From ‘doomsday talks’ to ‘excitement at last’:
A case study of incorporating sustainability perspectives into formal game education

Hanna Wirman
IT University of Copenhagen
Rued Langgaards Vej 7
2300 Copenhagen S
Denmark
+45 72185000
wirman@itu.dk

Jon Victor Bankler
University of Skövde
Högskolevägen, Box 408
54128 Skövde
Sweden
+46500448326
victor.bankler@his.se

Patrick Prax
Uppsala University
Strandgatan 1b
62156 Visby
Sweden
+46 18471679952
patrick.prax@speldesign.uu.se

Henrik Engström
University of Skövde
Högskolevägen, Box 408
54128 Skövde
Sweden
+46 500448306
henrik.engstrom@his.se

Maria B. Garda
University of Turku
Arcanuminkuja 1
20500 Turku
Finland
+358 504 634 161
maria.garda@utu.fi

Mikhail Fiadotau
University of Tallinn
Narva rd 25
10120 Tallinn
Estonia
+372 6409421
fiadotau@tlu.ee

Pawel Grabarczyk
IT University of Copenhagen
Rued Langgaards Vej 7
2300 Copenhagen S
Denmark
+45 72185000
pawg@itu.dk

Salvor Gissurardóttir
University of Iceland
Sæmundargata 2
102 Reykjavík
Iceland
+354 5255547
salvor@hi.is

Keywords
game design, game development, game jams, games education, pedagogy, sustainability

INTRODUCTION
Teaching about sustainability in relation to digital game cultures and game development is an urgent, yet still underexplored challenge. Meaningful engagement with climate change beyond greenwashing, based on the recommendations of the UN
requires a systemic approach that aims at real impact in the physical and material world, including the economic system (Böhm, Misoczky and Moog 2012). At the same time, digital games as digital media carry with them the original sin of carbon emissions (cf. Aslan 2020, Mills et al. 2019, Lönnyqvist 2022). Firstly, colonialist exploitation of rare natural resources is needed to construct the necessary hardware. Secondly, fossil fuels are used to power these devices to run the energy demanding software. Thirdly, aspects of cultural and social sustainability are often insufficiently addressed in game development where inclusion and working hours remain problematic.

Based on our pedagogical experience, game development students of today are often aware of the issues that come with the medium that they are learning to work with. Students want to be part of a possible solution and to make a positive impact on the world instead of contributing to an industry that is destroying the planet. Some of them experience ‘eco-anxiety’ (Pihkala, 2020). This means that there is a need as well as a demand to better address sustainability in relation to games education - in a way that is genuine and has a real-life, tangible impact (Ferreira 2019, Ferreira et al. 2013).

One attempt to explore what teaching about sustainability in game development might look like, is the NordEcoJam. The NordEcoJam was organised as a Nordplus-funded student intensive course involving six participating universities from five Nordic countries, and was held in Tallinn, Estonia. The second iteration of the event took place at the IT University of Copenhagen, Denmark, in June 2023. The third jam of the same kind is planned for the University of Skövde, Sweden, in June 2024. During the first event, 28 students grouped into six teams created serious game prototypes on the topic of sustainability over five days of talks and development. This paper reflects on the first jam as a case study while discussing the challenges we encountered and suggesting possible solutions for others to be applied.

**THEORY AND PREVIOUS WORK**

The aim of NordEcoJams is to allow the students to explore – in their own way – how to engage with questions of sustainability as part of game development or design. The NordEcoJam 2022 started with a lecture that stressed the need for a systemic perspective on the topic. The framing highlights that individual actions outside of a broader framework are not only futile but might even contribute to the exhaustion of potential for systemic change by exclusively stressing the role of the individual (Maniates 2001, Andersen 2013, Supran and Oreskes 2021). Discursive tactics of polluting corporations, for example greenwashing (Delmas and Burbano 2011), were critically analysed and deconstructed.

