Balancing inequalities: a board game for young people from coastal communities to discuss plausible futures

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Abstract. This paper describes and summarises the design process of making a board game for young people from coastal communities in England to engage and discuss perspectives about their futures. The board game was created around imagining plausible futures and aimed at providing scenarios for players to make decisions about their futures considering social, economic and health inequalities. The paper showcases an exploratory approach of identifying game design elements based on co-design sessions with stakeholders (young people between the ages of 14 - 17) and experts, while using real-world scenarios and game design balancing techniques. The contributions of the paper are twofold: 1) it describes the process of making the board game via stakeholder participation, game design systems and game balancing; and 2) it provides a research-through-design method in which the design of the game reflects the intrinsic system in which young people live and suggests ways to overcome barriers established by these systems. The paper concludes with suggestions for future research such as the use of the game in participatory design sessions, mentoring classes and as an initial framework for serious games that can emerge from the discussions (e.g., teaching life skills, entrepreneurship competencies, etc.).

Keywords: Board Game Design, Places and Inequalities, Coastal communities, Plausible Futures, Young People, Game Balancing, Gamification.

1 Introduction

In England, coastal communities have one of the worst health outcomes, with low life expectancy and high rates of major health diseases, including a vast range of physical and mental health conditions. The CMO's 2021 annual report describes how the UK's coastal communities exemplify the inequalities in health associated with geography and socio-economic status [1]. Deprivation is much higher in coastal communities when compared to non-coastal communities, particularly with regards to health, employment, education, and skills and training [2]. Thus, young people from coastal communities tend to leave their town and some never return, which makes it even

more difficult for local business to thrive and retain talent. Coastal communities include concentrations of both older people attracted by the idea of retiring by the seaside, and some of the poorest groups in the UK. Many of these communities were also created around single industries which have diminished, such as fishing, where employment opportunities are scarce or seasonal. Thinking about the future therefore becomes a complex and problematical task for young people. How might young people engage in creating new futures for their communities? How do they see their futures in these places? How might games facilitate this conversation? Although the motivation for this project was based in local UK communities, the issues presented in this paper are relevant to many deprived communities across the world.

This paper showcases the process of developing a board game, originated from a gamified version of previous research on plausible futures scenario development [3][4]. The research questions that we address in this paper are: *How might games facilitate and elicit conversations about plausible futures for young people in coastal communities? What is the design process of making this game?*

To address the research question posed in this paper and design project, we will i) look at evidence collected from playtests. And ii) highlight key theories and thought processes behind game design, inequalities, and games about the future. This is a research-through-design process [5], in which via the development of an artefact (game), we aim at identifying an emerging design process.

2 Related work and research background

2.1 Young people and the future

Deprivation has a profound effect on communities as a whole and young people are no exception. It has been documented through several studies that the effects of deprivation on young people create specific health challenges and adverse outcomes which are exacerbated in the adult population [6][7][8]. Specific problems noted in later years include reduced employment status, income and wealth, poor life satisfaction and mental & physical health [6]. In recent years there has been an increased interest in adolescent health and wellbeing in research and policy. Studies have shown that adolescents are developmentally primed to engage with interventions that focus on improved health and wellbeing [7], thereby reducing the prevalence of adverse outcomes later on in adult life [8]. In this way young people can be powerful agents of social change and given the opportunity, have the ability to promote their own health and wellbeing [9]. To elevate the health and wellbeing of whole communities, we need to focus on reducing inequalities experienced by young people within these communities and equip them with the skills they need to create healthy habits. There are many factors that play a role in the health and wellbeing of young people. Among these factors, recent research has pointed to where people live or, place, as a significant aspect in shaping the relationships, opportunities and identities of young people [10]. Places such as coastal communities have inherent challenges that create unique problems which young people need to overcome. Struggles such as material inequali-

ties, access to education and cultural assets and poor transport links create an environment that is unstimulating and uninviting for young people [10]. Informed by previous research and our own experiences, young people living in coastal communities feel that they are isolated from opportunities such as a lack of access to further education and skills-building programmes, which are more readily available in cities [10]. This was the main reason the young people we spoke to wanted to leave their local area. The explanations we received from young people in our own experience, fit in with existing research which shows that a lack of opportunities leads to a mass exodus of young people from coastal communities who are in search of better education or labour experiences [10]. This exacerbates inequalities within coastal communities even further by creating an aged population with fewer opportunities and a decreased focus on young people [10].

