The Games Realising Effective & Affective Transformation (GREAT) Project – A pathway to sustainable impact on climate change policy.

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Abstract

In this paper the authors introduce the Games Realising Effective and Affective Transformation (GREAT) research project. This EU funded intervention posits the application of digital games, game making and games technologies, as a realisable sustainable solution to actively engage citizens in meaningful dialogue with governments to address the global challenge of climate change.

The primary objective of the intervention is to facilitate citizens by using emergent technologies, to provide input into developing national and international policy priorities to address the challenges presented by global climate change, technologies that are both available and accessible.

The GREAT project commenced on 01 February 2023 and brings together leading scientists in academia and the games industry in a single programme of research and innovation. The Project aims to establish new forms of social engagement and encourage meaningful dialogue between citizens and senior policy stakeholders (policy makers, policy implementers, political parties, and affected citizens).

Introduction

This paper Reports on the early initial establishment stages of a European Commission (EC) and United Kingdom Research and Innovation funded three-year GREAT project. The project involves seven partners across Europe and aims to enhance citizens dialogue with governments and policy agendas relating to actions to mitigate climate emergency, using the medium of gaming to facilitate this. The scope of the paper does not address the sustainability of the digital Games industry per say but how the industry and specifically the associated playful development techniques for player engagement could be meaningfully deployed to address wider societal sustainability challenges.

The growth of games on computers and mobile platforms is a remarkable phenomenon of recent years that raises important questions about the cultural role and meaning of games and the potential social purposes which they can serve over and above their core purpose of entertainment. It is in this context that the GREAT project was established, framed by three major social issues.

The digital games industry is now a larger economic sector than either of the music or film industries and is estimated to have generated $180.3 billion in the year 2021 (Wijman, 2021). There is no consensus on the positive or negative nature of the impact of games on wider society though Digital games correspond to the current Zeitgeist of using information technology as an integral part of our everyday life, and they meet the trend of pedagogical paradigms calling for active constructive, and playful learning. Serious games are considered a major emerging technology that is expected to enter mainstream use, Steiner et al (2015)

In parallel, the proportion of citizens declaring dissatisfaction with functioning democracy in their countries has risen markedly. The deterioration has been especially evident within high-income, consolidated democracies, where the proportion has risen from a third to half of all citizens." (Foa et al., 2020). Similarly, the distrust of news sources and scientists fuelled by an increase in fake news is at an all-time low (United Nations 2021). This dissatisfaction and mistrust correlate with increased scepticism.

This has occurred in an environment where the volume of date generated through citizens interactions and transactions with media is increasing. The analysis of data has increased to the point that it has significant economic impact with the effect it is argued that social media is polarizing society (Vrontis et all 2022).

The GREAT project aims to address this dilemma by applying games technologies to achieve positive transformation restore community engagement and satisfaction with democracy and democratic processes in establishing policy priorities for addressing the challenges presented by climate change. By utilising the opportunities presented by the collection and storage of citizen generated big and small data to bring together communities, in an open, ethical process.

Methodology

The challenge facing the project is to apply games not simply to promote learning or social attitudes, but rather to gain insight into the cultural role of games through case studies which establish a new communication channel between citizens and policy makers centred around transparency and actionable insights.

The project is oriented to the goal of harnessing the cultural and communicative value of games to provide an opportunity for input and feedback for citizens who may not normally engage in socio-economic debates, and new sources of insight for policy stakeholders. The games and interventions co-designed and implemented are not one-off solutions acting as research tools that explore the effectiveness of the approach, establishing a method and data sources for future adoption.

Project activities support scalability and adoption from the outset, with case studies which test the concept and apply it in authentic conditions at a scale of genuine value to the policy stakeholders.

This undertaking is built on three well-founded assumptions:

1. Games constitute a rich source of data that can reveal a great deal about players' engagement, preferences, and attitudes. However, this is closely guarded by publishers and developers as a competitive advantage in optimising their games. This data constitutes a huge opportunity to draw out insights into social preferences and attitudes at scale, but this requires new methods of gathering, storing and analysing data, and new forms of engagement with stakeholders, together creating an engagement ecosystem.
2. Data analytics developed methods to extrapolate from online interactions to gain insight into citizens real-world experiences. The online interactions of game players generate a similar stream of data, and analytics methods can be adapted to reveal the connections between game-world interactions and players' engagement with and attitudes towards real world experiences and issues.
3. Policy stakeholders require informed insight into citizens preferences and attitudes. Policy stakeholders are open to and will engage with this input. This is supported by the active engagement of policy makers in the project and the participatory Citizen Science approach that engages all stakeholders from the onset,

As an exemplar, the project addresses the global social challenge of sustainability and the climate change crisis. The project also presents opportunities to demonstrate the transferability of the methods developed as the research undertaken will address a diverse range of sub-topics, including energy costs and consumption, government subsidies for green initiatives, the impact on disadvantaged sectors in society, and transport and contribute to the sustainability of Games development within the creative industries sector broadly.