To support conversations around the environmental impacts of gaming, Ben Abraham’s (2021) work and IGDA’s *The Environmental Game Design Playbook* (Whittle et al. 2021) were presented. Following lectures focused on different ways in which games can lead more directly to climate action. The conventional approach of creating serious games that address sustainability (cf. Shawna and Nardi 2014, Wu and Lee 2015) was presented as a viable starting point among many others. Taking a somewhat experimental stance, the teachers discussed if games that limit playtime or energy consumption could provide a much-needed critical perspective to sustainable game development. The idea of including domain specific educational components in our jam is in line with some earlier approaches to organising sustainability game jams (e.g. Foltz et al. 2019).

At the heart of such an approach to games and sustainability education lies the recognition of game making as a potentially transformative process. Research about game jams typically accepts them as events that focus on learning and personal
development during the jam instead of the actual game or prototype outcomes of the jam (Kultima 2015). Kultima (2015, p. 7) defines a game jam as “an accelerated opportunistic game creation event where a game is created in a relatively short timeframe exploring given design constraint(s) and end results are shared publically [sic]”. This definition does not cover the rationale, purpose, or intended effect of a game jam apart from the creation of a game (although most game jams result in multiple games). Therefore, Lai et al.’s (2021) proposal for a game jam taxonomy with seven categories is useful as it can assist in establishing our jam in relation to other types of jams:

1. Games Industry Commentary, Meta
2. Commercial Game Jams
3. Challenge
4. Regional Affiliation
5. Experience Economy, Part of Other Events
6. Purposeful Game Jams, Teaching & Learning
7. Technology

The game jam presented in this article mainly falls under the sixth category of ‘purposeful’ game jams that are likely to include an educational approach and a goal. While Lai et al. (2021) do not go to define this category of game jams, they give a range of examples and call such jams ‘serious game jams’ thus referring to the idea of ‘serious games’ originally proposed by Clark C. Abt in 1970. Abt wrote that “these games have an explicit and carefully thought-out educational purpose and are not intended to be played primarily for amusement” (Abt 1970) and the term has been adopted and widely used in relation to digital games today. Notably, however, the goal of our jam was not only to come up with ‘serious games’ but also to encourage wider discussion and application of sustainability concerns and thinking in relation to game development and play.

Prior studies have highlighted that game jams are commonly used for both formal and informal learning. Meriläinen et al. (2020) presents a literature review of educational game jams and show that “there is considerable potential in game jamming as a method and tool for developing a wide variety of skills and competences, especially related to game creation, design, and development.” (Meriläinen et al., 2020 p. 64). Kolek et al. (2022) follows up on this study focusing on the learning outcomes for participants from the game industry and why these chose to participate in jams. Through a combination of a literature review and an industry survey they show that game jams contribute to the industry and its professionals both with educational and non-educational benefits. The latter includes talent acquisition, networking, PR, and the way in which jams function as a way to generate new ideas. The educational benefits with game jams for companies have strong overlaps with those highlighted by Meriläinen et al. (2020) for educational game jams. This includes communication, teamwork, creative problem-solving, as well as game creation skills. Such characteristics of game jams make them very useful as both formal and informal parts of game education.

Game jams can provide learning opportunities of skills that are central for these types of education but they may also provide collaboration opportunities with game companies and industry professionals. Mikami et al. (2010) reports on how game jams are used in a game education curriculum as a means to bridge students with industry. The role of game jams as a bridge between game students and game industry does interestingly not fit into any of the categories proposed by Lai et al. (2021). For the presented study, this was not fully explored, but industry-student collaboration constitutes a potential capability in game jams, as shown by Mikami et al. (2010).
Additional potential lies in the therapeutic effects of making games about a sensitive, personally relevant topic. In an interview by game news site Kotaku, the horror game *Darkwood* developer Gustaw Stachaszewski expresses how developing the game has helped him overcome his own nightmares and fears. Wirman and Jones (2018) suggest that in the context of Hong Kong Global Game Jam, the games created during the jam often address problematic topics in young people’s everyday life in Hong Kong. The possibility to offer solutions or alternative readings of such situations is made available through game development and illustrates game jam’s potential in processing challenging topics, often with humour. “[G]ame jams might provide a safe, authority-free environment for addressing difficult aspects of young people’s lives” (Ibid., 3).

