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Designing and Using Game Environments as Historical Learning Contexts

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Abstract

The virtual presentation of landscapes in games, thanks to the exponential increase of representational power of digital technologies, has been progressively challenging the capacity of gaming audiences to distinguish virtual environments from real-world referents. This spectacular growth, however, has not been mirrored by a comparable progress in the simulation of the natural and social processes from real environments. Although highly realistic, game landscapes in most commercial titles still remain as inert theatrical scenery, devoid of any capacity to reflect the effects of human life agency and the inextricable nature of social and natural processes. In this paper, I present a historical game prototype, developed with the intention of representing the inherent complexity of historical landscapes. The game simulates everyday life in Anglo-Saxon Britain and has been iteratively produced in cycles of development and play-testing sessions with the participation of archaeologists, historians, and educators.

Keywords: games design, game-based learning, serious games, digital history

Introduction

Playing with the past in video games is primarily an engagement with ideas of space. As Aarseth (1997) and Jenkins (2004) eloquently argued, video games central motif is spatial representation, a preoccupation that overshadows the medium concerns on concepts of time, actions, or events. This strong bias sets the medium apart from other means of historical representation, with which games are often compared and judged upon. In video games, the meanings of the past are translated into navigable landscapes, not only to be watched or imagined, but also to be traversed by the player's embodiment in the game world. This ergodic spatial structuring of historical contexts, however, cannot be fully appreciated without the implementation of systems designed to make players 'inhabit' the game.

This paper explores the design of historical game landscapes drawing from the experimental development of a historical game prototype designed to be used as an educational resource in primary school classrooms. In the first section of this paper, Lefebvre's (1991) theory of the social production of space and Tim Ingold's (2000) 'dwelling perspective' on the perception of the landscape are reviewed as main referents for the development of an experimental game prototype. Next, the design process of the game is described according to its most important decision points: historical approach, historical focus, theoretical models/data, and pedagogical orientation. Finally, some initial results and insights from the testing process of the game in a primary school classroom are presented and discussed.

The Production of Game Space

A close look into the history of video games reveals how the medium has evolved, led predominantly by an increasing sophistication in spatial representation. For Wolf (2001), this evolution can be seen as

a progressive series of innovations that parallel the development of space in cinema. From the crude computing experiment that first allowed a bunch of pixels to be controlled in a two-dimensional screen, games have move rapidly to the rendering of highly realistic environments constructed with a painstaking level of detail. Realism quickly became one of the major selling points for new games introduced into the market, pushing the computing industry to continually increase its capacity to process and render graphic detail.

Looking at this path in spatial representation, it is easy to become seduced by the beauty and perceptual richness of these virtual environments and to identify complete representational mimesis as the ultimate goal of the medium. Furthermore, as the visual gap between virtual environments and the real world narrows, the natural expectation that follows is the extension of realism to the interactive affordances of the medium. Virtual landscapes not only have to look real but are expected to immerse users in the perfect concretisation of the 'Holodeck', the fictional entertainment system from the StarTrek spaceship, borrowed by Janet Murray (1998) to imagine the future of narrative in computer generated worlds. Although appealing, the problem with this way of conceptualising digital technologies–in particular, video games–has been noted by several authors, leading to long-standing debates about the appropriateness of the metaphor of immersion and the emphasis on narrative as the defining property of the medium. Ultimately, the relationship between the player and the game world is mediated by play, a characteristic that "makes [games spaces] allegorical: they are figurative comments on the ultimate impossibility of representing real space" (Aarseth 2007: 169).

Indeed, the conceptualisation of game spaces is far more complex than what the literal translation from real into virtual space affords to explain. To achieve a better comprehension of how players perceive, navigate, and make sense of historically reconstructed game worlds, more sophisticated theories of game-space need to be revised. Henri Lefebvre's (1991) theory of space offers a good point of departure in this undertaking. For Lefebvre, space is a social product, a dimension that does not exist "in itself" as a separate objective reality. Space is never finished or 'complete'; rather, it is constantly being constructed and reconstructed from the social interactions and everyday practices of people living in it.

