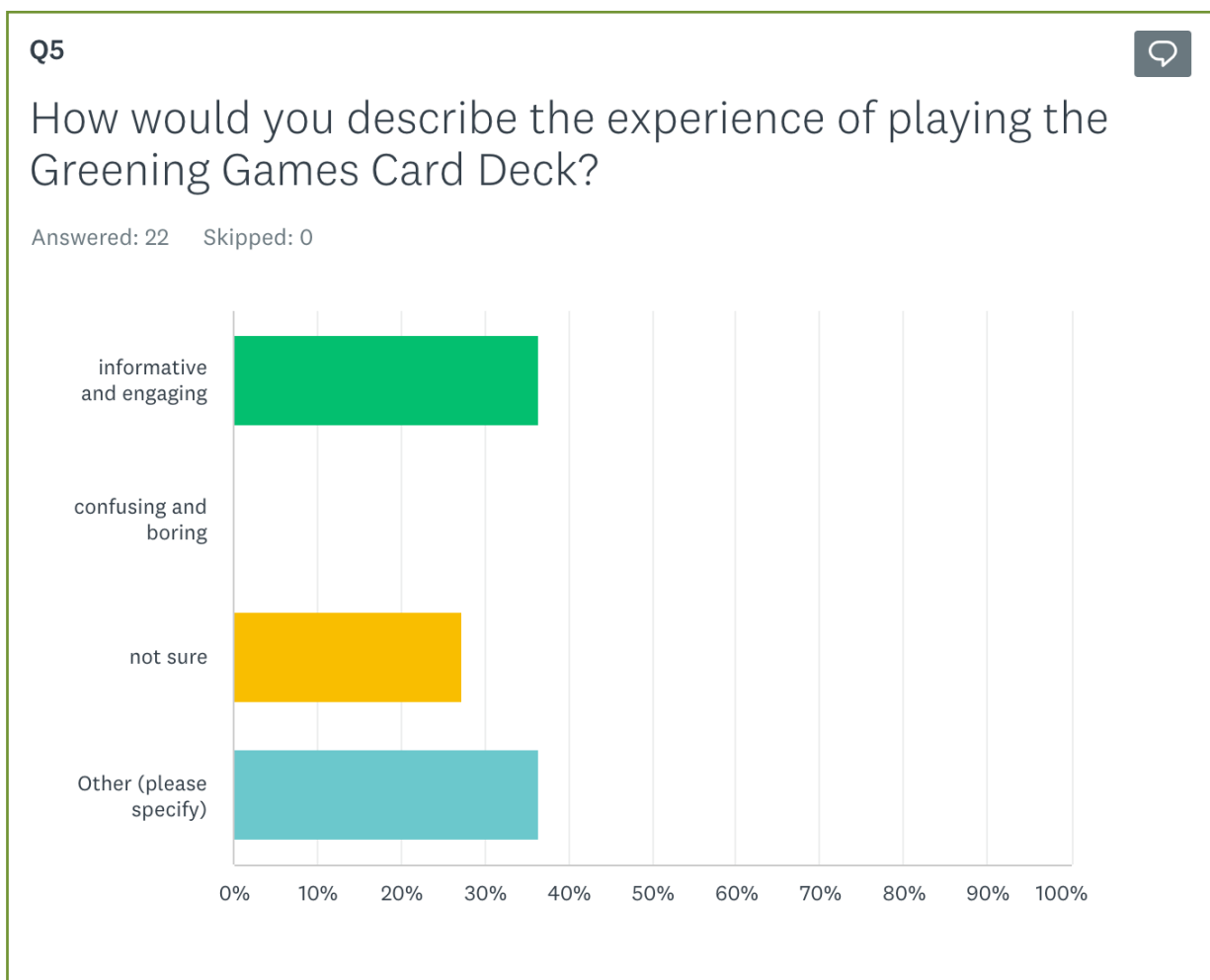
Figure 11. Answers to the fifth question

ANSWER CHOICES		RESPONSES	
informative and engaging		36.36%	8
confusing and boring		0.00%	0
not sure		27.27%	6
Other (please specify)	Responses	36.36%	8

I liked mechanics and how they interacted. But putting the Green Impact into the gameplay or own desicions was clearly lacking.