The collaborative participation of commercial digital game companies and data analytics insights scientists and companies in the process ensures a focus on economic viability and effective business models.

Applied Games

Social dilemmas have been represented in numerous games designed to raise awareness. In the context of the climate change crisis this has been characterised as asking players to make decisions

to balance potential positive and negative outcomes and then provide illustration to them the consequences of their decisions, For example, World Climate is a role-play simulation of UN climate negotiations, which provides feedback on the climate impact of policy decisions Rooney-Varga et al. (2018).

The GREAT project moves beyond this practice by designing and deploying games as research tools, in which the focus is not merely on simulation, nor on learners absorbing information but on capturing the interactions generating data to reflect players attitudes, views, opinions, and preferred solutions for social dilemmas within the context of climate crisis.

Analysing these interactions will provide insight to the individual player and stakeholders alike. The project adopts a modular approach to harvesting data that is most relevant to the policy dilemmas through contrasting but complimentary conduits by leveraging existing games platforms from participating commercial partners Playmob who specialise in game analytics and player engagement and applied games designers Serious Games Interactive (SGI) as detailed below in Table 1

	Quiz-style games	Collaborative Dilemma games
Play style	Single player	Multiplayer
Flow	Linear	Branching
Channel	Paid/Owned	Owned
Dilemma style	Pre-defined responses	Complex scenarios
Best for	Scale and speed	Depth of outcomes
Average playtime	1-2 minutes	40-120 minutes
Anonymous data set	Yes	No
Research style	Quantitative	Qualitative and quantitative
Reach	Millions	Hundreds
Facilitated	No	Yes
Incentivised	Yes	No

Table 1: Characteristics of the games used in the GREAT engagement ecosystem.

Quiz-style games are designed with mobile devices as the main platform, and capture players' knowledge, sentiment and behavioural choices. Building on the platforms and expertise of partner Playmob, the project will gather significant numbers of, both from the general public and from specific target groups of users. All data collected through this platform is anonymous, thereby protecting the privacy of players and their opinions. Players have the option to provide supplementary demographic data which will inform the analysis.

The primary distribution mechanism is via media embedded within existing popular mobile games. In addition, the quizzes will also be embedded into partner websites and applications related to the social issues of interest or will be accessed via unique QR codes. These options enable audience-specific data streams by geo-location, partner or date or time to be rigorously analysed. Moderated dilemma games provide the opportunity to explore topics in greater depth.

Expanding on the experience and expertise of applied game developer SGI these games will be played by large cohorts of players who have agreed to participate for a specified duration. These activities will be stimulated and coordinated by a human facilitator on the game platform. The consequent interactions within these collaborative games will generate opportunities for the collection

of rich data and the formulation of insights into climate change policy issues. Inevitably there is a balance to be reached between the richness of the data generated in these collaborative games and the number of players that can be expected to participate.

The commercial games utilised within the project will be supplemented with non-commercial open-source games developed by the academic partners in the consortium the University of Bolton (UoB), University of Rjoca (UNIR) and (DIPF). This will serve to provide the opportunity to obtain additional data and insight, but with the primary purpose of testing the degree to which the GREAT method is independent of the technology which has been used to facilitate the research.

As opposed to creating sophisticated delivery mechanisms and authoring environments, the open-source games focus on the demonstration of how the process of intervention design, implementation, data gathering, analysis, and generation of insight can be carried out without dependency on proprietary technologies. Open data analytics will analyse both the results of gameplay and interactions with users and stakeholders. 'Data analytics' refers to both statistical methods and machine learning techniques, used pervasively in the media, government, the military, health and education, as well as in policy and science which are the focus of the project.

It (the data and process) is 'open' in the sense that the methods used are exposed and explained, but the data itself is confidential and thoroughly anonymised prior to analysis. Data analysis provides numerous benefits, but it is also increasingly recognised that there are also negative consequences. As Lewandowsky and Pomerantsev (2022) argue, "The opacity of algorithms allows platforms to drench users in information that may be detrimental to democratic health. Even ignoring the specifics of content, algorithmic opacity also contributes to a general imbalance of power between platforms and users that can only be unhealthy in a democracy" leading to "a battle between technological hegemony and survival of democracy". In this context, the project explores ways in which data analytics can be deployed in ways which actively reinforce democracy and dialogue, committing to the concepts of open scientific data and open analytics methods see Muslim et al., (2020), by partner, the Leibniz Institute for Educational Research and Information (DIPF), moving forward this emerging practice. The project recognises the generation of data involves confidential information and interactions through channels, workshops and focus groups. However, once appropriate anonymisation has been carried out, the sources of data will be transparent, the analytics deployed in the project inspectable, and the analytics processes described in plain English terms.

Co-design, Participation and Citizen Science

Participatory methods are applied throughout the project. The key audiences, including policy stakeholders, will participate and inform the design, prototyping and research phases of the topics to be covered and how best to present them.