To gain a better understanding of how this process works Lefebvre proposed a dialectical model composed of three parts. First, the spatial practice, referring to the perceived experience of living in an urban reality, where networks of communication allow people to move between the places where they perform their daily practices and routines. Second, representations of space incorporates the ways in which space is conceptually conceived by the multiple disciplines that converge in the effort of building descriptions, definitions, and theories about it. Third, representational space refers to the ways in which space is lived, configuring a layer of symbolic associations that overlays the physical space.

The importance and relevance of Lefebvre's spatial theory have been recognised by several scholars but in general terms lacks an adequate level of consistency (Fraser 2011; Crawford 2015). Flynn (1991), for example, makes a first attempt to map the dimensions of space proposed by Lefebvre into game worlds, but his analysis remains at a preliminary stage. Aarseth (2007) also acknowledges the relevance of Lefebvre's theory for the conceptualisation of game spaces, but, recognising the difficulty of strictly mapping Lefebvre's triad into game spaces, does not move this analysis any further. Nitsche (2008) quotes Lefebvre as a reference in the construction of his own model of game space but notes the greater influence of his own experience and conceptions in its development.

In spite of this apparent lack of a serious academic effort in applying Lefebvre's theory to game space, I regard this line of analysis of chief importance to make sense of game spaces in general and to translate historical meanings into ideas of space. First, Lefebvre's ideas provide an analytical frame to look into the spatial practice of players, registered in their movements as they traverse and interact with the game world. Second, Lefebvre's dialectical model provides a conceptual lens to understand game environments as ideological constructions; in the same way that architects and urban planners build representations of space, game designers and indeed players also impose their views into the spatial configuration of the game world. Finally, this line of analysis also allows one to glimpse into the symbolic associations and affective connections that players build when moving and interacting with the game world.

The Dwelling Perspective

Can video games be used to gain a better understanding of how people lived in the past? For many authors, the representational power of this medium can be productively used to go back in time, allowing people to 'travel' to past worlds. I believe that this potential remains at a very superficial level. Most historical games are developed as play spaces skinned to 'look like' a past reality but very rarely are imbued with the complex layers of meaning from historical worlds. While many existent games let us navigate and marvel with skillfully crafted environments, sooner rather than later we discover that these environments are nothing but theatrical backdrops populated by robotic agents with which we cannot establish any meaningful connection. Even in rich and highly interactive worlds such as Skyrim, this lack of meaningful interaction leads some players to become frustrated and to lose any sense of inhabitation:

"I finally realised the problem I was having with Skyrim: It felt soulless. I may as well have killed Agnis and taken her stuff, because what did it matter whether she was there or not? I suspected that nothing I did would ever matter, and that has been my experience as I've progressed through the game. Skyrim is a huge world drawn with a level of detail that entices us to lose ourselves there, and is filled with things to do, enough to keep us occupied probably for years. But it also feels empty and pointless." (Scimea 2011)

Although many other players may disagree with this quote, the sense of placelessness experienced by this particular player cannot be overlooked. In many ways, this feeling can be compared with the psychological emptiness of the main character of the film 'I Am Legend' (2007), a lone survivor of a planetary apocalypse, who makes hopeless attempts to simulate a social life in an empty world by deploying mannequins at various city spots.

What would be needed to overcome the present limitations of video games and to create a more complete sense of inhabitation? A strong referent to move video games in this direction can be found in Ingold's (2000) ideas on the temporality of the landscape. This author argues for an integrated study of the landscape according to the 'dwelling perspective'; a way to see the landscape as an enduring record of the transformative power of the people living within it, generation after generation. From this perspective, temporality and historicity merge in the experience of the people carrying on with their activities of everyday life. The unitary form of analysis is the task, the constitutive acts of dwelling, which Ingold defines as "any practical operation, carried out by a skilled agent in an environment, as part of his or her normal business of life" (Ingold 2000: 194–195). Mapped on top of the physical environment, this complex web of agencies conforms an analytical layer that Ingold designates as 'taskscapes'.

