The Use of Grand Strategy Games and Gaming Practices to Teach History in Higher Education

The Use of Grand Strategy Games and Gaming Practices to Teach History in Higher Education

Rhett Loban

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The thesis evaluates the commercial Grand Strategy video game Europa Universalis IV (EUIV) as a tool for teaching history in higher education. Originating from tabletop wargaming, Grand Strategy games are digital platforms that depict history in dynamic and sophisticated ways, promoting both entertainment and informal learning. This balance between gameplay and learning is why EUIV has valuable pedagogical potential. By engaging players in game-based learning (GBL), EUIV provides meaningful content and practices players can draw on to expand their understandings of history. Educators might utilise EUIV to communicate the complexities of the past, helping students to engage with history in immersive ways.

The thesis uses a mixed method approach. A Formal Analysis is used to evaluate EUIV's most pedagogically valuable elements. Next, survey data (n331) collected from members of an EUIV online forum is thematically analysed. This informs a university case study (n18) examining EUIV's utility in a formal learning setting by engaging participants in: 1) a historical roleplay simulation; and 2) modifying ("modding") EUIV to create new content. A statistical test reveals a significant advantage of the modding exercise over the historical roleplay simulation.

A number of key findings are presented: 1) the survey data reveals EUIV acted as a catalyst to ignite an interest in history for 95% (n316) of participants; 2) analyses of the survey and case study data show spontaneous gameplay facilitated participants' discovery of marginalised histories; 3) participants visualised history and learnt geographical details through maps and interfaces; 4) some participants believed EUIV was too abstracted to teach specific details of history, but others considered it effective at explaining broader historical themes; 5) the survey data indicates 45% (n149) of participants modified EUIV and most gained historical knowledge; and 6) the modding case study participants creatively expressed their perspectives on history and learnt new knowledge.

The thesis concludes players' interests in gaming and history can be capitalised on in a formal adult education setting to promote reflective and meaningful understandings of history. Grand Strategy games thus afford a variety of opportunities to learn, analyse and express historical knowledge through active engagement in GBL.

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Chapter 1: Introduction

1.1 Introduction

Where my father was born, in the Torres Strait Islands of Far North Queensland, Australia, there is a celebration called the Coming of the Light, which marks the arrival of Christianity to the Islands. While many Islanders are devout Christians, some still believe, in a very real sense, in the stories and island magic that existed well before the arrival of the missionaries. The adaptation and harmonisation of Christian values and faith into the Islander understanding of the world has allowed two belief systems to intertwine and coexist. This has created new traditions such as the Tombstone Opening – a ceremony unique to the Torres Straits that is held after someone dies.

The tombstone opening is a ceremony in the Torres Strait that signals the end of the mourning period. This ceremony is front and centre of island custom (Beckett, 1990, p. 221). It is the anchor of island society. It brings together families from other islands and mainland Australia to plan, prepare and present the grave (Singe, 1979, p. 146), with feasting, dancing and singing for their guests[1]. The tombstone of an ancestor is a representation of unbroken connection with the past (Singe, 1979, p. 147). The Tombstone Opening integrates Christian burial practices with Islander artefacts and tradition (Elu, 2004, p. 149). In this way, cultural and religious synchronisation has allowed the manifestation of blended understandings of the world and, in some instances, ended inter-island conflicts in the Torres Strait.

A similar blending of understandings has occurred in academia with the arrival of digital technologies. Education, history and other disciplines have reformed and integrated these new tools and ideas into their existing systems, no longer operating in silos or in conflict with each other. Rather, they often overlap, integrate with one another and produce

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[1] For a more detailed description see Eric Alden Smith and Rebecca L. Bliege Bird, 'Turtle hunting and tombstone opening: public generosity as costly signaling' *Evolution and Human Behaviour* 21 (2000) at p249.

different ways of learning and knowing. For example, games are usually used for the purposes of entertainment and are defined as a "system in which players engage in an artificial conflict, defined by rules, that results in a quantifiable outcome" (Salen, Tekinbaş, & Zimmerman, 2004, p. 80). However, the joining of games with non-entertainment disciplines such as education has created a new genre of games called serious games. Serious games are defined as games used for purposes other than pure entertainment, including to promote healthy living, for spreading a political message or as advertising (George Mason University, 2010).

A number of video games, serious and non-serious, present new ways to learn information through what is often referred to as "game-based learning" (GBL). GBL is typically defined as "a type of game play with defined learning outcomes" (Plass, Homer, & Kinzer, 2015). While some of these games are educational, and intended to help players learn, they are not necessarily serious games. There are also games known as commercial off the shelf (COTS) games, which may not be purpose-built for education, but can nonetheless help the player engage in informal learning[2] through entertainment and play (Apperley, 2014, p. 42). Prime examples are games such as the *Civilization* series (Firaxis Games, 2001, 2005, 2010, 2016; MicroProse, 1996) and the *Age of Empires* series (Ensemble Studios, 1997, 1999, 2005). These games show the development of different civilisations through the different historical ages as well as illustrate cultural heritage though different game components. For instance, *Age of Empires II* (Ensemble Studios, 1999) depicts components of the architecture, religion, lifestyle and environment of different cultures with vivid historical imagery and detail, including those of the Burmese during the 16th century, as shown in *Figure 1.1*. The *Civilization* and *Age of Empires* series are critically acclaimed, with

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[2] The thesis defines informal learning as "learning resulting from daily activities related to work, family or leisure. It is not organised or structured in terms of objectives, time or learning support" (Cedefop-European Centre for the Development of Vocational Training, 2014, p. 111).

the *Age of Empires* series as a whole, selling 20 million copies (Dobbin, 2019) worldwide while the *Civilization* series selling more than 33 million copies (Takahashi, 2016). Thus, COTS video games evidently have the power and popularity to reach audiences, and could therefore be leveraged for educational purposes. In recognition of this possibility, this research considers the pedagogical potential of COTS in the specific case of teaching history to adults. The thesis evaluates the unique opportunities offered by video games as a means to learn history in informal and formal learning[3] contexts, and their application in higher education.

Figure 1.1. Screenshot of *Age of Empires II* of a Burmese town. The illustration provides vivid historical details of Burmese architecture, religion, lifestyle and environment.

In the past, as Rosenzweig and Thelen (1998) note, historical knowledge has often been considered to be knowledge obtained from traditional sources such as a book. However, players can interact with and may obtain knowledge about history through video games

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[3] The thesis defines formal learning as "learning that occurs in an organised and structured environment…and is explicitly designated as learning" (Cedefop-European Centre for the Development of Vocational Training, 2014, p. 99).

without consciously realising they are learning. The historical knowledge contained in games like *Civilization* and *Age of Empires* often lack the detail and precision of a historical textbook; although some games do provide these features. Either way, history is the very lifeblood drawn on by video game developers to shape narratives, visuals and the fundamental mechanics that govern the game itself (Hess, 2007; Kapell & Elliott, 2013; Rejack, 2007; Spring, 2015; Wainwright, 2014; Whalen & Taylor, 2008). Indeed, historical knowledge is frequently deeply embedded in what are known as the "game mechanics", which Hunicke, LeBlanc, and Zubek (2004) define as "the predefined aspects of the game" (p. 2). In such cases, historical knowledge is elicited as players explore the game, make in-game choices and experience the outcomes of those choices. In these games, players are given active perspectives about how history may have occurred, and learn the consequences of their gameplay history. Once a player is situated within a game's historical perspectives, history takes on a more profound meaning because players become engaged in game interactions in an often affective way. This process of taking on perspectives is similar to the process Yee describes where players become more emotionally invested in the game setting, the characters and other players in MMO's (Yee, 2006, pp. 193-194). This active engagement could provide the player with a different historical understanding than they might gain from more traditional forms of history such as books, documentaries and physical artefacts (Rosenzweig & Thelen, 1998). The thesis intends to illustrate the value of these historical perspectives and the sophisticated historical knowledge contained within video games by researching the historical knowledge learnt and developed by players of the game *Europa Universalis IV* (Paradox Development Studio, 2013a), also known as *EUIV*.

This introductory chapter will first briefly explore different but related converging fields of study including video games, Grand Strategy games (a subcategory of wargames) and the historical knowledge presented in video games. The intent of this exploration is to

provide background to the research. Second, the chapter will present the primary research question of the thesis and several sub-questions. Third, the chapter will outline the importance of the project. Fourth, the chapter will define the scope of the project. Finally, the chapter will provide a brief summary of the thesis chapters and their content. Holistically, this chapter should provide base knowledge from the relevant and interrelated fields of study, the objective of the research and a roadmap of the thesis.

1.2 Video Games and Game-Based Learning

Video games have long been a divisive topic for the general public, scholars, and educators alike, and have often been stigmatised, with attention focused on violent video games and more recently the perception of such games as being dangerously addictive (Anderson & Dill, 2000; Bushman & Anderson, 2002; Carnagey, Anderson, & Bushman, 2007; Dietz, 1998; Dowsett & Jackson, 2019; Egenfeldt-Nielsen, Smith, & Tosca, 2009; Fox & Tang, 2014; Funk, Baldacci, Pasold, & Baumgardner, 2004; Markey, Markey, & French, 2015; Smuts, 2005). Some video games, such as the *Mortal Kombat* series (Midway, 1995) shown in *Figure 1.2*, depict gratuitous violence that has created public, moral and media panics around the use of the medium (Bean, Nielsen, Van Rooij, & Ferguson, 2017; Bowman, 2015; Kowert & Quandt, 2015; Markey & Ferguson, 2017). Other research presents similar arguments about the negative impacts of violent video games, suggesting players of these games are desensitised to violence or likely to engage in aggressive behaviour (Anderson & Dill, 2000; Bushman & Anderson, 2002; Carnagey et al., 2007; Dowsett & Jackson, 2019; Konijn, Bijvank, & Bushman, 2007; Markey & Ferguson, 2017; Markey et al., 2015). There are also researchers who would classify what they define as "too much play" of video games as an addiction; one such study determined "too much play" to be an average time of 66.9 hours per week (Hellman, Schoenmakers, Nordstrom, & van Holst, 2013). Notwithstanding this debate, there is an increasing use of and reliance on digital media

in many facets of contemporary life. Moreover, media and research of this nature often neglects to explore and examine the positive effects of video games, instead focusing primarily on issues around violent games and video game addiction.

Figure 1.2. Mortal Kombat has been known for its gratuitous violence, where combatants fight to the death. Here, one of the protagonists, Liu Kang, faces off against one of the games antagonists, Motaro.

However, there is a growing body of research on the benefits of playing video games, much of which will be discussed in the literature review in the following chapter (Apperley, 2014; Apperley, 2018; Apperley & Beavis, 2013; Gee, 2008a, 2008b; Ryan, Rigby, & Przybylski, 2006; Squire, 2011). Such research has highlighted the many positive and beneficial forms of engagement players may have with video games, from social to cognitive to educational applications (Adachi & Willoughby, 2013; Basak, Boot, Voss, & Kramer, 2008; Ducheneaut & Moore, 2004, p. 360; Loban, 2017, 2018; Loban & Apperley, 2019; Squire, 2011; Voulgari & Komis, 2012, p. 290). Games researchers such as Gee (2008a, 2008b) argue that video games allow for experiential learning and teach players through situational problem-solving. Other researchers have found that strategy video games,

specifically *Rise of Nations* (Big Huge Games, 2003), significantly improve the executive

control function of the brain (Basak et al., 2008, pp. 775-776). Another research study has

found that in Massive Multiplayer Online Games (MMOG), players learn how to play the

game through social interactions and sharing knowledge between communities; thus, such

games are inherently social activities where players learn team skills by interacting within a

community (Ducheneaut & Moore, 2004, p. 360; Voulgari & Komis, 2012, p. 290). Studies

such as these highlight the considerable social benefit associated with game playing

(Ducheneaut & Moore, 2004, p. 360; Voulgari & Komis, 2012, p. 290).

Recognition of the benefits and usefulness of video games in formal education is also

growing, with several recent research studies showing players can learn about history from

playing video games on a variety of different subjects in numerous different ways (Brand,

Todhunter, & Jervis, 2017; Dow, 2013; Kuran, Tozoğlu, & Tavernari, 2018; Wiggins, 2016).

Some games depict history through interactive individual and first-person experience within

their environment, such as occurs in the historical settings of the *Call of Duty* series (Infinity

Ward, 2003, 2009; Salvati & Bullinger, 2013, p. 157 & 163). Others depict history through

story-driven gameplay, such as in *Assassin's Creed II* (Ubisoft Montreal, 2009), which takes

place in Renaissance Italy, where the player interacts with a host of historical characters

(Dow, 2013, p. 216 & 227).

This thesis focuses on a specific video game called *Europa Universalis IV* (*EUIV*).

EUIV is a Grand Strategy game that engages players on the historical world stage from 1450

to 1821, as shown in *Figure 1.3*. In this game players take on the task of controlling and

steering a nation through the early modern era of history. *EUIV* allows the player to manage

the different functions and parts of nation-building including the economy, diplomacy, trade,

military affairs, and internal stability. These mechanics and functions are built on the

foundational concept of Grand Strategy, the origins of which can be traced back to

wargaming, a phenomenon that will be discussed in detail below. Therefore, in order to understand the historical gameplay within *EUIV* we need first to understand the tradition of Grand Strategy, upon which it is built.

Figure 1.3. EUIV's large-scale view of world map in 1450.

1.3 Grand Strategy and Wargaming

The term "Grand Strategy" is often used by the military in the field of Strategic Studies (Hart, 1967; Sayle, 2012). Hart (1967) defines Grand Strategy as a means to "co-ordinate and direct resources of a nation, or band of nations, towards the attainment of the political objective of the war" (pp. 335-336). Sayle (2012) questions whether war always needs to be the objective of Grand Strategy, and suggests there is a more inclusive definition that embraces considerations outside the realm of pure conflict. Luttwak (2009) further argues that Grand Strategy draws on a number of different factors, and can be understood as:

> simply the *level* at which knowledge and persuasion, or in modern terms intelligence and diplomacy, interact with military strength to determine outcomes in a world of other states with their own "grand strategies" (p. 409).

Compared to Hart's (1967) earlier definition, Luttwak's (2009) definition is more specific in focusing on the types of resources a nation may use to achieve its objectives, with an emphasis on a higher and more abstract level of strategy.

Both Sayle (2012) and Luttwak's (2009) definitions are closely aligned with Grand Strategy depictions in video games. Players in these types of games utilise all of a nation's resources and powers to carry out the nation's national objectives, from its use of military force to matters of diplomacy and economic development. Hence, in this thesis "Grand Strategy" is defined as a nation's utilisation of all of its resources and powers to carry out its national objectives, from its use of military force to diplomacy and the operation of its economy. It thereby encapsulates non-war aspects of strategy. *Figure 1.4* shows where Grand Strategy fits into other forms of policy, strategy and tactics, and how it operates within the higher levels of strategy and national engagement (Department of the Army, 2008; Hart, 1967; Luttwak, 2009; Sayle, 2012; USAF College of Aerospace Doctrine, 1997; Wong, 2006).

Political & National Policy	The political and national policy that guide a nation and determines its objectives
Grand Strategy	A nation's utilisation of all of its resources and powers to carry out its national objectives
Strategy	Supports a nation's Grand Strategy focusing on an outcome of a war or whole conflict
Operational	Major operations and campaigns that fit into an overall larger strategy
Tactics	Focuses on a specific battle, manoeuvres and engagements
Combat	Physical battle between combatants

Figure 1.4. The different levels of strategy, showing Grand Strategy operating at a much higher level compared to other forms of strategy.

In all Grand Strategy games, the player utilises a nation's resources to achieve in-game objectives or objectives set by the player themselves. *EUIV* is no different, and the definition of Grand Strategy utilised in this thesis accurately embodies *EUIV*'s core gameplay and experience, whereby the player utilises their nation's economic, political and military might to become a global superpower, a trade empire or even seize the throne of China. Like *EUIV*, many wargames, digital and physical, past and present, are based on historical time periods and confrontations. Often in these games, history is represented as a set of counterfactuals (also known as alternate realities or hypotheticals). Counterfactuals are a depiction of history that results from asking "what if?" questions; in this case, the question is: "What if a particular historical event happened differently?" (Ferguson, 1997, p. 2). For example, in a counterfactual, one might ask "what if" Spain colonised Canada, and what the

historical consequences of this change might be. There are those who dismiss counterfactuals as "parlour games" with little historical value (Carr, 1961, p. 96). However, even if games depict inaccurate historical events as a result of such counterfactuals, they may still immerse the player in a particular context, presenting a historical viewpoint that allows the player to understand the underlying factors that contribute to the development of historical events. Counterfactuals will be discussed in more detail in later chapters; at this stage, it is important to note that understanding what a counterfactual is in the gaming context requires comprehension of how historical knowledge and history are presented in games.

1.4 Historical Knowledge and History in Games

Epistemology is the branch of philosophy that deals with the study and theory of knowledge (Goldman, 2004, p. 11; Rawnsley, 1998, p. 2). In this domain, the origin, nature, scope and structure of knowledge are explored (Goldman, 2004, p. 11; Rawnsley, 1998, p. 2). Knowledge is generally defined as a "true belief" (Goldman, 2004, p. 12; Honderich, 2005, p. 448); however, Bolisani and Bratianu (2018) argue, knowledge is more complex than this simple definition, involving three kinds of knowledge: emotional, spiritual and rational (pp. 30-31). Emotional knowledge relates to context and tends to be more subjective; spiritual knowledge is used to guide values and ethical principles; and rational knowledge is based on reasoning and relates more to facts (Bolisani & Bratianu, 2018, pp. 30-31). Biggam (2001) further adds that rational knowledge, which he calls "factual knowledge", must meet the criteria of being "true" (p. 3). That is, the perceiver must believe the knowledge in question to be true, and must be in a position to know that it is true (Biggam, 2001, p. 3). Therefore, facts play a significant role in the formation of certain types of knowledge, especially in regards to history.

Facts are considered true propositions of the actual state of affairs (Honderich, 2005, p. 267). Facts are usually associated with empiricist foundationalism, which dictates that

basic observation should be used as the groundwork on which other beliefs are built (Beards, 1997, p. 4). This basic observed knowledge is tied to experience, and experience consequently provides a reason for justifying a belief, which thus becomes a fact (Beards, 1997, p. 4). Most traditional historians deal with factual knowledge or facts to inform their knowledge of history, and facts play a significant role in helping the historian tell a wider narrative of history (Husbands, 1996, p. 62). Carr (1986) defines historical facts as those all historians agree upon; however, facts are only relevant when used by a historian (pp. 4-5). In this circumstance, history is really only history, or at least told history, if the historians support the facts they consider are worth preserving (Carr, 1986, p. 8). Therefore, Carr (1986) defines history as "a continuous process of interaction between the historian and his facts, an unending dialogue between the present and the past" (p. 24). Hence, historical facts may only become historical knowledge if told by historians, and this history is, at least in part, down to the interpretation of the historian (Carr, 1986). This process of interpretation is termed "narrative history", and often shifts between fact and supposed fiction (Husbands, 1996, pp. 47-48). Narrative forms of history are used to address wider and complex ideas of history (Husbands, 1996, pp. 47-48). To communicate history, descriptions of the past sometimes require the historian to use their imagination and make assumptions (Husbands, 1996, p. 62). This can be problematic when attempting to make a distinction between facts and fiction. However, Husbands (1996) believes fiction or stories are a means to an end, intended to help create historical understandings (p. 51). Husbands (1996) also states that history is not fiction because it involves a dialogue with evidence (p. 135). However, this dialogue is still partly subjective, as the historian chooses which history is told and how that history is told (Husbands, 1996).

Chapman (2016) also argues that portraying history often involves a process whereby the historian tries to make sense of and create a historical narrative rather than solely

collating precise facts and focusing strictly on accuracy (pp. 10-11). Chapman (2016) further

contends that stories and fiction that are informed by history can reveal valuable and

meaningful understandings about history, even if they do not present it with factual accuracy.

If we define history in these broader narrative terms we can surmise that narrative mediums

such as movies and video games may have the potential to teach us something valuable about

history (Kapell & Elliott, 2013; Salvati & Bullinger, 2013). In such forms, history becomes

more about the "story" being told, which may include a degree of falsehood, a stretching of

the facts or even an element of fantasy. In this context, an understanding of what history

comprises implicitly contradicts many definitions of history that are based on "facts".

However, it is arguable that even "official" versions of history, which cite various facts and

dates, nonetheless contain creative interpretations and falsehoods, stretch the facts and

neglect different perspectives (Alvares, 2011, p. 79; Carr, 1986, p. 8; Chapman, 2016, pp. 10-

11; Husbands, 1996, p. 62; Thiong'o, 1986, pp. 11-13). History then becomes less about

factual accuracy, and is instead revealed as a story within which different understandings of

that story are told from different perspectives (Alvares, 2011, p. 79; Carr, 1986, p. 8;

Husbands, 1996, p. 62; Thiong'o, 1986). This multi-perspective understanding is in contrast

to the notion of a singular 'objective' history (Beards, 1997, pp. 4-7; Bergmann, 2000;

Gorman, 1974; Stradling, 2003; Wansink, Akkerman, Zuiker, & Wubbels, 2018). The idea of

multi-perspective history, especially one facilitated by games, will be further discussed in-

depth in later chapters. In addition, Seixas, Morton, Colyer, and Fornazzari (2013, pp. 4-6)

point to six historical thinking concepts that are of great importance, namely establishing

historical significance, use of evidence (primary sources), examining continuity and change,

analysing cause and consequence, taking historical perspectives and attempting to understand

the ethical dimension. This framework helps the learner focus on certain historical elements

when they are learning history.

Chapman (2016) argues that popular history, including games, emphasises a historical narrative over historical detail or fact, and demonstrates that history can therefore come in many forms (pp. 7, 136). It is possible for a non-academic audience to unwittingly engage in informal learning about history through the consumption of forms of popular history. However, popular history is not formally or well acknowledged as useful for learning, when compared with traditional history and texts. As Chapman (2016) notes:

> In a relatively quiet, unacknowledged and often seemingly unintentional way, history in digital games, like historical film before it, has developed a widespread appeal and usage that professional historiography has generally struggled to achieve, even when actually desired. It is not enough, however, to simply acknowledge this popularity. Instead, it seems prudent for this observation to motivate our interests in looking at how digital historical games represent the past and what possibilities and limitations they entail (p. 265).

In a similar way, educators are still coming to terms with understanding the utility and possibility of using digital and popular media for depicting and learning about history. This thesis will explore whether games help the player to think about history as a representation of a certain perspective or of evidence available at the time, rather than being completely accurate and absolute. Similarly, historians may strive to be accurate, but they can never truly represent the situation precisely. Hence, important questions remain as to whether video games depict history appropriately and whether the medium has the potential to develop important pedagogical outcomes.

1.5 Research Purpose and Question

The integration of video games and wargames has produced the combined subcategory of Grand Strategy video games. Grand Strategy video games are typically COTS

games and are often historically themed, providing players with opportunities to incidentally learn about history. However, Grand Strategy video games are still not widely recognised, implemented or utilised for the learning of history. These games are highly complex and suited to adults or teenagers, yet GBL that involves the use of Grand Strategy video games is rare in adult education, especially in the context of teaching history (Apperley, 2018; Egenfeldt-Nielsen, 2005, p. 206; Koabel, 2017; Kuran et al., 2018; Loban & Apperley, 2019; Squire, 2011). Hence, the research question posed for the thesis is:

> ***What can a study of Europa Universalis IV reveal about how Grand Strategy video games can be utilised in higher education to teach history?***

This research question seeks to understand the educational utility of *EUIV* and, by association, most Grand Strategy video games. It is anticipated the research findings and their educational application could potentially be generalised to other COTS video games. History often forms an integral part of the mechanics, gameplay and content in Grand Strategy video games. Therefore, history is an ideal subject area for GBL. By investigating this question, the research will explore interrelated forms of GBL such as game modification by players (known as "modding") and multiplayer interaction and gameplay.

From this key thesis question stems several sub-questions:

1. How are Grand Strategy video games, and video games in general, currently used for formal adult learning of history?

2. What are the current attitudes of *EUIV* players to the use of video games for learning history?

3. How does *EUIV* engage with history and how do players perceive this engagement?

4. How do Grand Strategy video games promote experiential and visual learning of history, and how does this compare with players' perceptions of other forms of learning history?

5. How does a player's technology use, video game play experience and knowledge of history impact the effectiveness of *EUIV* as a formal adult tool for learning history?

6. How do different GBL implementations of *EUIV* influence its effectiveness as a formal adult educational tool for learning history?

Exploring these sub-questions will help develop an understanding of player attitudes and the use of video games in relation to education and history, and will provide insight into how players engage with and perceive historical games. Developing such insight is particularly relevant in relation to the potential educational value of *EUIV* because player attitudes and enjoyment of the game could affect how or if they learn from the game. Furthermore, it is important to understand how players' experiences with games, technology and history affect their attitudes and engagement with *EUIV*. It is crucial to appreciate how history is reflected in the game and how players recognise the game's history, if at all. Games have the power to engage the player through play and interaction (Salen et al., 2004, p. 383 & 387), and this research aims to understand how engagement with *EUIV* provides opportunities for players to learn visually and through experience. The thesis intends to explore how players may learn through generic single player gameplay as well as through other forms of game engagement such as modding. Holistically, this research should provide some insight into how *EUIV* could be implemented and used for adult learning about history.

1.6 Importance of the Study and Research Justification

Apart from a limited number of studies (Apperley, 2013; Egenfeldt-Nielsen, 2005; Koabel, 2017; Kuran et al., 2018; Loban, 2017; Loban & Apperley, 2019; Sjunnesson, 2019;

taffy3, 2013, 2014), the use of Grand Strategy video games as a tool to assist in teaching and learning is underexplored. One highly relevant study conducted by Egenfeldt-Nielsen (2005) used an earlier game in the *Europa Universalis* series – *Europa Universalis II* (*EUII*) (Paradox Development Studio, 2001) – to teach history to adolescents (15-19 years) in Copenhagen. The research found that many of the study's participants failed to appreciate, explore and link gameplay with history (p. 206). Egenfeldt-Nielsen (2005) concluded that his students often failed to link their game experiences with historical concepts as they viewed the history as primarily factual, and dismissed the narrative forms of history represented in the game (pp. 209 & 225-226). However, another study conducted by the US Marine Corp used a WWII Grand Strategy game mod[4], *Darkest Hour* (Darkest Hour Team, 2011) and achieved a different learning outcome (Barrick, 2014, pp. 6-7; taffy3, 2014). The benefit of the study would be clearer if the study had included a pre/post-test comparison. However, at the end of the exercise, the organiser, a senior military officer (lieutenant colonel), suggested that in the course of the exercise student officers had developed a "superb" understanding of strategic concepts involved in the different Grand Strategies of WWII (Barrick, 2014, pp. 6-7; taffy3, 2014). Although it remains to be seen whether these results would transfer to non-military populations who are less well-versed in strategy, the study still indicates a potential to use Grand Strategy games to learn about strategy and history. In addition, the student officers also learnt about the history of European and Pacific geography, logistics and relationships between military command hierarchies. Given the complexity of Grand Strategy games, it may be the case that adults rather than the teenagers of Egenfeldt-Nielson's (2005) study are better able to benefit from this kind of educational gameplay.

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[4] Modding, as defined by Scacchi (2010, p. 2), means customising, tailoring and remixing gaming objects such as gaming content, software or even hardware.

A recent survey (n3135 participants) showed 67% of Australians play video games, with an average age of 34 and with 77% of gamers over the age of 18 committing 89 minutes per day to gaming (Brand et al., 2017, p. 6). It was also found that 34% of the sample population used video games at work for improving job knowledge and 26% used video games to learn about health and safety rules. While these numbers on the use of games in the workplace are not insignificant, they show there is still room for games to be used with greater frequency in adult learning contexts. Although video games have been extensively studied and written about as a pedagogical and training tool, they have not been extensively implemented as a form of workplace instruction, coaching or education (Brand et al., 2017, p. 6; Wiggins, 2016). As Brand et al. (2017) survey data shows, the majority of Australian gamers are adults (p. 6), which is in keeping with a global trend of adult gamers (Brown, 2017). However, educational serious games for adults are still relatively uncommon (Egenfeldt-Nielsen, 2005, p. 9; Ito, 2012, p. 6). Furthermore, many of the existing educational serious games (often named edutainment and discussed further in chapter 2) are considered poorly designed and unsuitable for deep and engaging learning (Egenfeldt-Nielsen, 2005, p. 9; Ito, 2012, p. 6). Until there is an emergence of engaging and thoughtfully designed serious educational games, alternatives may be found in the form of COTS games that incidentally contain educational content. Van Eck (2009) describes how different COT games will provide different learning outcomes, not only in terms of content, but also the skills they test (problem solving, verbal literacy, etc). While Grand Strategy games have not been extensively explored, historical strategy games generally have been relatively well examined and will be discussed later. However, more research is needed to investigate and understand how these COTS games might fit into the future of GBL. It is conceivable that an opportunity exists to implement video games in an educational context and with a population of students who are familiar with the medium. Games could provide a more active form of

learning and engagement with history compared to traditional forms such as books or lectures. Games could offer an option for learning and assessment to those students who struggle to learn and express themselves eloquently through extensive reading and writing. Hence, there may be considerable potential to utilise COTS Grand Strategy video games as an educational tool within the Australian adult education context.