23.10.2024 17:56

Individualistic Game, not collaborative game

23.10.2024 17:06

Abstract and not educational

23.10.2024 17:04

not knowleadge-focused, rather bringing attention to the topic; engaging

23.10.2024 17:02

Figure 12. Selected answers from the "other" category

In the last open question we asked the respondents to focus on the suggestions for the deck's improvement. We received seventeen answers:

Content-wise - system of measurement and transaction that reflect mineral, water, energy resources and time.

I would put more of an incentive or focus on the research aspect of the game and also provide information on how resources and development actually result in more emissions. Once the graphics and the overall look of the game is finished, that would greatly improve the initial flow of the game.

More direct interaction between players, stronger focus on green development

Integrate green Impact cards directly into gameplay also to give the players more freedom to choose for their own playing style - will I be the one indie working on an 15-year-old laptop to put out „Stardew Valley"? Or will I be an EA putting out FIFA every new year with a big cloud and physical releases in every store cashing up people? And with what result in the end?readability b) game mechanics and meaning

Right now the only sustainability action is you pay for carbon offset and you still win - maybe there should be another message of the game?

Think about using other symbols and maybe the player should have two actions per turn.

As it stands, the green cards lack interactivity and force the player in a passive state which makes them feel not worth it + there is a lack of incentive to understand what the research itself

Onboarding experience is a bit rough (especially if just learning it through the rules)

Specific change in mechanic: make remaining resource-token count to the emissions negatively

Add value to research initiatives cards and more interaction between players.

Visual improvements such as colour coding the resources, making the rules easier to understand and digest because it was not easy for me to understand all of the text elements.
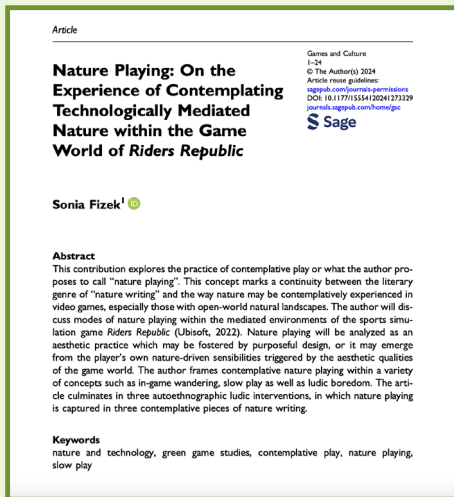
Main goals should be clearer

Improve pacing

UI of cards

Color coding, symbol language and spacing

Diversity of mechanics, narrative aspects, engagement points, collaborative aspects

More information on environmental impact / more text maybe - clearer rulebook - make emission reduction more important.

Our Scientific Publications

Abstract
This contribution explores the practice of contemplative play or what the author proposes to call "nature playing". This concept marks a continuity between the literary genre of "nature writing" and the way nature may be contemplatively experienced in video games, especially those with open-world natural landscapes. The author will discuss modes of nature playing within the mediated environments of the sports simulation game *Riders Republic* (Ubisoft, 2022). Nature playing will be analyzed as an aesthetic practice which may be fostered by purposeful design, or it may emerge from the player's own nature-driven sensibilities triggered by the aesthetic qualities of the game world. The author frames contemplative nature playing within a variety of concepts such as in-game wandering, slow play as well as ludic boredom. The article culminates in three autoethnographic ludic interventions, in which nature playing is captured in three contemplative pieces of nature writing.

Keywords
nature and technology, green game studies, contemplative play, nature playing, slow play

Journal: Games & Culture

Article: Nature Playing: On the Experience of Contemplating Technologically Mediated Nature within the Game World of Riders republic

Author: Sonia Fizek

Publication date: 28.08.2024

Summary

This contribution explores the practice of contemplative play or what the author proposes to call "nature playing". This concept marks a continuity between the literary genre of "nature writing" and the way nature may be contemplatively experienced in video games, especially those with open-world natural landscapes. The author will discuss modes of nature playing within the mediated environments of the sports simulation game Riders Republic (Ubisoft, 2022). Nature playing will be analyzed as an aesthetic practice which may be fostered by purposeful design, or it may emerge from the player's own nature-driven sensibilities triggered by the aesthetic qualities of the game world. The author frames contemplative nature playing within a variety of concepts such as in-game wandering, slow play as well as ludic boredom. The article culminates in three autoethnographic ludic interventions, in which nature playing is captured in three contemplative pieces of nature writing.