Drawing from a somewhat distant and sometimes contested field of study, the practices of crafting and making have been recognized as a form of art therapy (Collier 2011) and their impact on well-being was also studied in the context of more technology-oriented practices (Smith 2021). This can be extrapolated to game making where designing for other people’s experiences necessitates thinking through the meanings and values as well as logic of any given theme or topic. For example, some game jams invite persons with no prior experience in game design or development to create games that help them express, explore, and process topics close to them or potentially even overcome trauma and experience empowerment (cf. Game Girl Workshops by Andrea Brasch).

Hence, based on previous knowledge from therapeutic art making and craft as well as anecdotal evidence from professional game development and game jams, we can fairly assume that being involved in making games has a widely accepted potential in creating lasting changes in developers’ understanding of topics that are being built into the games they make. Such an approach is a meaningful contribution to game jam research that has successfully addressed the ways in which 1) game jams contribute to participant skills development (e.g. Reng et al. 2013, Law and McDonald 2015), 2) offer possibilities for confidence building and transformative self-reinvention (Kennedy 2018), or 3) result in games that address serious themes, among them sustainability or cultural heritage topics (e.g. Laiti, Harrer, Uusiautti and Kultima 2020).

The findings of our research add to the repertoire by discussing how game jams can contribute to jammers’ wellbeing by allowing them to tackle difficult issues while developing games on this very theme and stands in line with a prominent body of game jam research that foregrounds process over end results (Grace 2016).

In recent years, there were other numerous initiatives addressing sustainability within the framework of a game jam experience. From the perspective of environmental sustainability, probably the most visible series of events is the annual Green Game Jam organised since 2020 in collaboration with the UN’s ‘The Playing For The Planet Alliance’. However, even before that similar interventions were taking place, such as the one-month long Climate Jam 2018, hosted on itch.io which is a platform for game distribution and creation. This “slow jam” was thematically focused on science-based climate change communication in educational games and was specifically designed to be inclusive towards participants with demanding personal schedules (Foltz et al. 2019). Such sensitivity to other aspects of sustainability related to games’ potential impact in the surrounding world, as well as the process of game development itself, seems to be a growing concern of many ecologically oriented game jams. Other game jams organised around the topic of sustainability include IndieCade Climate Jam2, Eko

---

1 https://gotlandgameconference.com/2013/sessions/game-girl-workshop-palestine/
2 https://itch.io/jam/indiecade-climate-jam
Game Jam³, International Sustainability Game Jam 2020⁴, Abertay’s Serious Game Jam 5⁵, and “A Game to Save the World” Game Jam⁶, among others. Future research could focus on a systematic historical review of such initiatives and their interrelatedness with the many facets of the UN Sustainable Development Goals framework.

METHODOLOGY

This paper builds on participant reflections collected through two surveys: daily, end-of-day reflections during the jam and a post-event survey that was filled several weeks after the jam. Additionally, the organisers themselves filled in questionnaires both during and after the jam. In total the material covers 27 participants, 10 teachers/organisers, and their total 143 responses. The following observations are largely based on the daily student survey for which the participants reported on what they learned that day and what their mood was (87 responses). The participating students gave an informed consent to participate in this study and their reflections were given anonymously through Google Forms.

The survey results were analysed qualitatively, and significant themes were identified. This paper focuses on two of the themes that emerge most prominently from the data. We applied a form of “investigator triangulation” (Carter et al. 2014), since up to 8 people were involved in analysing and discussing the different survey results thus leading to stronger interpretations though the reduction of individual’s personal biases.

An early analysis of the participant reflections indicated that the eco-anxiety provoked by the grievous nature of the game jam’s topics was mitigated by the experience of participating in cooperative work and the creative process of developing games that addressed sustainability issues. We have organised our initial findings in two groups related to: a) personal mood and b) learning experience.