This thesis seeks to address the research gap around the use of commercial video games for adult learning. It does so by examining the potential of Grand Strategy video games as educational tools to teach history in higher education. The research will focus on two specific implementation strategies: using video games as a tool to explore historical scenarios, and the process of modding (creating content) video games. By exploring the use of Grand Strategy video games, the research aims to show the unique way these video games are able to depict and teach history. Grand Strategy video games may contain valuable educational processes and mechanics not yet afforded by other mediums. It is not only the play of these Grand Strategy video games that may have educational value, but also other forms of GBL such as content creation and modding. Modding, as defined by Scacchi (2010, p. 2), means customising, tailoring and remixing gaming objects such as gaming content, software or even hardware. While the process of modding was originally thought to be a useful exercise for technical skills such as programming or computer science, this thesis will use mods as a learning exercise for non-technical subject matter, and will specifically focus on modding content creation about history. Research by Squire (2011) will often be used as a point of modding comparison throughout the thesis; this study is discussed in the literature review in the following chapter. Modding has been applied in a wide range of games including the *Civilization* series, *Age of Empires*, *Total War* series and other Paradox Interactive games. Modders have also introduced history in non-strategy games such as *Mount & Blade series* (TaleWorlds Entertainment, 2008). An example of a mod, could be a

"total conversion" mod which is illustrated in *Figure 1.5*. This mod shifts *EUIV* from the Early Modern era to the Roman era, depicting in full detail the different nations that existed during that era including Carthage, the Greek city states and, of course, Rome. A starting proposition of this research project is that modding provides an additional avenue for learning history through content creation and development.

Figure 1.5. Through mods, a player can play as Rome and re-enact the expansion of the Roman Empire even in a game designed to depict the Renaissance, European colonisation and the Napoleonic era.

I seek to add value to the research with my own perspective and acknowledged biases as both a *EUIV* gamer and an Indigenous Australian. I have invested over a thousand hours of gameplay into *EUIV,* initiated hundreds of campaigns, and mastered different components of the game. I have developed a publicly released mod (Cosmosis7, 2016), and I am an active member of the *EUIV* forums. I have dedicated numerous hours to *EUIV*'s predecessor, *Europa Universalis III* (Paradox Development Studio, 2007), and frequently play many sister Grand Strategy games including *Heart of Iron IV* (Paradox Development Studio, 2016b), *Victoria II* (Paradox Development Studio, 2010), and *Crusader Kings II* (Paradox

Development Studio, 2012). In this process I have learnt much about both Early Modern and world history. I now have a far superior geographical understanding of the world than I did before I was introduced to the *Europa Universalis* series. Yet, from a Torres Strait Islander perspective, I know the game is quite subjective, with many of the historical depictions being only partial, and modified to suit certain perspectives. In various depictions, *EUIV* denies the historical significance and even existence of many of the world's Indigenous nations. Perhaps unintentionally, these depictions perpetuate limited and even prejudiced understandings of Indigenous cultures and histories, and I have witnessed these being expressed on the *EUIV* forums. Therefore, I seek through my dual perspective to cast some light on the valuable yet flawed historical knowledge contained within *EUIV*.

The innovation in this research stems from bringing together a multidisciplinary perspective at the intersection of games studies, education, and historical inquiry to investigate the use of video games to teach history to university students and other adults. In addition to focusing on adults, the largest consumers of games (Brand et al., 2017, p. 6), this thesis examines a video game genre that has yet to garner significant attention from scholars, that being Grand Strategy games (Apperley, 2013; Barrick, 2014; Egenfeldt-Nielsen, 2005; Koabel, 2017; Kuran et al., 2018; Loban & Apperley, 2019; Sjunnesson, 2019). The Grand Strategy genre considers a nation's history in a calculated, geopolitical and map-based fashion, showing history and historical change on a large scale. The historical depiction of this scale is relatively unique amongst video games. The study of *EUIV* illustrates how such games are not without their own challenges for effective implementation in education contexts, especially given their tendency to produce counterfactual scenarios and diverge from historical facts and details. Nevertheless, there is still considerable pedagogical utility for games of this genre, provided educators understand the limitations of the games and how best to use them. Modding provides an additional avenue for GBL of history and a platform

for players to provide their own historical critique and analysis. The investigation thereby gives insight into the unique opportunities to effectively learn and teach history through video games.

1.7 Research Thesis Scope

This thesis draws from multiple disciplines including games and media studies, education and pedagogical studies, and history and historical inquiry. The focus on games and media studies stems from the use of video games as the object of investigation, specifically the subgenre of Grand Strategy video games. The investigation will also draw on the history of board games and strategy games as well as the more recent phenomenon of wargames, which are developed to teach strategy to military officers. Each of these areas of gaming history has influenced and shaped contemporary table-top, computer-based wargames, and subsequently the Grand Strategy games upon which this thesis focuses.

This research project explores how Grand Strategy games contribute to pedagogy, education and learning. It begins with a brief analysis of *EUIV* to understand its different functions and potential educational value. This analysis is followed by an exploration of self-assessed informal learning among the online *EUIV* player community. By engaging and analysing the responses of a large sample of expert players, the thesis will demonstrate how players understand the historical and learning value of the game, and will indicate which elements of the game are considered more useful for learning history. The data from the online *EUIV* player community will inform the development of a university case study involving the gaming practices of modding and historical roleplay simulation.

The final part of the thesis will triangulate the collected data, evaluate the history contained within the game and consider how this may be used to learn or teach history in higher education. In order to understand how Grand Strategy games can support a new approach to learning and teaching history, the thesis explores learning activities where *EUIV*

was used to illustrate players' ideas, critiques and analyses of relevant history. As the thesis will show, more than just using digital games to learn about history, Grand Strategy games provide students with an opportunity to interrogate what counts as "history".

1.8 Research Thesis Chapter Outlines

The thesis is divided into several chapters with each chapter containing further interrelated themes and sections. The chapters are as follows:

1.8.1 Chapter 2: Literature Review

The Literature Review outlines three interrelated groups of literature. The first section examines the key work on video games in education contexts, with a specific focus on their integration into classroom learning and teaching. The second section focuses on the history of wargaming, its increasing complexity and digitisation, and the shift within the genre towards higher levels of strategy. Finally, the chapter examines the representation of history in games, focusing on three key themes:

- accuracy (historical accuracy/details),

- accessibility (historical narratives, player accessibility, and engaging gameplay) and

- inclusivity (whose history and types of history are reflected in the game).

The literature review provides background to the most recent GBL research, the transition of wargames to the digitised Grand Strategy genre, and the issues around representing history, or different forms of histories, in games.

1.8.2 Chapter 3: Method and Research Design

The Method and Research Design chapter details the field's knowledge gap, and contains an exploration of the population sample, recruitment and methods used in this thesis. It outlines how the project responds to the research question through several steps. First, the project explores the game through a thick (descriptive) platform analysis to assess *EUIV* as a

suitable research candidate, and to understand the different and most educationally valuable functions of the game. This Formal Analysis is then used to inform and design a *EUIV* online forum survey. The online forum survey seeks to understand players' views on the learning potential of *EUIV* and uncover the most valuable educational elements of the game. Next, the results and comments from the survey are used to guide the design of a university case study, which is divided into two sub-groups: a historical roleplay simulation group and a modding group. The data collected in the university case study includes interview data, data from the participants' mods, pre/post test data and observation notes made throughout the case study. Finally, critical, thematic and descriptive analysis is inductively used to find the most valuable and insightful themes to discuss and formulate a response to the research question. These themes shape later chapters around the learning utility of *EUIV* in its generic state, the limitations of the game when implemented in higher education contexts, and engagement with the game through modding. An overview of this thesis research design process is shown in *Figure 1.6*.

Figure 1.6. Research design of the data collection and analysis of the thesis.

1.8.3 Chapter 4: Europa Universalis IV: A Grand Strategy Candidate for Games-Based Learning of History

This chapter presents a detailed overview of the game by exploring *EUIV*'s core mechanics, illustrating its intricacies and level of engagement with historical knowledge. The chapter presents the reasons for *EUIV* as the game of choice for the case study and research. It reviews existing literature on *EUIV*, explains where *EUIV* sits in relation to other Strategy and Grand Strategy games, and considers specific community issues related to *EUIV* gaming, such as modding and the creation and sharing of what are known as "After Action Reports". It situates the Grand Strategy video game genre in the history of table-top and computer strategy games to highlight the potential for implementing these games for learning and teaching history.

1.8.4 Chapter 5: Europa Universalis IV Online Forum Survey Data and Interpretation

This chapter reviews and interprets the results of the *EUIV* online forum survey, which generated considerable data regarding the informal processes of learning history through playing *EUIV*. It explains how 331 survey participants were recruited into the study and the nature of the questions asked. These questions related primarily to understanding participants' interest in *EUIV*, whether they thought they had learnt history from the game, and what *EUIV* game-related player activities they engaged in (including multiplayer gaming and modding). Data concerning the participants' evaluations of the game's depictions of simulated history and/or governance is also presented.

1.8.5 Chapter 6: University Case Study Data and Interpretation

This chapter discusses the findings of the case study, which integrated *EUIV* and other GBL activities within a formal learning setting. The chapter describes how participants (n18) in the case study played through the initial *EUIV* tutorial before being divided into two

groups. The groups were observed as they engaged in different GBL activities, which included a historical roleplay simulation where students took on the role of a nation and played through a historic event, and a learning activity that required the students to create a mod on a historic event and period. The chapter presents data collected from these classroom-based learning activities through a pre and post-test (written and visual), observation notes, interview transcripts and mod scripts/code.

1.8.6 Chapter 7: Grand Strategy Video Games as a Highlighter, Catalyst and Visualiser for Learning History

This chapter discusses three key interlinked findings that stem from the complex, multifaceted and dynamic ways *EUIV* represents history. First, it examines the potential limitations associated with the Eurocentric and empire-building focus of *EUIV*, and the consequences of these for the type of history presented in the game as well as noting the impact on the game's pedagogical utility. Next, despite its Eurocentric and empire building focus, the chapter asks whether players might use the game as a tool for discovering marginalised histories. It examines whether the detail present in *EUIV* might confront players with new knowledge about the past, and if so whether this new knowledge may act as a catalyst for player curiosity, potentially leading to a sustained interest in history, including conducting historical research outside the game. Next, the chapter examines whether player learnings and discoveries were a result of the elements of visual learning present in the game, including the map-based game mechanics and historic information presented on the dynamic *EUIV* world map. In doing so the chapter highlights the baseline and unique learning benefits and uses of the game.

1.8.7 Chapter 8: Europa Universalis IV as a Learning Tool for Higher Education Implementation

This chapter examines issues encountered with *EUIV* in terms of teaching history in higher education. The chapter identifies the educational limitations of the game, as well as the types of history that can be learnt from it. First, data collected from participant responses is examined in terms of an ongoing concern regarding the balancing of historical accuracy and gameplay in *EUIV*. Second, participants' common concerns about historical abstraction, ahistorical nature and counterfactual elements within *EUIV* are discussed. Third, the chapter queries whether, despite these ahistorical elements, *EUIV* might potentially portray many of history's larger trends and influences with some level of accuracy. Fourth, the pedagogical utility of the game is examined in terms of narrative engagements with history and the promotion of deeper forms of learning. Finally, the chapter considers whether *EUIV's* potential use as a tool for the deeper learning of history would meet the expectations of higher education, whereby students must be able to express their understanding of history. The chapter suggests that modding may provide a means for creative and historical expression that does meet these expectations.

1.8.8 Chapter 9: Modding: An Informal Gaming Practice to a Formal Learning Activity and Product

This chapter considers modding as a tool for learning history. First, the chapter briefly explores the evidence that indicates modding is popular within the *EUIV* gaming community. It examines whether, given the popularity of gaming practice, modding might also be seen as a new casual form of engagement with games. Second, the chapter demonstrates the creation of a mod through the exposition of an exemplar mod created by the researcher called the *Indigenous People of Oceania* mod. Third, the chapter reviews the modding process in *EUIV*, and examines how both playing and creating mods may be beneficial for learning history.

Modding is examined in terms of its pedagogical importance and the unique educational

opportunities it may offer that are not otherwise accessible through other forms of GBL.

Finally, the chapter explores how and what the case study participants learnt when they were

tasked with creating and implementing playable mods to demonstrate their understanding of

history. Overall, the chapter considers the growing importance of mods, how learners can

create and represent history using mods, and how mods can provide a platform for learners to

develop their own critique and analysis of official history.

1.8.9 Chapter 10: Conclusion

This chapter summarises the thesis research with a specific focus on reinforcing the

value of the findings and their contribution to the field of GBL. The chapter also describes

how the study addressed the primary research question, outlines the research's key

knowledge contributions and compares the findings of this research with previous literature

in the field. The chapter also outlines implications of this research before addressing its

limitations. This chapter provides recommendations for future research.

1.9 Conclusion

This introductory chapter has presented a brief overview of the thesis and its

exploration of history, education and video games. First, the chapter provided an introductory

understanding of video games (especially GBL), Grand Strategy and history in games, and

the interrelationship between them. Second, it presented the thesis research question and sub-

questions. Third, the chapter illustrated the importance of the study and justified the research.

Fourth, it sketched out the scope of the project. Finally, it provided a chapter overview as a

guide to the thesis. The following chapters will explain how informal gaming practices within

Grand Strategy video games could be pedagogically deployed to teach history in higher

education. The research is founded on the belief that video games can often provide real

historical context and meaning in ways that speech, writing and other forms of expression may not. One of the greatest strengths of video games is that players can make choices that influence the game's outcome. Traditional perspectives view history as fact-based; however, in games, player choices may cause historical divergences from standard textbook history. While the game's course of history is still influenced by historical themes, idea and factors, in-game history is not an exact representation but a simulation of and journey through the events that influence history. Consequently, in GBL, it is not the historical outcome that is the most important piece of historical knowledge derived from games, but the development of an understanding of the intersecting and interacting processes through which history occurred.

Grand Strategy games do not just allow the player to observe history; rather, during gameplay, the player is immersed in historical processes and contexts. Outside of gameplay, these games also generate highly complex online communities of followers and encourage other gaming practices such as modding. Just as the games can be capitalised on to further a student's knowledge of history, these communities and related gaming practices may also inspire pedagogical practices that could encourage deep forms of interactive learning, player content creation, and comprehensive research outside the confines of the game itself. Grand Strategy games are therefore not just a medium that uses history as a mere backdrop. Instead, these games may be actual sources of historical knowledge, conduits for discussions about history, and a medium through which players can express their understandings of history.

Disciplines such as history and education cannot ignore the shifting circumstances and practices of today's popular culture and technology-centric world. These longstanding disciplines must adapt and employ popular technological artefacts like video games to more effectively communicate their content and spark interest in students. This thesis will argue that Grand Strategy video games could be particularly valuable for communicating historical content in ways that allow students to visualise, interact with, and learn about history from

fresh and unique perspectives. Such educational applications should not just target the traditional audiences of digitally savvy children and adolescents. Adult learners can also benefit from using this medium, especially when it is implemented in higher education settings. By examining the intersection of Grand Strategy video games, GBL and history, and the educational potential and application of *EUIV* for higher education, this thesis will show that adults who engage with and consume digital media can benefit from this change in pedagogical practices.

Chapter 2: Literature Review

2.1 Introduction

Chapman (2016) explains there are concerns that the general public are largely disinterested in traditionally presented history (pp. 5-7) . This may give the illusion, that history is boring and not valued. However, he notes digital history is alive and thriving in the forms of television series, movies and video games (Chapman, 2016). His arguments suggest new media and technologies, namely games, could be ideal vehicles to experience history (Chapman, 2016). Other research shows how different eras of history are depicted in wargames, and argues these games have engaged historical enthusiasts in ways books or videos cannot (Sabin, 2015b). The U.S. military has used digital wargames to educate their servicemen in warfare since 1982, and thus the genre shows potential to facilitate learning (Frank, 2012, pp. 5-7; taffy3, 2013, 2014). Despite these potentials, such new technology is yet to be used extensively to improve learning and engage students (Reynaud & Northcote, 2014; Sabin, 2015a, 2015b). Digital games have not yet been widely utilised by history departments at universities, which is disheartening, because wargames such as Grand Strategy video games allow players to deeply engage with history and may therefore be useful tools for history educators to employ in classroom settings.

This chapter will examine literature related to Grand Strategy video games and how players engage with the history those games portray. The first section of this chapter investigates video games as useful learning tools by examining research theories that focus on the concept of procedural rhetoric, and other concepts related to experiential learning. The second section explores the use of table-top wargames in a learning context. It examines the history of these games with an emphasis on the rise of Political-Military wargames, a predecessor to Grand Strategy games. This section also discusses the beneficial and necessary transition from physical to digital wargames, in order to depict the complexities of Grand

Strategy. The third section examines how history is depicted and implemented in video games, and touches on the issue of historical accuracy in gameplay. The focus here is on whether a game should reflect an accurate textbook version of history, or opt for an accessible historical narrative that revolves around engaging gameplay. The issue of historical inclusivity also comes into play in this section with the Western-centric narrative that often dominates historical literature and video games.

Three areas of interest interconnect within this study, those being video games, wargames and history. The Venn diagram in *Figure 2.1* shows the intersection of these three areas in relation to Grand Strategy video games. To distil the discussion, the section of this chapter devoted to video games focuses on game-based learning (GBL), while the section on history focuses on history in the specific context of video games. The exploration and intersection of research into the three discrete areas of interest will form the theoretical baseline of this research project.

Figure 2.1. Venn Diagram showing the intersection of video games, wargames and history that culminate in the emergence of Grand Strategy video games.

2.2 Learning and Video Games

The use of video games to learn and teach is a rapidly growing area of scholarly interest. Theorists who have investigated how we learn from video games argue they can provide a way of learning that is not dissimilar to that facilitated by other mediums of expression such as writing, speech or images (Apperley, 2014; Bogost, 2007, pp. 28-29). Bogost's (2007) theory of procedural rhetoric is one way of conceptualising learning through video games. Bogost (2007) defines procedural rhetoric as:

> a subdomain of procedural authorship; its arguments are made not through the construction of words or images, but through the authorship of rules of behavior, the construction of dynamic models. In computation, those rules are authored in code, through the practice of programming (pp. 28-29).

Procedural rhetoric explains how an idea or piece of information can be conveyed through a particular process, or through an interaction with that process (Bogost, 2007). Just as an idea can be conveyed through writing or verbal interaction, so too can a process convey an idea through an interaction (Bogost, 2007). Bogost (2007) suggests the outcome of this is a form of communication most commonly developed through the processes involved in interacting with computer programs, including video games. In such situations, the user's interaction with the program usually occurs via a process of problem solving; during this structured process, the user also engages in a learning process (Bogost, 2007). For example, in the game *Minecraft* (Mojang, 2011), the player crafts items by collecting and combining different components that have a meaningful impact upon or use in the game. By participating in the process of collecting and combining components, the player learns about the different materials that make up an item, and also learns about how that item functions. As such, engagement with the game provides the player with the information they require to progress through and further interact with the game.

Similarly, Gee (2008a, 2008b) believes students can learn by playing video games because they allow for embodied learning to take place, whereby the player can use learnt information as an instrument for solving real in-game problems. This type of problem solving involves using applied knowledge in a particular context (i.e. in-game), and differs to abstract knowledge acquired and tested in, for example, high school or university exams, where such knowledge is learnt out-of-context. A video game player is situated within the specific context of the game and its world or history, and embodies the game's avatar. The player then uses knowledge learnt in-game to problem solve within the in-game context. Gee (2008b) builds on this idea and discusses the concept of the "projective stance", whereby the player can learn a specific skillset by taking on the persona of another actor, whether that is an individual (pp. 260-261) or, in the case of Grand Strategy games, a nation . By first

looking at the "real" world in a particular time and place, and perceiving how it can be enhanced by a particular action, a "projective stance" is simulated (Gee, 2008b, pp. 260-261). This stance is based on the actions of an actor with certain intentions and objectives. The player can embody this actor and, within the given context, realise their intentions and objectives by playing out the actor's role. For example, if players take on the projective persona of a military general in-game, they must learn about warfare and military science in order to achieve their objective. In this way, by embodying the role of another actor, the player can learn the relevant skills and knowledge needed to embody a given position within a certain context. Furthermore, Rejack (2007) who examines the games *Façade* and *Brother in Arms* suggests that historical games may offer the opportunity for more emotional engagement with history, as well as a chance for revision of and reflection on history. Chapman (2016, p. 224) also suggests that some games (e.g. first-person and roleplay games) offer the player an individual experience of history in contrast to abstracted history, which is common in strategy games. Indeed, Seixas, Morton, Colyer, and Fornazzari's (2013) framework, specifically the concept of engaging primary sources, could be usefully represented in these individual and emotive gameplay approaches.

The concept of learning skills and knowledge within a particular context is known as "experiential learning", an educational process whereby students learn through experience or by resolving a real problem (Austin & Rust, 2015, pp. 143-145). For instance, a student in a medical, engineering or computer science field can learn experientially through an internship, a practicum or in public service. However, finding such opportunities is more difficult for students of the social sciences. Indeed, it is extremely difficult to find experiential learning opportunities for subjects such as history, for how might a student experience an event that occurred in the past? Playing a game could be one way to resolve this issue and to actively experience history (or a historical theme) as a participant. By playing and living a gamified

experience of history in real time, the player is thus placed in the context of history and learns through the game environment and interface.

Another important concept is immersion, which could play a large role in historical learning from games because of the way games can immerse the player in the context they are learning about. Jennett et al. (2008) argue that immersion can include the sensation of being involved in the task environment and a loss of time and awareness of the real world. As discussed earlier, Gee (2008a, 2008b) argues that engagement with and immersion in game worlds have great pedagogical benefits. Conversely, Hamari et al. (2016) discovered in a survey of university students playing Quantum Spectre (a 2D physics puzzle game about light properties) that there was no significant relationship between immersion and learning. However, there may be a difference between learning through immersion in an expansive historical game world where place, perspective and historical interactions are at the centre of the gaming experience compared to learning in a simple top down 2D puzzle game. Other theorists have focused more on the practical learning benefits of video games. For example, research by Apperley and Beavis (2011) illustrates the value of utilising the action-based approach of video games to enrich classroom learning of texts. Ryan, Rigby and Przyblski (2006) explain video games have a strong motivational pull that can be used to facilitate learning. Squire's (2011, p. 113) research follows a similar argument, examining how the social aspects of video games can facilitate learning through the player's involvement in a participatory culture (p. 113). In his research, Squire (2011) primarily explores the benefits experienced by children and adolescents who learn about history from their use of the commercial video game *Civilisation III* (Firaxis Games, 2001), as shown in *Figure 2.2* (p. 113). The results of Squire's (2011) study showed how students learnt to become designers and applied their gaming experiences externally in their academic work. Their experience with game designing in *Civilisation III* was applied in their academic work, this gaming

experience helped students improve their academic performance, become more interested in their academic work and consider their career trajectory (Squire, 2011, pp. 180-181).

Another classroom study by Egenfeldt-Nielsen (2005), discussed in Chapter 1, also found benefits to learning through playing Grand Strategy video games. The author found that adolescent students who had played *EUII* (Paradox Development Studio, 2001) had better retention of the history course content and the game promoted an interest in the subject matter (Egenfeldt-Nielsen, 2005, p. 239). However, his quantitative data suggested there was little difference in the learning outcome whether or not they used video games. Moreover, the author also found the students had difficulties linking textbook history with the broader historical story and setting in the game (Egenfeldt-Nielsen, 2005, p. 259). In spite of these mixed results, these studies suggest that educators who implement video games as a tool in a formal education context may be able to take advantage of the motivational, social, and action-based approach of games to inspire students to learn through interacting with relevant game content.

Figure 2.2. This screenshot shows a typical strategy of a Civilisation III player, expanding their civilisation by building multiple cities, roads and training military units to protect their borders. The red dotted line illustrates the nation's borders (Firaxis Games, 2001).

Some of the debate around the use of video games in the classroom centres on whether games are best used for informal or formal learning (Benson & Chik, 2014, pp. 26-38). Informal learning may involve playing video games with educational content for leisure and without a specific learning outcome, while formal learning may involve the use of video games in classrooms as a motivator, a topic lead-in, or a reward to facilitate learning (Benson & Chik, 2014, pp. 26-38). However, there may also be other opportunities for informal gaming practices to be used in formal learning settings. Apperley (2014, p. 49) argues the informal leisure activities associated with digital COTS games can be capitalised on in formal learning contexts, where they may have beneficial and valuable applications (p. 49). However, Apperley (2014, p. 49) also contends that the introduction of video games into the

classroom should do more than simply capitalise on student interest and engagement (p. 49).

Rather, Apperley (2014, p. 49) urges educators to acknowledge students' gaming skills as

legitimate skills, and to make use of these skills in formal learning settings. For example,

while an educator might initially capitalise on a student's interest and engagement with

Minecraft (Mojang, 2011) to enhance their motivation in a particular subject, they could also

use Minecraft more meaningfully to teach creative thinking and programming, which are

often required in the game and are useful skills with a wide variety of applications.

      Pedagogical approaches that blend informal and formal GBL often make use of COTS

games. Alternatively, they may use purpose-built video games that focus on specific

curriculum content. These games are often referred to as serious games and are discussed in

the previous chapter, however there are a subgroup of serious games called edutainment.

Some of the better known early edutainment titles include *Where in the World is Carmen*

Sandiego? (Brøderbund Software, 1996) (history and geography), *Freddi Fish* (Humongous

Entertainment, 1994) (general problem solving), and *Math Blaster* (Davidson & Associates,

1993) (maths problem solving), shown in *Figure 2.3*. According to Ito (2012), edutainment

"exemplifies the struggle to identify a cultural and social space between the polarities of

education and entertainment" (p. 6). Similarly, Benson and Chik (2014, p. 33) see the basic

principle of edutainment as "educational subject matter to be taught … embedded within the

entertainment of a popular culture form" (p. 33). Perhaps because they try to straddle both

education and entertainment, edutainment video games have received much criticism as they

often involve less innovative learning methods, questionable and rudimentary gameplay, and

rigid construction around a curriculum as opposed to encouraging players to engage with

broader concepts (Egenfeldt-Nielsen, 2005, p. 9). Charsky (2010) suggests that edutainment

promotes lower order thinking that focuses on learning facts and procedures, while a sound

serious game can promote higher order thinking which includes applying knowledge,

analysing and synthesising (p. 180). Edutainment games may also work against educational goals; for instance, Klopfer, Osterweil, Salen, and Forward (2009) give the example of a spaceship game that requires a player to answer a maths problem before being able to use the ship's controls (p. 25). They argue that if the player is unable to determine how to use the controls they may become adverse to the game and all its content (Klopfer et al., 2009, p. 25). These types of edutainment games often have simple gameplay, with repetitive game elements being used to drill the player on their existing knowledge of a topic. This is in contrast to more complex game systems built around concepts students are required to learn, or those that allow students to make impactful decisions that fundamentally influence the game. Consequently, issues can arise in the play of edutainment games when elements of the games themselves conflict with the player's ability to make the interesting choices and meaningful interactions that are intended to make those games appealing.

Figure 2.3. Maths Blaster requires the player to shoot the item with the correct answer to the maths equation (Davidson & Associates, 1993).