Although Ingold did not extend his theory to game or cyberspaces, his ideas can be legitimately exported and productively applied to historical games design, helping developers to construct interactive worlds perceived as inhabited spaces, not mere theatrical scenery devoid of social and cultural presence. Key to the production and implementation of game spaces as learning environments is the determination of their affordances, a concept introduced by Gibson (1979) in his ecological theory of perception. According to this theory, the interaction within the game world can be seen as a fine-tuning or sensitisation of the perceptual system of the player to particular features of the environment. The learning experience from this standpoint does not consist on the transmission of knowledge or experience, but on the setting up of situations in which the player is provided with the opportunity of exploring the game environment, discovering by him or herself the specific ways in which the salient features of the environment – game systems and/or other players – can be used or transformed in the context of play.

Designing an Anglo-Saxon Game

With the goal of investigating how games can be designed and used to foster the meaningful understanding of historical landscapes, I set myself the project of developing a historical game where I could test different design hypothesis. I decided to situate the game on the early Anglo-Saxon period of England, around the first half of the fifth century. The archaeological evidence suggests that at that time, Germanic tribes arrived to settle in this land, changing the culture, language, and establishing many of the towns and cities we are still able to visit today. Although this period is part of the national curriculum

for Key Stage 2 in England and Wales, too often it does not receive an adequate level of attention across schools in the UK, resulting in a significant number of students leaving formal education with almost no knowledge of British history prior to AD1500 (Houghton 2016:13–14).

In very broad terms, the game prototype should convey a sense of everyday life in Anglo-Saxon time. Making a contrast with other games of historical persuasion, I decided to avoid the representation of violent conflict, often the main focus of commercial historical titles and mainstream media situated in this period. Games centred on combat and action are especially appealing to young audiences but this form of interaction tends to overshadow non-violent mechanics, which are left as secondary, at best. Also, I wanted to avoid as far as possible the action game 'genre baggage', described by Champion (2008: 223) as the tendency of importing patterns of interaction from action games into games with more educational aspirations, which manifests in players often more interested in destroying the objects presented in the scene rather than investing any time and energy learning from them.

From this very initial brief, the next step consisted in initiating the process of designing and building a functional prototype able to translate historical meanings into definitions of ludic and narrative interaction. Very often, historical game researchers at this stage opt for 'picking up' a suitable game genre from the list of existent games in the market, adapting the game mechanics and representational skin to better match the pedagogical goals or historical aspirations of the project. My contention is that this approach severely limits the possibility of moving the analysis beyond proven formulas and ready-made solutions. In opposition, I think that historical game design should be regarded as a 'wicked problem'; contexts in which the experimental attempts to solve the problem are often the only way to get a better understanding of it in first place. In cases such as this, many times the best thing to do is to roll-up the sleeves and build experimental game prototypes, informed by the analysis of previous games, to gain a better understanding of the design problem space (Mateas and Stern 2005).

But before delving into the modelling of three-dimensional worlds and the writing of thousands of lines of code, a number of critical decisions needed to be made. These decisions were in essence design specifications; key requirements that needed to be met in order for the project to succeed. What follows is a review of the most important points in the design specification of the Anglo-Saxon game project, briefly describing the considerations explored in its development.

Like any other medium, games can be designed to present historical knowledge from a particular disciplinary standpoint. I identify this as a historical approach, the first critical decision point in the process of designing a historical game. In this point, a major distinction can be made between the micro- and macro-historical approaches. While a macro-historical approach focuses on the long-term developments of historical continuity and change across large sections of population, micro-historians put the emphasis on the minute detail of everyday life of one or very few people, investigating it with an almost obsessive attention to detail. For macro-historians, the object of interest is to unveil the patterns of historical change, whereas micro-historians concentrate on elaborating thick descriptions of everyday life, discovering the underlying attitudes, conceptions, and modes of thought of historical agents.

