**DRAFT GREAT Case Study GCS 1 Report:**

**UNDP Exploratory**

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1. Executive summary:

This report provides a detailed summary of a United Nations Development Programme (UNDP) exploratory Case Study (GCS1), conducted as part of the EU Horizon-funded Games Realising Effective and Affective Transformation (GREAT) project. UNDP1 Case Study (GCS1) is the first in a series of eight that are undertaken by the project team, engaging with authentic policy stakeholders. Each case study iteratively contributes to the refinement of GREAT case study documentation, research methodology and overall design. GCS1 started in December 2023 and was finalised in March 2024, involving the case study sponsor UNDP, and the GREAT project research team, coordinated by The Leibniz Institute for Research and Information in Education (DIPF). This exploratory study adopted the GREAT case study cycle design (figure 1.0), representing an eight-stage process of inquiry underpinned by an established mixed-methods research (MMR) methodology.

2. Introduction:

This document presents the first full GREAT case study (GCS1), drawing on lessons learned from the initial Frankfurt pilot cycle, and focusing on work with authentic policy stakeholders. The study centred on Nationally Determined Contributions (NDC), outlining individual government commitments to CO2 reductions as set out in the Paris Climate Agreement. The purpose of the case study was to explore the interaction between citizens and policymakers regarding these NDC commitments, examining how citizens could be better engaged in sustainability efforts and the potential of this engagement to influence government action on climate change.

Key objectives of the case study:

* Engage citizens in one market on the NDCs.
* Empower citizens to influence policy by facilitating their engagement with governments.
* Support policymakers in taking bold and ambitious action by providing them with better insights into citizens' views and priorities.
* Raise awareness of the importance of systemic change through NDCs, which reflect individual government commitments to CO2 reductions under the Paris Climate Agreement.

By focusing on these objectives, the case study sought to enhance mutual understanding between citizens and policymakers, fostering more collaborative approaches to tackling the climate crisis.

The overarching research objective aimed to explore the potential of games-based activities to function as a bridge between citizens and policymakers. The ambition was to provide participating policy stakeholders with insights into citizens' perspectives on various climate-related objectives. To achieve this, the case study sought to address the research questions defined within the GREAT project:

* RQ1: Which games-based activities can be used to elicit, represent and communicate citizens’ views on policy dilemmas?
* RQ2: How effective are games-based activities in eliciting, representing and communicating citizens’ views on policy dilemmas?
* RQ3: How efficient is the use of games-based activities in eliciting, representing and communicating citizens’ views on policy dilemmas?

2.1 Research Methodology:

The research methodology for the GREAT project case study utilised a multiple-case design, an increasingly popular strategy in the social sciences for investigating complex phenomena (Zainal, 2007; Grassel and Schirmer, 2006; Johnson, 2006). This design facilitated the collection of diverse data sources through replication, rather than sampling. The methodology was selected due to suitability for addressing the research questions, the capacity to elicit both implicit and explicit data, and its ability to adhere to established scientific conventions, systematically recording evidence both quantitatively and qualitatively. The case study methodology was designed to evaluate multidisciplinary challenges related to climate change and sustainable development problems, aiming to achieve the research objective regarding informing policy, improving citizens' engagement, and decision-making processes. Data analysis was contextually set; hence, the findings presented are systematically linked with the overall aims of the study. This approach ensured a thorough exploration of key themes, with the data collection process following the procedures established in the project’s MMR methodology.

2.2 Case Study Design Methodology:

The case study design followed an eight-step process, as outlined by the GREAT project, linking citizens and policy stakeholders through games-based activities; at the same time, integrating activities across multiple work packages to ensure consistency throughout all case studies. This methodology is framed as a cyclical process (figure 1.0), with detailed descriptions of the expected activities and outputs for each step defined in case study cycle. A framework was established with instruments for the design of individual case studies to ensure robustness in the evaluation. This is an exploratory approach to examine the potential for the methodology and identify how to best utilise the infrastructure for larger-scale case studies in the future. Each case study involved coordination between a case study sponsor, academic lead, and stakeholder representatives, following a structured sequence of planning, collaborative design, data collection, and evaluation. The systematic approach ensured coherence and alignment across the range of case studies developed within this project.

Steps 1 to 3 were supported by work package 2 (WP2), which focused on defining the case study's goals and designing game-based activities, these were made possible through work package 3 (WP3), while collaborative analysis and evaluation of data fell under work package 4 (WP4). The latter stages of the cycle, including community and policy stakeholder engagement, are overseen by work package 6 (WP6). The dynamic nature of this approach allowed activities to be revised as circumstances evolved, a reflection of the project's adoption of an agile approach. The cycle included ethical approval processes, consent, and data management procedures to ensure institutional and legal standards were met in each case study cycle.

A diagram of a case study cycle

Description automatically generatedFigure 1.0: GREAT Case Study Cycle.

3. Background to the Case Study:

The case study engaged citizens in discussions around their country’s Nationally Determined Contributions, with an emphasis on improving public understanding of government commitments to CO2 reductions and encouraging active participation in climate-related dialogues. Citizens were encouraged to engage with their government, providing feedback and contributing to discussions on how NDC goals could be realised in practical terms.

While the study aimed to empower citizens and policymakers alike, it was acknowledged that directly causing policy change is a complex and multifaceted process. Instead, the focus was on enhancing citizens' ability to influence policymakers, encouraging them to take bolder actions by elevating public awareness and priorities. This approach recognises that while immediate change may not always result, the collective influence of informed citizen engagement can shape and guide long-term policy decisions.

The insights gained from this case study have informed subsequent GREAT project activities and case studies, with particular attention to refining methods of engagement and evaluating the extent to which citizen participation can shape governmental climate actions.