2.2 Discussing futures and inequalities via games for serious contexts

When looking at the intersection between games and future thinking, design disciplines (e.g., Design Fiction [11]) can be merged with games design aspects, such as procedural rhetoric [12]. This enables designers to understand the meaning of 'time' in game systems. In 2016, Coulton, Burnett and Gradinar drew an insightful line between these disciplines, proposing the use of games for speculative design practice [13]. This intersection has shown that the sense of time is not linear, but a coexisting process, in which the perception and the future is linked to the players experience of the past and the present. One of the findings from Coulton, Burnett and Gradinar [13]'s design of the game *Cold Sun* is that speculative games should provide plausible scenarios and should be co-designed with experts, in order to avoid downfalls and possible misconceptions. Yet, the field of speculative game design is still underdeveloped and requires further research. Current research in games and future thinking has been tackling anticipatory governance via game design elements, such as role-playing and collective imagination [14]. Thinking about the future has become a need, particularly due to uncertainties already experienced in the real-world. However, it is challenging to think about a future in which current systems carry a historical legacy that might be difficult to change. Games are rhetorical systems and since dealing with issues such as climate change requires system 'thinking', games can offer an innovative way for people to learn how to solve complex problems [14].

The core context and motivation of this paper is grounded on the underlying health, social and economic inequalities that are inherent within the lives of young people. As such, it is crucial to understand how conflict and inequalities are represented in games, in order to inform our design process. Since conflict is a game design element that relies on the rules of the game, shaping victory and loss conditions is also intrinsically important in this context [15]. Inequalities can also come in different forms, such as asymmetric play, very common in multiplayer games. When choosing asymmetry in games design, it is expected that players will be given different abilities and resources. The board game *Pandemic*, for instance is an asymmetric game that requires thoughtful teamwork, but players start with different roles. The interesting aspect of 'conflict' in the case of asymmetric games is that there is conflict between

players as they are starting the game with different abilities/advantages that need to be 'fair' throughout the game [16]. Thus, this influences how game designers balance the game and is one of the approaches we brought in our design method later in this paper.

When dealing with geographical inequalities, games can be used to entice negotiation. Serious games can be used as a platform for decision making when it comes to consensus building and negotiation strategies. One example is the game *You Place It!*, developed by Monachesi [17], created to enable negotiation amongst players and spatial and financial obstacles players may encounter in the process. The use of different player roles is also a design strategy in serious games that tackle crisis management [18]. Role-playing games in particular have a large system of goals (e.g., the ones set by the game master or the ones set by your own character) and relies more on achieving these goals instead of having an established victory 'condition' [15].

All these aspects reflect a systematic approach based on procedural rhetoric, since it represents ways of thinking from both the designer and the player spectra.

3 Gamifying plausible futures

3.1 Developing Scenarios: Plausible Futures

The co-development of effective simulations (outputs) from scenarios (inputs) can be explored in several ways. These include *explorative* scenarios where the participants consider the consequences of specific interventions or phenomena or *normative* where a future state is envisaged and the pathways to achieving that state are considered [19]. In this work we have asked young people to explore normative scenarios of what their future might look like based upon pre-determined axis that address plausible choices, as opposed to issues, that are likely to face them [3][4].This approach allows stakeholders to consider future state axis that intersect to produce a matrix of fours future 'worlds'. Participants are then requested to identify, with a given time frame, where they might place themselves in the following context. Firstly, where they believe they are today, then where might they believe they would plot if current trends continued or Business as Usual (BaU) and finally where they would, plausibly, like to be at the future date. The information comes from the difference between these plots which can be linked to characteristics of the participants where permission has been gained.

