Chapter

Right Game, Wrong Place? A Case Study: Using a Gamified AR Application in a Heritage Context to Promote Engagement and Learning

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Abstract

This chapter describes an experiment in the use of gamified processes within a downloadable smartphone augmented reality (AR) application situated in a heritage context of national (UK) significance. The AR project incorporated two distinct game modes, both of which were designed to simultaneously provide users with information and motivate continued engagement. The learning gained from the AR project pertains specifically to three core threads; the first, being of fundamental importance to gamification, is that of challenge and how this links to user motivation, audience ability and prior knowledge. The second considers methodology, specifically the observation of 'representative' and 'expert users' and how a comparison of these can provide insight. The final, and most significant, thread reflects upon gamified content in relation to context, user expectation and environmental influences. The conclusion may assist others who seek to use gamification in any context by its exploration of the mistakes made and successes encountered in this case study.

Keywords: gamification, augmented reality, heritage, education, play, observation

1. Introduction

Gamification, as detailed throughout this publication, is a diverse and multifaceted process, which can be applied to many if not all areas of society and industry. The focus here is on the field of the Arts, and more specifically in cultural spaces, such as Art Galleries and Museums. This context offers much to a prospective scholar of gamification; willing audiences, compelling objects and spaces to unveil and hidden narratives to expose [1, 2]. This book chapter explores the development and delivery of a gamified, augmented reality smartphone application called TNAR (Temple Newsam Augmented Reality). The application, being educational in focus and site-specific in nature, was situated within Temple Newsam, a stately home on the outskirts of Leeds (UK), often referred to as the Hampton Court of the north. Here,

the intention was to develop gamified mechanics to not only motivate and maintain user engagement, but also to be the vehicle for the delivery of the educational content, thus being at once the medium and the message.

In order to develop and deliver the TNAR application, and subsequently to assess its efficacy, a number of areas are considered. Initially, a consideration of gamification as a means to motivate engagement and the characteristics of gamification that are perceived to foster this motivation will be undertaken, reflecting upon the dichotomy between the mechanistic and experiential perspectives [3] (Sections 2). Following this, an exploration of the relationship between pleasure and motivation when game playing will be undertaken, with a focus on individual play, in which one participant interacts with a gamified system, this being the most common model applied to cultural spaces [4] (Sections 3 and 4). This exploration of the relationship between play and pleasure supports the identification of three distinct characteristics of individual play: challenge, completion and creation. These characteristics are used to reflect upon existing examples of gamified systems placed in cultural spaces, the capacity of each to elicit these characteristics of play, and the impact this had on the experience of the participant (Section 5). This then is the rationale used in the design and development of the TNAR project (Section 6). A description of project implementation and a reflection on methodology applied to capture participant play is provided in Section 7. Finally, a reflection on the results obtained through observing participants engage with the TNAR project is presented in Section 8, with overarching conclusions and closing remarks contained in Section 9.

2. Gamification (1000)

At the time of writing, it is exactly two decades since Nick Pelling is widely attributed with coining the phrase 'Gamification' [5, 6]. He applied the term to an already recognised process of loading particular tasks with game-based mechanisms to enhance motivation, for example the non-computational serious games explored by Clark Abt [7]. Since 2002 the term has been much used and sometimes abused. It has been the focus of often intense scrutiny both within academia and beyond, with ongoing debates about both definition and application from a whole range of fields, and sometimes vehement criticism of both the term and the ideology behind it [8–10].

Gamification has been defined as '*The use of game design elements in non-game contexts*' [11]. This succinct and deceptively simple definition is often used to support a traditional and arguably transactional notion of gamification; the process of harnessing the mechanisms found within games, predominantly but not exclusively electronic, '*such as points, badges, levels, challenges, leaderboards, rewards and onboarding*' [12] and applying them to other contexts, such as manufacturing, distribution or IT services [13]. This is with the intention of encouraging, expediating, improving or prolonging engagement with and progress within the primary activity [14]. For example, awarding data entry clerks points for each entry correctly input, creating a league table and awarding the winner a prize. The gamified component within this system then is intended to act as a vehicle to motivate prompt and accurate completion of the primary task, data entry. This application of gamification has garnered interest from the commercial sector as a means of improving productivity, and from within the research community, with academics seeking to apply gamification to a range of fields, interest peaking in the early 2010s.

During this time there was a significant backlash against this conception of gamification, fermented most notably by Ian Bogost [3] who offered the term 'exploitationware' as a better description. It was argued that it reduces games to the '*incidental properties of their medium, points and leaderboards*' [3] and seeks to parcel up these mechanics into productivity products, which are devoid of the '*playful experiences meant to produce gratification*'. This position was supported by Thibault [9] who viewed gamification as certainly problematic and potentially dystopian, and Dragona [15], who positioned gamification as a mechanism *to 'enable exploitation and control'*. Koster went on to state that gamification misses the point of what a game should be, using '*the trappings of games (reward structures, points, etc.) to make people engage more with product offerings*' ([13], p. 50). Layering these trapping '*on top of systems that lack the rich interpretability of a good game. A reward structure alone does not a game make*' [13]. Nicholson [16] characterises this as a difference between meaningful and (BLAP) gamification with BLAP standing for badges, levels and leaderboards, achievements and points. Implicit in this debate are the opposing ideas of what elements within a game actually create the positive experiences that motivate and engage. On the one hand, this is positioned as the mechanics; the achievement of a certain level, or the accrual of points within the system in and of itself [12]. On the other, it is the more expansive notion of the contextually specific experience of engaging with a complex system in which playful moments are attained to produce gratifications [3].