4. Create and Prioritise Research Topics (step 1)

The team addressed the first phase of the case study cycle by drawing on work initiated by an earlier UNDP study. Rather than generating new research topics, they inherited those from the earlier study, which had been through the process of validation in several contexts. This continuity was essential in allowing the research team to focus attention on methodologies and systems to be tested without any requirement for revisiting or redefining research topics. In the previous study, UNDP had identified the research topics, which were then adapted to specific needs in this case study. This was done in order for the new infrastructure and methodologies to capture these pre-identified topics well instead of just matching them. This phase was pivotal in assessing how effectively these methods worked in real-world conditions, through the use of data gathered through tools such as surveys and Google Ads. This practical testing was instrumental in refining the data collection processes and the research approach, laying a sound foundation for the following stages of the study.

The involvement of games studios added further complexity, in this case, greater emphasis was placed on integrating the tools and infrastructure needed for the research, rather than on a significant collaborative design process with UNDP. Instead of devising new ways to do things together, the collaboration focused more on ensuring the infrastructure was present and working, drawing on insights from the preliminary study to guide this process.

Infrastructure testing included in-depth analysis of the integrated data and visual tools. To enhance the depth of insights and improve engagement with policy stakeholders, further data analysis was carried out using tools such as Microsoft Power BI. This process was crucial in ensuring the effectiveness of the tools and accurate data interpretation. The case study also collaborated with games developers to see how key elements, including visuals, messaging, and methods of collecting data, can be seamlessly integrated into an online game platform in a manner that would reach and engage the intended audience.

While the research topics were pre-determined by UNDP, the first phase of the case study cycle concentrated on refining and testing the methodologies and infrastructure necessary for investigating these topics. The phase involved a hands-on approach aimed at ensuring the tools and processes were sufficiently robust to generate meaningful insights in the case study. By adopting this practical approach, the team effectively fine-tuned both the data collection methods and the overall research strategy, laying a solid foundation for the subsequent phases of the study.

5. Collaborate in Study Design (step 2)

The second phase of the case study cycle encompassed a collaborative effort to design game-based activities and develop thematic content for the survey. The objective was to seamlessly integrate the survey into the game environment, ensuring it effectively engaged players whilst preserving the integrity of the gameplay experience. Strategic placing of the survey within the game was paramount to the success of this case study, as visibility and access were required to achieve adequate participation. The team evaluated various options for embedding the survey into the game, contemplating aesthetic design whilst considering the behavioural model of most gamers. The thematic content of the survey was focused on climate change, with the initial questions developed by the United Nations Development Programme (UNDP) for the People's Climate Change Vote in consultation with various stakeholders. These questions were further refined by the GREAT team in partnership with ZSI and the University of Bolton to ensure their suitability for integration within a gaming context. This stage extended beyond question refinement to include the adaptation of the survey’s visual identity, ensuring the climate change-related content would be both engaging to the players and consistent with the overall aesthetic of the game.

The study’s design placed an emphasis on high quality data collection; thus, considerable consideration was given to player behaviour patterns when planning the survey’s launch and duration. The team used insights from Data.di (Data DI 2024) a system for tracking player engagement; installs; and other metrics across various gaming platforms. This data helped confirm assumptions regarding the moments of player activity and, by extension, informed the timing of when the survey should be launched. Beyond this, the team ran informal consultations with a wide range of game studios, approximately 60 in total, including major platforms. These discussions provided further background regarding player behaviour and assisted in the overall design of the study. While such consultation was not always formally documented, they were considered integral to refining the approach. Drawing on data demonstrating engagement peaks typically being observed within the first few of days a survey going live, and then steadily declining, the team estimated an optimal open window of four to seven to maximise participation. Anecdotally, the team understand that player engagement is usually higher towards the end of the week, and especially over weekends. This assumption will be examined over the duration of the case studies Thus, launching surveys during the beginning of the week where player activity can be decreased was avoided, instead, the team targeted Friday through Sunday when gaming is more prominent.

A significant challenge during this phase was ensuring the survey could be adapted to fit into each game's technical and design limits. Some games required specific tweaks to the survey’s visual identity and placement of the survey, due to the scarcity of available spaces within the game environments. These modifications were made iteratively to ensure the survey remained functional and engaging across multiple games.

The team acknowledged the need for improved documentation of consultations processes. While the team consulted studios regularly, and gathered valuable insights from discussions, they did not always keep detailed records of which studios were consulted, when, and what specific input they had given. For future projects, the team recognised that systematic documentation of consultations this would have provided support for many of the choices they had to make in study design.

The second phase of the case study cycle involved an iterative and collaborative process, where game activities and thematic content were carefully designed to ensure maximum player engagement and produce valuable data. Despite some challenges with the adoption of the survey into various games and documentation, the team successfully navigated these obstacles and set a good premise for data collection via the survey.

Collaborate in design of games-based activities (step 3)

The third stage of the case study cycle focussed on the collaboration of stakeholders, policy makers, and game designers in the design of the interactive elements of the game; these were to be designed in such a way as to effectively elicit and communicate citizen views about policy dilemmas. The main objective being to design and implement game activities to encourage user engagement whilst providing valuable data regarding public sentiment. This design also included specific survey questions co-developed with the UNDP on the topics of climate change policies related to energy; transport; food security; and responses to natural disasters. Two distinct strategies for embedding these questions within the game were tested (table 1.0). Approach 1 utilised paid advertisements within the game (Google Ads), within this, two distinct visual approaches were developed and implemented (figure 2.0). These adverts aimed to engage players while seamlessly integrating with the playing experience, interestingly, no clear preference was identified among players between the two visual representations, suggesting both approaches were equally effective in maintaining player engagement without disrupting gameplay. This insight can inform future ad design strategies in similar interactive environments. Approach 2 was a direct in-game rollout requiring negotiation with studios to make the activity part of the experience within the game itself. In the direct in-game rollout, engagement rates were substantially higher: 58% of players interacted with the content, versus an insignificant 5% for the paid adverts. Completion rates were similarly higher at 84% for the in-game rollout, compared to 45% for Google Ads.