Fizek, S. (2024). Nature playing: On the experience of contemplating technologically mediated nature within the game world of *Riders Republic*. *Games and Culture.* Advance online publication. https://doi.org/10.1177/15554120241273329

Spielen für die Zukunft ☆

Games können die Spielenden zum Engagement gegen die Klimakrise animieren. Für den Transfer von der digitalen in die reale Welt braucht es allerdings neben Zukunfts- auch (kritische) Spielkompetenzen.

———————

Sonia Fizek
27.03.2024 / 15 Minuten zu lesen

Dossier: *Games als Mittel zur Förderung von Futures Literacy* (Games as drivers of futures literacy)

Article: Spielen für die Zukunft (Playing for the future)
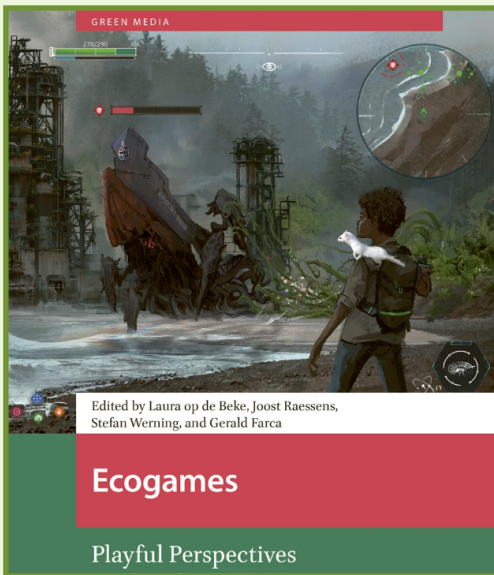
Author: Sonia Fizek

Publication date: 27.03.2024

Summary

Can video games help us rewrite the future in times of the climate crisis? Sonia Fizek explores how games can inspire players to engage in combating the climate crisis, emphasising the need for both future-oriented and critical gaming skills. Written for the Bundeszentrale für politische Bildung (Federal Agency for Civic Education).

Fizek, S. (2024, March 27). Spielen für die Zukunft. Retrieved from https://www.bpb.de/themen/kultur/digitale-spiele/546959/spielen-fuer-die-zukunft/

Collected volume: *Ecogames: Playful Perspectives on the Climate Crisis*

Chapter title: Material Infrastructures of Play: How the Games Industry Reimagines Itself in the Face of Climate Crisis

Author: Sonia Fizek

Publication date: 2024

Summary

Sonia Fizek explores the materiality of digital play and its connection to environmental sustainability, investigating how the video game industry responds to the climate crisis. Through a hermeneutic analysis of segments from the Green Games Guide, the chapter raises questions about the industry's reaction. Fizek queries whether green game-making commitments and self-regulatory initiatives are genuine shifts or merely PR tactics within the context of neoliberal culture's focus on growth and planned obsolescence. This chapter is part of the publication "Ecogames: Playful Perspectives on the Climate Crisis, 2024," spanning pages 525-542 (18 pages).

Fizek, S. (2024). Material Infrastructures of Play: How the Games Industry Reimagines Itself in the Face of Climate Crisis. In Ecogames: *Playful Perspectives on the Climate Crisis* (pp. 525-542). DOI: https://doi.org/10.2307/jj.10819591.28

Summary

An increasing number of higher education game design and development programs are integrating environmental considerations into their curricula, reflecting a broader trend towards responsible game production, consumption, and education. This article introduces two ongoing European inter-university projects: the Erasmus+ Greening Games project and the Nordplus-funded Nordic Alliance for Sustainability in Gaming network. Using them as case studies, the article reflects on lessons learned and challenges encountered during the projects' pilot stages, and discusses their implications for environmentally conscious game design education.