In this work the axes are a continuum between 'Comfortable and Safe' and 'Independent and Adventures' on the horizontal axis and prioritising between 'Money and Work' and 'Health and Wellness' on the Vertical Axis (see Fig.1.). These were derived from early engagement with young people and were retained in order to keep a consistency of results across the various young people stakeholder groups. Critically participants are rarely anticipated to select any extreme end member across a given axis, rather to consider the relative balance between the extremes and select an appropriate point on each axis that then provides a single point within the matrix. The matrix consists of four 'worlds' that can be named by the stakeholders. This process of

naming allows the different plausible future or scenario to be discussed and given a name that is reflective of the group's perspective. So, for example one group identifies the matrix quadrant that resulted from the combination of 'Money & Work' and 'Independent and Adventurous' as 'Entrepreneur World' reflecting the sort of risk taking and financially driven nature of this combination as perceived by the young people.

The result is that each young person is asked to provide 3 points on the matrix. These are, as mentioned above, Today, BaU and Plausibly ideal. Then a line is drawn between these in that order. This information provides a context for how they view the word today in the broadest sense, how they feel their lives are likely to turn out if thing carry on in the current trend (note, not exactly as today but in the current trend of change) and where they would like to be. The scale and direction of movement can be very revealing of the perspectives, hopes and fears of the young people and their futures.

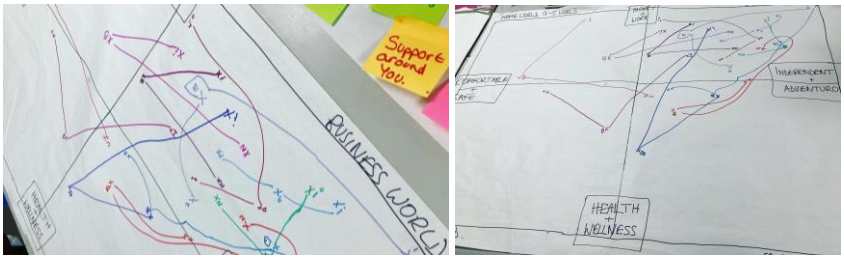

Fig. 1 Paths emerged from the Plausible Futures (PF) workshop with young people with already set axes.

3.2 Extracting and identifying game design elements

To identify the most relevant game design elements based on Plausible Futures (PF), we have looked at two general design questions: 1) what are the stakeholder's requirements and current conflicts/obstacles for young people? 2) which game design elements are more appropriate for the design (asymmetrical design, role-playing, negotiation)?

The project team was composed of experts in Sustainable Sciences (SS), Psychology and Behavioural Sciences (PBS) and game designers. Usually, games designed for specific contexts might have experts as content providers. In the case of our paper, the experts had a role to play in the design process, either as providers of realistic design constraints, or just players who had extensive knowledge and research not just about young people but also board games. In this case, 'ludo literacy' [20] was a factor that influenced the dynamics of the design of the game. Our first tactic to design was to utilise the axes from the PF exercise as a board, using them as underlying rules from our emerging game. This step was completed via an expert workshop, in which we identified key components and game requirements. later these were redefined during a workshop with young people at a school in the Isle of Wight (see Fig 2).

Additional components emerged after the PF exercise with students from the Isle of Wight. Initially, the PF exercise allowed participants to have a set of criteria, iden-

tify the axes, name the worlds, identify where they are now and think about scenarios in 10 years' time. Due to time constraints, researchers began giving predefined axes to participants, but it was their choice to identify where they were in each stage of their present and 'future' lives. This allowed them to visualise how they could move from today's world to a 'plausible' future. Based on this interaction and observations from the workshops, we have identified this as the main goal of the game (see Table 1). From this, we had to identify barriers and facilitators for this, 'main goal' to happen. The next step was looking for a winning/losing condition for the game, which then helped us design the first version of the game.