A person in a hat and scarf holding a stick

Description automatically generated with medium confidenceA hands holding a ball of fire

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Figure 2.0: Visual approaches of Google Ads embedded within the game activities, developed by the GREAT project.

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| --- | --- | --- |
|  | **Google Ads** | **In-Game Roll out** |
| **Reach/First page load** | 7,257 | 4,352 |
| **Engagement** | 398 (5%) | 2,539 (58%) |
| **Completion** | 179 (45%) | 2,148 (84%) |
| **Community Sign Up** | 18 (10%) | 282 (13%) |

Table 1.0: Results from strategies for embedding questions within the game.

The collaborative design of game activities began with a workshop involving all stakeholders-game developers, policy makers, researchers, and target audiences. Such interdisciplinarity ensured the game content not only met the project objectives but would also be engaging and appealing for players. Typically, game design involves the following stages:

* The collaborative process typically occurs in a workshop environment, where stakeholders co-create the core concepts of the game. This setting promotes idea-storming, during which each participant may give ideas concerning the structure, goals, and mechanics that the game will have. The aim is to balance policy communication needs with the player's gaming experience.
* Storytelling is one of the powerful game design methodologies, it is imperative to develop a narrative that resonates with the players whilst weaving in the key policy messages. The story needs to be meaningful and engaging, framed around real-world dilemmas such as climate change, social justice, or public health.
  + The co-creative process builds up a story corresponding to the policy issues at hand. For example, if the policy dilemma involves climate change, a story could revolve around a community or city under environmental stress in which players will have to make choices which involve sustaining energy consumption or responding to disasters.
  + Running parallel to the story will be the integration of quiz-style activities. These quizzes are to be designed on testing knowledge on the policy issues but also encourage players to reflect on how such policy matters are related to their own real-life implications. Such quizzes may be linked to different narrative stages, which might make them a natural part of the game's progression.

In-game characters, settings, and challenges are designed to reflect the dilemma scenario in a way that encourages players to engage with the key policy questions. For example, characters can come from various stakeholders in the policy process, such as citizens, business owners, government officials, etc., each with their interests and viewpoints.

The core of the design was based on the dilemma scenario, a set of choices presented to the player modelling real-world complexity in policymaking. The dilemma needed to be carefully crafted to represent the policy issue at discussion, allowing players to explore several solutions and consequences:

* The core of the game is the policy dilemma. For example, assuming there was a climate change scenario, one would have to decide either to impose more stringent environment regulations at the cost of hurting short-run economic growth, or to foster the economy at the price of slack environment control. Each of these moves has an aftermath that could be emulated in this game, such as changes in the environment or in the resources the player possesses.
  + The dilemma should introduce complex, multi-dimensional choices where players must consider and weigh trade-offs. For example, a player might be faced with making a choice between a reduction in carbon emissions and the maintenance of economic stability in a city-building game. To better reflect real-world policy decision complexity, there should be no clear right or wrong answers to these hypothetical situations.
  + Dilemmas should also consider ethical dimensions, such that the player can reflect upon issues regarding fairness, social justice, and long-term sustainability. For example, a decision that benefits wealthier citizens in the short term might lead to negative outcomes for poorer communities in the long term.
* The quiz game reiterated the messages of the policy in a more structured type of question-and-answer format. Questions can be set up to align with real-world data encouraging players to engage in critical thinking regarding policy options.
  + Questions can be tied directly to the scenarios the player has encountered in the game. For example, after a decision about environmental regulations, the player can be asked a quiz question such as "What effect do stricter carbon emission policies have on manufacturing jobs?”.
  + The quiz can implement some form of dynamic difficulty where questions get progressively more difficult as the player progresses through the game. Early questions test basic policy area knowledge, while later questions ask players to think through long-term implications of their in-game decisions.

The design of interactions along with the method of deployment of content was crucial for maintaining player engagement while data collection remained seamless and unobtrusive.

* Designing interactions played a critical role in keeping the player engaged while collecting meaningful data.
  + The interactive decision points are embedded within the narrative, and the player must choose between several policy options. The decisions can be represented visually through the game, for example by use of graphics or dialogue explicitly setting out the consequences of each of the different choices.
  + In-game, real-time feedback mechanisms may be provided to the players, depicting the immediate consequences of their choices. For example, in a city-building game, changes can be shown in pollution levels, energy consumption, or satisfaction of the citizens based on the player's decisions.
  + Allowing players to see how their choices compare to others can include global leaderboards or community discussions encouraging deeper reflection about policy issues. Social features also allow players to feel a sense of community in which they can share experiences and discuss implications of in-game decisions.
* The deployment of game content must be carefully managed to make ensure new data, features, and updates are integrated smoothly.
  + Content can be released in modular form, allowing for periodic updates to keep the game fresh and engaging. For example, new dilemma scenarios or quiz questions can be introduced over time, encouraging players to return to the game.
  + Players could be informed of content updates through notifications or in-game messages, to encourage and inspire them to try newer content or activities. These notifications should be unobtrusive but clearly visible, ensuring players are aware of new opportunities to interact
  + The game infrastructure should be designed to accommodate large numbers of players without performance issues. It will be more effective if the system uses cloud-based services for data storage and processing to ensure efficient scaling as the number of respondents grows.

The game selected for GCS1 was SMITE, a multiplayer online battle arena game with more than 10 million players globally (figure 3.0). The competitive, mythologically themed environment was selected because it could involve players in several complex situations to mimic real-world policy dilemmas. With its large community and collaboration modes, SMITE fitted all goals set by the project. GCS1 also used the Playmob platform (figure 4.0) to embed social impact questions and collect data.

A screenshot of a video game

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Figure 3.0: SMITE, the game selected for GCS1

A diagram of a computer and a device

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Figure 4.0: The Playmob Platform

Collaboration in game design through workshops, narrative development, and careful scenario creation is critical for effective integration of policy communication into a game environment. The success of this process relies on meaningful stakeholder engagement and effective interaction and content design. Future work could explore expanding the range of policy dilemmas, incorporating more diverse genres of games, and further refinement in how the content is deployed to ensure accessibility and scalability.