It is essential that the project facilitates authentic input, interaction and collaboration throughout the programme with the target audiences constantly receiving feedback and optimising as the project progresses. How we engage with audiences will be based on the International Association for Public-participation (IAP)2 model, which increases the impact on the decision of engaged actors by moving along the spectrum of participation: inform - consult - involve - collaborate - empower. (IAP2 2022) This spectrum of engagement will be reflected in the game content itself and the co-design leading to it. Equality, diversity and inclusion is a critical element of engaging audiences, and the project has developed the programme to consider accessibility, internet access, health requirements and language needs.

A citizen science approach is applied to all aspects of the research. This requires Participation beyond gathering opinions (= consulting), forming part of a research method focussing not on the explicit, quantifiable and reproductive knowledge of the users but on revealing the tacit aspects of human activity, as Spinuzzi says, it is "what people know without being able to articulate" (Spinuzzi, 2005) Following good practice in citizen science, the project offers different degrees of participation from consultation to empowerment.

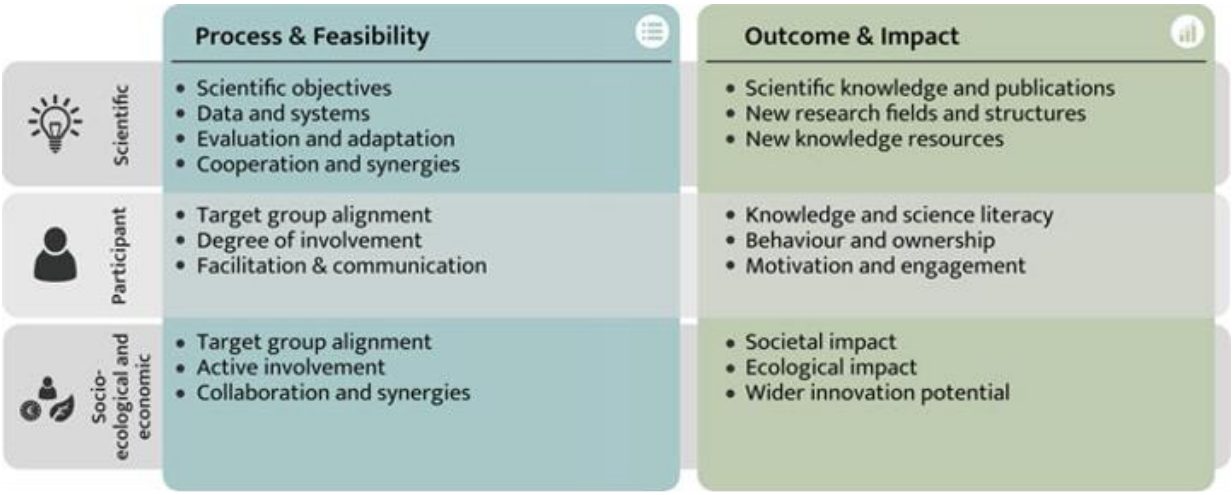

Figure 2: Methods for participatory approach and impact assessment. Keislinger et al (2018

Stakeholders will contribute to the co-design and choose what kind and level of engagement they want to reach. This can range from co-design of graphic elements to the definition of research questions and the co-analysis of the collected data.

The project will run a total of 5 iterative cycles. The first cycle will serve as a Preparatory Cycle with a tightly defined group of internal Test Users. Thereafter, at the start of each new cycle we will hold engagement workshops with around 20 participants in 5 languages (English, Spanish, German, Greek and Danish).

The workshops will take place both online and in-person to ease participation and recruiting will be done via the partner networks, to ensure we attract a diverse set of participants. As the project offers different levels of engagement, these workshops will also offer the possibility to engage with the collected data and add a human understanding to the open data analytics (above). At the start of cycle 2 we will hold engagement workshops with policy stakeholders to provide them with a sense of ownership of the project, and we will continue to consult with - and feedback to - these primary stakeholders throughout the project. To assess the effects of the active integration of key stakeholders in the scientific process, we will apply a comprehensive evaluation and impact assessment framework developed by partners Centre for Social Innovation ZSI in Fig 2 above that has been specifically designed and successfully applied in citizen science projects. This framework goes beyond the assessment of scientific achievements and specifically considers impact on the individual citizens, society at large and other socio-economic impacts.

Conclusions and Summary

In conclusion this paper provides an early summary of the planned methodologies and interventions of the EC funded GREAT research and Innovation project. A project that investigates the potential of digital games and gameplay to engage citizens across Europe through codesign activities to provide input into developing policy priorities on climate change.

The GREAT project makes a strong contribution to the impact of the Horizon Europe Strategic Plan i by realising this potential (a key sector of the *cultural and creative sector*) to achieve a *continuous engagement with society, citizens and wider economic sectors.*

A key contribution is to enable gameplay to become more than entertainment, simulation or learning, by situating it in authentic social issues.

The GREAT project also conceives and applies innovative data gathering and analysis methods to understand players' attitudes and preferences in relation to policy and closes the loop by feeding them forward to policy stakeholders.

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