Personal mood

The jam participants’ – jammers’ – reported mood changed over the course of the event. After the first day, several participants felt pessimistic and anxious. This can be partially attributed to social anxiety related to new team-mates and an unfamiliar setting. But for the most part, the negative mood seemed to stem from the topic and content of the jam itself, with several participants characterising the first day talks as ‘overwhelming’ and ‘very depressing’. It is notable that these experiences were highlighted even though everyone joined the jam fully voluntarily and knowing the theme of the jam. The purpose of the talks that day was largely to outline the scope and urgency of the climate crisis, as well as to problematize deceptively simplistic solutions such as carbon offsets in favour of genuine systemic change. One student wrote that “it was a little hard to start the event with the doomsday talks”. Interestingly, for some the talks were ‘inspiring’ and ‘insightful’.

Both the optimistic and the pessimistic moods persisted throughout the event complemented by participants increasingly bringing up feeling tired, but the balance between them shifted and the educational impact was largely appreciated. One participant suggested that: “the lectures triggered some eco-anxiety, but I definitely know more about sustainability than before”. Towards the end of the jam some hope

³https://ekogamejam.webflow.io/
⁴https://itch.io/jam/sustainability2020
⁵http://steppingupnexus.org.uk/?q=content/abertay%E2%80%99s-serious-game-jam-5-battles-weather-support-sustainability-developing-game-educate
⁶https://taikai.network/taikai/hackathons/game-to-save-the-world
surfaced yet the serious acceptance of the global situation prevailed: “Meh, let’s try but it’s the end of the world anyway.” Another excerpt highlights the mixed feelings as students were “satisfied, frustrated, both hopeful & hopeless.” Participants found possible solutions and alternatives to challenging situations through and in the games they made. The games tangibly simulated real-life scenarios with differing outcomes.

Delving into daunting and complex issues during the early stages of the game jam did not seem to stifle the participants’ creative mindset. For example, in response to how they would summarise their thoughts in relation to sustainability on the second day of the jam, one participant responded that they had been thinking of “how to disseminate the message to the public appropriately; and what could be the proper ways/tools to send a strong influential message”, showing that they maintained an ambitious focus in regard to the creative work ahead of them.

**Teaching about Sustainability in Game Design**

The negatively perceived pressing mood at the jam may not be surprising in the face of eco-anxiety and confronted with a perspective that clearly states the necessity of broad-scale systemic change. Here lies the difficulty of education about climate change: holding the balance between the need to include depressing systemic perspectives for valid education (Ferreira 2019, Ferreira et al. 2013) and mitigating eco-anxiety and a paralysing fear that makes it impossible to act (Pihkala, 2020). However, as Eriksson et al. (2022) state, it is not possible to take care of all of the students’ feelings as the highest priority all of the time. If this is foregrounded too much, then there is a real risk of a delivering a kind of therapeutic education that aims mostly at the students’ feelings in the crisis and that goes too far towards de-emphasizing the need for actual, material change in the world to address the crisis that is causing the anxiety (Ojala, 2020). Merely focusing on student wellbeing would be at odds with the goal of the jam to address exactly these systemic and material perspectives. Feeling some degree of anxiety, and especially the mixed feelings that the students report here, could instead be seen as a valid reaction to the state of the world and possibly even as a motivation for change.

Recommendations from research about eco-anxiety in education broadly address both providing safe spaces for people to work through and experience their emotions and the possibility of embodied creativity so that anxiety can be channeled into making, creativity, and resistance (Pihkala, 2020). However, as Eriksson et al. (2022) remark, the notion of a community to share these feelings is also highly relevant. The notion of “Active Hope” (Macy and Johnstone, 2012) is one example here.

**Using Game Jams for Teaching**

In our case, the game jam and the group of students and teachers became this safe space of active hope. The students point out that their feelings were both hopeless and hopeful, and it is visible that their mood improves over the course of the jam as they get to engage with the issues of sustainability through the group-based and creative practice that is the game jam. Their games and activities did not dip into a therapeutic perspective either. The feelings of the students and the alleviation of their stress was not the main goal of their work. They also did not simplify or marginalise the climate catastrophe to feel better. Instead, their work in most cases focusses on systemic perspectives, e.g. showing that the issue is not as much a bad or greedy CEO or manager but the economic system in which they also have to operate.