Piloting and gathering data (step 4)

Piloting and data gathering forms a pivotal part of the case study cycle as it trials the designed games and questionnaires with participants to establish their effectiveness in capturing and representing citizens' opinions on policy dilemmas. This step involves the implementation of various game-based activities, focusing both on targeted small-scale testing, such as dilemma games with focus groups, and large-scale data collection through mobile game surveys.

During this phase, game-based interventions were conducted with selected case study participants. In many instances, each game was specifically developed to focus on a specific policy challenge and offered participants the opportunity to engage with complex issues through interactive storytelling and decision-making tasks. Piloting allows researchers to gather preliminary insights regarding how participants engage with the content, make decisions, and face challenges while working with the game.

The use of dilemma-based games enables the collection of nuanced data. These types of games generally involve participants in moral, ethical, or logistical decisions related to the policy area under examination. For example, the issue of climate change can be approached by creating a scenario that requires a trade-off between short-term economic gain versus long-term benefits to the environment. Participants' choices reflect their attitudes, values, and knowledge concerning the issue at hand which can then be translated into valuable qualitative and quantitative data. In this interactive way, researchers can capture a range of responses indicating participant preferences and identify trends.

Focus groups provide an in-depth qualitative perspective on data gathered during the piloting phase. Here, specific groups of participants, usually matched from demographic or geographic bases, go through specially crafted dilemma games. The setting of a focus group allows the researchers to observe interactions among the participants and decision-making more closely. Researchers can also elicit immediate feedback regarding participants' reasoning about the dilemmas presented to them and the efficiency of the game.

Dilemma games are particularly useful when researchers are trying to tackle complex, multidimensional policy questions. Participants are guided through narratives where they are compelled to confront trade-offs and consequences-replicating the same kind of real-world complexity imbued in policy decisions. This method allows researchers to trace how participants' opinions change as they are exposed to various scenarios, thus painting a more dynamic picture of public opinion. Furthermore, a focused environment allows immediate changes in gameplay mechanics to ensure that the content is transparent and relevant.

Surveys have been embedded into popular mobile games in order to reach more people and collect data on a larger scale. This method capitalises on the high levels of engagement within these platforms, using their existing infrastructure to deploy surveys in a cost-effective and efficient manner. Designs for the survey format were made in such a way that they would not interfere with the gaming experience and would be highly unobtrusive in nature, ensuring high response rates.

There were no geographical boundaries in this case study, although data gathered through the game showed responses from different parts of the world (figure 5.0). This international approach agreed with the objective of this project in obtaining diverse opinions on climate policy. In future research, geographic targeting might be necessary depending on issues of policies under consideration as regional differences on many aspects of public opinion are distinct. For example, opinions about environmental policy may vary between city and countryside, or even between different cultural backgrounds. The embedding of questionnaires within location-based games allowed the researchers to gather data that was geographically applicable, adding contextual richness to the findings.

A white rectangular object with a black border

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Figure 5.0: Individual sessions undertaken identified by geographic location.

Piloting and the collection of data revealed a set of insights and challenges. Firstly, and positively, game-based approaches proved successful in the high level of engagement, especially mobile game questionnaires when respondents had already invested in the platform. However, the application of dilemma games showed the difficulty in capturing real opinions within a controlled, game-like environment. Reactions during the focus group discussions showed the games can be quite interesting, at the same time, some scenarios may be too simple or detached from reality. Thus, limiting the depth of the data collected.

A challenge arose from balancing the level of engagement required with meaningful data collection. While games are a very useful mechanism for holding the interest of participants, one concern may be that the game-like nature could result in superficial responses due to players focusing more on 'winning' the game rather than reflecting their opinion. Such tools need to be designed and set with due consideration so that the games are both entertaining yet preserve research validity.

Piloting and gathering data through games-based interventions offers a unique opportunity to engage participants with complex policy dilemmas in an interactive, engaging format. By incorporating both small-scale, focused tests through dilemma games and broader, geographically targeted surveys within popular mobile games, the case study was able to collect diverse, rich datasets that inform subsequent stages of the research. However, such methods must be calibrated with care to avoid the trap of over-gamification to ensure the findings obtained are a fair reflection of public opinion.

Data interpretation and outcomes (step 5)

Data interpretation and outcomes form the fifth critical stage of the case study cycle. Coming after substantial data has been collected from the game-based activities, this phase focuses on collaborative data analysis, interpreting results to evaluate significance, and an assessment of the quality and reliability of the findings. It also involves determining whether further data collection is necessary due to observed gaps or limitations.

This is an essential element in ensuring the interpretation of results is rigorous and representative of diverse perspectives. Typically, this stage would consist of holding a workshop assembling stakeholders, including researchers, game developers, policy experts, and other relevant participants, who would jointly analyse the data. The workshop format stimulates incorporation of various competencies and different perspectives to ensure no important features of the data are overlooked. Participants review the raw data resulting from the game-based activities, such as dilemma games and large-scale surveys, and engage in a structured interpretation of the data. Guiding analytical questions include: What patterns or trends can be seen? How do the responses reflect the original policy dilemmas? Do any of the demographic data jump out in the results? For example, any age, gender, or other location-based anomalies? This ensures the analysis is informed by insights stemming from different disciplines and, therefore, enhances the robustness and validity of the interpretations.

Once collation was completed, data analysis focussed on the interpretation of these data in relation to the research objectives and policy questions. Data obtained from the game-based activities, for example, the decisions made in dilemma games and survey responses, provides the value added of a lens into how citizens perceive and respond to complex policy issues. One of the most important outcomes of this process is to understand how well the game activities have elicited meaningful and representative responses. In the case of dilemma games, this includes subject choice analysis to see whether it truly reflects real decision-making processes or if it was swayed by the context of gamification. In the case of large-scale surveys nestled within mobile games, the researchers look at the response and completion rates, and the quality of data based on, for example, how consistently people have interacted with the content. During the interpretation of data attention is also paid to the biases or distortions that may be involved. For example, games-based data collection might be biased to certain demographics, such as young males, for which the game may appear most interesting. Workshop participants reviewed these biases, evaluating their potential impact on the validity of the results, and made judgments about the modification of study design or data interpretation that may be required.