Fizek, S., Fiadotau, M., Wirman, H., & Garda, M. (2023, March 12). Teaching Environmentally Conscious Game Design: Lessons and Challenges. *Games: Research and Practice,* 1(1), 1–9. DOI: https://doi.org/10.1145/3583058

Project report: *Greening Games Education Report* (Project Result 1)

Authors: Sonia Fizek, Laura Frings, Mata Haggis-Burridge, Tuki Clavero, Lukáš Kolek, Andrea Hubert, Maria B. Garda, Karoliina Koskinen

Publication date: 01.03.2023

Summary

The Greening Games Education report maps out the green gaming research, related didactic offer and the initiatives of the games development sector. Based on interview and survey material, the analysis of selected literature and games industry's outreach projects, we are providing a comprehensive picture of the current needs of higher education as well as the industry. Hopefully, this report will allow you to better understand and contextualise existing pro-environmental initiatives, identify gaps in current knowledge, and most of all to embrace the variety of voices and attitudes towards these issues across the field. The report is divided into three parts: Mapping out Teaching and Research, Mapping out the Video Games Industry and Summary and Next Steps. In the Appendices section, we are sharing the question sets and supporting visual data behind the semi-structured interviews and surveys that we conducted amongst higher education experts and game developers.

Fizek, S., Frings, L., Haggis-Burridge, M.m Clavero, T., Kolek, L., Hubert, A. Garda, M. B., & Koskinen, K. (2023) Greening Games Education Report. Retrieved from: http://greeningames. eu/wp-content/uploads/2023/04/Greening-Games-Report-2023.pdf

Conclusions & Recommendations

Looking back at our teaching experiences

The Greening Games project brought together video game scholars with diverse areas of expertise from four European universities: TH Köln in Germany, Breda University of Applied Sciences from the Netherlands, Charles University from Czechia as well as Turku University from Finland. Within our team we had members representing hands-on game development education as well as humanities-led games, media and cultural studies. The intersection of these different but complementing perspectives provided many enlightening and inspiring moments to the team and offered each partner new angles from which to examine their own work. Furthermore, the Greening Games project managed to extend the professional networks of its participants and build a solid ground for future projects and international collaborations.

In terms of challenges, scholars at the Breda University of Applied Sciences (BUAS) noted that while being a very practise focused institution, it was sometimes hard to convince their fellow lecturers towards involvement in the Greening Games project. This was the case even when there was a shared understanding of environmental sustainability as a critical global issue, as well as recognition of sustainability by the University Executive Board. Conversely, while experienced developers and lecturers did not see the connection between sustainability and game development, their students welcomed such content, which suggests a generational shift. Fortunately, starting from 2025, the Greening Games educational materials will be officially included in the B.A. curriculum at BUAS.

Interestingly enough, the project partners at Charles University were faced with the opposite dilemma. Too often they found themselves unable to delve into the topics of sustainability, as a substantial part of the seminar needed to be spent on convincing the students of the need for a greener games industry in the first place. Taking this into account, the provided teaching materials should be used as the basis for customisation: each educator needs to consider them through their own lens and judge the readiness of their students. Nevertheless, through incorporating environmental topics into their teaching, our group members from Charles University gained a more in-depth understanding of climate-related issues and novel experiences in teaching and engaging in discussion with people of different value systems.

At Cologne Game Lab at TH Köln, seminars and workshops related to all the four thematic pillars were taught across the span of two years and five semesters in total. We prepared dedicated seminars as well as drop-in sessions that were part of larger modules. This gave us numerous opportunities to change and refine the material, methods and scope of teaching. We also tested out diverse formats of assessment, from traditional essay-writing to academic podcasts. The latter were very welcomed by the students. In our Greening Games Repository we are including the best podcasts. The students at CGL were usually very curious and receptive towards the material. Although both, the B.A. and the M.A. programs are applied in nature focusing on game design, art and development, our students throughout their education take mandatory Media & Game Studies modules. From the first semester, they are exposed to humanities-led research around play and games. This may be the reason why, in comparison to the students in the applied program at Charles University, the students are welcoming the more critical and less applied teaching content as well.

Going beyond environmental sustainability

Sustainability often has been framed as consisting of three pillars: **environmental, economic, and social**. This taxonomy dates back to the 1990s, when John Elkington suggested a new frame for economic actors' sustainable development and corporate responsibility. Elkington's argument was that businesses must report, and be held accountable for, not just their economic activity, but also their environmental footprint and social impact (Gray and Milne, 2004). A similar three-pillar framework is the basis for the United Nations' Sustainable Development Goals and the 2030 Agenda.