Although rare, there are serious adult video games implemented in higher education. Research on novice adult programming students who played a serious computer science game found improvements in their grades; further, the research also found they enjoyed the use of games for learning (Marques, Levitt, & Nixon, 2012, pp. 3-4). In other research, a comparison was conducted between using traditional learning methods and digital games/GBL as pedagogical tools to illustrate and teach engineering concepts on a sample of 121 students in their seventh semester (Ebner & Holzinger, 2007, pp. 873, 887-888). While learning outcomes were similar between GBL and traditional methods, students indicated that they enjoyed GBL over traditional learning methods at a significantly higher rate (Ebner & Holzinger, 2007, pp. 873, 887-888). However, the novelty of using games for learning may have been a factor in these studies and have contributed to the positive response on participants' enjoyment of the games. Nonetheless, these studies provide further evidence as to the usefulness of video games as learning tools in different disciplines of adult education. While these successes are interesting and demonstrate the learning potential of serious adult games, in light of the issue of gameplay interfering with the player's ability to achieve learning outcomes, the thesis considers COTS games to be most promising in terms of their application as pedagogical tools because the engaging gameplay of COTS games could promote a more genuine interest in the subject matter as well as more complex and meaningful learning with the medium. The thesis also views COTS games as particularly valuable in adult education because of the limited availability and use of serious adult video games.

A recent study found the use of digital games and gamification[5] is still considered a novel teaching method in higher education (Wiggins, 2016, p. 27). Nonetheless, there does

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[5] The thesis defines gamification as "the use of game design elements in non-game contexts" (Groh, 2012, p. 39).

appear to be some demand for games to cater for formal adult learning (El-Masri, Tarhini, Hassouna, & Elyas, 2015, p. 8; Malala, 2009, p. 569). A 2009 study from the U.S. found that 85% of surveyed higher education teachers did not object to using a video game instead of a textbook; this compared to their elementary school counterparts, of whom 40% were willing to do so (Malala, 2009, p. 569). Among the higher education teacher participants, 41% "blame game creators for focussing on elementary education" as the reason they are unable to implement GBL in the classroom (Malala, 2009, p. 569). The same study also found that the various participants (primary, secondary and higher education) believed that between textbooks, television, and video games, the latter provided the greatest potential for socialisation, physical activity and creativity, leading to longer lasting knowledge acquisition (Malala, 2009, p. 571). Thus, while there appears to be an increasing openness amongst higher education teachers to learning new technologies and using video games to teach, there is also a strong sentiment that most educational video games focus on topics that are more appropriate for elementary education and therefore do not suit the needs of those teachers or the interests of their students (Malala, 2009). Moreover, compared to adolescents, Davis (2013, pp. 68-69) notes that adults approach learning with more life experience. This suggests that adults have a more sophisticated approach to learning as they have other experiences they can use to contextualise their learning. Adults also see themselves as mature and see traditional schooling as something for children and adolescents (Davis, 2013, pp. 68-69). Adults therefore prefer to learn in context and in ways that are not like traditional schooling. Based on these arguments, adults may perceive and learn from games differently compared to adolescents.

There has been limited use of COTS games in formal adult education contexts, especially Grand Strategy video games of which there are few (Barrick, 2014; Kuran et al., 2018; Marine Corps War College, 2014; taffy3, 2013, 2014). The most recent was research

by Kuran et al. (2018) who implemented *EUIV* as well as *Hearts of Iron IV* and *Crusader Kings II* in a history course. The researchers' observations reported these games provided students with in-depth geographical knowledge, an increased awareness of nation management interactions, experience-based learning and the modelling of historical decisions (Kuran et al., 2018). Students also contextualised key events from the point of view of a historical character as opposed to that of a historian who might view history differently. Kuran et al. (2018) ultimately suggest the games used in their study supported the understanding of different historical topics and helped students internalise historical knowledge through active participation. These were the researchers' experiential and observational findings, and provide a basis for further games studies.

As Seixas et al. (2013, pp. 4-6) point out in their six historical thinking concepts, taking historical perspectives and attempting to understand ethical dimensions are important when learning about history. The thinking involved in these two concepts can occur when a student takes on the perspective of a historical character. The student must also understand and contend with ethical questions about who is telling the history and whether there are other biases that might influence the way a history is communicated. We see this occurring in a game such as *EUIV*. Players learn through perspective by taking on the role of a historical nation and players create their own history based on the game's historical context. However, players are also faced with the ethical dilemmas of whose history is being told and in what way the history is being communicated, prompting the player to further analyse the game itself. Through the six historical thinking concepts framework (Seixas et al., 2013, pp. 4-6), we can analyse how games such as *EUIV* can afford certain forms of historical roleplay, analysis and learning. The most well documented exercise were simulations of a *Hearts of Iron II* mod called the *Darkest Hour* which was used by the United States Marine Corps (briefly discussed in Chapter 1). The *Darkest Hour* mod was built on *Hearts of Iron II* by

adding a new map and other game mechanics. The first exercise using *Darkest Hour*, shown

in *Figure 2.4*, was a recreation of World War I (WWI), and was used to teach content in a

war policy and strategy course (taffy3, 2013). The second simulation was used with the

following year's class to teach the players about the strategic setting of World War II

(WWII), including strategic theories as well as economic, diplomatic and production/supply

aspects of WWII (Marine Corps War College, 2014; taffy3, 2014). The WWII simulation

included 30 students who were divided into US, UK, and USSR teams and further divided

into joint and theatre staffs. Interesting dynamics and points of tension occurred not only

between different allies (US/UK vs Soviets), but also between the joint staff who provided

strategic plans, and theatre commanders who had to execute these plans with each perspective

prioritising different objectives (Barrick, 2014, pp. 5-7). These differences in perspectives

and dynamics contributed to the overall learning objective of evaluating strategic decisions,

prioritising their decisions, coalition planning and strategic negotiating. The exercise

instructor deemed the WWII simulation a success and reported the cadets met their learning

objectives (Marine Corps War College, 2014; taffy3, 2014). These examples demonstrate

how Grand Strategy games might be used successfully in an adult education context.

Figure 2.4. A student at the War College playing as the Austro-Hungarian Empire moves their troops to defend their borders against Romania, which has just entered on the war on the side of the Triple Entente (taffy3, 2013).

The concepts of surface and deep learning are also important when discussing GBL (Houghton, 2004, pp. 9-11; Marton & Säljö, 1976, p. 7; Ramsden, 2003, pp. 42-43). Forms of surface learning include rote learning and memorising facts without deeper conceptual engagement, meaning learners may not understand how these facts fit into the bigger picture or link them with other relevant information. In contrast, deeper learning involves linking higher-level ideas and concepts together, resulting in longer-term retention and more

meaningful understanding. In deeper learning, learners focus on central arguments and concepts as opposed to a specific example or assessing independent facts (Houghton, 2004, pp. 9-11; Ramsden, 2003, pp. 42-43). GBL aligns with many of the principles of deeper learning because it encourages learning through active interaction, assists learners in connecting different components of knowledge or information, allows learners to make mistakes without penalty, rewards effort, embeds learning content in real contexts, and promotes an interest in the subject matter (Houghton, 2004, pp. 9-11; Ramsden, 2003, pp. 42-43). Thus, it is arguable that video game players engage in the sorts of active interactions implicit in GBL that help them to engage more actively and meaningfully with content they are deeply passionate about, thereby promoting deeper forms of learning (Houghton, 2004, pp. 9-11; Marton & Säljö, 1976, p. 7; Ramsden, 2003, pp. 42-43).

The intention of this section was to briefly examine experiential learning within the context of video games and draw attention to the lack of GBL in formal adult education. Earlier in the chapter, the term "procedural rhetoric" was introduced to describe how we learn through interactions with processes; in this case, those within video games (Bogost, 2007, pp. 28-29). Gee's (2005, 2008b; 2003, 2011, 2014) work provides considerable insight into this area as it shows games can encourage the development of unique methods of learning and teaching, by placing players in a context where they must use different tools to solve problems. The outcome of this is the promotion of experiential learning (2005, 2008b; 2003, 2011, 2014) and perhaps deeper forms of learning (Houghton, 2004, pp. 9-11; Marton & Säljö, 1976, p. 7; Ramsden, 2003, pp. 42-43). Other research has shown how the implementation of suitable edutainment games within adult education contexts could be increased by focusing on the learning potentials offered by COTS games, including modded COTS games, similar to those in the military simulations of *Darkest Hour* (Darkest Hour Team, 2011). This section has established the educational value of COTS games and, in

particular, Grand Strategy games, supporting the focus of this thesis on *EUIV* (Paradox Development Studio, 2013a). The next section will delve more deeply into the specific characteristics and history of Grand Strategy, which finds its origins in physical wargames, to illuminate *EUIV*'s potential as a learning tool for adult education.

2.3 The History, Transformation and Difficulties of Physical Wargames

Figure 2.5. A historical physical wargame where a Macedonian army faces off against Roman forces (The Hall of Heros, 2010).

Wargames today are often played in both physical[6] and digital forms, with the former being the most common within the genre. Physical wargames are played between two miniature armies (or tokens) fighting for domination of a battlefield (*Figure 2.5*), and while wargames are now frequently played in a digital form, the physical form has a longstanding tradition and history that can be analysed in order to shed light on the newer digital phenomenon. Before conducting such an analysis it is important to examine several

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[6] Physical wargames are also referred to as table-top, manual or board wargames.

definitions of "wargame" to provide an understanding of the underlying concepts associated with the genre. Dunnigan (1997) believes a wargame is a combination of "game", "history and science" and that it is essentially "glorified chess" (p. 13). Perla (1990) defines a wargame as "a warfare model or simulation, not involving actual military forces, and in which the flow of events is affected by and in turn affects, decisions made during the course of those events by players representing the opposing sides" (p. 274). Sabin (2015b) states that wargames usually have two core characteristics: first, they have an "underlying mathematical model of reality" that simulates a war, which may include variables such as terrain, the military forces utilised, timing, and so on (p. 331). Second, wargames involve an "iterative set of active decision inputs by one or more players to guide the simulated action of the combatants", which they also respond to in the course of the game in order to win (Sabin, 2015b, p. 331). Gush and Finch (1980, p. 13) argue that a wargame is at the very least "a competitive game, and a simulation of an actual or hypothetical "real-life" situation" that involves a high degree of chance (p. 13). Further to this, physical wargames involve a level of physicality similar to moving pieces on a chessboard. Hence, this thesis defines a wargame as employing a combination of history, mathematics, science and chance to depict or model war in some form.

While the precise earliest purpose of playing wargames is unknown, there are several suggestions as to how wargames may have originated. As previously discussed, wargames have been used extensively during military operations, where they serve the purpose of assisting members of the military to plan strategies, instruct illiterate troops, and emphasise troop movement, as well as acting as a symbolic device for re-enactments of war, for a religious purpose, for leisurely playful simulations, or for competitions (Weiner, 1959, pp. 2-3). Similarities between the play aspect of wargames and real wars are embodied in the notion of war as a "noble game" (Hugues & Hildenbrand, 2009, p. 19; Huizinga, 1949, pp.

101-104). This concept refers to the rules that combatants in a war are compelled to obey, which have influenced the formation of societies, international law, and are similar to the rules that govern wargames (Huizinga, 1949, pp. 101-104). However, he suggests the idea of the noble game cannot to any great extent depict the bloodiness of war, and because of this, the "noble game" concept remains in the realm of games and social fiction. Despite, the whimsically notion of the "noble game", wargames have been used throughout history to plan strategies and represent war and its complexities.

Many cultures have designed wargames using different systems and forms, each adding their own socio-cultural view and interpretation (Mukherjee, 2015, p. 95; Perla, 1990, pp. 15-16; Setear & Lastowka, 1999; Tzu, 2003). It is unclear how long wargaming has existed, or when it was first invented (Perla, 1990, pp. 15-16). One belief is that Sun Tzu, author of the *Art of War*, invented the first known wargame, *Wei Hai*, which shares similarities to the older Chinese strategy game *Wei Qi* (in Chinese) or *Go* (in Japanese) (Perla, 1990, pp. 15-16; Shotwell, 1994, pp. 29, 48 & 50; Tzu, 2003). Some sources cite *Chaturanga*, thought to be the predecessor of chess, as the first wargame. *Chaturanga* was created in India during the 7th century and had pieces representing different divisions of ancient armies playing out a battle narrative similar to chess (Mukherjee, 2015, p. 95; Setear & Lastowka, 1999). While the Romans played *Latrunculi*, which was also similar to chess and draughts, *Chaturanga* extensively used military terminology throughout the game, which *Latrunculi* did not. Other sources suggest the first real documented wargame was *The Battle of Numbers*, which is still in existence (von Hilgers, 2012, pp. 1-3). *The Battle of Numbers* was created in Europe in around 1100AD, and was a game where odd and even numbers on opposing sides battled one another. Military etiquette and rules were integrated into *The Battle of Numbers*. For example, if the game unit, called the "pyramid", was taken, all units under its control were deemed null (von Hilgers, 2012, p. 10). This aspect of the game relates

back to a chivalric notion whereby, if the standard-bearer fell in battle, all soldiers under the standard-bearer would surrender. These original and rudimentary forms of wargaming, each positioned within a particular culture and time, thereby reflected tactics, low-level strategy, and simplified versions of the rules of warfare, which were then expanded upon in the development of later physical wargames.

Following the suite of ancient wargames came more complex variations that usually followed the pattern of chess. For instance, *Koenigspiel,* invented by Christopher Weikhmann in 1664 in Ulm (modern day Germany) was an expanded version of chess (Setear & Lastowka, 1999). In 1780, another German named Dr C.L. Helwig built on Weikhmann's game to create a version of *Koenigspiel* with 1666 squares and more than 200 unique military game pieces. However, it was not until the German *Kriegsspiel* games (a modern variant of *Koenigspiel* shown in *Figure 2.6*) were created in the 17th and 18th century that wargames would transcend from operating within squares to realistic terrain, becoming games where a designated umpire and military experience determined the outcome. It was the Prussian Lieutenant Reiswitz who would truly develop a wargame for a practical military application that had more complex rules than those that had come before it (von Hilgers, 2012, p. 13). Reiswitz's wargame was first implemented within the Prussian army, but then spread internationally to be utilised by other European militaries (von Hilgers, 2012, p. 13). Wargames during this period evolved into more realistic and complex simulations of the battlefield.

Figure 2.6. A recreation of the original Kriegsspiel shows a map, army pieces, dice and measuring instruments (Kirschenbaum, 2016).

During the Second Boer War (1899-1902) between the British and Dutch settlers in southern Africa, it was noted the British made use of wargaming to determine strategy, but quickly dropped the practice after facing the unconventional warfare methods of the Boers (Kainikara, 2003, p. 8; Thomson, 1962, p. 50). This change in practice partly occurred because the British wargame version did not incorporate psychosocial and political variables; nor did their practice cater to the unquantifiable strategic aspects of war. Following this decision, the British did not utilise wargaming again for nearly 50 years. In order to be useful in the new strategic world of modern warfare, which was less rule-driven than that before it, wargames needed to progress from being purely tactical and operational to encompassing higher-level strategy (Caffrey, 2000, pp. 44-45; Perla, 1990, pp. 109-110).

After the German defeat in WWI and during the lead up to WWII, the German army used wargames to test military tactics and strategies. As a result, the military strategy of

Blitzkrieg ("lightning war") was created (Caffrey, 2000, p. 41), whereby a mobile army would overwhelm their enemy for a fast victory (Fanning, 1997, p. 283). During WWII the German military continued to use tactical wargames; however, Hitler stopped the use of strategic wargames, preferring to make strategic decisions himself (Caffrey, 2000, p. 43). The Japanese, who also participated in WWII, used wargames that projected attrition with precision, but their games did not consider political factors and this impacted on the success of the translation from game to real warfare (Caffrey, 2000, pp. 44-45). The major tactical Japanese victory at Pearl Harbour was a product of trial and error through wargaming; however, the failure to factor in political elements meant Japan eventually surrendered to the United States (Caffrey, 2000, pp. 44-45). Consequently, the Japanese tactical victory could be considered a strategic defeat (Caffrey, 2000, pp. 44-45). This example illustrates the changing features of wargames in WWII and the importance of factoring in both tactics and strategies into modern wargames.

While the Germans and Japanese experimented with wargames before WWII, it was not until the end of WWII that a new breed of wargames began to emerge, known specifically as Political-Military wargames (Perla, 1990, pp. 109-110). These were a response to the failings of previous wargames due to their primary focus on tactics and battlefield variables rather than the more abstract social and political aspects of strategy (Perla, 1990, pp. 109-110). Around this time the board game *Diplomacy* (Calhamer, 1959) was created, which was based around the conflict of WWI. *Diplomacy* incorporated elements of chess, negotiation, geopolitics and economic objectives (Calhamer, 1974), and reflected the changing nature of wargames, shown in *Table 2.1*. This table lists the factors that began to be more widely included in wargaming, including political and non-military considerations. Some of these changes arose as a result of political figures critiquing military operations for their lack of focus on political factors; for instance, U.S. President Kennedy criticised his advisers after

the failure of the Bay of Pigs Invasion of Cuba, believing they did not adequately consider the political aspects of their plan (Caffrey, 2000, p. 48). This criticism prompted the integration of political aspects into wargaming at the Pentagon and at American military schools (Caffrey, 2000, p. 48). In 1998, during the Clinton administration, the administration used wargames to simulate a biological terrorism scenario which influenced the decision to bring forward a policy submission that substantially expanded the counter-terrorism budget (Perla & McGrady, 2011, p. 114). Following this, in 2001 the US government and policy studies academics ran a highly simulative joint biological terrorism wargaming exercise, as shown in *Figure 2.7* (O'toole, Michael, & Inglesby, 2002). This exercise was used to understand any potential policy challenges that might have resulted from a biological terror attack (O'toole et al., 2002). In these ways, wargames had out of necessity evolved from tactical and small-scale operations to a much higher-level Political-Military utilisation, thereby adapting to the changing nature of war.

Table 2.1. *Types of factors to consider in different wargames, based on Weiner's (1959, p. 13) wargames chart.*

Types of Factors Included in Simulation	Type of Conflict Simulation			
	Duel	Battle	Campaign	War
Resources	X	X	X	X
Objectives	X	X	X	X
Military Intelligence	X	X	X	X
Environmental Characteristics		X	X	X
Background Information		X	X	X
Logistics			X	X
Economic			X	X
Psychological			X	X
Political				X
Additional Sides				X

Note. Several non-tactical factors in the 'War' column can be included in wargame simulations depicting higher level factors in a Political-Military wargame (Weiner, 1959, p. 13). While non-tactical factors such as Economics and Politics come into play, the Political-Military wargame still focuses on the outcome of winning a war.

Figure 2.7. Mock news anchor reports on the rising number of civilians affect by the escalating biological threat as a part of a biological terrorism wargaming simulation developed between the U.S. government and policy studies academics (Centre for Health Security, 2012).

In contemporary military contexts, wargames are used in two ways (Kainikara, 2003, pp. 12-13). The first is for high-level analysis, which is employed to help formulate and experiment with national security and defence policy before implementation (Kainikara, 2003, pp. 12-13). At a lower level, wargames are used to help officers in decision-making processes, assessing current and future combat abilities, and ascertaining resource requirements, including finances, technical requirements and personnel (Kainikara, 2003, pp. 12-13). The second use for wargames is to educate officers in high-level decision-making and to consider more unquantifiable factors such as social issues (Kainikara, 2003, pp. 12-13). Military experimentation is important in military decisions and advancements as it allows for innovation and transformation without any significant large-scale production, while also

prompting reflection and the formulation of solutions to counter emerging threats (Kainikara, 2003, p. 13). In these ways, wargames depict visual, strategic and interactive representations of war, and Grand Strategy games, which follow contemporary wargames, similarly depict visual, strategic and interactive representations of war history that might be utilised for educational purposes.

This brief history has demonstrated the utilisation and usefulness of wargames in the military to train officers, formulate strategies and play out historical scenarios. However, as Sabin (2015b) argues, wargames could also be applied in academic contexts with a specific focus on history because they can represent historical information and scenarios and can thereby be used as educational tools (Sabin, 2015b, p. 341 & 344). Sabin (2015b, p. 338) believes that when historical wargames are used to teach a balance must be struck between creating a rich, realistic experience and a simple, quick and deliverable wargame (p. 338). In a similar discussion of history and video games, Elliot and Kappell (2013, p. 5) suggest there are two types of history: one comprised of hard facts, names and dates, the other a *narrative* created using facts, names and dates (p. 5). Complex wargames often express historical detail in the form of intricate details, facts and dates, while more simple wargames focus on conveying higher-level narratives of the conflict. Another aspect that impacts upon the historical character of a wargame is the game's historical coverage, including the timespan and different histories of the world it represents. Historical coverage gives the player considerable insight into different world histories and the transition and importance of historical periods and eras. Hence, I suggest when creating wargames for educational purposes, the educator needs to consider historical *breadth* in terms of the coverage of time and histories. Educators also need to consider *depth* in terms of macro-level historical narratives, as these are more comprehensible than the micro details of history, which are

more historically rich. This *breadth* and *depth* will be further discussed in Chapter 4 in the context of *EUIV*.

Perla and McGrady (2011, p. 127) suggest wargaming participants will best learn history through games that convey a compelling narrative (p. 127). However, unless there is an umpire with intimate knowledge of the original wargame narrative, scenario or rules, there will of course be some variation between games and a divergence from the real-life battle (Gush & Finch, 1980, p. 83 & 87). For example, a weapon may have a different range of shot in the game or vary in the amount of damage dealt compared to its real-life characteristics. Given these ahistorical variations, it is easy to dismiss these counterfactuals[7] or simulations as irrelevant or historically inaccurate. This begs the question, why might a player want to play history differently or inaccurately (Carr, 1961, p. 97)? As Ferguson (1997) explains, if a simulation plays out within realistic historical parameters and is couched in history, there is still educational value relating to history to be found in such simulations (pp. 87-88). Wargames often attempt to simulate events within realistic parameters, and are therefore very efficient in exploring the many variables that contributed to the occurrence of a given event (Sabin, 2015b, p. 333). These variables are often neglected in higher level and linear accounts of history that focus on exactly what "happened". Playing with these variables in a wargame gives the player key insight into the contingencies and practicalities of real military operations and situations encountered in real life.

This short history of wargames has shown how they have evolved from elementary physical games using tactics to more complex, higher-level Political-Military strategy games that encompass a large number of variables and calculations. Even more complex variables and historical content have been integrated into Grand Strategy games. Hence, for the

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[7] As discussed in the previous chapter, a counterfactual is a depiction of history that may have occurred if the outcomes of historical events were different (Ferguson, 1997, p. 2). That is to say, they ask 'what if' questions about a particular historical event.

transition from tactical wargames to more complex Grand Strategy games to occur, a move from a physical to a digital platform needed to occur, as will be discussed in the next section.

2.3.1 The Complexities of the Physical Wargame and Improvements through Digitisation

As the previous section showed, there are real benefits to using physical wargames to represent history, which may have significant outcomes for learning, including in higher education contexts. However, Sabin (2015b) identifies several problems with using physical wargames in education that relate to the *time*, *expertise* and *resources* needed to play a game (pp. 337-338). Wargames consume a lot of *time* during gameplay, given the different phases of the game, including moving, attacking, mobilising defence, and general strategising. It is common for these games to take several hours or more to play. Sabin (2015b) suggests *expertise* is another issue as these games can become extremely complex given the rules and mathematical calculations used to determine the combat outcome (pp. 337-338). In the past, an umpire or expert was needed to guide the game, particularly if the game and its rules were complex and detailed (Gush & Finch, 1980, p. 87). Sabin (2015b) notes *resources* are another constraint associated with creating and playing physical wargames. Players are one such resource, as often two or more are necessary to play the game; further, an expert or umpire is often involved as well to guide the game. Sabin (2015b) also notes that in contrast to physical wargames, digital wargames may require even more resources, as hardware requires upgrades. Added to this can be the need for programming skills and knowledge, should the user wish to mod the game (Sabin, 2015b). Sabin (2015b) proposes several ways to assist in this balancing act and alleviate the impact of some of the issues discussed above. These include:

- First, encouraging players to resolve the difficulties of some wargames by creating their own physical wargames, building upon other wargame designs and reflecting this in the wargames they create.

- Second, dedicating time to play a variety of wargames to understand the primary operational and strategic aspects of wargames, particularly in relation to how they may actually depict real life.

- Third, creating wargames that are very simple and quick to play so students will not need guidance or an umpire to direct them, thus allowing for multiple simulations to be played to develop familiarity with wargames.

- Last, using digital games, such as first-person shooters (but not digital wargames), which are easy to learn and can convey the individual experience and speed of battle better than a physical wargame (pp. 338-340).

Sabin's (2015b) solutions are sound; however, he does not acknowledge that digital wargames could also be used to resolve many of the issues of physical wargaming. Sabin (2015b) considers digital wargames too complex for an educational setting, instead preferring smaller, more simple board wargames (p. 339). He notes digital wargames do not offer a universal solution as computer programs are set in a particular context or could be complex to create and argues that because of this, it is better to focus on simple tailored physical wargames (Sabin, 2015b, p. 341). Sabin (2015b) also believes there is a greater focus on computer graphics than content in commercial digital wargames, which he views as an issue in terms of its educational implementation (Sabin, 2015a, p. xx). In contrast to his view, I argue that the translation of wargames to a digital platform has made many elements of wargames more efficient, providing a solution that reduces the expenditure by the players while achieving a desired pedagogical result that wargames can provide, primarily through savings on *time, expertise* and *resources*. The next sections will address each of these factors and explore how the transition from more traditional wargames to digital Grand Strategy video games has improved the overall historical wargaming experience.

2.3.1.1 Time

Similar to physical wargames, digital wargames may require many dedicated playing hours during one sitting for noticeable progression. However, all moves, battle engagements, phases and outcomes are computer calculated, making the play much quicker. Pens, paper and calculators are not needed as battles are resolved in a matter of seconds. Yet a digital wargame still maintains the tactical complexities of its physical predecessors, as shown in *Table 2.2*, taken from the *EUIV* Wiki. This table illustrates the complex mathematical formula used by *EUIV* to determine the winner of a battle between attacking and defending armies, which factors in leadership, terrain and army combat statistics. Furthermore, the ability to save a game and then return to it at a later time means players no longer need to continue playing for extended periods, or forfeit the game altogether. Indeed, there is considerable time efficiency as large and numerous calculations are not required for the game to nonetheless achieve more complex simulations.

Table 2.2. *Hidden equation in EUIV used to calculate dice roll results variable in battles (EUIV Wiki).*

$$D_{result} = D_{roll} + Ls_{Atk} + Up_{Atk} - Ls_{Def} - Up_{Def} - T_{mod}$$

Symbol	Variable	Description
D_{result}	Die results	The total calculation of the die roll results.
D_{roll}	Die roll	A random number between 0-9, rolled for each entire side at the beginning of each phase.
Ls	Leader skill	The leader skill for that phase (Fire or Shock).
Up	Attacking unit attack pips	Pips for the attacking or defending unit for the current phase, or Morale pips if computing morale damage.
T_{mod}	Terrain modifiers	Harsh terrain may give a penalty to the attacks of the attacking army.
Def	Attacking	Signifying the attacking player.
Atk	Defending	Signifying the defending player.

The notion of the "black box" is a concept drawn from the technical and social sciences that can help us understand the temporal efficiencies offered by Grand Strategy video games. The term "black box" refers to:

> a device or system that, for convenience, is described solely in terms of its inputs and outputs. One need not understand anything about what goes on inside such black boxes. One simply brackets them as instruments that perform certain valuable functions (Winner, 1993, p. 365).

In a similar process, Grand Strategy games take the important details, actions and strategies input by the player to produce an outcome and gameplay. The game "black boxes" the unnecessary and laborious calculations, maths and measurements, streamlining the player's wargaming experience (Winner, 1993). Through black boxing, the focus of a wargame shifts away from its mathematical and scientific origins (Dunnigan, 1997), and towards its subject matter. The player is then able to focus making the more interesting and important decisions of strategy formulation and historical engagement. Black boxing may also increase the potential audience for wargames, as players disenchanted by physical wargame requirements of mathematical calculations may be attracted by the game's purely historical focus. By black boxing calculations, a wargame increases the time players have for learning about historical content. In this way, only important details at the tactical level and higher-level strategic factors need to be understood to succeed in the game. The player can then focus on the important details that determine the outcome of a battle, campaign, war or national ambition (Winner, 1993). It is also worth noting that black boxing can be useful as it hides information from the player. Hiding the information from the player can better represent the conditions under which historical actors had to make decisions. These conditions can be useful for historical roleplay because they provide a historical perspective on the factors, environment and processes that led history down one path rather than another. Hence, the primary focuses

of wargaming using a black box are the inputs made by the player and the outputs made by the historical simulation.