Examining depth, breadth, reliability, and accuracy of data collected with respect to answering the original research questions is a major activity undertaken in this phase. The collaborating team reaches a judgment about whether data is informative with respect to the citizens' views concerning the policy dilemmas set forth through the games. High-quality data typically shows a balance of perspectives across different demographic groups and provides rich information on participants’ reasoning behind their decisions. The data quality is also assessed based on the level at which such data supports the policy stakeholder's goals. For example, where the research dealt with the change in the climate, then the data should give actionable insights that can help in informing the development or adjustment of a certain policy. The team considers whether such findings are robust enough to influence discussions on policy or whether such data needs further refinement before it can be used within that context. At this point, data verification may also be carried out, for example, data resulting from games can be checked against other data sources, like previous surveys or research within the same policy area, to check if the results obtained through games would appear consistent, or if any discrepancies arise. Such triangulation is an essential element in the process of establishing credibility of the results.

An important outcome of this step is determining whether further data collection is required. If the preliminary analysis presents gaps, inconsistencies, or biases in the data, or if the data is inadequate to answer the research questions, then the team may decide more rounds of data collection are required. For this, refinement may need to take place in the game mechanics, survey questions, or balancing out the pool of respondents, targeting a different demographic altogether. For example, if the activities based on games resulted in a biased sample such as a dominance of young, urban males, then subsequent data gathering could be tailored to capture underrepresented groups, such as older citizens or those from outside metropolitan centres. If the dilemma games fail to generate substantive responses or data is sparse in certain areas, it may be necessary to conduct further rounds of gameplay with adjustments to either the framing of scenarios or questions to elicit more substantive participant engagement.

The data interpretation and outcomes phase form a crucial process in which the raw data collected from games-based activities is translated into meaningful insights informing policy development. This collaborative workshop setting allows the pulling together of diverse expertise to interpret the data, assess its value, and identify any gaps. The team, through critical examination of the quality of the data and its relevance to the research questions, can establish whether the findings are robust enough to influence policy or whether further data collection is needed to ensure full comprehension of citizens' views on the presented policy dilemmas. This step is thus a key turning point in the case study cycle, bridging the gap between data collection and actionable outcomes.

Conclusions and Outputs (step 6)

The sixth step cycle is the process of translating data and their interpretations into concrete policy suggestions. It is at this stage findings will be collaboratively developed, and the research methods' efficacy appraised, yielding reflections regarding implications for future research and policy formation. These are compiled and appraised in terms of value to inform policy and guide the methodological approach.

As with other phases in the case study cycle, collaboration is the foundation of this approach. This usually takes the form of a workshop, or series of workshops during which researchers, policy experts, game developers, and representatives from various governmental and non-governmental organisations meet to formulate findings. The objective of this type of workshop is to discuss the data together in the context of original research questions and policy dilemmas and to come to an agreement on what should be done based on that data. These findings were based on a rich dataset developed from game-based activities. They provide guidance on how these findings better inform policy, reflect on the implications of findings for policy, and summarise key lessons we learned from citizens' perspectives.

Phase six of the case study cycle once again includes a reflective process of the strengths and weaknesses of the case study itself, for example, whether the research questions are being adequately addressed, and if the data collection techniques correspond to the available data. These retrospective events support the elaboration of conclusions in addition to bringing suggestions for further research of alterations to the policy approach.

A central component of this phase is assessing the degree to which the games-based strategy was successful in gathering opinions from the public. This entails assessing the methodological approach and its effectiveness in contributing to policy.

The methodological evaluation denotes the extent to which the games-based activities have elicited high-quality data from a representative sample of respondents. Several factors are considered, including:

* Engagement: Was it possible to engage participants by embedding dilemma games and large surveys in mobile games? High response rates and high qualities of engagement would suggest this method was indeed effective.
* Data quality: Was the data obtained appropriate to answer the research questions? The study review considers whether the available data portrayed a sufficient sample of the population, or if stereotypes such as age or gender bias cut down on the study's objectives.
* Technical execution assessment: How well did the system handle the scale of data collection? The review covers the sufficiency of the game mechanics and infrastructure, while also mentioning the issues that were encountered in or post-deployment while running the game mechanics in the study.

The review also analyses the extent to which the more in-depth approach achieved its aim, which is the provision of information that can be used in a policy-making process. Important questions in this domain include:

* Alignment to policy: Was the information acquired to accord value addition to the policy stakeholders such as the UNDP, other government bodies among others? Were citizen's views captured in a manner that could reasonably be considered while addressing the policies or new policy initiatives that could be formulated?
* Scalability: Was the method scalable and relevant in other policy contexts? In this example, for instance, would the games-based approach be used in other policy problems aside from that of climate change to other parts of the world and with different population demography?
* Efficiency: How efficient was the process in terms of time, resource utilisation, and cost? This concern regarding the method's efficiency was not only based on how technical implementation could get but also the partner engagement effort to game studios and soliciting wide participants.

This evaluation is crucial in determining whether this method should be recommended for future use.

The last of the recommendation's rests on the interpretation of the data or the impacts of the possible intervention, how effectively the approach would function in practice as an intervention. These proposed recommendations are intended to raise the professional level of decision makers by offering them viable reasonably designed measures based on opinions and preferences of citizens who have participated in the games. These recommendations may be on how to move forward in changing policies to better accommodate the view of citizens, or even point out areas requiring more public participation. Additionally, recommendations may provide more detailed feedback regarding extensions to the model, such as how to make more use of citizen inputs within the policy-making process in the future, with respect to the technology and games and other methods of mass engagement that are available.