This debate is essential to an exploration of the efficacy of Temple Newsam Augmented Reality (TNAR), in that the project aimed to create a gamified system that is enjoyable in its own right; to simultaneously educate and entertain. The participants, far from being paid to engage with a task that could be gamified to increase their productivity, had paid to visit the space in which the game was situated. As such it is incumbent on the gamified system itself to evoke pleasure in those engaging with it. To achieve this, an understanding of which characteristics within the gamified system deliver these positive experiences is required. Is it the mechanical or the experiential or a more complicated and context-specific combination of the two as suggested by, for example Tulloch [5]. According to Koster [17], gaming is fundamentally about fun, and that fun, when elicited by playing games, is complex, individual and related to learning and mastery, exploration and rich interpretations.

Bilda [18] aligned positive experience to the notion of 'meaningful play', which is achieved by designing '*experiences that have meaning and are meaningful*' (p.34), with this meaning emerging from '*the interaction between players and the system of game, as well as from the context in which the game is played*'. Two notions are contained in this quote: the first relates to context and will be returned later. The second is the notion of enjoyment, which is at once entirely obvious and often overlooked. The reason players play games is because they are fun. This is the underlying premise of gamification, that it can make a rote or uninteresting task enjoyable or engaging. The perceived enjoyment of the participant is positively related to their continuance intention [19]. Salen and Zimmerman point to the writing of Caillios [20] as proving a model to understand this, offering characteristics of play and pleasure through which positive experience can be understood, designed for and measured. This provides a potential way forward that bypasses the rhetoric of the above debate and looks at the fundamentals of play, '*the task is to find how this potential can be translated to actuality*' [21]. To do this, a wider exploration of the history and theory of game playing and the pleasure it offers is needed, this being the focus of the next section.

3. Playing games

In this section, a brief consideration of games and play from a social and, to some extent, historical perspective will be made to support the identification of the characteristic forms and types of pleasure that are elicited when one engages in play. This will provide the means and measure by which the efficacy of the TNAR project can be assessed.

The playing of games has served an important function across much of human history, with board games being discovered in the tombs of the Pharaohs [22], in Roman archaeological digs [23] and evidence of game play and in particular adversarial or gambling games emerging from many ancient civilisations [24, 25]. The vast majority of these games are competitive in nature, being played between two or more participants who seek to defeat their opponents. Well-known examples of ancient games that are still played today are Chess, Backgammon and Go [26]. In relation to the function these games played this is seen to be largely social, with the players deriving satisfaction from interacting, competing, collaborating with and hopefully overcoming their peers [27]. Game playing was often associated with monetary gain through gambling [28] although the focus here is necessarily on non-financial motivations as TNAR has no financial or monetized dimension.

Malaby [29] and Walsh et al. [30] coined the term gaming capital, an extension of cultural capital [31], with a player's skill and mode of play contributing to or reducing their perceived capital in relation to their peers. Thus, an individual's gaming abilities define their position within the community of players and to an extent in wider society, an idea taken to its limits in Ian, M Bank's novel *The Player of Games* [32].

Turning to a consideration of electronic games, pre-C2000 gameplay was primarily designed as a solitary activity, and whilst there are notable exceptions to this, for the most part, the mechanism was one of a single player interacting with a system to achieve specific goals. This dichotomy between multiplayer analogue games and single-player electronic games was highlighted by Zegal et al. [25, 33]. Whilst this certainly is not the case now, with the proliferation of mass multiplayer online games, and arguably was not entirely true even in 2000 if commercial video games are included in the gaming array [27], it is certainly still the case for gamified systems placed in cultural spaces. Here *'the model places the individual and the individual's interaction with the artefact or system at the heart of the agenda'* [34].

It is essential then to consider what motivates a single player, and whilst the single-player model does not necessarily preclude all social incentives, there are certain impetuses that are notably more significant in solo play. To move forward we must explore the experience of play, and more particularly the characteristics or categories that can be used to define it. Fortunately, a number of theorists, not least Roger Caillois [20], Mihaly Csikszentmihalyi [21], Marc Leblanc [35] and Brigid Costello [36], have committed much thought to this, and whilst a detailed examination of the categorisations posited is not possible, a broad overview will provide much of use. Some of these categories are primarily related to social, multi-participant play such as 'fellowship' [35], 'friendship' [21] or 'Competition' [21]. However, others are fundamental to the perceived pleasure and motivation of participants of single-player games, and the gamified systems placed in cultural spaces. These are categorised from the above literature here as challenge, creation and completion and are explored in more detail in the following section.

4. Single-player mode(s) of engagement

> *'Play is a total activity. It involves a totality of human behaviour and interests'.*
> *R Caillois: [20]*

In the previous section, three key characteristics of single-player play were suggested: challenge, creation and completion and a detailed consideration of these three aspects of gaming pleasure is the substance of this section. These characteristics will then be employed to evaluate the case study to follow and as a vehicle to assess the effectiveness of the TNAR-gamified application central to this chapter.