Digital wargames are complex and past studies have shown children and adolescents have difficulty understanding them (Egenfeldt-Nielsen, 2005, p. 206). However, newer computer versions of these wargames have intuitive and streamlined Guided User Interfaces and are able to present (as well as hide) large amounts of information without simplifying the game rules or mechanics, or over burdening the player with too much information. Yet the player must still understand the variables that contribute to combat, such as terrain, attrition and morale, otherwise they will be faced with defeat. These savings on a tactical level allow the player to focus more time on strategic variables as well as giving them a much fuller historical experience. Thus, newer games achieve *time* efficiency as the user is steadily provided with and guided towards information rather than over-burdened with a substantial amount of information at once.

2.3.1.2 Expertise

In regards to expertise, Sabin (2015b) concedes that digital wargames can be played without any reference to rules (pp. 337-338). He further notes digital wargames are more complex than physical wargames and that modifying digital wargames requires specialist programming skills that many humanities students and educators may lack (Sabin, 2015b, pp. 337-338). Contrary to Sabin's (2015b) assertions, it is arguable the expertise required for video games in terms of calculating outcomes are self-contained in the game, and that no outside expertise is required to play, perform or umpire the game, as is the case in physical wargaming. Rather, the player can learn history by focusing on the strategic and tactical factors revealed within the game. Furthermore, challenging Sabin's (2015b) argument that players need to have programming skills (pp. 337-338), there is evidence such skills may not be necessary for players to be able to simulate different scenarios, given the content and scale

of some digital wargames. For example, *EUIV* covers over 350 years of history in detail, with its main focus being European history, showing great scope for many different scenarios (Paradox Development Studio, 2013a). The level of difficulty of the programming skills required to change the game depends on the game being modded, with some games being easier to mod than others. Newer Grand Strategy games, such as *Hearts of Iron IV* (Paradox Development Studio, 2016b), are very mod-friendly, with guides from the developers and comprehensive community-produced wikis focused on how to mod the games. In these games, most content is produced in intuitive and editable formats (scripts) to make it even easier for players to mod the game (HOI4 Wiki, 2016; Paradox Interactive, 2016a). Furthermore, *Hearts of Iron IV* has a feature called "modder mode" which enables in-game modding tools and displays additional information to further support modders. Paradox Interactive, the developers of the *Europa Universalis* titles, have even released the Clausewitz Maya Exporter program (Paradox Development Studio, 2016a) for free, which allows modders to export their own 3D models created in Maya (Autodesk, 2019), for Paradox Interactive's games (Paradox Development Studio, 2016a). These in-game features and exporter tools are quite valuable for players as they allow them to easily create their own content, making the game highly customisable. As such, while some Grand Strategy video games require complex programming skills and are less customisable, other companies have made it much easier for players to modify games and create their own content, while also providing support for ease of modding.

One typical characteristic of a Grand Strategy video game like *EUIV* is the steep learning curve or level of expertise needed to understand the game (Paradox Development Studio, 2013a). Given this, it could be argued that physical wargames, especially those Sabin (2015b) describes as "quick, simple and deliverable" wargames (pp. 338-340), are far more efficient as learning tools. However, *EUIV* could be likened to other complex software that

requires a significant time investment yet ultimately yields greater benefits; for example, writing by hand versus writing in MS Word (Microsoft, 2013c), or calculating statistics by pen and paper versus SPSS (IBM, 2015). Usually, once the intricacies of software have been learnt, the computerised equivalent for each process is typically more streamlined, efficient and accurate. Indeed, after a while a rhythm is developed, and working with the software becomes second nature. Consequently, the player can then focus on learning the historical complexity and richness a game like *EUIV* has to offer. Therefore, the effort required to develop this *expertise* can ultimately provide greater efficiency in rich historical detail over the long-term than physical wargames.

2.3.1.3 Resources

Digital wargames are less resource intensive and have a greater ease of access for the player than physical wargames because they utilise computers rather than boxes of models, boards and rules. The physical space required to play and store the physical wargaming material is also vastly greater than the space a computer requires, which also has a multi-purpose function for both gaming and non-gaming purposes. Simpler wargames using only tokens and sheets of paper exist, but typically the rules and historical depiction will be simplified as well. Computers also provide greater ease of access to *EUIV* and many other digital wargames that can be downloaded from Steam (Valve Corporation, 2003) (a computer game client) and other digital distribution systems. Certain computer hardware specifications are required for the game, and because technology can quickly become obsolete, upgrades are often required to play newer versions of games. However, Grand Strategy video games generally do not require high computer specifications (Paradox Interactive, 2016b) compared to the technical specifications of other contemporary genres of computer games, such as *Far Cry 5* (Ubisoft Montreal, 2018) a first-person shooter which places players in a highly detailed and visually impressive world (Ubisoft Support, 2018), thus making them more

financially accessible. Further, the base game of *EUIV* is financially accessible at around AUD $50 on release, with additional expansions purchasable for affordable prices. The developers also frequently update *EUIV* at no additional cost. Thus, there is resource efficiency associated with Grand Strategy games like *EUIV*, namely in terms of cost, computing space and hardware, compared to the physical materials and space required for physical wargames. Moreover, there is also resource efficiency in terms of the distribution and replication of the software via computers and the internet compared to that of physical wargames.

Furthermore, Grand Strategy games rely on forms of Artificial Intelligence (AI)[8] that mean the game can be played by a single player. In *EUIV*, AI components are computer-controlled players or nations that act as opponents in the game. In contrast, in a physical wargame, other human players are often required to play the role of other opposing nations. While single player wargames do exist, they lack the social element of multiplayer wargames and may not match the competitive experience of a real opponent. An endless number of simulations throughout history with the many nations that existed within that time period can be played in a digital game, without the need to tailor-make every scenario, as is the case in physical wargames. Grand Strategy video games can also be further customised by downloading mods or through player-developed mods created with the help of online guides and modding tools that are easily accessible via the internet. Thus, Grand Strategy video games are more efficient than physical wargames as they require fewer resources such as other players and physical materials. They are also more efficient because they provide more resources and increased accessibility with little effort or cost. A single game thereby

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[8] The thesis defines Artificial Intelligence as "agents that receive percepts from the environment and perform actions" (Russell & Norvig, 2016, p. viii). In a gaming context, these agents receive information from the player and perform actions in response.

efficiently captures a wide range of scenarios and has easily accessible modding tools should further customisation be needed.

2.3.1.4 Overall Benefits of Digital Wargames for Learning

This section has shown that in physical wargames there is a trade-off between accuracy and simplicity in terms of the time, expertise and resources required to undertake the game. In contrast, digital wargames such as Grand Strategy video games offer historical richness and complexity while automating and simplifying the tedious aspects of wargaming. Hence, Grand Strategy video games are more technically, financially, and physically accessible, which increases their potential for use in adult education. *Table 2.3* illustrates the full advantages and disadvantages of both physical and digital wargames based on resources, expertise and time. As argued, it is clear Grand Strategy video games can mitigate several physical wargaming efficiency issues relating to *time*, *expertise*, and *resources*. The shift from physical to digital wargames is not just driven by a desire to reflect greater historical and strategic complexity, but by a need for greater practicality and efficiency. However, while digital wargames are able to overcome many of the efficiency and practical issues that could impact their use in education, issues exist in terms of their historical accuracy, accessibility and inclusivity, which will be discussed in the next section.

Table 2.3. *Comparison between the characteristics of physical and digital wargames, showing the advantages and disadvantages.*

Characteristics	Physical Wargames	Digital Wargames
Easier to setup and play straight away	✓	✗
Modifiable without computer literacy skills	✓	✗
Removes player need to perform calculations and dice rolls (automated calculations)	✗	✓
Run complex simulations without need for calculation of large amounts of variables	✗	✓
No other human player required to run simulation while still playing against an opponent	✗	✓
Vast number of scenarios and content contained in a singular simulation	✗	✓
No simulation expertise or knowledge needed to play, manage or umpire game	✗	✓
Mobility and ease of access via the internet	✗	✓
Highly compact materials for storage	✗	✓
Overall more cost effective to setup, maintain and run	✗	✓

2.4 Grand Strategy Video Games: Accuracy, Accessibility and Inclusivity

The historical accuracy, accessibility[9] and inclusivity of Grand Strategy video games have been analysed by a number of GBL theorists who recognise the genre's potentials and limitations for learning based on these three factors. According to Elliot & Kapell (Elliot & Kapell, 2013), video games typically convey history using two techniques (p. 5) 1) by using

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[9] For this thesis accessibility refers to the ease of gameplay and access to the game's engaging gameplay, especially the learnings and experiences that come from this engagement.

accurate factual information such as exact and detailed historical facts, name and dates (e.g., in a pop-up game text window), or 2) by including historical elements in the narrative of the history that is revealed through gameplay (e.g., a game mechanic that reflects colonial settlement of the new world). These two techniques can each play a role in terms of how accurate, accessible and inclusive the games may be.

The *Civilisation* series (Firaxis Games, 2001, 2005, 2010, 2016) incorporates a wealth of historical content into their games (Squire, 2011, pp. 23-24); however, the games have been criticised for their historical representations, and thus usefulness as an educational tool (Friedman, 1999; Galloway, 2006). For example, Galloway (2006) believes that little accurate historical content exists in *Civilization* and games like it, and the history in these games is merely created by a series of algorithms with no authentic reflection of historical facts (p. 103). Galloway (2006) further argues that *Civilisation* players do not necessarily learn about history, but rather the algorithm. In a similar vein, Friedman (1999) asserts that once the player has mastered the algorithm they will lose interest in the game and that game's, by their very nature, are designed to be mastered (p. 146). However, McCall (2012) explains how historical games present an opportunity to engage in history through problem spaces. These problem spaces allow the player to gain a sense of the plethora of possibilities of the past, learn the constraints and affordances that determine human actions and develop strategic problem-solving skills. Kee (2011) would suggest games are useful depending on what it is you want to teach about history. Kee recommends matching your educational aims with an appropriate game as each game has different educational affordances.

A further concern relating to historical video games is the potential for players to distrust the accuracy of the game's historical content when they perceive there to be a conflict between historical accuracy and the commercial entertainment value of the game. For example, O'Neill and Feenstra's (2016) research on the game *Medal of Honor* (DreamWorks

Interactive, 1999) found that participants did not believe they were learning about history from the game, unless they were told verifiable historical facts. Indeed, the study showed participants considered the historical realism of the *Medal of Honor* game as "absurd, pointless or naïve" (O'Neill & Feenstra, 2016). The depictions of collectible medkits and lack of real gore were cited as evidence that the game did not depict history accurately (O'Neill & Feenstra, 2016). Moreover, their participants also perceived the developers had commercial motivation to sensationalise and warp history to increase sales (O'Neill & Feenstra, 2016). However, a critical stance of a game or historical medium could in fact be a generally desirable way of thinking for history students. It is the extent that these students are potentially so critical as to dismiss games altogether that is problematic. Hence, the participants harboured distrust in the accuracy of historical content in games because of an apparent lack of realism and accuracy as well as commercial motivation.

Similarly, work by Campbell (2008b) also suggests that historical games, such as first-person shooter WWII games, are not simulations of actual events (p. 187 & 198). Rather, they simulate heroic war stories or films, thereby acting as historical recreations of other historical recreations. Campbell (2008b) argues this is the case because these games do not encompass all aspects of WWII history; for instance, they do not portray the horror or scale of the war, and focus on using history to create a playable game rather than simulating accurate historical combat (Campbell, 2008b, p. 187 & 198). Similarly, Wackerfuss (2013) argues realistic historical simulations can hinder gameplay (pp. 241-244). Wackerfuss (2013) gives the example of WWI flight simulations which, if accurate, would mean players would be met with constant death throughout the game, as would occur in real life WWI flights (pp. 241-244). Such experiences may be realistic, but are not necessarily entertaining, and in some instances are frustrating; this might mean players do not engage with the game mechanics and choices, and act in opposition to the objectives of the game, thereby learning little about

history as a result (Wackerfuss, 2013). As such, when considering the educational potential of games, it is evident there needs to be a balance of enjoyable gameplay and historical accuracy. It may therefore be more valuable to convey narratives or overarching themes related to history rather than technical or historical accuracy, if players are to learn from the game. Salvati and Bullinger (2013) also argue games such as *Call of Duty* (Infinity Ward, 2003) do not portray realistic historical events; rather, they reflect the content of the blockbuster movies that inspired them (p. 157 & 163). However, the authors believe games such as these nonetheless simulate various elements of history with a degree of authenticity through various game components, including the depiction of weapons, cinematic cut-scenes and narrative delivery (Salvati & Bullinger, 2013, p. 157 & 163). Similarly, Dow (2013) argues that although specific details of architecture reflected in *Assassin's Creed II* (Ubisoft Montreal, 2009) are often inaccurate, they do nevertheless conform to a historical interpretation and sentiment of Florentine architecture (p. 216 & 227). Dow (2013) notes this is a valid historical representation because architecture such as this is often appropriated from the Renaissance, which itself was an interpretation and appropriation of Roman ideas and culture. Thus, Renaissance architecture was not an exact recreation of Roman architecture but rather conveyed a broader idea, narrative and sentiment of history (Dow, 2013). In a similar fashion, it is arguable that no historical representation, including those in video games, could ever be taken as an exact recreation; rather, it will always be a reinterpretation developed by the creator. It could therefore be noted that such forms of appropriation and reinterpretation do not diminish the educational value of such games, but can instead help impart elements of historical knowledge to the player that are, at some level, accurate.

Extending upon these ideas, Chapman (2013) is very positive about how history is depicted within historical video games, contending that games are legitimate forms of history as much as the historical narratives written well before them (pp. 322, 326-328). Chapman

(2013, 2016) argues games such as *Civilisation* follow a similar path to historical literature and can communicate historical narratives through player interactions and immersion within the historical world. Similarly, Squire's (2011, p. 113) study, which focused on children and adolescents who played *Civilisation III* to learn about world history, found that games such as *Civilisation III* are effective at highlighting key themes and influences in history rather than just specific events or facts (Squire, 2011, p. 23). In a similar vein, Elliot and Kapell (2013) claim we should not ask whether a video game is able to represent precise historical facts or recreate history; rather, educators should focus on how a video game meaningfully engages with history and the significance of that engagement (p. 9).

The studies discussed above show how historical accuracy in video games exists on a spectrum, and certainly shows the potential of these games to teach elements of history. However, in questioning such historical accuracy, it is also important to note that the accuracy of in-game representations of history may differ depending on whose viewpoints or narratives are being represented. As such, discussions around historical accuracy must also ask the question: "accurate to whom?" This is turn raises questions about culture, marginalisation and inclusivity, primarily connected to the fact that Western perspectives have typically dominated Strategy video games (Dillon, 2008; Ford, 2016; Friedman, 1999; Galloway, 2006, pp. 91-92; Mukherjee, 2017), meaning they often represent a linear, Eurocentric representation of history that does not include the experiences and narratives of non-Western cultures (Dillon, 2008; Ford, 2016; Friedman, 1999; Mukherjee, 2017; Pobłocki, 2002a, pp. 174-175; Uricchio, 2005, pp. 335-336). For example, work by Poblocksi (2002a) shows the *Civilisation* series (Firaxis Games, 2001, 2005, 2010; MicroProse, 1996) staunchly represents a Western perspective of history and its progression (pp. 174-175). Poblocksi (2002a) argues that while non-Western cultures are represented in the game, the technology tree, which provides in-game bonuses and a measure of progress in-game, is

mostly linear for all the civilisations, and the most advantageous in-game benefits (such as those relating to democracy) are generally associated with Western progression and the history of the United States (pp. 174-175). The in-game characteristics of the nations represented are also biased, with the U.S. being characterised as "friendly" and "civilised" while the Russians are "aggressive" and "militaristic" (Pobłocki, 2002a, p. 169). Moreover, in a radical (and possibly offensive) change of character, Gandhi is portrayed as hyper-militaristic, dropping nuclear weapons on other civilisations. This Gandhi character originally started out as a glitch (a programming error), but then changed to an intended game feature (Mukherjee, 2017, p. 79; Pobłocki, 2002a, p. 169). Lagace (2018, p. 86 & 88) in his examination of various games depicting indigenous people suggests that, while there have been games that reinforce negative stereotypes, e.g. *Mad Dog 2: The Lost Gold* (American Laser Games, 1992), there are also some with positive depictions, e.g. *Never Alone* (Upper One Games, 2014). Similar Western-centric representations occur in many other Grand Strategy games, and the histories of non-Western and Indigenous nations are generally poorly represented. This has clear implications for the educational value of the historical content in these games, which presents only one viewpoint of history.

Other scholars such as Ford (2016) who studied *Civilization V*, Dillion (2008) who studied *Age of Empires III: the Warchiefs* and Mukherjee (2017) who studied many games, but in the specific instance of *Empire: Total War*, describe how, through these various games (especially 4X[10] games), the player is still required to act out imperial, Western and militaristic ideologies. These ideologies are embedded in the game's mechanics which the player must manipulate and embody to win, even if they are non-Western or traditionally

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[10] 4X stands for explore, expand, exploit and exterminate. 4X games typically focus on empire building with the player using economics, technology, politics and their military to expand their empire.

non-imperialistic nations. These ideas and how they are entrenched within the game will be further explored in the discussion chapters.

We can consider historical video games as operating along a gradient, whereby historical accuracy and accessibility (gameplay) are opposite poles (Kapell & Elliott, 2013). At one extreme is a realistic and historically accurate game that is bland and sometimes frustrating, limited by the accuracy it needs to convey. At the other end is a game that, while historically inaccurate, expresses history through an accessible and easily playable historical narrative (e.g. see Kapell and Elliot (2013, p. 5)). As discussed, the latter would appear to be the most effective in conveying history to a wide audience; however, a middle ground may be the optimal solution. It is also arguable that inclusivity provides a third axis to the continuum, as the Eurocentric perspective that dominates much of the historical content within games affects both accuracy and accessibility (*Figure 2.8*). However, there is also evidence that Grand Strategy video games can encourage diverse and inclusive historical content. This potential for inclusivity to exist alongside and challenge the accuracy and accessibility of Grand Strategy video games is what makes them particularly relevant for history educators interested in GBL. The balance between historical accuracy[11], accessibility and inclusivity and its impact on the pedagogical value of Grand Strategy games will be a reoccurring theme throughout the thesis. It is clear that such a balance might harmonise historical realism, accuracy, and the viewpoints of other cultures with engaging gameplay. Interestingly, there are some games that are successful in finding such a balance. For example, *EUIV* is able, at least to some extent, to incorporate more accurate historical events and themes with the historical perspectives of other cultures. Its ability to do so will be examined in detail throughout the rest of this thesis.

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[11] This theme could also be known as gameplay versus historical accuracy, historical details/facts versus narratives, and so on (Beards, 1997; Campbell, 2008b; Kapell & Elliott, 2013; Wackerfuss, 2013).
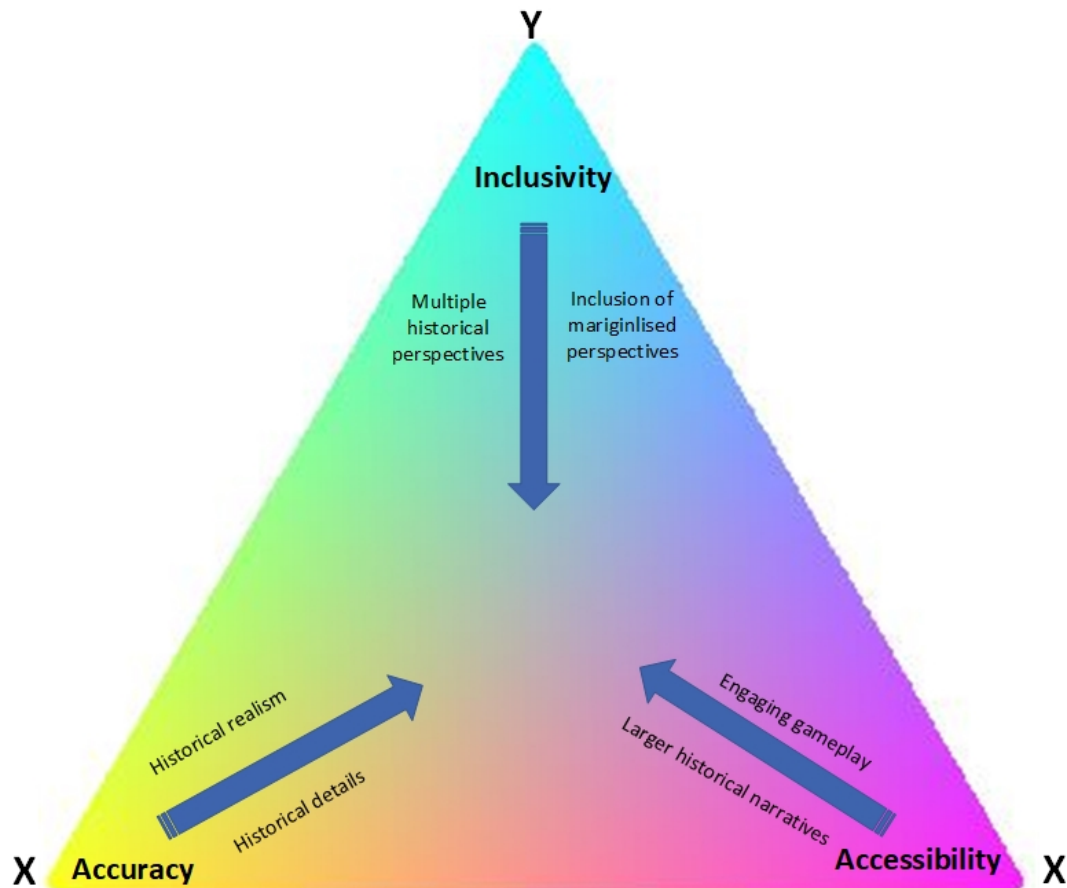
Figure 2.8. A continuum exists between the poles of accuracy and accessibility, represented on the X axis, and inclusivity, represented on the Y axis. This illustrates the tension between historical accuracy and historical narratives that are supported by gameplay. It also shows the importance of accounting for varying historical and cultural perspectives within games.

2.5 Conclusion

This chapter has reviewed existing literature on video games to provide context for a discussion of the use of historical games in education. The review first explored the use of video games for experiential learning, whereby the player learns through "doing" rather than rote learning abstract facts. It is evident video games embody a form of experiential learning as players are asked to take action to resolve in-game problems in a realistic though gamified context. The review showed that few educators have made use of video games in formal adult learning, even though there is demand and potential. Furthermore, the research shows that

serious games (specifically edutainment) are not always successful in terms of their educational potential due to their simplistic design, which does not always engender GBL. The review showed that COTS games may be more effective pedagogical tools than serious games, utilising the increasing popularity of video games in the digital age to engage learners in historical education.

The review then explored wargames as the origins of Grand Strategy, with particular attention to the rise of Political-Military wargames. It showed that both in the past and today, the primary educational uses of wargames have been in the military and universities, though, in the case of the latter, wargames have remained in their physical form (Sabin, 2015b). University educators have not yet taken advantage of the potential of digital wargames to circumvent difficulties around *time*, *resources* and *expertise* while still maintaining rich and in-depth content. It is arguable Grand Strategy games such as *EUIV* could resolve many issues associated with wargaming because they go beyond tactical and Political-Military wargames to become something more complex, shifting the primary focus away from tactical warfare and towards strategic and conceptual considerations. Grand Strategy video games encompass more than war, but also peacetime governance and portray these through a much broader lens of history compared to tactical and Political-Military wargames. Grand Strategy games have unique ways of depicting and embodying history, which will be further explored in Chapter 4. In terms of academic research, these games have been relatively neglected compared to other game genres.

The review finally examined a dilemma in historical video games, that being the balance between representing historical accuracy with an accessible historical narrative, which has a significant impact on engaging gameplay. Exploring this debate inevitably raised the question of *whose* history is depicted in Grand Strategy games, which are generally constructed in terms of Western perspectives of history. In an attempt to further understand

and address these issues, Chapter 4 will explore *EUIV* as an example of a Grand Strategy video game with many qualities that may alleviate the "accuracy vs accessibility vs inclusivity" dilemma and the evolution of wargaming from representing war to broader topics around history. *EUIV* will be examined in terms of how it covers not only a significant historical timespan, but also the perspectives of many different cultures and histories. The study of video games is still an area of recent academic growth, with more research necessary to explore and uncover gaps in the intersection of research into history, culture and wargames, and Grand Strategy games in particular. Investigating these topics will provide insights into how players learn about history using Grand Strategy games, as well as how players engage with history during gameplay and other gaming practices like modding. The investigation will also show how GBL may be applied in history education, and how educators can most usefully implement Grand Strategy games in higher education.

Chapter 3: Method and Research Design

3.1 Introduction

The method and research design employed in this thesis were developed for the purpose of answering the research question: "What can a study of *Europa Universalis IV* reveal about how Grand Strategy video games can be utilised in higher education to teach history?" This chapter outlines how the research was conducted, following the steps represented in the Thesis Research Design Process in *Figure 3.1*. The chapter describes how the initial phase of the research involved undertaking a Formal Analysis, which was used to understand the different game components and their educational value. It then discusses how the Formal Analysis findings helped to situate and design the *EUIV* online forum survey, which was used to obtain both quantitative and qualitative empirical data from the *EUIV* online forum community. The chapter then explains how the survey was specifically used to capture data on how expert gamers understand history in *EUIV,* and to determine whether *EUIV* could promote the learning of history. It will also show how the forum survey data subsequently informed the design of a university case study that analysed both the process of gameplay in a learning context and the behaviour of participants in the study, both in-game and outside of the game. Next, the chapter discusses how a comprehensive evaluation was conducted on all collected data to establish whether playing *EUIV* had helped the participants to learn history, and discusses the multisource triangulation and a mixed qualitative and quantitative method that were used to offset biases and validate the findings. The chapter concludes by explaining how the research method endeavoured to address the research question and sub-questions, ultimately exploring how players' gaming practices and informal learning of history through *EUIV* could be capitalised upon to promote forms of historical learning in higher education.
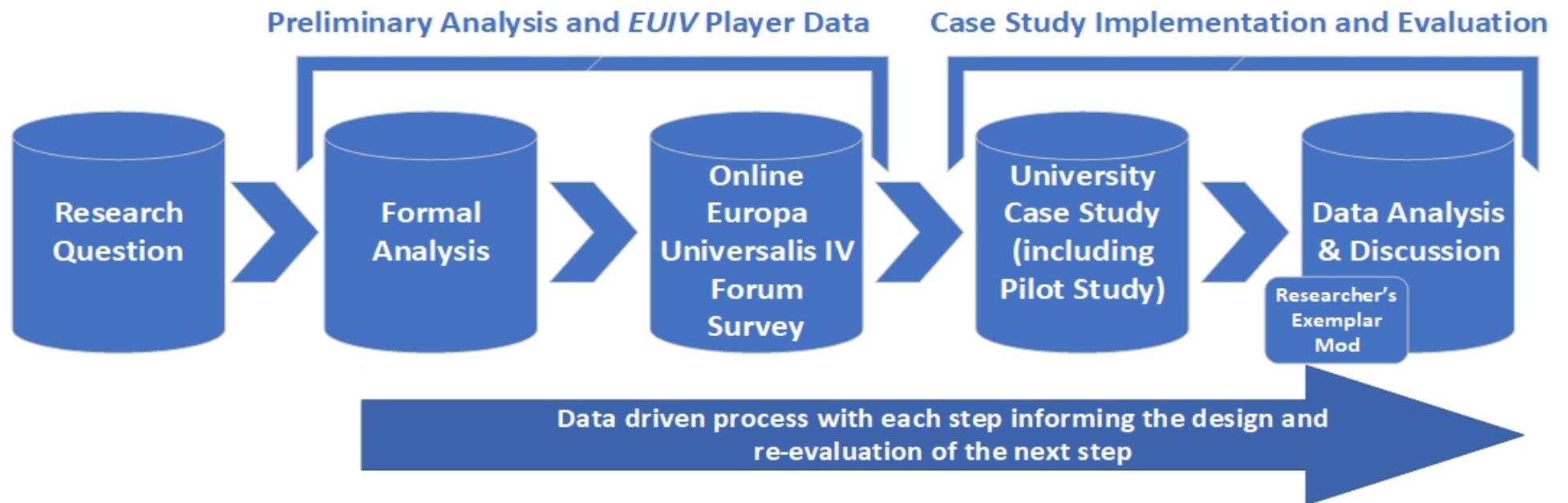
Figure 3.1. Thesis research design process is the roadmap that was used to guide the thesis project.