Calibration or deterministic optimisation is sometimes insufficient, and some consequences may also point to new questions requiring further research or collection of other available data, if any, particularly in cases where biases or certain gaps were alleviated during the evaluation. Such anticipations would serve to improve on the methodology in subsequent versions, making it possible for the tool to be used effectively in policy consultations and in the formulation of policies.

The final step of this phase allows reflections on the overall process and considerations for the future. The team evaluated lessons learned about the use of games as a research method. This allowed for the establishment of best practices for future research projects, laying the groundwork for further exploration of how digital engagement methods can be utilised in policy development processes. Future work may focus on broadening the methodology to examine how different types of games could be utilised to engage different demographic groups. The reflections may be focussed on new insights concerning possible improvements in the partnership model, particularly in promoting smoother collaboration between policymakers and the gaming industry.

We refer to the policy conclusions and evaluation stage as the moment of truth in the case study cycle, akin to the last stepping stone converting game-based insights into real-life outcomes. This phase elaborates the implications for policies after taking a thorough examination of general applicability of the case study, assessment of effectiveness, and method of results collection through applied analysis. This is followed by an evaluative component to create a holistic picture of the games-based approach in terms of what it can and cannot do, in concrete terms, to ensure conclusions are underpinned by an expansive range of expertise.

Public Engagement and Dissemination of Outcomes (step 7)

The seventh phase of the case study cycle involved the dissemination of results to the largest extent possible, to ensure data and insights obtained from activities in games and play are effectively communicated to wider audiences and stakeholders. The findings and recommendations are circulated through web-based articles, particularly the GREAT project website, and open-access repositories, such as Zenodo, where project deliverables, datasets, analysis summaries, and academic papers can be uploaded at all intermediate stages to provide transparency and foster further research collaboration. These repositories not only serve as archives, but also provide a gateway to citations in future academic discussions.

A main source of dissemination activity has been community engagement, which has seen the project and findings presented in webinars and numerous presentations to a variety of stakeholders. For example, webinars have targeted policymakers, climate activists, and industry professionals, such as those in the gaming sector, whereby direct discussions can be made regarding how games-based activities may influence policy and public awareness of climate change dilemmas. Webinars have allowed for a more conversational format than found in writing, allowing attendees to ask questions, increasing engagement with the subject matter. Events and presentations have also formed the basis of the engagement strategy, with case study results presented at conferences related to climate change, game studies, and public policy. Featured either in person or as a virtual event, these events become places to offer feedback that may feed into research efforts rather than a point to simply supply information.

The effort of engagement has been directed to pursue broad and varied coverage for the case study results, yet in channels capable of preserving an academic quality of communication. Results are communicated in formats that are friendly to the public at large and, simultaneously, valid in academic and policymaking circles. This not only increases the dissemination and visibility of the research but also potentially drives impact on policy decisions and future projects

Conclusions and outputs (step 8)

This is the final phase of the case study cycle, requiring structured efforts in actively distributing the results derived during the game-based activities to policy stakeholders. This phase is concerned with devising an inclusive dialogue between policymakers and the public regarding urgent dilemmas during climate emergency crises. The engagement process is designed to ensure the emerging data, conclusions, and possible policy recommendations from the case study are communicated in a way that informs and influences decision-making.

An output of this phase is the Insight Report, pulling together learning from games-based activities, surveys, and dilemma games throughout the project. This report serves to enable policy makers to understand how citizens think about and respond to complex climate-related policy challenges. Raising the alarm on major trends in popular opinion, distinctions between demographic groups, and any observed level of bias. The insight report will be diffused at multiple times in the process through various media channels to a diverse audiences and stakeholders, such as the direct end users in the case study, UNDP, or other international organisations involved in climate policy. The report will also be shared more widely via open access platforms such as Zenodo, to ensure accessibility to a greater audience of both policymakers, researchers, and the public.

Results of the case study will be presented to policymakers in special briefing sessions as a means of achieving dissemination and action of results. These will be tailor-made for various audiences, from the international level such as UNDP, right down to local government representatives. This aims to offer an overview of the approach, results, and potential policy implications regarding how best to formulate climate change policies and environmental governance. These presentations allow the team to demonstrate the potential innovative policy uses of game-generated insights, such as information on trade-offs between economic growth and environmental sustainability, or long-term inter-generational impacts, data might allow policymakers to make more informed choices about how the public considers them. Presentations also offer an opportunity for policymakers to ask questions and ensure a two-way dialogue to allow further refinement of the report and its recommendations.

Other than formal presentations, an ongoing dialogue with dilemma-stakeholders was necessary in the process of creating engagement. This dialogue took the form of focus groups, workshops, and one-on-one meetings with a variety of policymakers and representatives of industry leaders facing climate dilemmas. These discussions help set the data from the case study into relevant policy landscapes and allow an opportunity to demonstrate how perspectives from within society ought to play into attention to nuance inside useful public policies. The collaborative aspect of this engagement is critical in ensuring insights arising from the games-based activities do not just exist as academic findings but are translated into actionable policy recommendations. This can help stakeholders think critically about how data can be used to inform decision making, whilst also giving them tools with which to interact and engage with the public more thoroughly, possibly incorporating games-based methods into their own outreach efforts.