4.1 Challenge

According to Costello [37] challenge is largely analogous to difficulty; participants derive this form of pleasure *'from having to develop a skill or to exercise skill in order to do something'*, and *'an activity can often be more fun if it is not too easy'* (p. 66). Csikszentmihalyi's ([18], p. 74) example of rock climbing, as *'a private experience rather than a public event'*, is of relevance here, as it allows the participant to *'choose the level of challenge that best suits one's level of skill'* ([18], p. 79) or mood for challenge at the time. In his example, there is a grading system for potential climbs that allows the climber to compare their inherent ability to the potential future challenge. The successful completion of sufficient challenge is found to produce both pleasure and self-fulfilment, with the activity of engaging providing its own intrinsic reward. Similar entirely non-social pleasure is present in other game-playing activities, such as playing solitaire or attempting to solve a crossword puzzle; pleasure is derived from using skill and/or perseverance to tackle the challenges presented by the system being engaged with.

> *'Games that are too hard kind of bore me, and games that are too easy also kind of bore me'. Koster ([13], p.10).*

Koster's position, as defined in the above quotation, supports Csikszentmihalyi's argument that in order for a single participant to derive pleasure from engaging with a gamified system it must present the correct level of challenge. As in the Three Bears story, for every Goldilocks gamer, the beds should not be too hard, or too soft... they should be just right. Of course, as shall be seen in the studies below, games, like beds, do not always have a hardness level or degree of difficulty indicator to usefully guide us through our challenges. In the arena of electronic games, this raises the spectre of the potential for a mismatch between desired and offered challenges.

4.2 Completion

This characteristic is to an extent akin to challenge in that it forms part of the same process of engaging with the game or system to achieve an end: reaching the top of the cliff and finishing the jigsaw. However, there is an important difference, which relates fundamentally to the specific pleasure derived. Challenge is conceived as the embodied experience of the encounter; that moment of pleasure in the effective application of skill, the achievement of a 'flow state' [21] that can only occur whilst actively engaging. Completion is generally the goal at the game's start, but the pleasure

derived from challenge is not dependent upon completion. Completion is seen more as a lasting sense of achievement, residing in memory rather than in the instant. Whilst this sense of satisfaction can be related to the challenge faced in attaining completion—the *'process'* to take an Aristotelian view [38, 39]—it is not necessarily dependent upon it. Sizar [40] summarises this position succinctly as the one being the 'excited engagement during activity' and the other the 'satisfaction and contentment at their completion'.

4.3 Creation

> *'Creation is the pleasure participants get from having the power to create something while interacting with a work. It is also the pleasure participants get from being able to express themselves creatively'. Zagal, Rick and Hsi ([33], p. 65).*

The final characteristic of the pleasure derived from play is that of creativity. Unlike challenge and completion, for creativity to exist the system being engaged with must offer the opportunity to express creativity for this pleasure to be elicited. This distinction is perhaps not immediately clear, as the definition of creativity is somewhat ambiguous; for example, it could be argued that a chess player displays creativity when playing, taking an unexpected approach to certain game situations. However, for our purposes here we will make the following differentiation, which links to notions of opportunity and uniqueness. Our chess player demonstrates skill and understanding when choosing an unexpected move, but does so in a system with clearly defined set outcomes. This differs from the experience of the painter, where the artist has the opportunity 'to make exist that which didn't' [41]. To return to the example of rock climbing, when the climber climbs an existing route that someone else has defined and laid out, the pleasure of challenge and completion are elicited, but when the climber looks at a virgin cliff and defines a new route from scratch the pleasure of creation is also a factor and can predominate. Or, to take an example from commercial video games, in Minecraft™ the player can create something entirely unique from the varied building blocks provided, with pleasure derived from the creative process, which is non-defined and open-ended. Creativity within gaming then provides a distinct form of pleasure that may or may not be experienced depending on the game and perhaps on the skill of the player.

5. Gamification in cultural spaces

> *'Digital technologies, in particular interactive storytelling and gaming, have a great potential for assisting both the education and entertainment of visitors in museums'. Danks et al. [42]*

In this section, we will consider the ability of gamified systems situated in cultural spaces to elicit the forms of pleasure posited above, with this by extension providing a method to assess the capacity these games offer to motivate and prolong engagement. Testing the hypothesis of Danks et al. above, there is now a growing repository of papers that explore gamification applied to cultural spaces, predominantly museums ([43–47] e.g. with [48, 49] both offering literature reviews). Beyond this, Scheuer [50] offers a useful study relating to the form the vast majority of projects take, this being an 'add-on' game, which augments an existing exhibition

rather than being developed as part of it. Furthermore, there is the consideration of purpose when applying these games, which the literature positions as almost universally related to learning, with motivations, when given any attention, generally seen to be derived from the act of learning. This is a position disputed by Martens et al. [51] who see the game as providing pleasure distinct from the wider goal of learning, with that pleasure providing the motivation to engage. However, in order to consider the characteristics of pleasure posited here, a reflection on specific gamified systems which have been, for the most part, directly experienced by the author will be most valuable to our purposes, with due effort made to offer examples in a representative range of forms.