Translated into video game form, both approaches constitute completely different design programs. Typically, a micro-historical game would privilege the use of a first or third person point of perception to control one or a very limited number of characters. In contrast, a macro-historical game would use a top-down or distant camera to perceive and navigate large sections of game space, allowing to efficiently control a number of agents. These specifications provide a first look at the implications that the selected approach will have in the following stages of development, highlighting the importance of making a commitment in an early phase of the project.

A second decision point in this project regards the definition of historical focus and perspective. Theoretically, a development team with enough time and resources can construct a game world of an astonishing level of complexity. Giving ourselves freedom to dream, we can imagine a world in which plants are not just two-dimensional billboards, but actually change in time, growing and showing real-world patterns and behaviours; animals of different classes roam freely through the environment; weather changes according to seasons, and a multitude of

Figure 1. View of the player's avatar in the Anglo-Saxon game world.

agents carry on with their independent lives. Although open worlds like this are becoming very close to be real in recent triple-A titles such as Grand Theft Auto (GTA), still games with this level of openness present a clear definition of who the player is, and what he or she has to do. Following the same principle, historical game designers need to make an early commitment in terms of the perspective and focus of the playing experience. Continuing with our GTA example, we could state–albeit in very simplistic terms–that this game focuses on gangster life from the perspective of an aspiring gang member. Undoubtedly, the experience that the game offers would be completely different if we change the perspective to be that of a policeman, or perhaps a normal citizen affected by gang crime.

In regard to the Anglo-Saxon game, after some initial prototyping I decided to concentrate my efforts on a micro-historical game, centred on everyday life, where gameplay and narrative could be experienced through the embodiment of a single character, a particular Anglo-Saxon individual–a powerful ealdormen (nobleman), ðegn (land owner), ceorl (free man), or slave–through whom the player could experience the life, problems, and limitations of the time (Figure 1).

The third decision point concerned the adherence of the project to specific theoretical models and data sets. In this sense, we regard games as simulations of past realities. Although we can easily establish distinctions between games and simulations, we can also agree that every game, even the most abstract ones, contains some sort of simulation, albeit with a varying degree of fidelity to a real-world source. This makes video games a privileged medium to communicate scientific knowledge about the past. As an example, the developers of the popular Sid Meier Civilization reportedly based the game's model on Paul M Kennedy's (1989) economic theory, presented in his seminal work The Rise and Fall of Great Powers: Economic Change and Military Conflict from 1500 to 2000. Likewise, we can concur that any historical game can be designed to convey theoretical frameworks, historical interpretations, or/and archaeological data, embedding this scientific knowledge into its procedural simulations and graphical representations. This view taps directly into procedural rhetorics, a paradigm that sees games as powerful persuasive devices, capable of conveying complex meanings about the world in the formal encoding of its procedures and rules.

In the Anglo-Saxon prototype, the procedural interaction is aligned to the idea of using the game as a mediation of historical taskscapes. For this purpose, a special emphasis was placed on making almost every object of world 'clickable'. Through the interaction with the mouse, players are able to access contextual information about the selected object, as well as a selectable list of its 'affordances'. This intuitive interface gives players the ability to perform a variety of tasks, some of which have a direct immediate effect, while others are part of a chain of tasks

that needs to be performed until the end to have any measurable impact in the game. Every task was assigned a specific duration, which is required to reach its end to be performed. 'Waiting time', thus, is defined as the 'cost' or the 'currency' of the task. This idea mirrors Ingold's definition of the value of tasks as the unitary acts of dwelling: "Now if the value is measured out in units of money, and land in units of space, what is the currency of labour? The answer, of course, is time–but it is time of a very peculiar sort, one that must be wholly indifferent to the modulations of human experience" (Ingold 2000: 195).