## Discussion: Case Study Alignment with GREAT Objectives and Research Questions

The GREAT project research questions are detailed in deliverable D4.2. in this section we provide detail on how the activities described in this report align with the GREAT project research questions.

|  |  |
| --- | --- |
| **GCS1 United Nations Development Programme (UNDP)**  Mapping of the Case Study focus and contribution to the GREAT project research questions as proposed in (D4.2) | |
| **Objective 1.** Establish ways in which games can be designed to provide a link between citizens and policymakers. | |
| RQ 1.1: Which methods in digital games can be used to create an information exchange between attitudes and preferences of citizens on societal challenges (e.g., climate change) and policy makers working on these challenges? | Yes |
| RQ 1.2: How effective and efficient is the use of games in creating an information exchange between attitudes and preferences of citizens on societal challenges (e.g. climate change) and policy makers? | No |
| RQ 1.3: How can games be used to foster dialogue and collaboration on societal challenges (e.g. climate change)? | Yes |
| **Objective 2.** Understand the actual and potential impact that games can have on citizens' engagement in social issues and challenges, and on policy stakeholders’ awareness of citizens’ attitudes and preferences. | |
| RQ 2.1: What are the affordances of games in developing citizens’ engagement with challenges and dilemmas arising from societal challenges like climate crisis? | No |
| RQ 2.2: What are the affordances of games in informing policy on the societal challenges like climate crisis? |  |
| RQ 2.3: What is the value to policy stakeholder groups of the information on citizens’ attitudes and preferences generated through games-based activities? | No |
| RQ 2.4: What is the value to citizens of enabling them to engage in policy discourse through the design of and engagement in games-based activities? | No |
| RQ 2.5: How generalisable are the GREAT methods to other global challenges or other fields of research and innovation? | No |
| **Objective 3.** Provide practical guidance for games developers and policy stakeholders. | |
| RQ 3.1: Which are the key interventions in the GREAT method which lead to its effectiveness and efficiency? | No |
| RQ 3.2: Which variables need to be taken into consideration when adapting the method to new contexts? | Yes |
| RQ 3.3: What documentation and/or training is required for games developers, policy stakeholder groups? | Yes |
| **Objective 4.** Assess the benefits and risks to individuals and society of using games to promote engagement with societal challenges. | |
| RQ 4.1: What are the benefits and risks experienced by citizen participants, policy stakeholders, games designers and providers, as well as policy makers and organisations, when they participate in the GREAT method? | No |

Table Two: Mapping of Research Questions within GCS1

**Objective 1.** Establish ways in which games can be designed to provide a link between citizens and policymakers.

**RQ 1.1: Which methods in digital games can be used to create an information exchange between attitudes and preferences of citizens on societal challenges (e.g., climate change) and policy makers working on these challenges?**

The pilots conducted over the summer, alongside the design of the case study cycle steps, represented beginnings to answer this research question. If the method(s) defined within RQ1.1 correspond to the step cycle, then the case study addresses this, although the initial stages were not exclusively undertaken by the GREAT project, drawing on approaches and questions developed from earlier UNDP-validated activities. In this case study, the Playmob method was employed without the inclusion of Dilemma-Based Learning (DiBL). The application of the Playmob approach, using established digital games, served to test the method and confirmed that it supported the exchange of information or, at the very least, provided policymakers with an indication of public preferences.

**RQ 1.2: How effective and efficient is the use of games in creating an information exchange between attitudes and preferences of citizens on societal challenges (e.g. climate change) and policy makers?**

The case study provided quantitative data on the numbers of people who accessed and completed questionnaires. Data included in this report, page [6], indicates the approach is 'effective', but a more rigorous comparative assessment would be required to confirm the method is 'efficient'. The case study did not provide any qualitative responses to the research question.

**RQ 1.3: How can games be used to foster dialogue and collaboration on societal challenges (e.g. climate change)?**

* The dialogues in the project can be conceptualised on two levels:  
  Direct interactions, such as conversations among stakeholders in the course of the case study activities.
* Information exchanges between policymakers and citizens, enabled by the GREAT project activities.

This case study focuses on the latter, gaming for dialogue and collaboration. To this end, two models were employed, the first purchased advertising space through Google Ads, while the second contacted game development studios to integrate the approach directly into gameplay. The data relating to engagement and completion suggests direct engagement in this case was more effective in fostering and supporting this dialogue. The data further suggests games can be used as a medium for facilitating dialogue.

**Objective 2.** Understand the actual and potential impact that games can have on citizens' engagement in social issues and challenges, and on policy stakeholders’ awareness of citizens’ attitudes and preferences.

**RQ 2.1: What are the affordances of games in developing citizens’ engagement with challenges and dilemmas arising from societal challenges like climate crisis?**

This case study identifies affordances anecdotally, but evidence with substance to back these claims is not given. The quantitative data generated may suggest some indication of the existence of some affordances but raises the question of whether this evidence is compelling.

Data was collected relating to citizen engagement:

* Although there is quantitative data in the case study, it is limited and may not amount to convincing evidence of 'engagement'.
* The case study question is vague regarding the definition of the term 'affordances' and whether this is a useful term to guide the inquiry.
* There can be an overlap of Research Questions 1.1, 1.2, and 1.3.

**RQ 2.2: What are the affordances of games in informing policy on the societal challenges like climate crisis?**

**RQ 2.3: What is the value to policy stakeholder groups of the information on citizens’ attitudes and preferences generated through games-based activities?**

The case study involved consultations with stakeholders; in this case, consultations were done during earlier activities not managed under the GREAT project, and consequently does not directly respond to the question. Consultation with UNDP as the sponsor of the activity is a form of consultation.  
  
In future case studies, where feasible, it would be beneficial to ask UNDP about the qualitative 'value' they assign to the information provided through this research, and specifically how the data generated from the games-based activities is utilised.  
  
This research question is related to 'policy stakeholders', participants who may not be policy owners or general participants. While the case study gathered data on this group, there is a clear need to distinguish these users more explicitly.

**RQ 2.4: What is the value to citizens of enabling them to engage in policy discourse through the design of and engagement in games-based activities?**

To address this would involve surveying citizens to gauge the value they feel they derived from engagement with the project, it is not something explicitly addressed in this case study. The completion rates suggest citizens, or, at the very least, the players of SMITE, valued the games-based learning activity enough to complete the questionnaire.  
  
The questions embedded within this activity will be redesigned for a future case study scheduled for April/May 2024 and incorporate evaluative questions to address this issue. The GREAT project will also need to clearly define the concepts 'value' and 'discourse'.