5.1 High tea

The first example is '*High Tea*' (Welcome Collection 2011). This browser-based strategy game was commissioned as part of the web presence for the 2010/11 Welcome Trust exhibition *High Society* with the '*aim of establishing new and meaningful engagement with the themes of the exhibition*' [52] and is still available to play at https://preloaded.com/work/wellcome-collection-high-tea/. In this game, users were asked to take on the role of the nineteenth century opium smuggler, developing a strategy to sell enough opium to the Chinese of the Pearl Basin to fund the purchase of tea to supply the expanding UK market. The clear intention here is to develop a compelling game whose mechanics not only motivate but also educate, with the motivating factor—the accrual of tea—being fundamental to the educational narrative. Exposing the dubious ethics of Victorian England and the historical appetite for narcotic substances—Opium or Caffeine—was key for the curatorial intentions of the wider exhibition.

This is a useful example for two reasons: the first relates to the mechanism of gamification in that the educational goal—the learning that is the primary task—is seamlessly integrated into the mechanics of the game. Points and scores are awarded in the form of currency or products (tea or opium), and levels and outcomes can be attained through the collection and distribution of these, but the process the player undertakes to achieve these goals is based on historical events and interactions. The game itself is thus the lesson. The playable moments that offer pleasure, primarily through achieving the increasingly challenging levels, simultaneously motivate continued engagement and deliver the educational goals of the game itself. The second is the distribution method chosen by the designers, who did not situate this within the gallery space, but made it available *via* online gaming platforms and their own proprietary web presence. This had the dual purpose of both widening, and making international, opportunities to consume, and of allowing players to interact in a context of their choosing, rather than being constrained to play during a visit to a cultural space.

5.2 CHESS project

> '*Museums have graduated from the mere display and presentation of collections to the creation of experiences that respond to their visitors' evolving needs and expectations*'.
> Katifori et al. [53]

The second example only arguably fits into the game category. The Chess Project, however, has many of the characteristics of a game, such as challenge and completion.

The CHESS project, situated at the Acropolis Museum in Athens (CHESS: Cultural Heritage Experiences through Socio-personal interactions and Storytelling), is a long-running, part EU-funded research project that seeks 'to enrich museum visits through personalized interactive storytelling' [54]. The project uses interactive narratives delivered *via* mobile-augmented reality to engage and educate participants about the historical artefacts on display, with participants being required to follow clues and locate physical objects in order to progress through the on-screen narratives. The story is intended to motivate players to explore the museum and gain a deeper understanding of the historical context of the physical exhibits.

What is of note here is the direct approach the authors took to the notion of challenge, and their evident desire to respond to each participant's individual level of prior knowledge and understanding. This recalls Nicholson's [16] concern that '*the challenge in creating something meaningful is that the concept of what is meaningful is defined by each individual'*. In the CHESS project, pre-engagement questionnaires were used to create personalised narrative experiences, designed to reflect the individual participant's interests and knowledge [55]. The designers used this mechanism to address the issue that level of difficulty is both individual and context-specific, as raised above. Using this approach, players were able to access tailored narratives that provided sufficient challenge to motivate, without being too easy or too hard, and took into account the varied ages, backgrounds, interests and enthusiasms presented by a diverse visiting public.

This reiterates the importance of challenge level for a challenge to be a motivating pleasure within gamified applications in cultural spaces. As per Nicholson: '*small differences in age or interests of visitors may have considerable impact on the appropriateness of the digital activities and the delivered experiences' (Ibid [55], p. 16).* Personalisation needs to be 'dynamic and highly targeted' to be effective which poses considerable challenges to designers as such a level of personalization can require detailed understanding of the age, interests and motivations of individual game players [56].

5.3 If you go away

> '*We wanted to know if you can move people emotionally through an augmented digital experience. It turns out you can, but only a some of them!*' [57]

The final example offered here is *If You Go Away,* created by UK-based arts organisation Invisible Flock (2015). This interactive, site-specific game sought to explore ideas of loneliness and isolation in urban settings, using GPS and augmented reality to offer a reimagination of the cities in which it was hosted including Leeds, Nottingham and Manchester (UK). The game offered an '*augmented reality journey through the streets made strange and new*' [58]. The game used a point-click model of gaming, inspired by titles such as Monkey Island™ and combined this with augmented reality to provide a games mechanic that required players to interact simultaneously with both physical and digital features in order to solve puzzles and progress. Players were required to, for example, place a digital (on-screen) beer can in a physical (real world) bin.

An interview with the creative director of Invisible Flock, Ben Eaton [57], found a number of relevant concepts that both relate to, and were to some extent the inspiration for, the measures of pleasure explored in this chapter. With reference to completion, for example, 240 participants began engaging with the game, which took about 2 hours and culminated with a digitally mediated dance on a bridge at sunset.

Of those 240, only around 10 reached this culmination, which *'from a publicly funded piece of art perspective, you could argue is slightly problematic in terms of access. But as a game with a certain amount of win or fail state built into it, it is less problematic, it's actually part of the medium'* [57].

To turn to the second pleasure concept, the pleasure of challenge, Eaton says of the puzzle element of the point and clicks mechanic in his game: *'..it was hard, and for people who understood what they were doing, they enjoyed it and it was fun'*, but *'a lot of people didn't*. It is reasonable to assume an interrelationship here; the level of challenge was either greater than expected and implied by the context of the offering, or those participating did not recognise the puzzle mechanism and thus found it difficult to progress. This will be considered in more detail in the context of the main project.