Although through the execution of tasks players are able to develop a situated understanding of life in the harsh conditions Anglo-Saxon England, I would claim that the major educational potential of the historical game does not reside on its capacity to model the past with scientific accuracy. In this sense I agree with Nitsche (2008: 9) in that the most important function of video games is not to "provide new knowledge through the execution of their code", but to propose "engaging questions" and a dramatic experience that does not concentrate on the data, but on the player. While we can certainly gain a better understanding of the available data and theories about historical contexts by playing a game, this is something that we could also obtain from tinkering sliders in an interactive simulation. Games extend this function and reach their full potential as historical learning contexts when, instead of just giving players space to play and visualise data, they are designed in a way that drives them to care about the potential outcomes of their actions and decisions. This subjective engagement, and in some cases strong emotional involvement, is a characteristic that makes this medium distinct from other forms of historical mediation and offers multiple opportunities for its use in educational contexts.

With this idea in mind, I developed a series of characters in the Anglo-Saxon game. These characters have no manifestation or embodiment in the three-dimensional world but connect with the player through the game's graphic interface, offering a range of opportunities to explore conflicting aspects of culture through text-based conversations. Some of these characters are presented as "family members", who the player needs to feed and take care of (Figure 2).

Finally, and taking into account the educational motivation of this project, I introduced the decisional layer of pedagogical orientation. For this purpose, I took as a referent the historical pedagogies proposed by Seixas (2000): collective memory, disciplinary history, and post-modern history. 'Collective memory' supports the idea that it is possible to have a single, unified version of a historical account, concentrating efforts in providing students with the means to recall the 'best possible version' of the past; 'disciplinary history' aims to engage students on following the disciplinary processes and modes of thought of professional historians; and finally, 'post-modern history' concentrates on raising awareness of the critiques that post-modern thought does to authoritative versions of the past, providing a learning environment in which students build skill and confidence in navigating through multiple and sometimes conflicting versions of the past.

We could theoretically build our historical game to accommodate the requirements of any of the three perspectives outlined by Seixas, but arguably only the second and third perspectives make use of the full potential of games as historical learning contexts. It would be perfectly possible to design a game with the goal of leading the player through the 'best possible version' of the past, but this hypothetical game would most certainly have to nullify player participation and agency, both defining characteristics of the medium. This could be achieved by, for example, preventing the player from progressing unless she or he followed the 'correct path', but this type of game would most certainly restrict or completely disable player choice. Games can certainly remediate linear media, offering potential design solutions to the problem of deviating through alternative, 'inaccurate' versions of history, but, in my view, games work at their best when they present worlds that can be freely explored, traversing the multiple paths of navigation in a decisional space. Within these environments, players are allowed to construct alternative, non-authoritative, and even highly unlikely versions of the past, accessing the intricate web of causal connections encoded in the game algorithmic model. Manifestly, games constructed in this way have greater affinity with the "disciplinary" or "post-modern" historical pedagogies than the linear account proposed by "collective memory".

Figure 2. Dialogue interface with Vilburg, one of the family members implemented in the game.

Testing the Anglo-Saxon Game

After a sequence of iterations, the Anglo-Saxon game prototype is in its final stage of development. This version was tested in a primary school classroom, where data was collected following a pre-post test methodology. In the first session, children between 6 to 7 years old were asked to draw a picture representing life in Anglo-Saxon time. In the following sessions, the game was played by the children, collecting in-game data from their actions and navigation. Lastly, children were asked to draw a final picture communicating their ideas about the period. In both the first and final drawing sessions, mini-interviews were conducted with students, following a "talk and draw" research approach (Prosser 2007: 22).

Although the analysis of the data collected is still in process, the combination of drawings and mini-interviews proved to be revealing. This methodology provided an insight into children's previous historical assumptions and thoughts before and after playing the Anglo-Saxon game. Children were able to express ideas, emotions, and experiences often difficult to articulate in verbal language. In most cases, these ideas were expressed in the form of narratives, with the drawing's author assuming an active role within the representation. Indeed, when asked to explain certain aspects of the drawing, in most cases children situated themselves as part of the represented world, describing their actions and their relationship with the objects depicted in their imaginary historical setting. Through these narratives, children represented their understanding of the world, making sense of it both emotionally and factually while also defining their place in it.