3.2 Formal Analysis

The initial phase of the research involved undertaking a Formal Analysis and developing a thick description to understand the fundamental game systems and features of *EUIV*. Geertz (1973) argues that thick descriptions provide context for the actions of a person or an object of study (p. 14); thus, a thick description of a game can provide an understanding of the context in which gamers are immersed when they play video games, as well as the actions and behaviours of those players. However, separate to how it is understood and experienced by players, the context of a game (in this case, *EUIV*) needs to be explored in order to give significance to the actions and statements of players (in this case, the participants in this study). The thick description presented in this thesis is slightly different from Geertz's (1973) conceptualisation, which focused on describing people and social interactions "thickly", rather than on describing a particular context independently from people or interactions (p. 14). Furthermore, the study uses a Formal Analysis to analyse the *EUIV*, which involves "studying a game independent of context, that is, without regarding which specific people are playing a specific instance of the game" (Lankoski & Björk, 2015, p. 23). In terms of studying video games, a Formal Analysis could therefore entail a thick description (Geertz, 1973, p. 14; Schrier & Shaenfield, 2015, p. 293) of the game's digital platform without regard to any specific instance of the game as it might be played by people. *EUIV* served as the data source for the Formal Analysis in this thesis, and the researcher accessed and used online *EUIV* wikis to further inform the Formal Analysis. Other authors discuss how to analyse game structures. For example, Uricchio (2005) also discusses and places the depiction of history in historical games on a spectrum, from games like the *Civilisation* series (Firaxis Games, 2016) which communicate abstract history to others that are highly detailed and claim great historical specificity. Uricchio's understanding might also be usefully applied in the Formal Analysis. Another useful approach is that of McCall (2012)

who discusses how games can be seen as problem spaces, but specifically problem spaces through which one learns about history. McCall (2012, pp. 19-20) also points out the need to acknowledge that games contain bias which will affect the history they can teach. Games can oversimplify history, privilege certain historical narratives and be imprecise in terms of history. These biases need to be acknowledged when analysing historical games and their structures. The thesis' Formal Analysis was intended to provide insight into the educational and historical value of *EUIV*'s different game elements while also exploring historical knowledge embedded in those elements. A high-performance gaming computer and copy of *EUIV* were used to carry out the initial Formal Analysis. The Formal Analysis revealed *EUIV*'s most pedagogically valuable mechanics that then formed part of the foci and line of inquiry in the *EUIV* online forum survey. These findings are flagged in Chapter 4.

3.3 Europa Universalis IV Online Forum Survey

3.3.1 Design Rationale and Concepts

As discussed in Chapters 1 and 2, video games have considerable potential as tools to engender experiential learning; that is, learning through real applications, rather than learning and being tested on abstract facts (Austin & Rust, 2015; Gee, 2005, 2008b). This potential has been neglected in formal adult learning contexts, despite the demand educators have for the development of adult GBL tools (Brand et al., 2017, p. 6; Malala, 2009). To fill this gap, this thesis analyses *EUIV* as an example of a COTS game that has great potential as a pedagogical tool for learning history in higher education contexts. As discussed in the previous chapter, in the domain of GBL and history one of the major dilemmas relates to the balancing of precise textbook history with a more accessible historical narrative (Kapell & Elliott, 2013; Squire, 2011, p. 23). Another dilemma related to historical accuracy is that of inclusivity, which asks us to question whose history is being told or favoured in historical

games. There are many ways in which history can be open to individual interpretation, and individual players may have their own experiences and views on matters of historical accuracy, accessibility and inclusivity. To determine how players view these aspects of video games, the opinions of *EUIV* players from real gaming communities and gaming contexts were sought by the researcher, and an online survey targeting the *EUIV* gaming community was designed that would allow them to express these opinions.

3.3.2 Forum Survey Instruments/Method

The online survey posted on the *EUIV* forum collected quantitative data through a poll with multiple-choice questions. Qualitative data was collected using short survey responses that allowed for richer and more detailed user comments. Survey research and opinion polls are considered reliable and valuable instruments for accessing and understanding the views of its participants because surveys have a wide application, broad coverage to reach many people (or players in this case), are anonymous and provide an equal opportunity for all participants to respond (Barribeau et al., 2012; Fowler, 2013, pp. 1-2; Krosnick, 1999, pp. 538-539; Roper Centre, 2019). The forum survey was a simple, inexpensive method for quickly reaching a sizeable global online audience of players who possessed intimate knowledge of the game (Krosnick, 1999, pp. 538-539; Weerakkody, 2008, p. 131). It is important to acknowledge the self-reporting survey participants may have held biases (Araujo, Wonneberger, Neijens, & de Vreese, 2017), and that this may have impacted on how they perceived learning to occur through playing *EUIV*. It should also be noted that participants are describing hobbies (i.e. playing *EUIV* and gameplay) that they may feel passionate about and spend a lot of time playing. Therefore, players may wish to see their hobby validated as meaningful in terms of learning. This potential bias needs to be acknowledged as a possible factor in the results. However, this passion also often equates to significant experience of the game and a long-developed understanding of its historical and

pedagogical content. Video games, including *EUIV*, frequently have archived game material, mostly found on wikis, blogs and, of particular interest, online forums (Sköld, Adams, Harviainen, & Huvila, 2015, p. 59). This material usually describes strategies, in-game details, player opinions and more, indicating the existence of an interested and active community. The *EUIV* forums were therefore viewed as a prime place to collect information for a survey of *EUIV* players because of the amount and breadth of this material.

3.3.3 Participants and Materials

Participants responded as individuals to the survey questions, voluntarily self-selecting to form part of the sample, and were not asked to provide any demographic details. As the survey was available via the Paradox Interactive official forum, data from *EUIV* expert players was readily available. It should be noted that the online *EUIV* gaming community may be different from the target population of adult learners; however, the survey text responses revealed many of the participants were adults, with several studying or teaching history. The age requirement to participate on the *EUIV* forum is 16 years and above unless the user has parental permission, then the age limit is 13 years and above. The survey received 331 responses from *EUIV* forum participants, and no participant was excluded from the final dataset. The survey questions and other related materials are available at *Appendix B*. A number of software and electronic services were used to carry out the forum survey, including:

- A yearly licence for *Survey Monkey* (SurveyMonkey, 2019) to collect and analyse the survey data; and

- A computer with internet access to the *EUIV* forums to post the survey link and to retrieve participant responses.

3.3.4 Data Collection Process

A web link to the survey was posted on the forum, along with the consent form (located at *Appendix B*). The researcher sought and received consent from the game developers and forum moderators before posting the survey link on the forum. Participants gave their consent to have their anonymous responses collected and used in the research study. The survey was accessible on the *EUIV* forum in mid-August 2016 for two weeks. It should be noted that cross/multiple-coding was not performed by other independent researchers. However, measures were put in place to improve the research's rigour and to reduce bias, including triangulation of different sets of data (quantative and qualitative), response validation (e.g. confirming answers in interview), purposive sampling (targeting players and university students) and acknowledging biases. Furthermore, the research refrained from collecting too much demographic information via survey, in order to not overburden the participants and ensure forum members were not discouraged from taking part in the survey.

3.4 University Case Study

3.4.1 Design Concepts and Rationale

The forum survey provided information about the level of player interest in history, and the informal learning that occurred within the context of the *EUIV* gaming community. However, the forum survey was not able to provide descriptions of the participants' use of *EUIV* that were sufficiently rich and in-depth to inform the research, nor did it provide adequate details of the participants' interactions with other players. Furthermore, the forum survey did not provide an understanding of how *EUIV* would perform as a tool for learning history in a formal learning context. Thus, the next phase of the research required a case study conducted on a university campus with participants in such a learning context.

Qualitative methods specifically involving descriptive research were employed in several different ways in the case study (Cohen, Manion, & Morrison, 2007, p. 205). These included researcher observation, demographic forms, written and visual pre/post-tests, interview questions and an examination of participants' mods. The university case study consisted of two GBL groups. One group modded *EUIV* while the second engaged in a historical roleplay simulation using *EUIV*. Participants self-nominated to join the study and were assigned a number according to the order in which they joined. They were then assigned to the two groups, with even numbered participants being assigned to the modding group and odd numbers to the historical roleplay simulation group. To examine whether social engagement affected gameplay, the participants were further subdivided into single and multiplayer setups of the historical roleplay simulation. There were no other differences between the two historical roleplay simulation setups. The case study participants were provided with different exercise information, depending on the exercise they participated in. The modding exercise participants were provided with modding guides, cheat sheets, links to useful history websites about the Aztec-Spanish War and an event mod template. These documents and electronic files were provided to aid the participants' learning of the modding process allowing the participants to focus on historical research. The Historical Roleplay Simulation participants were provided with documents that outlined the Historical Roleplay simulation exercise objectives, the nation they were playing as, and their nation's objectives. Moreover, *EUIV* and other digital war games could serve to replace other historical point of view materials, as in-game the player takes on the perspective of a nation. Educators could also replace historical map-based activities with digital wargames as these games place the player in a detailed map of the world, and promote player interaction with various political, economic, social and strategic variables. Digital wargames are unlikely to replace content related to an

individual perspective or micro-narrative of history, although this does not mean the game

cannot communicate them; e.g. in the text of pop-up boxes.

3.4.1.1 Modding Group

In previous GBL research (El-Nasr & Smith, 2006; Yucel, Zupko, & Seif El-Nasr,

2006), modding has been used to enhance or change the experience of a game, and in some

cases has been used to educational effect, primarily for learning software coding. However,

several studies have found that modding can be used to engender learning about a variety of

topics, not just programming, such as maths, physics, 3D design, architecture, character

design, project management, etc (El-Nasr & Smith, 2006; Monterrat, Lavoué, & George,

2012, p. 346; Subramanian, 2012, p. 190; Yucel et al., 2006). This thesis is interested in

whether the modder can learn about history through the creation of discipline-specific

content, and thereby draws on such studies. While modding is often thought of as requiring

proficient programming skills, modding can in fact be made accessible to a broader range of

learners from different backgrounds if the right tools and support are provided (Monterrat et

al., 2012, p. 346; Subramanian, 2012, p. 190). Some games are published with mod-friendly

tools, while others require a more coding-based approach for content creation (El-Nasr &

Smith, 2006, pp. 18-19). For example, the *Warcraft III* (Blizzard Entertainment, 2002) editor

promotes a basic and visually intuitive experience with more emphasis on landscaping,

modelling and animation, while games like *Unreal Tournament* (Epic Games and Digital

Extremes, 1999) are more complex to mod, requiring the ability to manipulate 3D

architecture, sounds and events in details. In my own experience of creating the *Indigenous

People of Oceania* mod (Cosmosis7, 2016) for *EUIV*, I found the most difficult and time

consuming part of the project to be the historical research and content writing involved, as

opposed to the technical file navigation and scripting[12] aspect. In this case, the focus of the

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[12] Scripting focuses on "gluing". This means it assumes the "existence of a set of powerful components and are
intended primarily for connecting components together" (Ousterhout, 1998, p. 1). This is slightly different from

modding exercise was not the mastery of scripting, but rather the historical research and its in-game representation. Undertaking this process indicated to me that modding could be used as a tool for engagement, analysis and the expression of history.

Squire's (2011) study, discussed in Chapters 1 and 2, showed that engaging in modding improved learning among secondary students (pp. 176, 180 & 181). The research showed that students who played *Civilisation III* were able to make the transition from playing the game to designing/modding it to further their learning. Indeed, there was compelling evidence that playing and modding *Civilisation III* did align with improvements in academic performance. However, modding does have limitations which are important to acknowledge as the game cannot be changed to simulate every historical scenario or situation (Squire, 2011, p. 157). For example, Grand Strategy games such as *EUIV* are not intended to be modded for micro-level details such as managing food, crops, hunting, mining or building the exact location of structures, which differs to games such as the *Age of Empires* series (Ensemble Studios, 1997, 1999, 2005), in which this is possible. Nonetheless, modding is an effective learning tool if these limits are understood in the context of the pedagogical intervention (Squire, 2011). Squire's (2011) study showed that developing mods is never simply a case of integrating content into the relevant game, but rather can teach students research skills as they have to assess the value and reliability of sources they use for modding, as well as seeking out pertinent information for the mod to be accurate (p. 176). Squire (2011) also argues that playing and modding video games is valuable as a lead-in activity to prompt students to further develop their knowledge and skills (p. 177). Hence, for the purpose of this case study, modding will be understood as a tool and medium of expression for historical learning, research and analysis.

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programming which focuses on developing software from scratch (Ousterhout, 1998, p. 1). Modding aligns with scripting as the modder already operates within the game's structure and is introducing or "gluing" their own content into the game's structures.

3.4.1.2 Historical Roleplay Simulation Group

Studies indicate collaborative interactions between students that involve discussions and play using electronic media, show promise for improving knowledge construction (Kuo, Hwang, & Lee, 2012, p. 361) and problem solving (Schellens & Valcke, 2005, p. 974). For example, a study by Kuo et al. (2012) involved students working collaboratively to problem solve a variety of web-based activities that were centred on social science issues (p. 361). The study showed that "through a collaborative mechanism, high-achieving students can assist middle- and low-achieving students in improving their learning performance" (Kuo et al., 2012, p. 361). The study noted a lower achieving student began to become more involved in discussions with other students as a result of the collaboration, subsequently adopted the topic terminology in these discussions, and contributed to them more constructively (Kuo et al., 2012, p. 361). Other studies of the outcomes of collaborative learning experiments using video games suggest they facilitate positive interdependence, personal accountability, face-to-face interaction, social skills and group processing (Johnson & Johnson, 1988; Zea, Sánchez, Gutiérrez, Cabrera, & Paderewski, 2009, p. 1252 & 1260). Another study found that competition between participating groups, mutual assistance within teams to overcome game blockers, and constant feedback from collaborators also promoted a conducive environment for learning through video games (Infante et al., 2010, pp. 190-193). These findings were used as guidelines in the case study to help the researcher set up a case study that encouraged participants to learn both independently and collaboratively while the researcher provided support.

For collaborative games such as *World of Warcraft* (Blizzard Entertainment, 2004), the community itself is a valuable source of information for learning about the game (Blizzard Entertainment, 2004; Nardi & Harris, 2006, pp. 157-158). Nardi and Harris (2006) found collaborative design and interaction to be not only sound processes to entertain players and encourage learning, but that collaborative activities resulted in the creation of social

organisations and cultures based around players helping one another (pp. 157-158). In this vein, this research opposes the view that video games socially isolate players from the real world (Kraut et al., 1998, p. 1030; Nie & Erbring, 2002, p. 278). As such, the thesis aims to follow a different path from research such as that by Ducheneaut, Yee, Nickell and Moore (2006), that argued although a player was surrounded by other players, they did not actively interact with other players in the game (pp. 9-10). In contrast, this research focused on facilitating the considerable potential for both active online and real-world participant collaboration in the historical simulation used in the case study. This included collaboration between participants to achieve exercise objectives, and participants acting on information provided to them from outside the game.

Squire's (2011) identified additional positive aspects of the use of gameplay for education. The study found that *Civilisation III* (Firaxis Games, 2001) helped adolescents think about historical questions and issues that related to the game, such as how to think like a Civ Leader (a leader of a nation or historical leader) (p. 180). The *Europa Universalis* series seems to have the same potential as *Civilisation III* to stimulate and interest in and teach history. Hence, one of the case study groups was based around a similar premise, whereby participants were given the role of a nation or historical leader, certain objectives they needed to achieve, and a particular historical background. The intention was to combine historical roleplay and, where possible, encourage collaborative interactions with other players to create a dynamic and interesting scenario for the participants to engage with history.

3.4.2 Case Study Research Instruments/Method

The case study data from the modding and historical simulation groups was collected using qualitative methods, namely participant demographic forms, pre/post-tests, researcher observation, interviews, and mods templates/files. The Case Study Participant Demographic Form was used to collect demographic data about the participants and to enable exploration

into who may benefit the most from video game learning by collating the demographic and the test data. The pre/post tests were used to determine whether participants had learnt about the Aztec-Spanish conflict from the GBL activities. There were two pre/post history tests given to the participants. One set of pre/post-tests required short written responses to questions that covered basic themes around the Aztec-Spanish conflict. The other set of pre/post-tests were visual/geographic tests that required the participant to mark the geographical locations of certain nations on a map. The pre/post-test method is considered a strong method for measuring learning from an activity or process because it is a clear method for identifying what participants know both before and after exposure to an activity (Cohen et al., 2007, p. 274 & 278; Kuo et al., 2012, p. 361; Lieberoth, Wellnitz, & Aagaard, 2015, p. 178).

Interviews were also employed as a research method, and were conducted at the end of the university case study. These were used to provide insight into the actions and opinions of players that was not obtainable through the surveys, gameplay and the pre/post-tests methods (Castillo-Montoya, 2016, p. 811; DiCicco-Bloom & Crabtree, 2006, p. 314; Gubrium & Holstein, 2001, p. 2). The interviews were intended to elicit new information from participants and to develop new topics for analysis that might not otherwise have been considered in the research design.

As discussed above, participants were divided into two groups – a modding group and a simulation group. The first group was asked to create a *EUIV* mod based on the Aztec-Spanish conflict using a script file (computer code) template from *EUIV*'s files. As the final products of the participants' learning processes, the mods were deemed to be strong indicators of the content research, critical analysis and creative expression in which participants had engaged, which were communicated through the modding template. The template included a mod title, description and options (a game mechanic) that allows the

player to choose one or more options which can then be assigned different in-game consequences as shown in *Figure 3.2*.

<div style="border:1px solid black; padding:1em;">

James's mod

<u>Trigger:</u>

October 1519, Hernán Cortés suspects that the people of Cholula are plotting against him.

<u>Options:</u>

Cortés had the leaders of Cholula killed. Thousands of the city's residents are murdered by Spanish troops and parts of Cholula are burned. 'Declares War Between Two Nations'.

<u>Description:</u>

The Massacre of Cholula

In October 1519 while at Cholula Hernán Cortés suspects that the city's leaders and warriors are plotting to attack his Spanish Forces. Cholula was the second largest city in the region, behind Tenochtitlan – the capital of the Aztec Empire. Cortés confronted the city's leaders at the main temple. The leaders claimed that while King Moctezuma of the Aztecs had ordered them to fight the Spanish, they had no intention of resisting. Nonetheless, Cortés had the leaders killed; thousands of people murdered; and, parts of the city burned.

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Figure 3.2. The participants used the modding template as an initial guide to draft their mod before inserting their content into the actual *EUIV* game files, thereby implementing their mod.

A further research method employed was that of participant observation, whereby the researcher observed gameplay sessions and noted any significant actions by and interactions between participants, as well as comments they made both in-game and outside of the game (Kawulich, 2005, pp. 1-4). This gave insight into the behaviours and opinions of the participants through an analysis of non-verbal cues that revealed information about actions the participant may not have explained in an interview.

One of the main issues associated with implementing the case study was the inherent complexity of *EUIV*, which has a vast number of functions, variables and actions that players need to understand to play and win the game. A participant's ability to manage these aspects of the game simultaneously was a concern for the researcher, who recognised that this could impede participant learning (Paradox Development Studio, 2013a). A potential solution to minimise and mitigate this risk was to increase exposure to *EUIV* during the study, including more gameplay under researcher supervision. Alternatively, students could play the game at home, as several copies of the game were purchased and one was given to each participant.

Another measure to minimise issues around the game's complexity was to allow multiple players to play and manage the same nation from different computers. This reduced the workload and number of variables each player had to manage, and also permitted a more collaborative gameplay approach for the participants. The researcher's historical roleplay simulation, used in this study, was inspired by the military gaming exercise carried out by the Marine Corps War College (2014), discussed in the previous chapters, which used *Hearts of Iron II* (Paradox Development Studio, 2005) and *Darkest Hour* (Darkest Hour Team, 2011) to simulate a *WWII* scenario (Darkest Hour Team, 2011; Paradox Development Studio, 2005). The historical Roleplay simulation primarily consisted of the participants engaging in gameplay through the game. The thesis study utilised several of the design features from the military gaming exercise, including providing participants with information from outside the game which they had to act on as part of gameplay.

3.4.3 Participants

In total, 18 participants were recruited for the university case study, and were students undertaking Bachelors, Masters and PhD degrees. The participants were from a range of different disciplines including Business, History, Medicine, Media, Engineering and Science. The participants included males (n14) and females (n4), and their ages ranged from 18 to 32

years. They were from several different countries, including Australia, China, Malaysia, Singapore, Philippines and New Zealand. The researcher monitored and guided the participants in the exercise, while two supervisory academics (PhD supervisors) oversaw the project externally. The university student participants were recruited using flyers that were distributed throughout the university. These identified the researcher and provided contact details and information about the study. The participants gave their consent to participate in the case study and have their data collected by signing a participant consent form (located at *Appendix D*) at the initial stage of the case study. The case study participants were given pseudonyms to anonymise the data; these pseudonyms are used when discussing their involvement in the case study within the thesis. As previously discussed, participants were randomly allocated to two case study exercise groups, with nine (odd numbers) engaged in the modding and nine (even numbers) engaged in the historical roleplay simulation. In the simulation, six of the nine participants engaged in a multiplayer setup of the historical roleplay multiplayer game while the remaining three engaged in a single player setup. These participants were assigned at random by writing each case study participant's name onto a piece of paper, pooling the nine pieces and selecting three pieces at random. The participants whose names were selected were assigned to the single player setup while the rest were assigned to multiplayer setup.

3.4.4 Materials

The researcher distributed 18 copies of *EUIV* to the case study participants for use in both the modding and historical roleplay simulation case study exercises. The demographics form, pre and post-tests, interview questions, and other case study materials are available in *Appendices D, E, F & G*[13]. Six computers[14] with specifications capable of running *EUIV*

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[13] Materials used to guide the modding case study exercises were based on the *EUIV* wiki entries (*EUIV* Wiki; *EUIV* Wiki).

[14] An additional personal laptop was used by the researcher to monitor participants and type notes.

smoothly were used in the university case study, and the participants used those computers to learn about, play and mod *EUIV* in a computer lab on campus with access to the internet for multiplayer functions. The researcher used an iPhone to record the interview audio. Participants were required to commit five hours in total over a week to the case study exercise. In return, participants were given a $50 shopping voucher as well as a copy of *EUIV* as compensation for their time and effort. It is common practice in university social and learning research to reimburse participants for their time and effort for participation in the research[15] (Curtin University, 2015; Seymour, 2012; Stanford Graduate School of Business, 2016; University of Toronto, 2011). The voucher value was based on the recommendation of the researcher's university Human Ethics Committee. Due to resource and access constraints, it was not feasible to implement a classroom case study within an existing university course. Therefore, the case study was conducted outside of any specific course, and the use of a university computer lab on campus and involvement of volunteer participants was the most practical option employed in response to this limitation. The university computer lab nonetheless offered a formal learning environment in which the case study was administered and managed, as shown in *Figure 3.3*.

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[15] The University of Toronto suggests that participants <u>should</u> be reimbursed or compensated for the expense and effort of participation (University of Toronto, 2011).
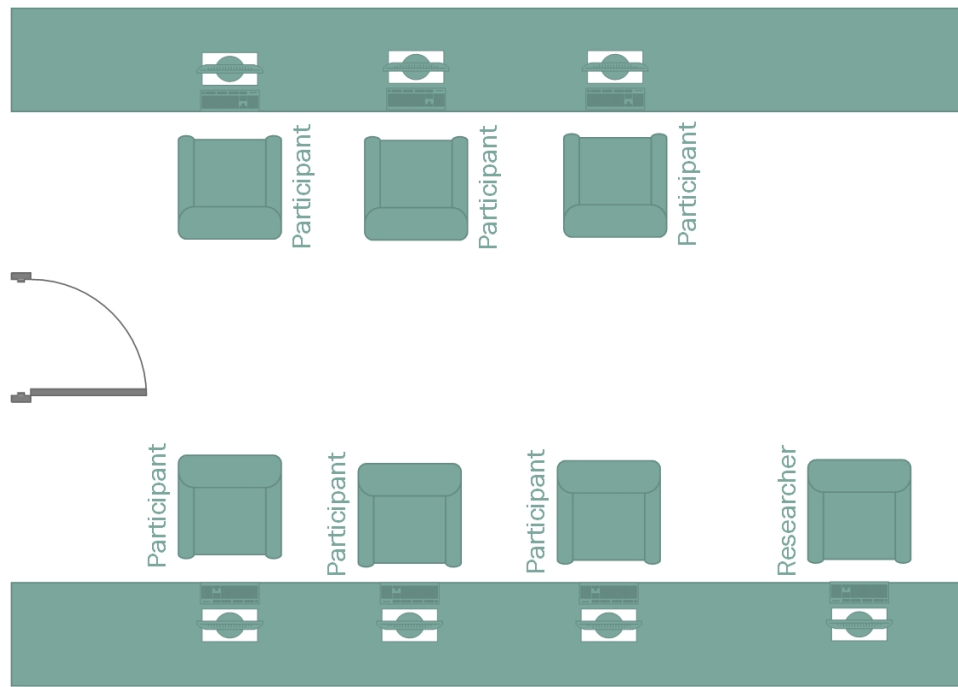
Figure 3.3. Computer lab layout for the university case study. Participants were monitored both in-game from the researcher's computer, and outside the game as the researcher frequently moved around the room, observing participants' actions and interactions.

3.4.5 Data Collection Process

To test the case study method proposed for the data collection process, a pilot case study was conducted in November 2016, four months prior to when the university case study began in early March 2017. Both the pilot case study and university case study were held in the dedicated university computer lab. There are several benefits to performing a pilot study, including identifying and understanding problems associated with the method. A pilot study provides an opportunity to make changes to the method and to resolve any identified problems before undertaking the main case study. For example, the pilot study revealed that the researcher had provided insufficient information and guidance for the modding exercise. As a result, the researcher developed further guidance documents and a mod template for the main case study, which facilitated smoother and clearer modding exercises. The pilot study also allowed for a preliminary assessment of the usefulness of the data collection method proposed, as well as the collected data itself (Centre for Teaching and Learning, pp. 1-2; Van

Teijlingen & Hundley, 2010, p. 4). The pilot case study thereby clarified the research method while also minimising issues relating to time, money and misunderstandings, especially by providing further support around the modding exercise allowing participants to focus on creating their mod and transposing history into gamified content.

As discussed earlier, at the start of the university case study, demographic information was collected using a Case Study Participant Demographic Form, which was distributed after participants had completed the participant consent form. The Case Study Participant Demographic Form allowed the researcher to collect basic demographic information on the case study participants, including data on age, sex, nationality and their university area of expertise. However, the form also allowed participants to detail their experiences using information technology, video games, and, more specifically, strategy games, as well as their general interest in history. It was anticipated this information would give insight into possible links with written pre and post-tests, for example were there any correlations between test scores and university area of expertise, or test scores and experience with information technology.

The pre-test and post-test were conducted before and after the case study. These were used to measure improvements in the participants' learning outcomes. The pre and post-test each contained eight questions related to the Aztec-Spanish conflict that the participants were required to answer. The answers took the form of short responses, and the researcher awarded marks to the participants based on the correctness of the answer[16]. There was no time limit to complete the tests. After the participants completed the post-test, they were interviewed.

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[16] For example, for the question: "What was the commodity (or commodities) that was highly valued in Europe, but was in abundance in Aztec Society?", either the answers "gold" or "silver" were awarded full marks. However, for more precise questions such as: "When did the Spanish land in Mexico?", full test marks were given for answers closest to the exact date, while answers that named the century alone were given partial marks.

The researcher used interviews with the participants to understand their experiences playing *EUIV*, their thoughts on how they learnt history from the game's mechanics compared to other mediums such as books, and whether they had learnt about history through playing *EUIV*. The interviewer asked a core set of seven questions (located at *Appendix G*); however, if the participant provided a unique or interesting insight, the researcher asked probing questions to further flesh out these themes. Each interview took approximately 10 to 15 minutes in total.

Overall, the university case study was primarily a comparative two group system that evaluated the effects of different GBL activities (Lieberoth et al., 2015, p. 178). The case study implemented a multistage design for the two different branching stages – modding and historical roleplay simulation (Cohen et al., 2007, p. 282). All participants initially received the *EUIV* tutorial and supported gameplay sessions before being divided into the modding and simulation groups. The mod files created by the modding group participants were collected at the end of the case study exercise, while observation notes were taken throughout the entire study of both the modding and historical simulation groups. At the end of the case study, participants received the gift voucher for reimbursement. All case study participants completed the case study.