What of course the eagle-eyed reader will have realised is that the pleasure of creativity as defined above is not found in any of the above examples. A search for examples of gamified applications, situated in cultural spaces, seeking to, or capable of eliciting, the pleasure of creativity as defined here has been unsuccessful to date, despite all the models, both from within game design and more broadly, emphasising its efficacy. Indeed, there are only limited examples to be found in the wider literature (see Refs. [59–61]) primary motivation for exploring this form of pleasure and in seeking to employ it in the TNAR project described below.

6. Project motivation and description

6.1 Motivation

The TNAR project was informed by all the research findings summarised above and its objectives are their product. To summarise: firstly, the opposing ideas of what motivates player engagement with a gamified system emerged; these being either transactional metrics [16] or emotive playable moments [3]. The second consideration relates to outcome and gamified mechanism, and how their alignment can be used to simultaneously motivate engagement and deliver outcomes, with this being effectively demonstrated in the High Tea game example. The third is the tension between eliciting the pleasure of challenge and that of completion, in particular when games are played by diverse incidental audiences. The final consideration relates to the pleasure of creativity as described in Section 4, with this being potentially impactful but underexplored within the wider literature. The development of the TNAR application was then, a project to enhance understanding of the operation of these four aspects of game-playing pleasure.

6.2 Description

TNAR was a gamified augmented reality application located in the Picture Gallery, an historically significant space in Temple Newsam, a stately home near Leeds (UK). The augmented reality application used two distinct game mechanics with the aim of explaining the social and economic factors that influenced the construction and decoration of the physical space, the primary goal being the education of participants. The educational content was intended to offer context about two important characters from Temple Newsam's history; Sir Arthur Ingram, who commissioned the original construction of the Picture Gallery and his descendant, Viscount William Ingram,

who was instrumental in its renovation. This educational information is not readily available within the physical space itself.

The first games mechanic was modelled upon text-based adventures such as Planet Fall (1983), which are in turn based upon earlier adventure gamebooks like the Fighting Fantasy series. As in these, players are required to make choices based on real historical events and navigate conflicting pressures to obtain enough money to either build the picture gallery in the first place or to refurbish it. Through this means a series of historical scenarios are encountered, with the player required to make choices between different courses of action in order to progress. The challenge element derives from the imperative to navigate these historical encounters, with each choice made having repercussions and only certain paths leading to successful outcomes. The player is required to use their judgement and to develop understanding of the historical and political influences at play, using this knowledge to inform their choices, learning from mistakes and accruing knowledge about the characters involved, their personalities and the pressures they faced. The mode of play is intended to align the educational goals with the motive influence of the game mechanic (**Figure 1**). Scenarios are sequential in nature, growing in both complexity and difficulty as the player progresses, with intervals in which the second games mechanic (below) is deployed, to offer a sense of completion, and to illustrate and mark progress.

The second game mechanic is most analogous to computer games such as Sims™ (2000) or SimCity™ (1997) with the player asked to construct and decorate a digital version of the physical picture gallery in which the game is being played. This digital model was overlaid and mapped onto the physical space, offering a direct comparison between the current physical reality of the space and the presented historical recreations. These recreations were the bare walls and architectural features followed by a representation of the Tudor space and finally a faithful digital recreation of the space as it is currently seen, with this becoming a digital souvenir the player can take away with them and revisit at their leisure (**Figures 2** and **3**).

The game incorporates a number of functions germane to this chapter. Primarily, it aims to offer the opportunity for the player to exercise creativity, giving them
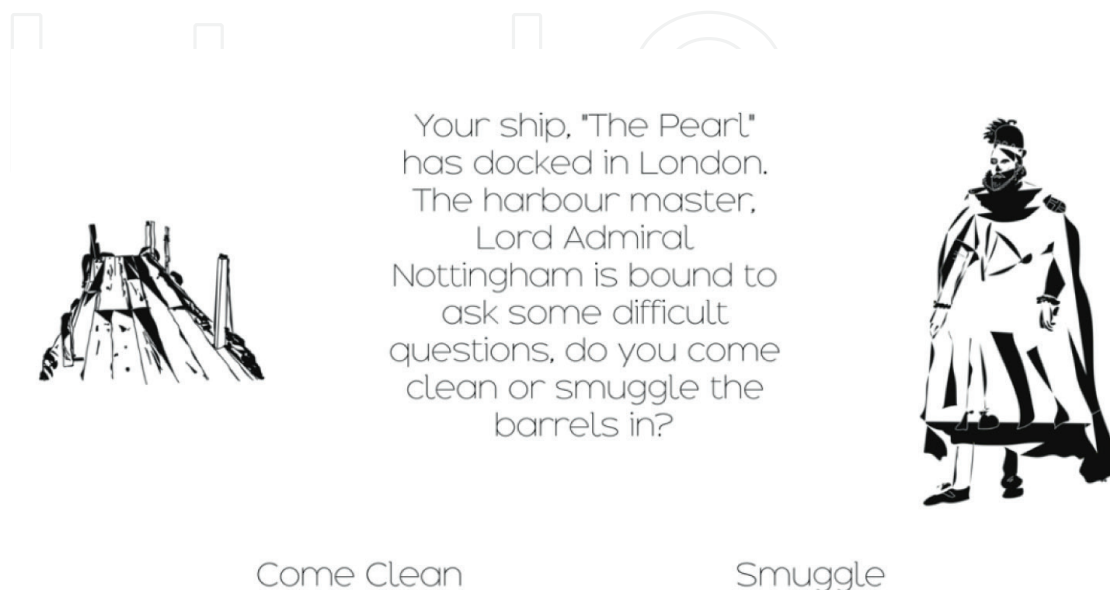