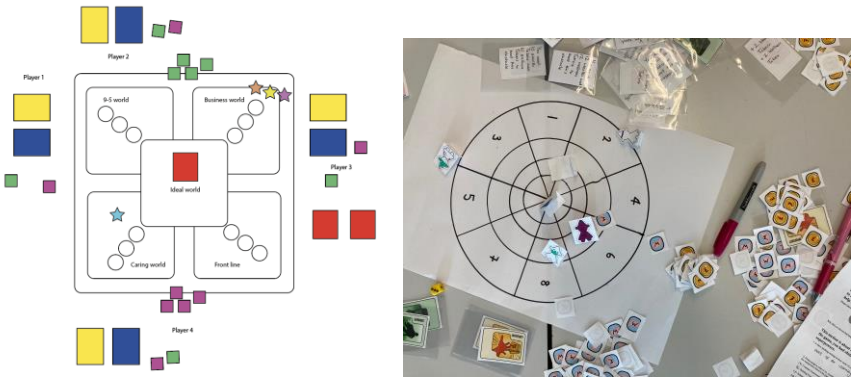

Fig. 2 First iteration of the board game (left) and current version (right)

Table 1 Initial design requirements

Component	Technical and design requirements based on stakeholder conversations
Number of players	12 (initially), later changed to 4-8.
Expected age group	Year 10 UK (usually aged between 13.5 and 15).
Gameplay length	50 minutes to fit into a standard school lesson.
Game platform	Board or table-top game
Goal	Move from 'today's' world to a plausible future. Thus, BaU was removed, and the main 'journey' was represented from today's position to a 'generic' plausible world at the center of the board.

4 The game

4.1 Collaboration, competition, or both?

Initial discussions around gameplay included thinking about if players would have a common goal if they were going to work together or compete to achieve this goal. As part of the discussion, we identified potential barriers and facilitators for players to achieve their goal (the plausible future). With that in mind, there was a need to dis-

cover barriers and facilitators (changed to ‘obstacles’ and ‘opportunities’ respectively), which was identified during a workshop with young people prior to the game design. During the workshop, such obstacles included GCSE marks, managing their mental health, not having money, the possibility that they could change their minds and death. As for opportunities, they mentioned having self-belief, having support around them, confidence, and good grades. While discussing these results with experts in the project, we have identified three aspects: the need to learn ‘life’ skills as different stages in the game, balancing wellness and wealth and having individual aptitudes such as ‘superpowers’. From our market analysis and research background, we have identified that having different roles and starting in an asymmetric way could make the game more engaging for the target audience. This was considered in the design, together with resources available in each of the axes (‘wealth’ and ‘wellness’). In this case, each player would not start with the same amount of resources and the number of tokens was determined by the position they chose on the board (which was relative to the axes of the PF workshop). Negotiation was one element mentioned by experts after the first iteration and was included in the subsequent version of the game (see Fig 2).

4.2 Identifying the nature of conflict and game balancing

Our next approach was to identify and frame the game as a system, in the same way that it was presented to young people. Since the context of our game does not belong to a fantasy world, we have replicated a few elements from the ‘real-world’ as a system, following the systemic approach from [15] of objects, attributes, internal relationships and environment (see Table 2). Players had to first select who would be their partner and then they would receive a character card each. Each character card had a specific set of resources available to the player. Players can only win if they reach the centre together by overcoming obstacles via token ‘exchange’.