3.5 Data Analysis, Discussion and Evaluation

This thesis understands perspectives in terms of relativism and pragmatism. Engaging in relativism means recognising that a perspective can be understood as different and valid in its own way, and that there can be multiple perspectives and truths relating to the construction of narratives, especially in history (Baghramian & Carter, 2015). A pragmatic view maintains the belief that a greater value might be found in either individual or consensus perspectives (Pratt, 2016). An individual perspective of this type refers to personalised understandings of history, while a consensus perspective refers to collective understandings. When studying

how people understand and create their own narratives, recognising these different perspectives can provide clarity and reduce bias in our understandings of world event. This is because an approach that acknowledges the biases inherent in different perspectives is able to reveal the conditions that influence those perspectives and background any research conducted on them.

The thesis epistemology will take into account constructivist and pragmatic approaches to analysing the primary research question, sub-questions and data (Pratt, 2016; Von Glasersfeld, 1995, p. 18). Von Glasersfeld (1995, p. 18) states that "knowledge, no matter how it be defined, is in the heads of persons, and that the thinking subject has no alternative but to construct what he or she knows on the basis of his or her own experience" (p. 18). The researcher concurs with this understanding to an extent, but also believes the consensus perspective provides important insights into the educational value of games like *EUIV* and the contexts in which they have been developed and played. Individuals naturally have their own constructed understanding of the world, which provides unique insights into the contexts that shape their experiences. However, collectively, and in a pragmatic sense, there might be broader meanings that can be construed from a consensus view that will provide other insights of value on the experiences of collectives. In the case of video games, a pragmatic and "non-dualistic view of the world" (Pratt, 2016, p. 509) is important because group understandings may reveal the wider context of and changes in the gaming community that affect the experience of players. Nonetheless, it is also arguable that understandings of individual constructivist perspectives provide deeper and richer examples of how these changes influence the experiences of members of these gaming communities than consensus perspectives. The author also takes a constructivist approach to learning, whereby "students learn by fitting new information together with what they already know" (Bada & Olusegun, 2015, p. 66).

Hence, the thesis will primarily conduct its study through a relativist and constructivist lens, but will also be informed by a pragmatic approach in order to incorporate group perspectives.

Thematic analysis was used as the method of data analysis to describe and interpret both the survey forum data and the university case study data. Thematic analysis is a useful and common method for finding, grouping and understanding themes across data and datasets (Braun & Clarke, 2006, p. 79; Guest, MacQueen, & Namey, 2011, pp. 10-11). It was used inductively[17] to link common and related data together to produce themes and sub-themes. These themes are then discussed and critically analysed in Chapters 7, 8 and 9.

The researcher also utilised the statistical Mann-Whitney U test, a non-parametric statistical test used with small datasets which do not have normally distributed data (Field, 2013, p. 550). The test compares the medians from two independent groups to determine any significant differences. This test was used on only two datasets in the case study because the other datasets had unequal participant numbers, and would therefore not produce statistically meaningful results. The researcher used the IBM Statistical Package for the Social Sciences (SPSS) (IBM, 2015) to analyse the case study datasets. Collectively, each dataset was triangulated (Mabuza, Govender, Ogunbanjo, & Mash, 2014, p. 3) with other datasets, as shown in *Figure 3.4*, providing further validity to the data and strengthening the analysis. Microsoft word (Microsoft, 2013c), Visio (Microsoft, 2013b) and Excel (Microsoft, 2013a) were used to document and illustrate the data in text and various figures and tables throughout the thesis.

EUIV and the participant mods were critically analysed in relation to their historical and educational value. *EUIV* is analysed primarily in Chapters 4, 7, 8 and 9, while the case study participant mods are analysed in Chapter 9 and, to some extent, in Chapter 6. Critical

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[17] Inductive research begins by examining the data to then develop a theory, while deductive research starts with a theory and uses the data to prove or disprove the theory (Thorne, 2000, p. 68).

analysis (Ennis, 1993, p. 180; LeJeune, 1997) was used to understand the comments, biases and arguments of the developers and case study participants. By analysing *EUIV* and the *EUIV* mods, the researcher was given insight into how history is understood, expressed and challenged by both game developers and the case study participants. As previously discussed, throughout the course of the research and prior to the case study, the researcher developed his own *EUIV* mod, *Indigenous People of Oceania* (*IPO*) (Cosmosis7, 2016), which was used as an exemplar to illustrate the modding process and the pedagogical benefits and limitations of modding as they relate to learning history.

Case Study Data (Chapter 6)
- Pilot Case Study
- Written Pre/Post-Tests
- Geographical Pre/Post-Tests
- Interview Data
- Participants' Mods and Mod Outlines
- Pre/Post-Tests Statistical Results

EUIV Forum Survey Data (Chapter 5)
- EUIV Introduction and Interest
- EUIV Modding and Multiplayer
- EUIV and Learning History
- EUIV and Learning Governance and Nation Management

Researcher's Analysis & Input
- Formal Analysis (Chapter 4)
- Development of Exemplar Mod – *Indigenous People of Oceania* (Chapter 9)

Figure 3.4. Triangulation of the thesis datasets to evaluate the historical pedagogical value of *EUIV*.

3.6 Conclusion

The methodology used in this thesis was designed to answer the research question: "What can a study of *Europa Universalis IV* reveal about how Grand Strategy video games can be utilised in higher education to teach history?". The research considers this question within the broader context of interrogating and understanding how players of *EUIV* engage with history, and how their experiences could be used to inform how Grand Strategy games like *EUIV* might be utilised in a formal education setting. The thesis builds on Egenfeldt-Nielsen's (2005) existing study on adolescents using *Europa Universalis II* (*EUII*) (Paradox Development Studio, 2001) by similarly observing and appraising adult university student participants who used a new version of the game. Egenfeldt-Nielsen (2005) found that adolescent students believed there was little historical knowledge to be found within games; in contrast, this research theorises that adults may have a more sophisticated and flexible comprehension of what constitutes history, particularly in a gaming context.

The thesis further aims to contribute to existing research by incorporating data collected on unconventional game implementations, such as modding and a historical roleplay simulation. Playing *EUIV* alone may not utilise the historical pedagogy of the game to its fullest potential; rather, different gaming practices may open new avenues for more complex and deeper forms of GBL. This research will also assist in bridging the knowledge gaps around learning about diverse histories and visualising gamified history.

In summary, this chapter explained how the thesis aims to answer the primary research question and sub-questions through several steps. First, the chapter described how the researcher explored the game through a Formal Analysis, which examined *EUIV*'s suitability as a historical pedagogical tool to understand the game's most educationally valuable mechanics. Second, the chapter explained how, based on the findings from the Formal Analysis, the researcher conducted a survey via the *EUIV* forum that was used to

understand players' views on the game's educational content around history, as well as how they engaged with the game. Third, the chapter described how responses from the survey were used to inform the design of the university case study by focusing on players' views and opinions about the game, which showed *EUIV*'s most pedagogically valuable elements. Finally, the chapter outlined how the researcher inductively utilised critical and thematic analyses to find the most valuable and insightful themes and ideas to discuss in order to answer the thesis research question and sub-questions. Taken together, the steps described in this chapter show the particularities of the method used and its specific design, which was ultimately focused on understanding the ways in which players of *EUIV* learn history, and their views and opinions on the experience.

Chapter 4: *Europa Universalis IV*: A Grand Strategy Candidate for Game-Based Learning of History

4.1 Introduction

This chapter presents an in-depth exploration of the main features of *EUIV*, its gaming community and related GBL literature. To begin, the chapter provides a general outline of the Grand Strategy genre and related Strategy video games to show *EUIV*'s place in the broader games family. Second, the chapter explains important terminology, definitions and the core game mechanics of *EUIV*, with further explanations available in *Appendix A*. It also sets out the features of the *EUIV* gaming community. Next, the chapter broadly examines *EUIV* in the context of the rise of Grand Strategy games to demonstrate its importance, usefulness and suitability as a subject of study for formal learning. Finally, the chapter briefly reviews the existing literature on *EUIV* and specifically considers the game's contribution to the learning and teaching of history. The chapter will thereby provide fundamental insights about *EUIV* and the Grand Strategy genre, and will present a case for *EUIV*'s potential as a pedagogical tool. The researcher's observations and experiences as a strategy gamer will contribute to and

form part of the analysis. The deep understanding of *EUIV*'s formal elements that are developed in this chapter will form the foundation of critical reflections on the game in later chapters. This chapter largely contains rich descriptions of the formal game elements of *EUIV*. Note, the researcher used game materials from the latest *EUIV* patch 1.28.3[18] (released 04 February 2019) for the illustrations and figures in this chapter.

To appreciate the historical value of *EUIV*, it is important to understand the historical knowledge contained within the game's mechanics. Based on the Mechanics Design Aesthetics (MDA) framework (Hunicke et al., 2004, p. 2), mechanics are "particular components of the game, at the level of data representation and algorithms" and in historical games, mechanics often contain historical information with which the player engages. Based on the MDA framework (Hunicke et al., 2004, p. 2), the researcher developed a new framework to show how the player learns historical knowledge from the game mechanics through the following process:

1. The mechanics inform the player of history and immerse them in a historical environment.

2. As a result of this immersion, historical gameplay, strategies and other interaction outputs are produced.

3. From these outputs the player formulates their own experiences of history.

4. These experiences are then used by the player to analyse and evaluate history, and subsequently create their own historical understanding and perspective.

This process is shown in *Figure 4.1*, and reveals the importance of understanding both the historical knowledge itself and assumptions about that knowledge contained in the game

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[18] A "patch" updates an existing game to further improve gameplay or fix bugs. In *EUIV*, patches are released quite often, but large patch updates often go hand-in-hand with the release of new expansions and downloadable content.

mechanics to provide insight into the environment in which the player plays, and any associated pedagogical affordances.
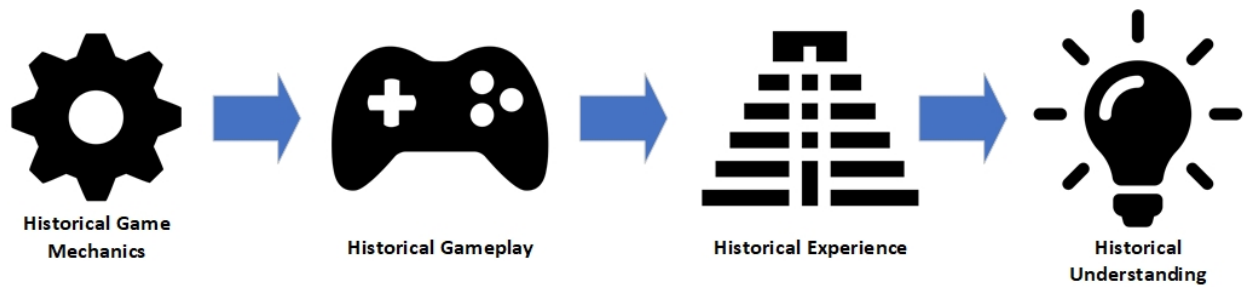
Figure 4.1. Historical mechanics, gameplay, experience and knowledge framework based on MDA framework (Hunicke et al., 2004) [19].

As defined in Chapter 1, a Grand Strategy game is one that allows the player to utilise all of a nation's resources and powers to carry out its national objectives, from the use of military force, to diplomacy, to the economy. *EUIV* stands out as a Grand Strategy title given its sizeable historical timespan, diverse historical depictions, and positive critic and player feedback. Paradox Interactive published *EUIV* in 2013, and the developers regularly release downloadable content (Paradox Development Studio, 2013a, 2013b, 2015a, 2015b, 2017, 2018). The game is based on the Early Modern historical era, with a focus on empire building and colonialism (Paradox Development Studio, 2013a). Critics on gaming websites have rated *EUIV* highly: PCgamer (Hafer, 2013) rated *EUIV* 91/100; Gamespot (Shannon, 2013) rated the game 9/10; while IGN rated it 8.9/10 (Kaiser, 2013). On the Steam game distribution platform, since *EUIV*'s release, 82% of *EUIV*'s reviews have been positive (Steam, 2019). While enjoyment is a subjective notion, these ratings demonstrate there is a significant positive response to the game, suggesting *EUIV* is very appealing to the community of players who play Grand Strategy games. This could therefore have implications for its use as a pedagogical tool, as students may also find the game highly appealing and enjoyable to play.

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[19] Icons were made by Freepik and Gregor Cresnar from www.flaticon.com.

4.2 The Grand Strategy Video Games Genre

Grand Strategy video games sit within a broader family of video games, strategy games and wargames. *Figure 4.2* illustrates this family, starting with generic video games and ending with Grand Strategy video games. It shows that with each new branch of sub-genre comes new traits, with the next sub-genre encompassing and building on traits from the previous. Common Grand Strategy game traits can include:

- Consideration of high-level strategy, but not necessarily to the exclusion of tactical-level strategy

- Inclusion of both war and peacetime events (hence inclusion of non-military consideration such as economics, politics, diplomacy, etc.)

- An emphasis on geography and geopolitics.

These traits appear to be consistent across the Grand Strategy genre and are found in several well-known-titles that vary in terms of the historical era on which they focus (e.g. Medieval era, Victorian era, WWII and so on) and the level of strategy they involve. The strategic focus of Grand Strategy ranges from exploration of the battlefield and tactics in *March of the Eagles* (Paradox Development Studio, 2013c), to a detailed examination of a specific war, such as in *Hearts of Iron IV* (Paradox Development Studio, 2016b), to a focus on historical governance over several centuries, such as in *EUIV* and *Victoria II* (Paradox Development Studio, 2010, 2013a). It should also be noted that while strategy games are effective at depicting large scale historical processes, much like those broader historical narratives, macro historical depictions have greater difficulty communicating individual and more emotive historical perspectives.

Non-Strategy Video Games

Strategy Video games

Strategic and Tactical Wargames

Grand Strategy Video Games

Games that emphasise using all a nation's resources and tools to win

Operates primarily at high levels of strategy

Often involves the tactical, strategic and <u>non-military</u> considerations to win

Non-military consideration normally include economics, politics and diplomacy

Emphasis on geography <u>and</u> geopolitics

Games that emphasise strategic or tactical warfare

Depicts war and warfare

Often related to history

Played on maps that represent real places in the world

Geography important in strategy and tactics

Games that require adept thinking and planning to win

Frequently depicts a god-like view of game world

Indirect control of units in game

Playing against strategic opponent

Played on a map

Games that require a variety of methods to win

Figure 4.2. The sub-genre of Grand Strategy video games fits into a wider family of video games and is also a sub-genre of strategy games and wargames.

In terms of historical knowledge, Grand Strategy games depict high-level historical themes, but not at the expense of details. One example is *Hearts of Iron IV* (Paradox Development Studio, 2016b). This game focuses on broader historical themes and narratives concerning WWII, and explores important concepts such as the Lend Lease, an agreement whereby the United States provided supplies to the Allies without openly declaring war on the Axis powers (Steitinius, 1944). The game also includes tactical considerations in the form of logistics, recruitment, deployment, construction, weapons types and military technology (Paradox Development Studio, 2016b). While gameplay in *Hearts of Iron IV* focuses on WWII, the period of peacetime leading up to the war is also important. The game depicts the preparation involved in war as well as illustrating how different actors became involved, both historically and as an in-game path. For example, within the game, Germany attacks Poland and Britain and France enter the war (Donnelly, 1999, p. iii). Non-military considerations such as arms production feature heavily in the game, as these were central to WWII (Hyde, 2013, pp. xiii-xiv).

The Grand Strategy title *Victoria II* (Paradox Development Studio, 2010) takes a very different approach to history, focusing on the economic aspects of nation governance during the Victorian era. The game uses various mechanics to communicate historically important themes that are often non-military in nature. Such themes include global trade (Bell, 2007, pp. 1-2), employment (Hopkins, 2013) and industrialisation (Hopkins, 2013). The game also depicts realistic geography with geopolitics forming a large part of the gameplay. However, *Victoria II* still retains features that are reminiscent of table-top and digital wargaming, including historical tactical combat units such as the Dragoon class (Hughes, 1970), a type of mounted infantry, and the Cuirassier class (Roemer, 1863, p. 54), an armoured firearm cavalry. These examples show how historical knowledge is portrayed in Grand Strategy games as both higher-level historical themes, such as the Lend Lease strategy in *Hearts of*

Iron IV or global trade in *Victoria II*, and lower-level historical details such as weapon types (*Hearts of Iron IV*) or combat unit class (*Victoria II*).

The *Total War* (Creative Assembly, 2000, 2002, 2004, 2006, 2013, 2015) series provides an interesting and alternative take on the usual Grand Strategy format. It involves dual game modes, the first of which is a highly detailed and controllable tactical map mode, reminiscent of table-top and digital wargames, and the second which is a grand campaign map encompassing higher-level strategic factors. Both modes communicate historical knowledge; for example, in *Rome II: Total War* (Creative Assembly, 2013), a Roman player invading Britain might have to command armies in the tactical map mode to defeat a Celtic army, such as in the Battle of Medway (Burn, 1953). However, the Roman player will then have to manage their campaign via the grand campaign map mode to conquer the rest of Britannia as the Romans historically did (Braund, 2013).

Total War: Attila (Creative Assembly, 2015) takes places in the Early Dark Ages and simulates the significant historical narratives of the overextension and fall of the Western Roman Empire (Goffart, 2006, p. 231) and the migration of "barbarians" throughout Europe (Goffart, 1980, p. 231; Rebenich, 2009, p. 50). In this game, the player must contend with the population movements that occurred within Europe during that period and the cultural shifts that occurred within different regions as a result of these migrations. *Total War: Attila* offers the player access to historical details through the command of different military units and the use of different warfare tactics. For instance, a Roman player can deploy Foderati military units who were historically "barbarians" in the service of Rome (Heather, 1997, p. 57), or can use the testudo formation tactic, which was a defensive formation to block projectiles (Rance, 2004). Consequently, the dual system of tactical and grand campaign map modes provides opportunities for players to learn about both broader historical themes and historical details. However, the *Total War* series tends to lack the non-military and governance variables,

options and actions found in *EUIV* and other Paradox Interactive games. For example, in *Total War: Rome II* there are nine diplomatic interactions while in *EUIV* there are more than 80. Hence, historical knowledge manifests itself in Grand Strategy games through larger historical game mechanics and strategies, and through details of military engagements and units.

Another Grand Strategy game, *Supreme Commander: Cold War* (BattleGoat Studios, 2011), places the player in the Cold War era and communicates more contemporary historical and strategic concepts than the games previously discussed. In this game's scenario, the United States and the Soviet Union, through diplomacy or military force, need to increase their "Sphere of Influence" (Lebow, 1994, p. 262) while also competing in a Space Race against each other (Siddiqi, 2000). This all occurs during the tension of a rising DEFCON[20] level (Department of Defense, 2001) and a potential nuclear war. Throughout the game the player builds and controls specific historical military units with precise class IDs such as the M4A3E8 Sherman tank (Zaloga, 2011) and the F2H-2 Banshee interceptor (Mallick, 2006). While *Supreme Commander* and *Total War: Attila* vary in terms of historical focuses, each game targets and conveys broader historical themes and narratives of the Cold War and the Dark Ages respectively, and attends to historical details in the form of depictions of military units.

Realpolitiks (Jujubee S.A., 2017), a Grand Strategy game with a more contemporary focus, is set in the present and near future and portrays many modern issues around diplomacy and international relations. The game depicts a simplified version of the United Nations (UN), whereby the wealthiest and most powerful nations interact in similar ways to the UN security council (Malone, 2004). In the game, the UN member states make

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[20] DEFCON is a term used by the United States military that stands for "defence readiness condition" and indicates a state of alertness (Department of Defense, 2001).

propositions to the council on a number of contemporary issues such as foreign aid programs (Litwak, 2003), the Non-Proliferation of Nuclear Weapons (Litwak, 2003), or sanctions against authoritarian or totalitarian regimes (Hurd, 2005). Voting on a proposition takes place and, if passed, the proposition becomes an active resolution. While *Realpolitiks*' depiction involves a highly abstracted version of UN processes, these may nonetheless realistically occur at the UN, showing an intersection between the game's representation of political situations and actual politics (Smith, 2006, pp. 12-15). *Realpolitiks* also depicts issues around the use of nuclear weapons, such as a nation's stock levels of nuclear arsenals, the concept of Mutual Assured Destruction (MAD)[21] (Sokolski, 2004, p. 3), and the impact of nuclear weapons on the environment (Koppe, 2008, p. 5). The game depicts factors and measurements that demonstrate the power and development of a nation including contemporary metrics and concepts like the Human Development Index (Kelley, 1991, p. 316), Gross Domestic Product (Kravis, Heston, & Summers, 1982, p. 3) and blocs of nations with similar ideals or goals (Dicken, 1997, pp. 82-84; Michalak & Gibb, 1997, p. 264). Gameplay in *Realpolitiks* also reflects overarching themes like globalisation, world trade and security matters such as the nuclear armaments dilemma. However, *Realpolitiks* also includes smaller details on tactical concepts such as joint warfare[22] (House, 1985; Strachan, 2009; Vego, 2009), elastic defence (Campbell, 2010, p. 48; Curtis, 2005, p. 53) and breakthrough tactics (Reeves, 1978, p. 4).

Other strategy video games such as the *Civilization* series (Firaxis Games, 2001, 2005, 2010, 2016; MicroProse, 1996) and the *Age of Empires* series (Ensemble Studios, 1997, 1999, 2005) could be considered Grand Strategy games because these games have

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[21] Mutual Assured Destruction or MAD is a doctrine that deters the use of nuclear weapons (Sokolski, 2004, p. 3), based on the notion that if two or more opposing powers engage in nuclear war, they would cause and be subjected to complete nuclear annihilation.
[22] Joint warfare (or combined arms warfare) is a doctrine that combines the different branches of the army, navy and air force to achieve maximum combat effectiveness (House, 1985).

degrees of high and tactical-level strategy, inclusion of both war and peacetime or emphasis on geography and geopolitics respectively. However, the *Civilization* series lacks finer combat and tactical details and instead provides much broader historical timeline coverage (from Ancient to a hypothetical Future era) and a greater emphasis on non-military histories and gameplay, such as options to construct structures like the Sydney Opera House (Colbert, 2003) or Oxford University (Brockliss, 2016). In contrast, the *Age of Empires* series (Ensemble Studios, 1997, 1999, 2005) lacks the higher level and more diverse governance options and variables of Grand Strategy games, but provides a variety of historical details and tactical units. For example, in *Age of Empires III* (Ensemble Studios, 2005) the Chinese Empire can deploy Chu Ko Nu crossbowmen (Vitt, 1995) and Changdao swordsmen (Di Cosmo, 2009) to battle against other armies. The distinction between these games and Grand Strategy games is the lack the geopolitical aspects and real-world maps. The *Age of Empires* series generally includes map views that use environmental features to convey historical and geographic settings; for example, in *Age of Empires III* the map of Yucatán, a region in Mexico (Aissen, England, & Maldonado, 2017, p. 123), will depict tropical surroundings, and players will have the opportunity to recruit local peoples such as Mayas from this region (Kirkwood, 2009, pp. 23-24). However, the actual geographic location and formations of this map are fictional, while in Grand Strategy games, maps are accurate. Similarly, in the *Civilization* series, game maps depict different environments such as deserts and jungles and a spread of resources over the nations portrayed, but these maps are usually randomly generated and almost never resemble the geography of real-world maps (Barros & Togelius, 2015). Hence, while *Civilization* series and *Age of Empires* share many features of Grand Strategy games, their lack of accurate maps and focus on geopolitics differentiate them from Grand Strategy games.

The Grand Strategy genre is quite diverse in its depiction of historical, modern and even futuristic scenarios. Each game is set in a different era with different forms of strategy, different issues and ultimately different histories. As previously discussed, many of these Grand Strategy games operate at a high strategic level and convey many of the grander themes and dynamics of history while also depicting a wealth of historical detail, often in the form of military and tactical information. The illustration of both makes the scenarios and worlds with which the player interacts quite complex and dynamic. A thick analysis of *EUIV* and its mechanics can be used to understand the historical knowledge contained in the game, as will be considered in the next section.

4.3 *EUIV* Terminology, Definitions and Core Game Mechanics

As has been discussed, *EUIV* is a real-time Grand Strategy game that replicates the Early Modern period, encompassing over 350 years from 1444 to 1821, starting with the collapse of the Byzantine Empire and concluding around the time of the French and American Revolutions. There are several starting points the player can choose from, but the year 1444 is the most common. The game focuses on Europe's transition from being governed by a collection of monarchies to being controlled by a number of global European empires (Paradox Development Studio, 2013a). The player chooses a nation to play as, which can include almost any that existed within the game's timeframe, with the exception of many Indigenous nations. They must effectively manage that nation's economy, military, trade and diplomatic relations to endure the era. While the player is presented with various missions they may choose to undertake, these are not compulsory. Rather, *EUIV* is a sandbox[23] game in which players can set their own goals. A player may wish to expand into the Americas and become a colonial superpower, or may choose to capture wealthy trade provinces to become

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[23] A "sandbox" game is one with open goals and forms of play as opposed to a highly structured and guided game.

a trade empire, or gain power through other means, such as by becoming the Holy Roman Emperor or the Emperor of China. Choices available to players in terms of how they might play to win are highly varied and flexible. The game covers a vast number of historical themes and events, both of which are depicted through different mechanics, game maps and pop-up boxes, at various levels of historical accuracy. *EUIV* was primarily designed as a single player game, but multiplayer mode is available and played by many. The game is usually not played in one sitting, but over hours, days, weeks or even months.

This section outlines the different terminology, definitions, game currencies and mechanics in *EUIV*. Only the most historically important features and aspects of the game will be explored with additional details from the Formal Analysis provided in *Appendix A*. *EUIV* interfaces will be explained in terms of their functionality, the complexity and interrelatedness of these functions, and the historical knowledge they contain. This section will also explain some of the interfaces and variables that together create a highly complex depiction of world history that immerses the player and teaches them about history, additional interfaces are provided in *Appendix A*. Most nations in the game can be played by either the player or the AI, and examining how such play occurs will provide a broad understanding of the character of the game and *EUIV*'s operations as a whole. The typical game interface layout shown in *Figure 4.3* corresponds with the explanation provided below in *Table 4.1*.

Table 4.1. *Typical Interface Layout and Itemisation Table.*

Interface No. and Name	Information
1. Country View/Nation Management Interface	The primary interface for managing the player's nation. There is a sub-tab to select and manage each of the <u>14 different</u> elements of the nation. These 14 elements are explained in more detail later in the chapter, with an outline in *Figure 4.6*.
2. Notifications	Here the player receives notifications about changes in their nation (e.g. possibility to construct new buildings)
3. Country View Select	Contains the button to open the nation management interface.
4. Game Currencies	This section contains most of the currencies the player will use throughout the game to buy armies, construct buildings, advance in technology, and so on.
5. Time Mechanic	The game operates in real-time, but the player can slow down and pause the game while still interacting with many of the game elements (e.g. pause the game to manage and adjust the nation's economy).
6. Agents, Armies and Estates	This section lists the player's agents (e.g. diplomats), armies, navies and estates (e.g. aristocracy)
7. Hints	The player can receive hints from this section to help them progress in the game.
8. Mini-Map and Map Modes	The player can view the entire world map from this mini-map as well as change the map mode to view different variables (e.g. religions, goods, terrain).
9. Special Mechanics	The player can access special mechanics that are determined by their nation, its religion, culture, government type and so on (e.g. Curia Interface, Holy Roman Empire Interface).
10. World Map	The player can view and access the rest of the world from this interface. Further details are provided in section 4.3.1.

Figure 4.3. Typical *EUIV* interface layout and itemisation.

4.3.1 World Map Interface

In *EUIV* the world map, shown in *Figure 4.4* and *4.5*, is the first interface the player

sees and is used extensively throughout the game. The world map allows the player to access

specific provinces, explore the world, control colonies or move military units. It can be

changed to reflect different parameters depending on the player's situation. For example,

players playing as a Christian nation may switch to religion map mode to see which

provinces are Christian compared to those that are Muslim. This is useful information as

conquering provinces with a different religion may lead to civil unrest, while conquering

those of a similar religion minimises the conquered land's discontent. Players can also change

to the goods production map mode to see what goods are produced in each province and plan

conquests of provinces that will be most significant for their economy. The map refreshes

over the course of the game to reflect different gameplay and interaction outcomes. The

different map modes have educational value with the details of each map often being quite

historically informative, indicating the borders of nations, the dispersal of different religions,

the locations of resources and the names of regions. For example, both in-game and

historically, central America is rich in gold (Papademos, 2007, p. 593; Walton, 2002, p. 19 &

21) and cacao (Mathiowetz, 2019, pp. 287-289), and Indonesia in spices (Aritonang &

Steenbrink, 2008, p. 15; Jordan, 2016; Raghavan, 2006, p. 3 & 5). Similarly, the historical

location and spread of religions are also depicted in-game, including the Protestant

Reformation (Hillerbrand, 1968, pp. xi-xiii), the spread of Islam across South-East Asia

(Kersten, 2017; Ricklefs, 2008, pp. 3-4) and the Christianisation of the Americas (Benavides,

2015; Johnson, Zurlo, Hickman, & Crossing, 2017; Vanzanten, 2016). Names of provinces

change depending on their owner; for example, if Constantinople changes from Byzantium to

Ottoman control, its name will change to Kostantiniyye (Necipoğlu, 2010). However, the

map mode implementations are the developers' interpretations of historic data and must be

interpreted by the player while allowing for biases. For example, in its depiction in *EUIV*,

most of Australia is a wasteland, and its Indigenous nations are not recognised.