Your ship, "The Pearl" has docked in London. The harbour master, Lord Admiral Nottingham is bound to ask some difficult questions, do you come clean or smuggle the barrels in?

Come Clean   Smuggle
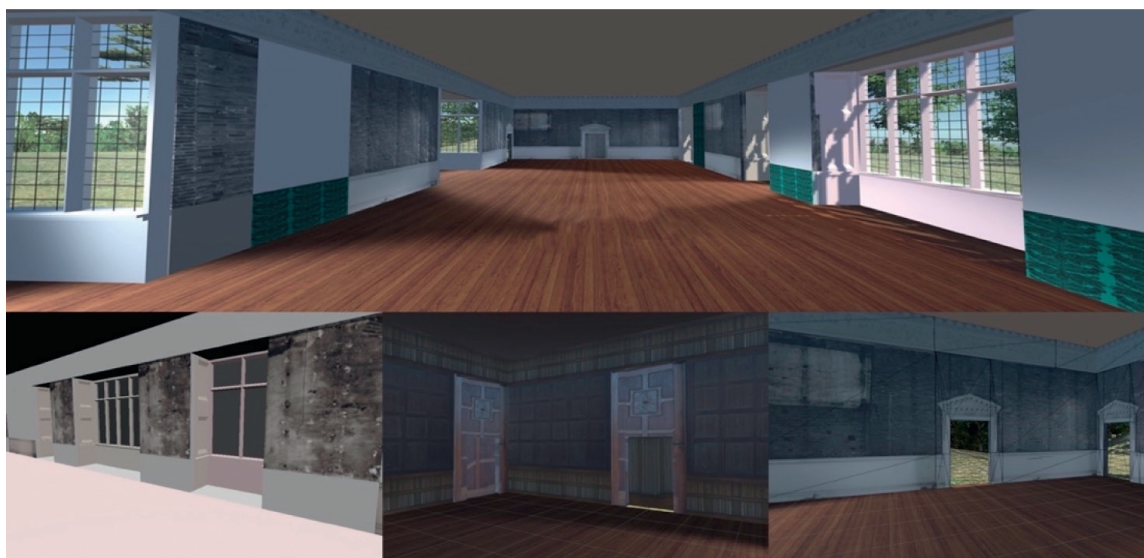
Figure 1.
TNAR: (2018).

Figure 2.
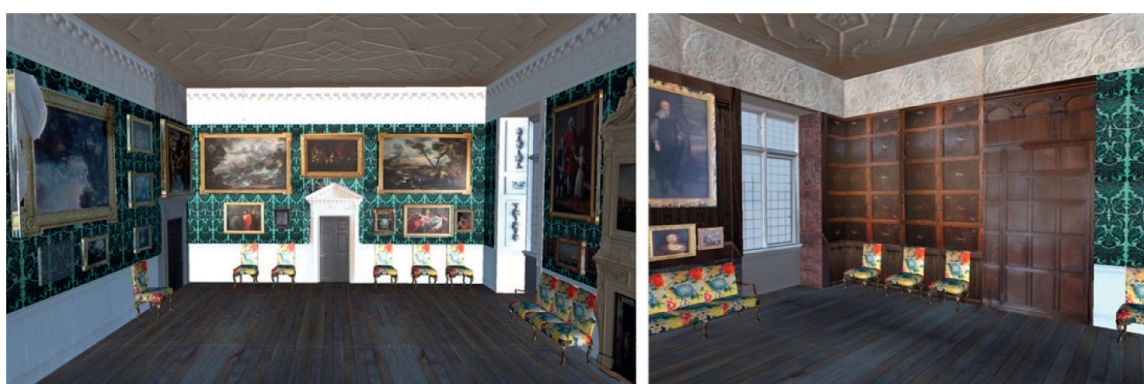*Early redecoration scenes (2018).*

Figure 3.
Final redecoration scenes (2018).

choices on how to apply the various elements of decoration and construction, with a large variety of potential outcomes being available. The second function relates to progress and completion, with the building and redecoration of the digital space operating to illustrate and reward player progression in the text-based game, but doing so in a way that is directly related to the educational goals rather than using arbitrary points or levels. The third function also relates to this imperative to align method and mechanism of play through playable moments, such as completing the gallery and comparing it with the original, and through the overarching goal of the application, to wit, the dissemination of contextual and educational information relating to the hidden histories of the space itself.