The effect of feeling “excitement at last” was reached through their own shared and creative engagement with the issue. This really highlights the viability of game jams
for this kind of education. The centrality of making and active engagement that is at the very core of game jams is instrumental here. That said, there was also another relevant element to this: The jam and the group did create a safe space for discussing climate catastrophe and sustainability also because of the selection of the students and teachers. All of us were participating because we already cared about sustainability. This meant that feelings of eco-anxiety were shared by the entire group and that nobody was stigmatised for expressing these feelings. This space of collective engagement with ‘trauma’ may be a necessary element for the game jams to work that needs to be considered when recreating them.

Learning experience
During the jam, several student participants reported to have gained an understanding that cultural and social dimensions are also part of sustainability. These insights were made several days into the event which meant it was too late to apply them into game design itself as the ideation phase had passed and prototyping began. One participant stated: “I thought that the cultural and social sustainability should have been talked about on the first day so it could have been taken into account when finding game ideas. All my ideas were focused on environmental sustainability”. Regardless of the tight schedule and numerous talks, some participants experienced the planning positively: “I think the scheduling and the layout of the work time were spot on.” Yet, it was clear that in this regard participant experiences varied drastically, some students calling for more development time and others for more talks. Implementable feedback can be found from a comment that recalls sharing: “Playing others’ games was very interesting and some were very successful in making you aware and reflective of their topics”

Addressing cultural and social sustainability in group work was strongly recommended by the organisers who discouraged ‘crunch’ – a phenomenon known in software development and currently also in game development that refers to an unhealthy working mode involving extended working hours to finish projects by a looming deadline. ‘Crunch time’ has received wide criticism in the games industry in the past years and some companies aim at reducing the existence of these periods.

The feedback from students of the NordEcoJam widely suggests that we succeeded in creating a healthy working environment through simple guidelines. The students for example reported that “We were asked not to crunch, so we didn’t”. Meanwhile, diversifying activities can help in balancing learning and mood: “In the future it might help to avoid burnout by including activities that excite and motivate me.” Notably, student responses suggest that a rare opportunity to engage in a serious topic was welcome. The possibilities for seeking actual solutions for problems related to sustainability are limited in conventional education. Our results suggest that downplaying the complexity and vastness of climate catastrophe is not needed if there is space for processing new information through game making. We believe that this approach allowed for empowering experiences to emerge as there was time for reflection and negotiation.

CONCLUSIONS
Our study contributes to research on game jams by building on an existing emphasis on the process of jamming over the produced games and by addressing the development of ‘serious games’ in a game jam. Distinctively, our paper demonstrates how game jamming productively facilitates tackling personally significant and distressing topics and foregrounds jammers’ experiences over scrutinising messages embedded in the

7 None of the authors of the paper carries a qualification or a degree from a medical field. The use of seemingly medical terms, such as ‘trauma’, operates on a colloquial level only.
games created. Game jams are often considered to contribute to jammers’ skills development and game jams are widely accepted as learning spaces, but they also have potential in offering a space for ‘therapeutic’ engagement with specific topics. NordEcoJam, while dealing with a daunting topic, resulted in positive, potentially empowering experiences relating to the most critical challenges of the present day.

Experiences from the NordEcoJam suggest that it is possible to teach about sustainability with an orientation towards systemic and material change and that the active, creative, and social engagement with the topic that is central to the game jam can mediate the eco-anxiety that is the result of these approaches. While more work is needed, this suggests that the game jams can be used to create positive excitement even when faced with the reality of a doomsday scenario. It remains a challenge for teachers in such events to further deal with their own anxieties while facilitating learning and care of students. Understanding organiser experiences and possibilities for addressing issues in relation to them is an important area of future research.

BIBLIOGRAPHY


Macy, J. and Johnstone, C. *Active hope: How to face the mess we’re in without going crazy*. New World Library, 2012