Figure 4.4. A zoom-in of the World Map and the province of Madrid, Spain. Each province reflects a city and the map depicts characteristics of the terrain, e.g. a river travels through this province.

Figure 4.5. Full view of the World Map in the year 1776, when European empires have colonised the New World and the Qing dynasty has formed.

4.3.2 Country View/Nation Management Interface

Figure 4.6. Nation Management Interface with sub-interface tabs.

As of patch 1.28.3 (released 04 February 2019) there are approximately 14 different tabs for managing the different aspects of the player's nation, or for interacting with other nations. As shown in *Figure 4.6*, each icon number corresponds with the numbered list below. The Country View Interface is one of the primary interfaces the player interacts with and contains the following tabs:

1. Court Interface

2. Government Interface

3. Diplomacy Interface

4. Economy Interface

5. Trade Interface

6. Technology Interface (plus the Institutions Sub-Interface)

7. Ideas Interface

8. Missions Interface

9. Decisions and Policy Interface

10. Stability and Expansion Interface

11. Religion Interface

12. Military Interface

13. Subjects Interface

14. Estates Interface.

4.3.3 Court Interface

From the Court Interface (*Figure 4.7*), the player can view and manage their nation's leader, consort, heir and any advisors to the nation's leadership and monarchy. Monarch power points[24] are accumulated and spent throughout the game, usually on Technology and Ideas. The Court Interface is historically informative as the player can learn about historically important leaders and even dynasties that ruled nations at different time periods, such as the Habsburgs (Kann, 1974, pp. 1-2).

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[24] Monarch power points are explained the Game Points and Currencies section of *Appendix A*.

Figure 4.7. Court Interface showing the Trastamara dynasty of Spain. King Juan has the traits of Zealot (shown by the priest icon under his name) and Well Advised (icons of the adviser and plus sign), making it easier to convert other religions and less costly to hire an advisor. However, he is also a Naïve Enthusiast (the hands shaking), making it harder to improve relationships with other nations under his rule.

4.3.4 Government Interface

The Government Interface (*Figure 4.8*) allows the player to manage aspects of a nation such as the form its government takes (e.g. monarchy, republic), various Country modifiers[25] (e.g. building the Forbidden City provides prestige and stability bonuses), and the

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[25] Modifiers are bonuses, penalties or a variables that affect the game.

different cultures that are represented in the player's nation. This interface contains historical details of forms of government that existed throughout history, and each unique government has a number of in-game bonuses that are linked to the historical characteristics of that government. For example, the Japanese Shogunate government can control vast numbers of Daimyo subject nations. However, the Shogunate nation has much less control over these Daimyo nations as they can declare war against one another, as they did in history (Hall, Keiji, & Yamamura, 2014, p. 7; Osamu, 1982, pp. 344-345).

Figure 4.8. Government Interface showing Castile is a Kingdom (a monarchist government) that has accepted the Castilian, Andalusian and Leonese cultures. However, Galician and Basque cultures remain non-accepted and will incur in-game penalties.

4.3.5 Diplomacy Interface

The Diplomacy Interface (*Figure 4.9*) allows the player to manage aspects of their nation that relate to diplomacy. For instance, the player can declare war, form alliances, offer vassalization/subjugation, engage in covert actions (e.g. support rebels, fabricate claims), issue embargos, ask for military access and undertake special actions for certain nations (e.g. papal actions such as excommunication). The player can use diplomats as agents to carry out these actions, but has only a limited number that can be used at any one time. This interface shows the state's relations with other nations and a number of statistics about the player's nation. The interface provides information on various diplomatic actions and spy-craft such as supporting rebels, forming coalitions and arranging royal marriages. Some nations have special forms of diplomacy that are historically specific and informative; for example, a nation that controls the papacy can excommunicate the leader of another nation, thereby bringing the excommunicated nation into disrepute and imposing negative modifiers. Historically, excommunication had negative social, religious and political implications for the excommunicated individual (Hill, 1957, pp. 1-2; Pavlac, 1991, p. 22), which are reflected in those negative modifiers.

Figure 4.9. Diplomacy Interface showing Castile has a truce with Granada, represented by a white flag against the emblem of the opponent nation (placed below the Enemies and Rivals section).

4.3.6 Economy Interface

From the Economy Interface (*Figure 4.10*) the player can manage their nation's economy. The interface displays the nation's income and expenses, and their final income balance. A nation's income can come from several sources, including taxation, produce, trade, gold mines, tributes from vassals and so on. Expenses can include those relating to the military and navy, state maintenance, counter-corruption expenses, missionary costs, colonising costs, interest from loans and so on. The player can increase and decrease their expenses via the expenses slider, which subsequently affects the upkeep of their military and navy, as well as any colonial and missionary efforts. From this interface the player can also take out or repay loans, reduce inflation, debase their nation's currency and raise war taxes. The interface often reveals considerable information about the economic history or actions of some nations. For example, when Spain and other colonial nations discover and conquer New World provinces with an abundance of gold and/or precious metals, the inflation in those colonising nations increases, as do its expenses. If not managed, inflation can contribute to a nation's economic collapse, just as it did for the Spanish after their excessive exploitation of gold and silver-rich provinces in the Americas (Papademos, 2007, p. 593).

Figure 4.10. Economy Interface showing the nation is in surplus of 5.12 ducats each month.

4.3.7 Trade Interface

From the Trade Interface (*Figure 4.11*), the player can view their trade income, see the variables affecting that income and the value/income of trade nodes, and send merchants to a specific trade node to collect or transfer trade power. Like diplomats, the player only has a limited number of merchants they can use to engage in trade missions. The player can send merchants to collect income and steer trade from this interface. Trade income is affected by a variety of trade variables, including trade efficiency, trade range, trade steering, global trade power, embargos and piracy. These game elements are historically relevant as each occurred as a function of the Europeans' conquest of the New World, when new trade nodes and goods

that became available to those conquering nations, such as gold and precious metals, were sent back to the conquering nations (Walton, 2002, p. 19 & 21). Another historically relevant aspect around trade that is reflected in this interface is the rise of piracy (Anderson, 1995, pp. 193-194; Walton, 2002, p. 19), which compromises national economic interests and affects how much income colonising nations receive. Other historical details feed into the trade system. For example, certain provinces in Indonesia provide trade bonuses as they have the Spice Islands modifier. Historically, certain islands in Indonesia grew the highly sought after spice, nutmeg (Jordan, 2016, p. 1), and this is represented in the game through the trade bonuses.

Figure 4.11. Trade Interface showing a pie-chart (top left) indicates that trade produces over a quarter of this nation's total monthly income.

4.3.8 Technology Interface

The Technology Interface (*Figure 4.12*) displays the player's levels of administrative, diplomatic and military technologies. Advancing through each level by spending monarch power points will provide the player with different in-game bonuses, representing technological advancement in the Early Modern era. Administrative Technology generally unlocks different forms of government that can be used to help expand the nation, Diplomatic

Technology is used to improve naval technology and expand trade capacity, and Military Technology is used to improve military knowledge and skills. The Technology Interface reveals different advancements in history such as the development of the military formation the pike square (Eltis, 1998, p. 23), the cure of scurvy with lime (Manchester, 1998, p. 168), and the emergence of the non-religious university (Forest & Altbach, 2006, pp. 42-43). Most of the technological advancements are European, in keeping with the game's Eurocentric focus. Technology groups also affect how fast a nation can research technology. Some groups are seen as superior to others in terms of their technology advancements. For example, the Western and Eastern European technology groups experience no technology penalty, while some African and Native American technology groups suffer a harsh 50% penalty imposed on their technological progress. These examples show a bias for some cultures over others in *EUIV*.

Figure 4.12. Technology Interface showing the nation is on level 3 for Administrative, Diplomacy and Military Technologies. Linked to the various types/forms of technological advancement are in-game bonuses that reflect technological developments during the era. For example, this interface shows the development of the pike square (Eltis, 1998, p. 23), a military technological advancement that increases unit damage in-game.

4.3.9 Institutions Interface

Institutions affect the technology penalties imposed on a nation by increasing the cost of the advancements required to achieve the level of Administrative, Diplomatic or Military Technology. The player can purchase Institutions with gold; however, the cost is reduced if the institution is present in the provinces the nation already controls. The spread and original

location of an institution depends on its type, and information about institutions and their emergences are usually historically informative. For example, in *Figure 4.13* below, the Renaissance has not yet occurred in the game, but will do sometime around 1450, usually in Italy and spreads quickly in rich and densely populated provinces. Historically, the Renaissance began in the 1300s, however it first appeared in rich and densely populated Florence (Goldthwaite, 1982, pp. 1-8), showing some parallels between counterfactual in-game history and factual history.

Figure 4.13. Institutions Interface showing different institutions in the game. This nation has not yet embraced the Renaissance, as it has not yet occurred.

4.3.10 Ideas and Idea Groups Interface

National ideas (see *Figure 4.14*) are regional, national, or culturally specific game bonuses that are obtained when the player purchases enough administrative, diplomatic and military ideas which are another set of in-game bonuses. The player can choose and view their national ideas and the historical information associated with these ideas in the interface. Each national idea presents the player with information about a specific fact related to that nation. For example, the Reconquista idea for Castile (Spain) presents some details about the Spanish Reconquista which was the expansion of Christian kingdoms and the fall of the Muslim Sultanates in the Iberian peninsula as it occurred in history (Modood, Triandafyllidou, & Zapata-Barrero, 2006, p. 145), as well as giving the nation's military a discipline bonus. In another example, the English Bill of Rights is represented in the game as an idea that, once implemented, reduces in-game separatism and uprisings. Historically, the bill created a separation of powers, promoted democratic elections and enhanced freedom of speech (Malcolm, 1993, pp. 245-246).

Figure 4.14. Ideas Interface showing Spain/Castile's Idea set, focused on colonial expansion, converting other religions and improving the military. National ideas are nation-specific and reflect the factual history about a nation.

Idea groups are unlocked as advancements in administrative technology progress, and the player uses each group to improve their nation (*Figure 4.15*). For example, economic ideas will improve the nation's economy, increasing income and reducing expenses, while quantity ideas will increase the nation's military capacity by increasing incoming manpower, force limit (the numbers of armies a player can have) and so on. The player chooses which ideas they wish to unlock to enhance their nation's strengths or offset its weaknesses. For example, a player playing as Muscovy/Russia, which has a large manpower surplus in the

game, just as they did in history (Porter, 2002, pp. 115-116), will often choose quantity ideas to create extremely large armies and manpower pools.

Figure 4.15. Idea Groups Interface showing three idea groups (Administrative, Diplomatic and Military) for the player to choose from. Within each group, idea sets focused on a specific improvement can be utilised by the player. For example, Exploration ideas are often chosen by Western European nations as this allows them to explore and expand into the New World.

4.3.11 Missions Interface

Although *EUIV* has no ultimate objective, missions act as mini-objectives that the player may choose to complete. Missions can be both generic and nation-specific, depending on their relevance to a nation's historic path. As the player achieves the conditions required for each mission they can select to receive the bonuses and follow their nation's historical or counterfactual mission path. For example, in *Figure 4.16*, one mission branch of Castile/Spain details the historical expulsion of the Moors from Southern Spain (Modood et al., 2006, p. 145), the conversion of Southern Spain to Catholicism and the option to continue the Reconquista into North Africa.

Figure 4.16. Missions Interface showing Spanish/Castilian missions. The mission tree
branches follow several historical themes relevant to the Spanish Empire. The exploration
and conquest of the Americas branch includes missions relating to conquests of the Aztec,
Maya and Incan nations. The European expansion branch includes missions to conquer the
Netherlands and sections of Italy, to assume control of the Holy Roman Empire and to launch
an invasion of England by the Spanish Armada.

4.3.12 Decisions and Policy Interface

National Decisions are options that can be enacted using the Decisions and Policy Interface once a player has fulfilled the required conditions to access those decisions. The player can then choose when to enact the decision if they meet those requirements. Decisions can be both generic and nation-specific, relevant to a nation's religion, technology and culture. For example, in *Figure 4.17*, the player controlling Florence has a series of decisions available including the option to form Italy. Once the decision is made, the player's nation will then change from Florence to Italy, accompanied by a new set of National Ideas and other in-game bonuses. On this interface the player can view historical information in the form of the Italian unification process (DiScala, 2018, pp. 37-40). Policies become available once two or more idea groups are unlocked, and the player can then choose whether to unlock the policy for the cost of one monarch power point each month. For example, Innovative idea sets and Trade idea sets unlock the Banking System policy, which increases trade efficiency and reduces interest on loans.

Figure 4.17. The Decisions and Policies Interface allows the player to execute different decisions once they meet the requirements to do so. The figure shows that if the player gains the required provinces, they can change their nation to Tuscany and then to Italy.

4.3.13 Stability and Expansion Interface

The Stability and Expansion Interface (*Figure 4.18*) allows the player to manage some of their nation's internal affairs and matters of stability. The game mechanic of stability affects a large number of other factors. One way it is used is to counteract national unrest

within the player's nation. If there is too much national unrest, rebels will rise up and a rebellion will potentially spawn; hence, stability reduces the likelihood of rebellions. Rebellions and potential rebellion are shown under the "Rebels and possible rebels" section of this interface. Rebels can range from nationalists wanting to gain independence to religious minorities wishing to enforce their religion on the state. Rebels are most likely to rise up after the conquest of land or in times of war. The Overextension parameter on this interface interlinks with the rebel mechanic. Overextending by conquering too much land will cause a rebellious sentiment in the player's nation. Therefore, the player must integrate the land into their nation before the conquest of new land can be undertaken. The player must also manage the Disasters parameter in this interface, which displays major events related to rebellions and civil discontent. Certain conditions must be met for these disasters to occur, and many are historically based, such as events like the Janissary uprising that occurred in the Ottoman empire from the 15th-19th century (Kafadar, 1991, p. 273). In-game, the Janissary uprising will occur in the Ottoman Empire if the player builds too many Janissary units.

Figure 4.18. Stability and Expansion Interface showing a nation facing possible collapse due to the existence of several rebel factions, including Albanian and Crimean separatists, organising against the player's nation.

4.3.14 Religion Interface

The Religion Interface (*Figure 4.19*) shows the religion of the player's nation and its associated benefits and actions. The interface also shows the nation's tolerance of heretical and heathen religions, which may be converted to the national religion. Conversions are carried out using missionaries, who are agents of the nation and available to the player, much like diplomats or merchants. The number of missionaries the player can use at any one time is also limited. Each religion will typically have characteristics and strengths that depict historical details that are specific to that religion. For example, Islamic nations may be more religiously devout being able to easily covert provinces to Islam as well as having better troop morale, at the cost of innovation/technological progress, or vice versa.

Figure 4.19. Religion Interface showing the state religion as Sunni Islam and the option to send missionaries to convert Christian Orthodox and Catholic provinces to Islam.

4.3.15 Military Interface

From the Military Interface (*Figure 4.20*) the player can view their recruitable

military units, choosing from infantry, cavalry or artillery. The types of ships the player can

build include small ships (effective in coastal areas), trade ships and capital ships (effective in

open seas). From this interface the player can also view their leaders and explorers and hire

new ones. Army and navy variables are displayed here, including the player's army and navy

force limit, any forts that exist around the nation, and other variables that influence the

effectiveness of the army and navy (army tradition, naval morale, military tactics, discipline,

etc). The interface also lists historical detail in the form of military and naval units used

throughout history, such as Janissary infantry (Jennings, 1993, p. 107), Spahi cavalry

(Jennings, 1993, p. 107), Carracks (ship type) (Unger, 1997, p. 509) and Merchantman (ship

type) (Unger, 1997, p. 507 & 518). The Battle and Battle Outcome Interfaces are located in

Appendix A.

Western Unit Tech	🪙	✊	✕	⚡	#
Latin Medieval Infantry	10	+0%	0.35	0.5	17
Latin Knights	25	+0%	0	1	7
		+0%	0	0	0

Naval Units	🪙	✊	⚙	🚢	#
Early Carrack	50	+0%	40	20	4
Barque	20	+0%	10	8	6
Galley	10	+0%	12	8	0
Cog	12	+0%	4	12	10

0.5		8.9		
100.0%		2.97		
+1.0%		24/31		
50		6.8		
20		2.17		
+2.4%		20/21		
2/2		0.0%		

1 Leaders (1/2)

♂ Álvaro de Luna

✔ Automatically raise maintenance during war

Figure 4.20. Military Interface showing typical military composition and tools available for use by many Western European nations. From this interface the player can manage their army and navy and conduct military leadership strategies.

4.3.16 Subjects Interface

From the Subject Interface (*Figure 4.21*) the player can manage all the nations they have under their influence and control. This interface shows the relationship between the subject nation and colonising nation, the subject's desire for liberation, the income the colonising nation acquires from the subject nation, the size of the subject's army, whether a merchant is provided to manage income and trade, and an interaction button which provides more subject interaction options that vary depending on the nation in question. Different subject types have different historical and in-game significance. For example, subject nations can only be formed in the Americas and Oceania, are more independent than other vassals (i.e. they can declare war on other nations), and provide shipments of gold back to the colonising nation. In such cases, historical themes are represented that relate to the loose governance of some subject nations (Burroughs, 1984, pp. 39-40), and the European exploitation of precious metals in the Americas (Papademos, 2007, p. 593).

Figure 4.21. Subjects Interface showing the British collection of subjects, including a Personal Union with Hannover, Carnatic (a British Protectorate), and the British West Indies, a British colony.

4.3.17 Estates Interface

From the Estates Interface (*Figure 4.22*) the player can manage their nation's internal affairs and interest groups (e.g. aristocracy, clergy, etc), known as "estates", within their nation. Here, the player can see the name of the estate, the positive or negative effects of an estate on the player's nation, the loyalty of the estate to the player's nation, the influence the player holds within the nation, the amount of land they control, and an interaction button (the hand with the red circle), which provides another drop-down tab with a list of further interactions. A player's nation with higher loyalty to the state will accrue more benefits (e.g. more manpower or receives more tax), while the more disloyal an estate is, the more negative modifiers will be enforced on the player (i.e. receives less tax). If the influence of an estate is too high, the estate will rebel and, if the rebellion is successful, negative modifiers will affect the player's nation. This interface provides the player with the choice of a variety of actions, such as consolidating loyalty in exchange for resources, or providing benefits, usually in exchange for a portion of loyalty, which is used as a form of in-game currency. The estates represented in a typical nation are the merchant class, the aristocracy and the clergy. Some nations have historically unique estates such as the Dhimmi (Ye'or, 1985, pp. 35-36 & 94) in the Ottoman Empire or the Cossacks (Plokhy, 2001, pp. 18-19) in Russia, both which played significant roles in the histories of those nations.

Figure 4.22. Estates Interface showing the Ottoman estates, including the Umera (Aristocracy), the Ulema (Clergy), the Merchant Guilds and the Dhimmi (Christian/non-Muslim subjects unique to the Ottomans).

4.3.18 Pop-up Boxes

Messages in pop-up boxes appear on the world map to notify the player of any changes in the world or within their nation. These can be customised to filter out any information the player does not deem to be useful, and can provide details on almost any in-game action or event that has occurred, such as a declaration of war, an advisor dying or the declaration of a truce. In many cases these directly affect the player's nation.

4.3.18.1 Event Pop-up Boxes

An event pop-up displays the title of the event, a picture that represents it, an excerpt of information about the event, and at least one option for the player to select from to acknowledge the event and/or choose an outcome with in-game consequences. Event pop-ups can be notifications of small changes (*Figure 4.23*) or of larger events and decisions (*Figure 4.24*). Event pop-ups occur throughout the game and can provide the player with positive, negative or mixed outcomes. These can relate to larger-scale events relating to the governance of the player's nation, or can be specific to that nation's religion, culture or government. Some events are even nation-specific, as discussed below.

Figure 4.23. A simple event pop-up showing that Lucca has joined the Genoa Trade League.

Figure 4.24. A decision event pop-up, Records of the Grand Historian, will give the player prestige and currency at the expense of some ducats.

4.3.18.2 Dynamic Historical Events (DHEs).

DHEs are usually nation-specific and can be triggered in any fashion. These events are useful for conveying the history of a specific nation and often cite the exact details of certain events, including names, dates, locations and actions. For example, the Spanish DHE (*Figure 4.25*) details the marriage between Ferdinand II of Aragon and Isabella of Castile in October 1469, and cites historical dates, actors and places (Rubin & Stuart, 2004, pp. 81-82). DHEs and popup events more broadly are highly customisable for modders to insert their own content into *EUIV*. Further exploration of this feature, in other chapters, could be useful to understand *EUIV*'s pedagogical value.

Figure 4.25. The DHE "The Iberian Wedding" provides the player with two options: to follow history and form a union between Castile and Aragon, or to marry locally within Castile, providing a boost in stability.

4.3.19 Ages Mechanic

The game timeline is divided into four ages that are intended to represent the Age of Discovery (Lestringant, 2016; Lewis, 1996; Matar, 2000), Age of Reformation (Harbison, 2013; Skinner, 1978), Age of Absolutism (Beloff, 2013; Ranum, 1968; Vierhaus, 1988) and Age of Revolutions (Armitage & Subrahmanyam, 2009; Hobsbawm, 2010; Onuf, Onuf, & Onuf, 1993). The Age interface (*Figure 4.6*) shows various objectives associated with each age, and the player can also purchase certain abilities using splendour (an in-game currency) that accrues from achieving those different objectives. A player who achieves these

objectives can also initiate the beginning of a Golden Age that provides further bonuses for their nation. These occur once per game. For example, a player playing as the Portuguese in the Age of Discovery can achieve the Discover America objective and choose increased colonial growth as a purchasable ability.

Figure 4.26. The Ages Interface allows the player can view the different ages, achievable objectives and purchasable abilities. The current tab shows the Age of Discovery.

Explanations of other game elements and functions in *EUIV* are located in *Appendix A*, which includes information about the game's currencies, time mechanics, nation specific mechanics and so on. These elements are essential parts of the game, but are not necessarily historically-specific or as important as those explored in this chapter.

4.3.20 The Europa Universalis Community and Gaming Practices

EUIV has a large and active online community whose members interact in the Paradox Interactive game forums. Each Paradox Interactive game has its own forum as well as sub-forums for FAQs and strategy guides, technical support, bug reporting, game suggestions, multiplayer and user mods, After Action Reports (AARs) and fan fiction (*Figure 4.27*). Each sub-forum contains threads and discussions initiated by Paradox Interactive's developers or forum members, and other developers and forum members can respond to these. In the main *EUIV* sub-forum, developers and forum members discuss everything from what players enjoy about the game to suggestions for improvements (*Figure 4.28*). The *EUIV* forums form a pivotal part of the *EUIV* gaming community, where over 68,000 threads discuss the game across *EUIV* sub-forums and in four languages other than English: Spanish, German, Swedish and French (Paradox Interactive).

Figure 4.27. The forum list of sub-forums including technical support, FAQs and Strategies, Multiplayer, Mods and more (Screenshot taken 29 July 2019).

Title	Start Date	Replies	Views	Last Message ↓
Europa Universalis IV: Golden Century out now! BjornB, Dec 12, 2018 … 5 6 7	PINNED	Replies: 138	Views: 125.667	Serg1777 May 31, 2019
Europa Universalis IV: Golden Century Game Manual (EN/FR/GER/SPA) BjornB, Dec 8, 2018 … 2	PINNED	Replies: 22	Views: 54.227	Quackytheduck Dec 18, 2018
Europa Universalis IV: DLC Render Pictures Archive LarsHahus, May 2, 2014 … 30 31 32	PINNED	Replies: 634	Views: 594.559	IndigoRage Jul 22, 2019
Europa Universalis 4 Wiki Meneth, Apr 4, 2013 … 15 16 17	PINNED	Replies: 329	Views: 256.410	Dauth Jan 2, 2019
Changes to Playing Previous Versions of PDS Titles /How To Roll-back Your Game Version HottestRod, Sep 25, 2018	LOCKED PINNED	Replies: 0	Views: 17.025	HottestRod Sep 25, 2018
Europa Universalis patch 1.28.3 is now LIVE! [checksum 3ba8] - Not for problem reports BjornB, Feb 4, 2019 … 2 3	PINNED	Replies: 40	Views: 77.872	corgi911 Jun 1, 2019
A Reminder Regarding the use of "Kebab" as a Slur Mr. Capiatlist, Oct 28, 2016	LOCKED PINNED	Replies: 2	Views: 176.195	Mr. Capiatlist Aug 29, 2018
Is there a way to force curtail_estate_noble? bucketofsquid, Today at 10:46		Replies: 2	Views: 38	bucketofsquid Today at 11:12
EU4 - Development Diary - 23rd of July 2019 Caligula Caesar, Tuesday at 18:00 … 9 10 11		Replies: 211	Views: 104.392	Kurva Anyátok Today at 11:02
Double war on Ottoman Empire at game start as Byzantium, made out with 1500 ducats and provinces Golbez01, Apr 27, 2018		Replies: 11	Views: 3.274	TeutonicImpaler Today at 11:00
EUIV: Evangelical Majors Renders Catalack, Oct 10, 2016 … 5 6 7		Replies: 126	Views: 69.540	Carlberg Today at 10:56
Are Devs theseday focus too much on mission tree but forget about history events? zweihander, Saturday at 02:45 … 2		Replies: 33	Views: 3.573	Kurva Anyátok Today at 10:55
Is manpower pool gonna be buffed? CR0N0S LXIII, Today at 08:53		Replies: 2	Views: 153	Jarvin Today at 10:54
Tips for Diplo-Vassalizing? BrotherJonathan, Friday at 07:13 … 2		Replies: 23	Views: 1.320	BrotherJonathan Today at 10:50
Army comparison ledger EarlKonrad, Today at 09:51		Replies: 2	Views: 28	Jarvin Today at 10:48

Figure 4.28. The sub-forums show pinned topics about large announcements such new downloadable content (DLCS) and the *EUIV* wiki are located at the top. Threads/discussions started by forum player members follow (Screenshot taken 29 July 2019).

In addition to general discussions about *EUIV*, the forums are a place where players can share detailed stories about their previous play-throughs of *EUIV*, known as After-Action Reports (AARs). In AARs, users recall their experiences with a given game, campaign or play-through, often in a story-like format (Apperley, 2018; Mukherjee, 2017, p. 39). AARs do not have to be based on factual history, with some users creating their own fan fiction about game-based scenarios or historical events. Through AARs, players can convey to the rest of the community the details of their greatest or most interesting in-game experiences.

The researcher's experiences indicated that players also use the forums to circulate mods they have developed. Discussions of these mods are integral to interactions between members of the gaming community, and the mods themselves are one of the reasons the game is so popular. The ease of modding the games means that players can create their own game content or modified versions of a game using anything from small changes in variables, which might resolve any imbalances perceived by the player, through to total conversion mods that can change the entire setting of the game to another era or context (gigau, 2019). Paradox Interactive has facilitated the creation of mods and the growth of the modding community by creating an intuitive in-house language that players can use to modify the game. This language is based on accessible scripts rather than hard or backend code. The developers also employ a full-time Usermod Coordinator to support the modding community (Captain Gars, 2014).

Alongside the players, developers also actively engage with the gaming community, interacting with community members and sharing information such as forum posts, Developer Diaries[26], Twitch and YouTube game videos, and social media content like Twitter updates. Paradox Interactive generally maintains good relations with the community by acting on player suggestions and concerns. For example, a mechanic called Estates that

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[26] Developer Diaries are posts where developers explain the game's development and new features.

typically depicts the historical classes of the nobility, clergy and burghers was introduced to cater to player requests to have more control over internal governance (Paradox Interactive, 2015a). The developers continue to release new DLCs and free patches/content for *EUIV* as well as integrating new historical content into the game to meet the interests of players. As such, the game is constantly improved and expanded upon, with developers engaging in a constant dialogue with players.