7. Methodology and dissemination

7.1 Dissemination

The intention was to offer TNAR to the general public, but this proved unworkable due to accessibility concerns and the potential alienating effect of this on incidental

Figure 4.
TNAR In-use (2019).

audiences, related to WIFI™ availability and software compatibility. Therefore, seven participants were invited to take part at Temple Newsam, with their experience designed to model those of an incidental audience as far as possible (**Figure 4**). Of the seven observed, two were deemed to be expert users, in that they had significant previous experience engaging with mobile augmented reality applications. These participants were included as a form of control in a bid to understand the impact of technological familiarity on the engaged experience [62, 63]. The TNAR application was also displayed, in the form of a 2-hour workshop, to 20 invited guests. In this scenario, participants were given contextual information relating to the project, their interaction was recorded, and written feedback was obtained post-participation.

7.2 Methodology

Two primary approaches, or paradigms to use Hein's [4] phrase, dominate methodological discourse around the capture of audience experience with interactive or indeed gamified systems. One approach is principally quantitative, focusing on measurable metrics, for example 'use time', participant progress or click count, and the other is principally qualitative, seeking to capture individual experience or subjective responses [48, 64, 65]. Much of the contemporary literature suggests that the purely quantitative is insufficient in capturing the nuances of engagement, with many advocating an ethnographic model, employing naturalistic methods as better equipped to offer experiential insight [66–72]. Moving away from methods derived from the 'behavioural and cognitive sciences', models founded in the 'cognitive and educational sciences' [68] are exemplified by the following quote: '*Observation, in some sense, of an interactive system in action is the only way to understand it*' [71]. This position is supported by many in the fields pertaining to audience studies in cultural spaces [73–75]. Refs. [76–78] highlight qualitative observation as being the best method of assessing complex behaviours or subjective emotions such as satisfaction or enjoyment.

With this in mind, a methodology primarily employing narrative participant observation was selected as being best positioned to capture and understand the capacity of the TNAR application to elicit the forms of playful engagement that are our focus. These observations were undertaken by the author and describe the participant's engaging experience as a narrative, in which evidence, both verbal and physical, pertaining to the gaming experience, is captured. This employed, as far as

possible, a total of one observer model [79, 80] in which interactions between participant and observer are limited. The observational narratives were augmented with post-engagement, semi-structured interviews and written feedback. This aligned to methods successfully applied by, that is Costello, Edmond or Muller [36, 71, 81], when seeking to understand the pleasure participants experience when engaging with interactive artworks.

These observations, and other evidence, including verbal and written feedback were subjected to systematic review [82] seeking interpretive commonalities, which were then categorised; these form the basis of the results and discussion to follow. This data can be viewed here.

8. Results and discussion

In this section, an examination of the key finding that emerged through the systematic review of the participant observations and supporting feedback will be offered. These findings largely align with considerations outlined in Section 6.1 and coalesce around the following headings: challenge, creativity, completion and alignment. A reflection on methodological appropriateness and application is also offered.

8.1 Challenge

As discussed in Section 4, the pleasure elicited through the challenge of engaging with a game or gamified system such as TNAR is perceived to have significant bearing on the ability of that game to motivate participants to continue to engage. Observations of those using the TNAR application support that thesis, but possibly the motivation was less pleasurable than per the model. Five of the seven participants presented verbal or physical signs of frustration when engaging with the text-based game, with comments, such as 'How am I supposed to know the right answer?', 'Oh no, I have to start again!' and 'Oh this is ridiculous!' as representative examples of the range of emotional responses observed. Whilst some of the observed frustration was directed specifically towards the system and interface, with technical issues and unfamiliarity with modes of engaging with AR accounting for this, four of seven participants, including the expert users, were observed to be demotivated by the text-based game mechanism specifically. Comments indicated that this is related to two factors: degree of difficulty caused too many failures and repetitions, and this was insufficiently mitigated by the motivational boosts of perceived incremental progressions and rewards. Secondly, failure and repetition—exploring different avenues in order to progress—is a tried and tested mechanism in text-based games, but failure and the need to repeat in the context of an educational game in a stately home were received extremely negatively, indicating a misalignment between expected mode of play and what was offered.

8.2 Creativity

Creativity is identified as one of the key components of pleasurable play; however, with very few examples of this form of play being present in the literature, exploring this was one of the primary objectives of the TNAR project. It is interesting from a research perspective and gratifying from a creative one, then, that the creative game mechanism was the most successful element of the project in stimulating positive

responses. All those who successfully progressed through the game to this component, and had a device capable of rendering it successfully, (4/7) were observed to derive pleasure from building and decorating the digital rendition of the picture galley. Players were seen to experiment for prolonged periods with the different options, and there was evidence that the creative process had an educational dimension, with comments from participants about the effectiveness of their recreation and expressions of interest about the historical decorative options. The TNAR project then was, in this component, effective both as an educational tool and as a motivational mechanism in that players were motivated to continue playing. There is evidence that gameplay *via* augmented reality also provided meaningful playable moments through comments, such as 'Visually, very cool, I felt very much part of the experience', and 'It's magic'. Motivation was not, it was observed, necessarily sufficient, however, for players to re-engage with the text-based game.