Economic sustainability refers to the long-term sustainability of a business from a business owner's perspective, with a focus on financial performance and efficiency. Historically, the video game industry has not been known for being economically sustainable. The leading cause of the 1983 Game Crash in North America was pervasive corporate malpractice and the opportunistic "gold rush" mentality demonstrated by even the largest game companies such as Atari (Elkington, 1994). A case in point is the infamous ET game, whose rushed production schedule and disastrous quality became the epitome of the problems prevalent in the North American game industry at the time.

Social sustainability refers to identifying and managing businesses' impact — whether positive or negative — on people and as such is often assessed in Corporate Social Responsibility reports. A major challenge for the game industry has been the pervasiveness of crunch culture (the normalisation of compulsory, often uncompensated overtime work) as well as other equity issues (Legault & Weststar, 2024). There is hope that the rise of game worker unions may improve the situation. Other major issues include the historic lack of racial, gender, and sexual diversity in mainstream video game representations (Malkowski & Russworm, 2017), as well as accessibility barriers faced by players with disabilities, ranging from colour blindness to motor issues (Hassan, 2024).

Cultural sustainability began to be viewed as another pillar of sustainability somewhat more recently, and it focuses on maintaining cultural practices and heritage preservation. Videogames are a form of digital heritage that, due to its relevant novelty, can be viewed as emergent heritage (Nylund, 2020). Due to unsustainable business practices and marketing dominated by the rhetoric of "the best game is the next game" (Newman, 2009), preservation has historically not been a priority for the game industry. Many of the earliest known video games have indeed irretrievably disappeared (McDonough et al., 2010).

Even now, following the emergence of **game museums and archives** around the world, there remain significant blind spots. Historiographies of video games tend to focus on North America and, to a lesser extent, Western Europe and Japan, mirroring the **postcolonial legacy** still evident in other spheres of cultural heritage (see, e.g., Mukherjee, 2017). The same bias is evident in most major public game collections, which rarely highlight other regional and local histories (Swalwell, 2021). Another blind spot pertains to the nearly exclusive focus on commercial video games, which leaves out the thousands of hobbyist and amateur games, despite the fact that these, too, have been a large part of gaming cultures around the world (Fiadotau, 2020). Additionally, contemporaneous evidence (e.g., promotional materials and game magazines) often fails to reflect the diversity of game players (Kirkpatrick, 2015), although individual efforts exist focusing on preserving cultural memories around "atypical" and/or marginalised player communities (e.g., the Rainbow Arcade project).

At the same time, the emerging **retro gaming** culture offers a valuable counterpoint to the logic of **planned obsolescence** and constant technological growth evident in today's gaming culture. By encouraging the reuse and highlighting the engaging potential of older games, which typically consume much less resources, it provides a lower-footprint alternative to AAA games' emphasis on hyper realistic graphics and latest hardware.

A possible consideration for the development of future educational materials could be to draw inspiration from retro gaming and local gaming histories. For example, this could involve exercises in developing games for older platforms that are still in use (from Commodore-64 to GameBoy), or contemporary alternative platforms with a lower environmental footprint (such as Playdate).

It is important to consider environmental sustainability alongside the other pillars, as they are closely intertwined. For example, the 1983 video game crash not only left many game workers unemployed but also resulted in Atari burying thousands of unsold game cartridges and consoles in a New Mexico desert with no attempt at recycling. Environmental issues are also directly connected to **global inequalities**. A prominent example is the mining of rare-earth minerals used in the production of PCs, smartphones, and game consoles. There is evidence that in Myanmar, which is a major supplier of rare-earth minerals, the mining often takes place in unregulated mines fraught with human right violations, and its impact on the local environment has also been devastating (Mouterde, 2024). More broadly, the imperative for constant market growth that is at the core of today's global capitalism is the source of both the unsustainable use of natural resources, job precarity, and high-risk business models that pose a danger to today's economy.

A future direction for developing the teaching materials further would thus be to integrate the other aspects of sustainability and offer a more holistic approach that highlights the connections between environmental crises, societal issues, and economic practices.

Last but not least, we would like to make a comment on creating a broader community around sharing teaching materials as living documents. Rather than being seen as the finished article, the teaching materials can be treated as living documents, subject to customisation and updating based on the developments in the game industry, environmental policy, etc. A key to ensuring broader adoption and continued use is an active community of educators who are motivated not only to use the existing materials, but to contribute to their continued development.

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