**RQ 2.5: How generalisable are the GREAT methods to other global challenges or other fields of research and innovation?**

This question falls within the wider ambit of the GREAT project, tGCS1 does not provide a direct answer. However, it does offer some evidence of the method being applied in the context of global climate change challenge. This question will be fully answered by reviewing the project in its entirety, since it is based on how the adaptation of the GREAT method(s) to various case study contexts is documented in detail, along with the processes involved.

**Objective 3.** Provide practical guidance for games developers and policy stakeholders.

**RQ 3.1: Which are the key interventions in the GREAT method which lead to its effectiveness and efficiency?**

This question is not directly answered from the case study; however, interventions with game characteristics are implicitly recognised within the GREAT approach. For example, access to large volumes of players might be regarded as an effective characteristic of the intervention. Additionally, consultation to co-create engaging question sets might also be an asset, as is the association with large-scale and successful commercial games.  
  
The next UNDP case study could undertake a comparative study incorporating future refinements and improvements based on insights from GCS1. This could be integrated into the research cycle where applicable for ongoing activities with the GREAT case study sponsors.  
  
Each case study could explicate a theory about the context (i.e. participant characteristics and circumstances) and detail which characteristics of the intervention were responsible for the success or failure, for example, an explanatory mechanism. These insights could be compiled to guide future use, with an awareness of the key decisions to be made. Further insights may be gained through internal evaluation by the GREAT team, supplemented by documented reflections from stakeholders and sponsors. Additional valuable input might be obtained through….-

**RQ 3.2: Which variables need to be taken into consideration when adapting the method to new contexts?**

**RQ 3.3: What documentation and/or training is required for games developers, policy stakeholder groups?**

**Objective 4.** Assess the benefits and risks to individuals and society of using games to promote engagement with societal challenges.

**RQ 4.1: What are the benefits and risks experienced by citizen participants, policy stakeholders, games designers and providers, as well as policy makers and organizations, when they participate in the GREAT method?**

12 Summary

The UNDP exploratory case study conducted under the GREAT project, aimed to engage citizens in the dialogue on climate emergency dilemmas through innovative games-based activities. The eight-stage case study cycle, from collaborative design to engagement with policy stakeholders, was an instrumental learning process in public engagement and policy development.

12.1 UNDP Case Study Significance

The UNDP case has shown clear evidence that games-based methodologies could be potent instruments for crowdsourced policy advocacy, particularly in areas related to critical social dilemmas such as those issues concerning climate change. This is significant as it contributes to testing new ways of bringing people and policymakers together to discuss and shape policies in a more inclusive and informed manner. This case study demonstrated the potential for this approach, and what followed was an opening up to more use of novel digital tools in policy making in the future.

12.2 UNDP Case Study Impact:

The impact of this case study is multi-faceted, influencing not only the field of public policy research but also the climate change dialogue. Embedding dilemma games and large-scale surveys into popular mobile games significantly extended the reach to a younger, more tech-savvy audience often underrepresented within traditional policy discourse.

12.2.1 Context of Study

The motivation for this research is rooted in the growing global imperative to resist climate change. Conventional approaches to public engagement often fail to reach populations, notably the younger demographic and gamers. This study addressed the need to provide a voice to those underrepresented groups on complex policy challenges regarding climate action. The use of innovative games in engaging with the participants also made this study elicit a high volume of responses while the quality of the engagement was maintained.

12.2.2 Impact

The research brought some fundamental changes in the approach of public engagement in climate policy:

* Engagement: The project allowed for a new methodology in engaging citizens using games, increasing the reach and diversity of participants with notable engagement rates of 58% for in-game rollouts versus 5% of paid placements.
* Informed policy: Knowledge collected so far informed UNDP policy discussions and reached several policymakers, being used to inform a new approach to climate emergency dilemmas.
* Stakeholder collaboration: The case study brought more game studios and policy stakeholders together for better collaboration, enabling studios to contribute to socially responsible practices while enabling policymakers to understand the view of the public on climate policy.
* Scalability: The case study results demonstrated this approach could be scaled up to bigger interventions-a factor that will make the approach stand out for future policy engagements.

12.3 Strengths, Weaknesses, Opportunities, Threats Analysis

A SWOT analysis of CGS1 case study reveals the following:

A blue and green square with text and a logo

Description automatically generated with medium confidence

Figure 6.0: SWOT Analysis of GCS1

Conclusions

The GSC1 case study provided the GREAT project with valuable lessons on how innovative methodologies, in this case, games-based activities, can be used to involve citizens in policy discussions, particularly around critical issues such as the climate emergency. This case study indicated integrating surveys and dilemma games into popular commercial games is an effective method to elicit public opinion among young, tech-savvy audiences who have traditionally been more difficult to reach.

Collaboration with game studios can significantly increase response rates. Another favourable attribute of the approach is that it works well in tandem with game studios' commitments to corporate and social responsibility. Success from the in-game rollouts, as opposed to paid placements, suggests these types of interventions can be scaled to answer larger policy questions. However, this approach carries its own set of difficulties, represented by demographic biases and resource-intensive data collocation with game studios.

The case study has had a tangible impact on the policy landscape, with its climate emergency dialogues currently informing UNDP policy and offering a scalable model for future public engagement. In so doing, it highlights the importance of ongoing collaboration between policy stakeholders and the gaming industry, to ensure future public policy reflects a representative range of citizen voices.

Future iterations of this approach should strive for reducing demographic skews by selecting a wider array of games and targeting more specific populations where necessary. Additionally, lessons learned from this case study can generalise beyond climate policy and provide a road map on how citizens can be engaged with the creation of a wide array of policy areas in active, digital, and participatory ways. This case study represents a significant step towards the modernisation of public engagement techniques, narrowing the gap between policy and people, while investigating how digital innovation could usefully inform public policy. The opportunities for further development and implementation are vast, with potential to reshape how governments, organisations, and the public interact on key societal challenges.

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