Table 2 Game System and board design

Elements	Applied elements in the current version of the game
Objects	One board with different stages, cards (obstacles, opportunities, superpowers, character cards), 2x dice, tokens (wellness and wealth), meeples
Attributes	Each stage in the board represents an obstacle leading towards the center (the main goal); character cards show different tokens available to each player in each round; superpower cards provide an advantage for the player in 2 rounds; obstacle cards provide information about how many tokens are required to overcome it; opportunity cards provide a chance for players to acquire more tokens; each dice provide 50/50 chance for players to receive tokens of wellness or wealth, meeples represent where players are (these were customizable)
Internal relationships	Players start with different amounts of tokens and need to think about how they might obtain more tokens to overcome obstacles; players do not know which obstacle they will encounter in each round. Every round the players need to get an obstacle or an opportunity card. If they cannot pass the obstacle, they do not

	move on the board.
Environment	Players play in pairs and trade tokens with their partner; they should not have a 'shared' pile of resources. Players win when their team reaches the center.

The game had conflicts within its own system such as 'economic' conflict. In the case of our game, the economic conflict posits a real-world scenario as 'wealth' representing 'money' and 'wellness' as also a unit of value. It is possible that the game had a 'territorial' conflict since players could win the game once their team reaches the centre of the board. However, the game main loop was attached to its economic value due to overcoming obstacles and working together. Without defeating the obstacles, players were not allowed to progress; thus, trading was a game strategy.

We have conducted 3 playtests (see Table 3). During the third playtest with a school in the Isle of Wight, we held a discussion after gameplay that allowed young people to step back from the game for a reflection. Players mentioned that they were aware of the inequalities in the real-world and therefore could understand why they were starting at different stages.

Table 3 Playtesting session summary

Playtesting sessions	Findings and elements evaluated
Version # 1 - Participants: Postgraduate students and game designers (online)	**Collaboration vs competition**: we have decided to keep both elements after playtesting two different set of rules. With the game designers, we found that there is a need to balance risk and reward.
Version #2 – Participants: Researchers and research assistants from the team; game designers	**Difficulty**: Players were using the trading mechanism as a 'one pot' that belongs to the whole team. We had to add to the rules that each player should have their own set of resources and could choose to trade or not. The game had too many rounds.
Version #3 – Participants: Young people (age 14 years old) in the Isle of Wight	**Engagement and understanding;** Round rules were difficult to remember in each round; players stayed engaged in the game but had difficulties remembering all elements combined.

5 Conclusion and next steps

Based on the research questions proposed in Section 1, this paper has introduced the design and process of making a board game that facilitates conversations around inequalities. This paper opens a discussion for interdisciplinary research in serious games and addresses current and new challenges in the field. The process has been documented by experts via a research through design approach. Compared to other projects with similar themes [13][17][18], this paper showcases a mechanics-driven iterative process. Yet, although the game itself promotes conversations, one of the limitations of the current game is that it requires a knowledgeable facilitator (which may be the tutor or researcher), a short debriefing stage and a reflective stage. Since

this is a prototype, there is still a need to include a narrative element to the cards to give them meaning to the players. We are working together with the experts in the next stage of the design to incorporate youth specific narratives.

We have also identified potential learning outcomes that could emerge from gameplay such as life skills or acquiring entrepreneurial skills to achieve their life goals. Expansions of the game might be a way to address these ideas in the future, to support sessions like mentoring and career competences that can help young people to thrive in their environment. Therefore, the game itself can be a tool to generate other games, according to player's needs. We hope to explore this aspect in the future as this opens the scope for research-through-design and through game making. Since most of serious games for learning are designed with learning objectives at their core, our design approach identifies these later in the process. In addition, the process of gamifying plausible futures adds to the literature mechanisms in which interdisciplinary researchers can work together on the same level but bring their own expertise to the design of the game.

We also expect our game can be utilised as a participatory design method/game, to elicit conversations about difficult questions. With this in mind, we hope our game is a starting point for the design of games that could aid young people in coastal communities and further afield, not just to express their ideas about the future but to be able to be active agents of change in their own lives and their communities.

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