8.3 Completion

The pleasure offered by completion—that lasting sense of achievement and satisfaction when a challenge is overcome successfully—was not a significant feature in the players observed as only one of the seven participants completed the game. The creative scene decorating component of the game was open-ended with no clear point of completion. The text-based game did have a definite completion point, but this proved too challenging for the majority of the participants to achieve. Participants were observed to become demotivated and disengaged. What is of note is the length of time players were willing to commit to persevering in the text-based game; a matter of 5–10 minutes in most cases before giving up. This engagement time was significantly less than expected during design and testing, and again suggests differing expectations set by the context of the experience. Would the players have been prepared to commit more time to play the game in a setting such as their own front room for example? Is attention span necessarily short in an environment that offers so much to engage with in a limited timeframe? There was of course one exception; one super-participant navigated the text-based game with fluency and enthusiasm. In this case, the challenge level was appropriate and completion—a sense of achievement— was experienced.

8.4 Alignment

Alignment refers back to the concept initially discussed when examining the High Tea project in Section 5 and specifically the alignment of a game mechanism with an educational goal. In the case of the High Tea project, the medium was very much the message and this was intended to be the case with the TNAR project in both game modes but was, for the majority of participants, only observed to be effective during the creative decoration scenes. In this section, the participants were observed to make tangible and visible links between the historical content and the real work context of the space, with the redecoration scenes unveiling the hidden histories in a way that had real meaning for the participants. The text-based game, however, despite being more contextually and educationally rich, proved less interesting to participants and they seemed to derive less pleasure from navigating these choices. It was intended that during the text-based game participants would come to emotionally respond to characters and their predicaments, with this being key to the motive power of the game mechanism. However, this did not occur, and while a clear rationale for this

does not emerge from the evidence, there were references in the participant feedback related to the aesthetic experience with the text-based game being described as 'text heavy', overly 'educational' and 'confined'.

8.5 Method

The final area of note from this process is related to the methodology used. This is seen as effective, but raises some interesting points, particularly in relation to the efficacy of qualitative observation. This is inherently subjective and reliant on the observer being able to interpret the external evidence of internal emotion in an unbiased way. To combat this potential, observed perception of emotional experience was not included without physical evidence of this occurring. Generally, this took the form of verbal comment or non-verbal utterance or other easily interpreted physical action, such as feet stamping, gesticulation or subdued or introverted behaviour. This led to sometimes descriptive narratives of observation being produced, in which what was happening is clear, but not what the participant was feeling. It was at this point that the other methods of feedback capture became useful to corroborate, inform and augment the impression garnered from the observations (which were by and large more negative than the written feedback).

9. Conclusions

When reflecting upon the topics covered in this chapter, a number of conclusions have been reached. These are summarised here in the hope that they accrete in some small way to the research discourse pertaining to gamified systems in cultural spaces.

Firstly, challenge has been identified as a key characteristic of play within gamified systems and has been observed to exert a powerful motive influence on participants in terms of continued participation and enjoyment. This has both positive and negative implications. For challenge to have a positive impact upon engaged experience, it must fall within a Goldilocks Zone, at a point, between boredom and anxiety, being not too hard, or too soft, but just right. Achieving this is complicated by the diversity of audiences present within a visiting public. The CHESS project, above, developed strategies to align interest with topic offered: a similar strategy would be possible with a menu of challenge levels although there are barriers to achieving this such as time and potential bias, which make this a difficult proposition.

Arguably, one in seven is a reasonable statistic for completion of a challenge game in a heritage setting within a limited timeframe and where the individual has numerous competing priorities vying for their attention. The High Tea project worked around the negatives of the heritage context by making the game accessible outside of the setting, so that the visitor could navigate the game in their own time and space. As above, context is everything. Game player motivation and perseverance levels are very different when sitting on a comfortable sofa at home with plenty of time and few distractions than when playing a game in a culturally significant space with a myriad of competing experiential offerings. The game designer can factor in levels as in the Chess Project, allows the game to be played beyond the heritage context as in the High Tea setting above or incorporate game elements where completion is not defined by the designer but is the subjective decision of the game player—by the incorporation of creative elements.

Creation was observed to be the most significant pleasure in the case of the TNAR project, with participants at their most engaged when creating their own spaces. It was also at this point that the mechanism of the game most succinctly aligned with the educational intention in that the pleasure the participant experienced, and which motivated them to continue, was also the mechanism by which the educational information (the task) was delivered. This is perhaps the key conclusion here, and one that has relevance to the debate about what gamification is and should be. One in which a nuanced appreciation of the desired outcome, the pleasure the player is expected to experience and the gamified mechanism used to achieve this is required. This is in part a response to the debate outlined in Section 2, in that gamification is not a silver bullet to motivate, and that a mismatch between mechanism and outcome can in fact do the reverse; demotivate and disengage or even make it more difficult or confusing the attainment of the learning goal, as perhaps, for novice gamers, was the case with the text-based sections of TNAR.

When all the above factors align, when the game is suitably presented for its context, when participants are time confident, when the participant is challenged to the correct degree, motivation to play and to continue playing to the end is achieved and the educational goals embedded in the experience will be delivered; then, the task is gamified. The alternative is a gamified creative gameplay that can, as in the TNAR project creative component, deliver meaningful educational content. In either case, the task being gamified must be integrated into the system itself, for points and leaderboards do not an effective game make. As with the High Tea project, when the playable moments within the system that elicit pleasure at the same time constitute the task these things align and positive experience and positive learning outcomes are achieved.

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