In many ways, the personal narratives situated in this imaginary setting can be seen as acts of re-enactment, an affective form of historical encountering that has received an increasing amount of academic attention in recent years. When children concretise their ideas about Anglo-Saxon time in the form drawings, they are not just depicting a world detached from themselves; they 'inhabit' the representation through their narratives, which give evidence of personal ideologies and theories about the world. When questions were raised about their creations, children spontaneously explained their drawings as vivid accounts of a personal experience as had been 'lived' by them. Reading between the lines, these accounts are a rich source of explanation about 'the order of things', where assumptions about the present and the past often blend together. As an example, a child that presented himself as 'the best hunter' drew a village in which a house looked bigger and more elaborate than the rest:

Interviewer: Is this your house?
Student 1: Yes
Interviewer: Why is this your house?
Student 1: Because is the best house I drew in this picture

Interviewer: So you would be living in the best house?
Student 1: Yes
Interviewer: Why? Why you would be living in the best house?
Student 1: Because, I'm thinking that I am respected… Because, food was an important thing for the Saxons […] there was quite a bit but it was hard to get… and if you were a good hunter that means you would have more money from selling the food that you caught… and if you had family you were able to keep your family safe.

In this case, the child built a world in which his personal identity, as a result of a natural talent to bring food to the table and to the market, occupied a predominant position in the social ladder of his imagined Anglo-Saxon world. Similarly, children expressed assumptions about genre: "there were kings, but not queens"; violence: "they used to fight a lot and people got hurt a lot"; social life: "sometimes they meet on campfires to sing stories and tell stories"; and the hardships of everyday life: "life was very hard". Interestingly, by representing their thoughts in paper space, children also built an environment where the space was not seen as a neutral container of objects and artefacts, but as a defining factor in everyday life and the affordances of objects and artefacts. This can be seen in the following interview extract where the child drew campfires situated outside.

Interviewer: Why do you have a fire in there?
Student 2: I'm not really sure. They did have these fires in those days
Interviewer: They made campfires?
Student 2: Yes
Interviewer: Why did they make campfires? Maybe for cooking?
Student 2: Yes
Interviewer: And they are outside the house…
Student 2: Some can be outside, and some can be inside
Interviewer: Why do you think they made them outside?
Student 2: Mmm… I think the outside ones were more for… you know, like singing songs and getting together
Interviewer: I think that's important, and the ones inside were for?
Student 2: Cooking things

While playing the game prototype, these assumptions were very much present, and were revised in connection with the gameplay feedback. As an example, the difficulty posed by the game in finding or farming food and keeping all the family members alive was judged as "authentic", as it corresponded with the perception that "life was hard". In other cases, the game triggered a cognitive dissonance when it presented situations that challenged their previous assumptions about the period. As an example, the game presented an instance of a dialogue in which a family member called Vilburg–the son of the player's avatar–asked his father not to be sold as a slave in the case that the crops failed. This situation–not at all unusual in Anglo-Saxon time–was one of the few narrative scenarios remembered by all the children and provided an opportunity to extensively discuss the topic of slavery during a post-play session. Used in this way, the game became an 'emotional trigger', successful in concentrating the attention of most of the children in a particular historical topic.

Conclusion

This paper presented an overview of the development process of an experimental historical game prototype based on Anglo-Saxon England. In this development, Lefebvre's theory on the production of space and Ingold's ideas on the perception of the landscape were used as referential frameworks in the development of the game prototype and the design of its testing methodologies. Both theoretical bodies were continuously interrogated during the iterative development process and contextual implementation of the game in a primary school classroom, furthering the understanding of historical game landscapes and the processes of embodiment, incorporation, and expressive appropriation of the space. Initial testing in the context of a primary school classroom revealed that children's previous knowledge, assumptions, and naive theories about the past are being constantly interrogated by them while playing the game, resulting in dissonances that can be productively exploited to foster their understanding of the historical period.

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