Spring (2015, p. 212) suggests that games often have rich historical detail ingrained in their worlds, ranging from basic elements such as character clothing to complex political, social and economic system in-game. Spring points to the *Assassin's Creed* series (Ubisoft Montreal, 2009, 2012, 2014) as an example which details historical architecture and items (e.g. cloths and weapons of the historical era) of the game setting as well as including elements of more complex themes (e.g. *Assassin's Creed IV: Black Flag* contains systems around piracy, exploration and whaling). Similarly, the exploration of *EUIV*'s different game mechanics has provided insight into the historical knowledge contained in *EUIV* and its various interfaces. These elements provide small historical details as well as sophisticated depictions and recreations of history. Game elements such as the world map, governance mechanics and pop-up boxes warrant further interrogation, and will be examined in relation to data drawn from the *EUIV* online forum survey, discussed in the next chapter. Research into the online community that forms such a crucial part of *EUIV* gaming practices, including AARs and modding, will present important insights into the game and the potential of those mechanics and practices to operate as pedagogical tools.

4.4 *EUIV*: War, Peace and the Rise of Grand Strategy Games

Paradox Interactive dominates the Grand Strategy genre, and *EUIV*'s ability to present both grand historical narratives and finer details means it is the game of choice for many history enthusiasts. This section will demonstrate why *EUIV* is an ideal candidate for this

research in terms of its potential use as a tool for learning history. This section will analyse how Grand Strategy games have evolved from wargames as a means to understand the complexity that Grand Strategy games reflect about war and peace. To briefly reiterate the analysis in Chapter 2, wargaming has evolved from elementary physical games using basic tactics to more complex Political-Military strategy wargames that encompass a large number of variables and calculations (Caffrey, 2000, p. 41; Lastowka, 1999; Perla, 1990, pp. 109-110; Setear & Lastowka, 1999; von Hilgers, 2012, p. 13). The *Europa Universalis* series initially began as a board wargame (Board Game Geek, 2019; Thibaut & Scorraille, 1993), and has maintained tactical elements of wargaming, including variables such as terrain and morale. This formula is a core mechanism in tactical wargaming, as it is in *EUIV*. However, *EUIV* has moved beyond its tactical and Political-Military wargaming roots (*Table 4.2*). As discussed in Chapter 2, in Political-Military wargames, higher-level economic and political factors are at play, but the games are ultimately still based around war. In comparison, *EUIV* is more complex, simulating both war and peacetime governance. There are numerous governance aspects (shown in *Figure 4.6*) the player must consider for their nation, including but not limited to diplomacy, the economy, trade and technology. Each peacetime element is highly complex, as shown in the Trade Interface in *Figure 4.11*. Hence, warfare is not the only focus of *EUIV*, with peacetime governance and nation development forming a crucial part of *EUIV* and Grand Strategy games. Accordingly, the game reflects both times of peace and of war, offering potential as an educational tool to teach a wide range of historical topics, concepts and narratives.

Table 4.2. *Types of factors to consider in different wargames, based on Weiner's (1959, p. 13) wargames chart.*

Types of Factors Included in Simulation	Type of Conflict Simulation			
	Duel	Battle	Campaign	War
Resources	X	X	X	X
Objectives	X	X	X	X
Military Intelligence	X	X	X	X
Environmental Characteristics		X	X	X
Background Information		X	X	X
Logistics			X	X
Economic			X	X
Psychological			X	X
Political				X
Additional Sides				X

Note. Several non-tactical factors in the "War" column can be included to depict higher-level factors in a Political-Military wargame (Weiner, 1959, p. 13). While non-tactical factors such as economics and politics come into play, the Political-Military wargame still focuses on the outcomes of war.

In *EUIV,* there are many viable peacetime strategies and gameplay options that different nations might utilise, some have a unique historical approach. For instance, Venice historically derived its power through trade and wealth (Lane, 1973, pp. 1-2; Rosand, 1993),

rather than through military might. With this focus, a player who is playing as Venice might be better suited to developing provinces they already own or strategically conquering trade provinces rather than warring over large portions of land, which slows down production and hinders trade. Therefore, peacetime governance is an important consideration for gameplay when playing as Venice. Another strategy a player playing Venice (or other Merchant Republics) could undertake is forming Trade Leagues (such as the Hanseatic League (Fink, 2012)) by banding together with other smaller nations in a defence pact. The main benefit of being part of such a league is an increase in trade power and wealth, which each league member experiences. This more measured gameplay strategy differs to others that would involve conquering smaller nations outright, showing that more peaceful strategies are also viable options. Similarly, in such situations war and expansion do not just relate to military might, but can occur through peacetime governance with the introduction of economic warfare, coercive diplomacy and espionage. In such circumstances, *EUIV* requires players to understand how economics relates to warfare, governance is connected to economic growth and technology assists military developments. Recognising the interconnectedness of these different elements of nation management provides the player with insight into how a nation operates.

All of *EUIV*'s processes, mechanics and ideas are demonstrated within their particular historical contexts. For example, a common historical narrative in Ottoman history was that the Janissaries played a part in the Ottoman Empire's decline because the Janissaries shifted from being disciplined and loyal soldiers to an unruly military force more concerned with their own self-interests (Kafadar, 1991, p. 273). *EUIV* reflects the actions of the Janissaries in a similar way. The player can choose to build up the Janissaries, giving them a huge military advantage at the beginning of the game; however, over time and under the right circumstances, a "Janissary Decadence" event can occur which will slow down the player's

technological progress, reduce their manpower and impose other negative modifiers (Paradox Development Studio, 2013a). The Janissaries Decadence event is therefore game-changing, affecting the military capacity of the player's nation while also making it difficult to govern during peacetime and achieve technological progress throughout the game. In this way, *EUIV* is not purely a military simulation or traditional wargame, but is a simulation of war and peace, with both elements intrinsically connected to and affecting each other. These intricate relationships show the complexity of history and how these historical themes and details interconnect and interact.

As the player encounters historical details and narratives, they develop a greater understanding of the time period they are playing. One example of this is the colonial nations system, which depicts the colonisation of the Americas and formation of new colony nations. For instance, nations that colonise the Americas will create new colonial subjects whenever they settle in provinces in certain regions (Paradox Development Studio, 2013a). The newly created subject nation (e.g. New Spain) is constrained diplomatically, economically and militarily by their colonising nation, and is thereby compelled to serve them. However, as a colonised nation's desire for liberty increases (through certain events or increased tariffs imposed by the colonising nation), so too does the chance of them declaring independence. If their European masters placate the colonies, the latter will send large deposits of gold back to the old world via treasure fleets, but these can be raided by privateers and pirates, affecting the income of the nation that owns the treasure fleets. These historical elements can be seen in *Figure 4.29*, which reflects the colonisation of the Americas and the wealth the event produced. In some simulations, ahistorical counterfactual scenarios will appear. For example, Spain may colonise Canada and thus Spanish Canada will be created (Apperley, 2006; Paradox Development Studio, 2013a). Despite this counterfactual rendering of history, the mechanics and details around these inaccurate reflections nonetheless still represent the

broader historical theme of European colonisation of the Americas (Rodríguez & Guez, 1998, pp. 7-8; Ward, 1976; Zimmerman, 1931, pp. 439-440), the rise of piracy/privateering (Anderson, 1995, pp. 193-194; Walton, 2002, p. 19), the creation of global trade (Buckman, 2005, pp. 7-8) and the formation and independence of colonial nations (Rodríguez & Guez, 1998, p. 223; Webb, 1995, pp. 5-6). These trends characterise the narratives of the Early Modern era. In this way, the player can learn history when situated in a specific historical context by experiencing a nation's opportunities, hardships and dynamics.

Figure 4.29. Subject Management Interface showing Spain's subjects, who are all distant colonial nations, and provide income at tariffs of 67%. The tab also shows that many of Spain's subjects are disloyal or rebellious and may declare independence soon (Paradox Development Studio, 2013b).

In *EUIV*, fine-grained historical details are represented through traditional table-top wargaming variables such as terrain and troop morale, but also through non-military parameters such as leaders, province details and DHEs. DHEs may appear if a nation meets certain trigger conditions that often relate to real historical circumstances and details. For instance, DHE frequently relates to issues of peacetime governance; for example, one DHE specific to the nation of France reflects the creation of the Mississippi Trade Company (*Figure 4.30*), and can only occur within a certain timeframe and under specific conditions.

Figure 4.30. The Mississippi Trade Company event can only occur between 1700 and 1750 for players playing as France and with a colony in Louisiana.

The event provides the player playing as France a lump sum of ducats to reflect the wealth generated by the company, and the names, numbers, dates, places and details

presented in the pop-up are, if not almost, factually accurate (Knight, 2002, p. 77; Velde, 2009, p. 103). Moreover, near historically accurate conditions must be met for the DHE pop-up to appear in-game. The code shown in *Figure 4.31* reveals the trigger conditions required for the Mississippi event to occur, those being the player is France (tag = FRA), the year as between 1700 and 1750, and the colony of Louisiana as being in existence. In terms of gameplay, the player is rewarded with nation-specific events such as the Mississippi Event when they follow that nation's historical path and narrative. Hence, the player is rewarded for knowing a nation's history through gameplay.

```
# The Mississippi Trade Company
country_event = {
        id = flavor_fra.3132
        title = "flavor_fra.EVTNAME3132"
        desc = "flavor_fra.EVTDESC3132"
        picture = MERCHANTS_TALKING_eventPicture

        fire_only_once = yes

        trigger = {
                tag = FRA
                is_year = 1700
                NOT = { is_year = 1750 }
                colonial_louisiana = {
                        country_or_vassal_holds = FRA
                }
        }

        mean_time_to_happen = {
                months = 150
        }

        immediate = {
                set_country_flag = FRA_had_event_3132
        }

        option = {                  # This sounds like Easy Money!
                name = "flavor_fra.EVTOPTA3132"
                add_years_of_income = 0.5
                set_country_flag = mississippi_trade_company
        }
}
```

Figure 4.31. The Mississippi Event code is hidden but can be found in the game files (Paradox Development Studio, 2013a). The trigger code tagged in red illustrates the conditions that must be met for the event to appear, and are historically-based.

This example also shows the Eurocentric nature of *EUIV*, and the Western bias that is encoded into the game. As previously discussed, technological progression in the game is experienced by European nations, including various philosophical concepts and scientific advancements (Paradox Development Studio, 2013a; Pobłocki, 2002b, pp. 174-175). There are several technology groups entitled "Western", "Anatolian", "South American" and "Chinese", and each may suffer certain penalties that affect their technological progress. In earlier versions of the game, nations not a part of the "Western" technology group could undergo a process of "Westernisation", during which they will experience periods of turmoil before becoming part of the "superior" Western technology group. In more recent patches, technology penalties are imposed on nations if they do not develop Western institutions such as Feudalism, the Renaissance, Colonialism or Enlightenment. Such depictions suggest that technology in *EUIV* suffers from the same problem as other strategy games (Creative Assembly, 2009; Ensemble Studios, 2005, 2006; Firaxis Games, 2005, 2008, 2010; Paradox Development Studio, 2001), which has also been noted by other authors who have critiqued this Eurocentric focus (Apperley, 2006; Dillon, 2008; Ford, 2016; Mukherjee, 2017).

Nevertheless, while Western progression dominates the game, the histories of many non-Western nations are included and presented in considerable detail in *EUIV*, and Paradox Interactive has attempted to provide more diverse perspectives through DHEs, including those of nations of the Asian and Indian sub-continents and Native Americans. As a result, the game does represent traditionally marginalised nations in a level of historical detail. For example, *EUIV* does effectively provide Indigenous perspectives on certain aspects of history, especially through newer versions of the game such as *Europa Universalis VI: Conquest of Paradise* (Paradox Development Studio, 2013b, 2015a) and *Europa Universalis VI: El Dorado* (Paradox Development Studio, 2013b, 2015a), both which depict the nomadic lifestyles of some northern Native American nations (Bastian, Mitchell, & Mitchell, 2004, pp.

10, 11, 15; Pritzker, 2000, p. 292) and the apocalyptic features of Aztec society respectively (Pedelty, 2004, p. 8; Restall & Solari, 2011, p. 67). Further perspectives are offered in free DLCs, such as *Women in History* (Paradox Interactive, 2015b), which brings in additional DHEs related to prominent women figures such as La Malinche (see *Figure 4.32*). Several other DLCs and expansions supplement existing DHEs and game mechanics and further depict the history of Islamic and Asian countries. Thus, while *EUIV* does not provide a completely pluralistic history, it at least gives the sense that these often-marginalised nations and cultures did have their own unique histories and societies.

Many COTS strategy games and Grand Strategy games often present an "us and others" mentality, and provide very few details about nations or cultures outside of Europe or the US (Bembeneck, 2013, pp. 86-87). In comparison, the non-European nations represented in *EUIV* are not anonymous "barbarians"[27], but are rendered in considerable cultural, geographical and historical detail. This level of detail might have little impact on the colonial logic of the game, but these rich depictions may attract the attention of players who are otherwise uninformed about those nations or cultures, potentially leading to a wider engagement with this area of knowledge.

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[27] The *Civilization* series is famous for depicting "barbarians" of unknown origins who harass players as they build their nations at the beginning of the game.

Figure 4.32. A DHE showing La Malinche from the DLE *Women in History* (Paradox Interactive, 2015b). This DHE occurs when Spain discovers Central America, and gives the player the choice to make La Malinche a leader or gain in-game prestige for the player nation (Paradox Development Studio, 2015b).

Compared with other wargames, *EUIV* and Grand Strategy games place greater emphasis on the important features of the time period they depict, during both war and peacetime. The transformation of table-top wargames to digital wargames and then to Grand Strategy video games shows how higher-level, complex elements of historical simulations can be utilised to create historically-rich gaming content. In table-top wargames (Sabin, 2015b, p. 333), and some video games (Kapell & Elliott, 2013, p. 5), there is often a trade-off between accuracy versus simplicity, or historical details versus broader narrative. In contrast, *EUIV* embodies both aspects, providing *breadth* in terms of war and peacetime history, and *depth* in terms of broader accessible historical narratives and lower-level historical details.

These two aspects are compared in *Figure 4.33*[28]. The *breadth* axis covers small-scale tactical battles, entire wars, and peacetime events both before and after a war. The *depth* axis shows at its lowest level details of history similar to those found in tactical wargames and at its highest levels broader, less quantifiable concepts such as governance and diplomacy, which are often associated with peacetime. For example, the player may be affected by economic or trade issues, and may use war as a way of resolving or improving those issues. The player may then experience the economic and trade implications of the outcome of the war during peacetime. The *breadth* and *depth* axes thereby show how the transition between tactical wargames to Political-Military Wargames to Grand Strategy games occurred, whereby each stage of the transition encompasses new and more complex factors while retaining the characteristics of the previous stage. Grand Strategy video games on the scale of *EUIV* can therefore reflect the complexities of both war and peacetime governance (*breadth*), as well as historical details and broader narratives (*depth*). Hence, *EUIV is* a good candidate for teaching broader historical concepts as well as smaller details of history, with the game's inclusion of both war and peacetime events providing a more diverse perspective on history, in addition to the games' reflection of more marginalised perspectives.

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[28] The characteristics of tactical wargames and Political-Military games are based on Weiner's (1959, p. 13) wargames chart.
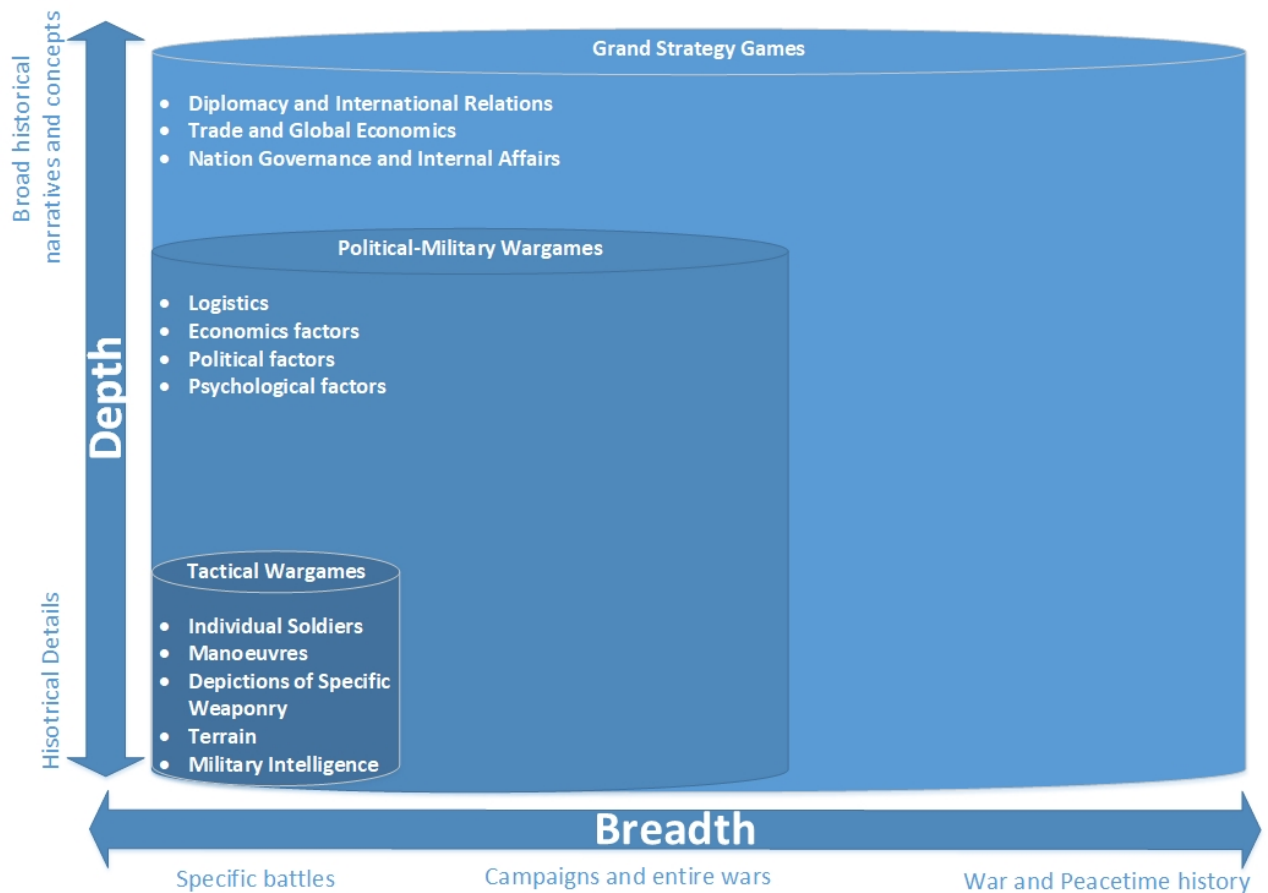
Figure 4.33. Historical breadth and depth of wargames with their associated characteristics and content.

4.5 Existing Pedagogical and Historical Scholarship on *EUIV*

As discussed in Chapter 2, there has been some academic interest in the Grand Strategy genre, especially around pedagogical usage. Although research is limited, there are several notable studies that use the *Europa Universalis* series as a subject of study (Apperley, 2006, 2013, 2018; Egenfeldt-Nielsen, 2005; Koabel, 2017). Chapter 2 discussed research by Kuran et al. (2018) who implemented *EUIV, Hearts of Iron IV* and *Crusader Kings II* in a history course. Kuran et al. (2018) observed students' learnt geographical knowledge, aspects of nation management and the modelling of historical decisions. These are promising observational findings, however player data would add to the study.

Egenfeldt-Nielsen's (2005, p. 193) analysis of *EUII* found participants believed the game lacked historical authenticity, and that other sources (literature) needed to be accessed to properly learn about history. It is arguable that older versions of *Europa Universalis* series, while still content rich and complex, pale in comparison to newer versions of the game in terms of game mechanics that reflect history in a sophisticated and interesting way. Using a newer version of the game that has more thematic and textual content (such as pop-up boxes and DHEs) and more inclusive content (such as depictions of the histories of different nations and cultures), along with a better user interface, may provide more positive results in terms of the series' usefulness in pedagogy. In Egenfeldt-Nielsen's (2005, p. 206: 206) study, it was evident many participants, who were adolescents, failed to appreciate, explore and link gameplay to history. It is arguable that adults may have greater patience and capacity to learn through the game's complexities, and thus benefit more from gameplay. This theory was applied when choosing the participants for the research.

Apperley (2013, pp. 193-195) also analysed the *Europa Universalis* series (and other Grand Strategy games) in several research papers, with a focus on historical depictions. In Apperley's (2013, pp. 193-195) study of *EUII* (Paradox Development Studio, 2001) the author notes players can choose whether to attempt to re-enact factual history or to create a counterfactual. Regardless of the player's choice, the game history is usually within realistic parameters to give it "historical verisimilitude"; that is, the appearance of being historical. It is clearly apparent that *EUIV* has such realistic parameters. Since 2013 and in newer games in the *Europa Universalis* series, players now have the option to attempt to simulate textbook history should they wish, and are rewarded with DHEs for their attempts. An example of this is the DHE involving France, shown in *Figure 4.30*, where the player is encouraged to colonise Louisiana, triggering the Mississippi Company event. DHEs such as these allow players to create a textbook-like rendering of historical events while also representing these

events as in-game bonuses. Similarly, the in-game benefits awarded to prolific colonisers of the New World encourage the colonisation of the Americas by replicating some of the advantages those colonisers experienced during the process. Thus, the game does not just provide historical verisimilitude, but actively encourages the player to replicate authentic aspects of history by providing such rewards.

Apperley (2006, pp. 17-18) also found that *EUII* presented simplified and homogenised representations of Indigenous cultures, whereby players were forced to either assimilate or destroy Indigenous populations in Australia and other colonised nations[29]. The researcher's own work on Indigenous histories and cultures in Grand Strategy games (Loban, 2016) explored how Indigenous cultures, particularly in the Pacific region, are either represented homogenously or not represented in-game at all. Including these marginalised peoples would enrich the historical and entertainment value of the game, and a counter-measure for this issue could arguably exist in the practice of modding. The researcher's mod, *Indigenous People of Oceania* (*IPO*) (Cosmosis7, 2016)[30], will be used as an exemplar of how modding can be used to analyse and convey history in Chapter 9, drawing on the most useful aspects of *EUIV* as a pedagogical tool while also overcoming some of the issues around the representation of marginalised nations and cultures.

4.6 Conclusion

This chapter explored the historical knowledge contained in *EUIV* and provided an analysis of its potential to immerse the player in a historically realistic environment. First, the chapter examined *EUIV* and the family of Grand Strategy games. Second, the chapter introduced terminology, definitions and core game elements of *EUIV* through a discussion of the game mechanics used by the player. Third, the chapter examined the rise of Grand

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[29] The main colonisable areas on the world map are North and South America, Siberia, Oceania and Africa.
[30] Cosmosis7 is the researcher's online alias and the username under which he published the *IPO* mod.

Strategy games and argued that *EUIV* is a suitable candidate for further research because of its depiction of broad historical concepts and smaller historical details (*depth*) and its depictions of both war and peacetime governance (*breadth*), as well as the extensive timeline of the game and the multiple historical perspectives it portrays. Finally, the chapter reviewed related literature on the *Europa Universalis* series showing its pedagogical potential.

The Grand Strategy genre has come a long way since its origins in table-top wargaming, where the focus was always on war and less on other interconnected factors. The latest developments in Grand Strategy video games demonstrate that peacetime governance also plays an important role in these games, providing a much broader historical context. The game represents peacetime in terms of the motivations behind war as well as the benefits or disadvantages experienced by nations both before and after. Furthermore, despite the focus on Western history and achievement, these games also depict many non-Western nations and cultures, and therefore have the potential to educate players about these marginalised groups. As such, through *EUIV*'s mechanics, players are exposed to a variety of perspectives on history.

As demonstrated by the US military's use of the WWII game *Darkest Hour* (Marine Corps War College, 2014; taffy3, 2013, 2014) and observational university study by Kuran et al. (2018), both discussed in Chapter 2, there is a significant opportunity for Grand Strategy games to be successfully implemented in higher education. Grand Strategy games like *EUIV* can be used to complement learning from more traditional resources like textbooks, and can be incorporated into a suite of pedagogical tools, taking advantage of a player's interest in and engagement with popular history to develop innovative teaching practices. From a technical standpoint, *EUIV* has improved on its predecessors in the *Europa Universalis* series and previous Grand Strategy games. Since the last major scholarly examinations of the series (Apperley, 2013; Egenfeldt-Nielsen, 2005), there have been a further two iterations of the

game with crucial improvements to the user interface, graphics, AI, game accessibility and overall flow of the game. These changes have enhanced the usability and accessibility of the game, which also flows through to its potentials for learning. Several of these game improvements will act as points of inquiry in the *EUIV* online forum survey and case study, and will show how the various aspects of the games' mechanics discussed in this chapter can be utilised as pedagogical affordances. These include:

- Historical pop-up events in the game, which describe accurate details and outcomes of historical events

- The world map (and other map modes), which provide detailed and dynamic visual perspectives on geopolitical forms of history

- The generic governance system and tabs, which provide insight into potential issues and changes faced by rulers and nations during the timeline (e.g. religious tensions and the importance of technology).

These areas of inquiry will form the basis for a number of the survey questions and case study activities to further expand upon the pedagogical affordances of *EUIV*.

The Early Modern era of *EUIV*'s timeframe reflects several world-changing events throughout history, from colonialism and the global expansion of European empires to the emergence of the Qing dynasty that dominated China, and the rise and eventual fall of the Ottoman Empire. During the Early Modern period piracy reached its "golden age", revolutionary France shook Europe and colonial nations began to declare independence from their former European masters. These themes and influences are reflected or simulated in *EUIV* in dynamic game mechanics and details, and historical knowledge is embedded not only in its game content, but also in its code. To some degree, *EUIV* railroads[31] players to

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[31] "Railroading" means that the game has been designed to influence or even force the player to follow a certain game path.

generate historically authentic outcomes (or at least those that are believable), making the game a useful tool for developing pedagogical approaches to history. However, such approaches must also be understood from the perspectives of the players who engage with those historical outcomes. These perspectives will be explored in the next chapter with regards to the *EUIV* online forum survey.

Chapter 5: *Europa Universalis IV* Forum Survey Data and Interpretation

5.1 Introduction

This chapter will provide the results of the online *EUIV* forum survey, including the data collected and an interpretation of that data. First, the background to the survey will be outlined, including its aims and the sorts of questions used to elicit players' views on the representation of history in *EUIV*. Next, the results are presented. The chapter will initially explore how players became interested in *EUIV* and their thoughts on the most pedagogically useful aspects of the game for learning history. Second, the chapter will discuss how *EUIV* sparked participants' interest in history and prompted them to conduct historical research outside the game. Third, the chapter will explore participants' views on the use and utility of modding and multiplayer interaction for learning history and improving gameplay. Fourth, the chapter will investigate participants' views about the historical accuracy of *EUIV*. Finally, the chapter will examine whether *EUIV* can teach concepts related to nation management and governance. The chapter concludes with a summary of the survey data, which will show a number of themes were identified and used to inform the university case study, and will be discussed in the next chapter and further explored in Chapters 7, 8 and 9.

To understand the learning potential of *EUIV*, a survey was conducted to explore players' perspectives on how history is represented in *EUIV*. The researcher determined the official *EUIV* game forums would provide the most relevant, rich and authentic data source to collect the opinions of *EUIV* players. These forums are replete with in-depth discussions about the state of the game, what players enjoy about it, what needs improvement, what is missing from the game, and what needs more attention. Players discuss their gaming sessions and gameplay on the forums in what are known as "After Action Reports" (AARs)[32]. Players

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[32] AARs are where a player tells their experience of a given game, campaign or play-through, often recounting their experience in a story like format (Apperley, 2018; Mukherjee, 2017, p. 39).

also discuss the mods they have developed and are about to release, or mods they have tried and any technical problems they encountered while playing them. The researcher anticipated the online *EUIV* forum survey would reveal diverse participant views that would explain how they viewed *EUIV*'s depiction of history and their own engagement with it.

The method used in the forum survey was explained in Chapter 3, and the survey materials, including survey questions, are located in *Appendix B*. SurveyMonkey (SurveyMonkey, 2019) was used for the data collection process, and a link to the survey was posted on the *EUIV* forums. The survey focused on gaming practices and asked participants about their engagement with *EUIV*, with a specific focus on whether the game had helped them learn about history and/or nation management and governance. The survey was open from 14/08/2016 until 26/08/2016, received 331 participant responses and had a 100% completion rate. There were 12 questions in total that were either multiple-choice or required a short response. Most multiple-choice questions (1, 2, 3a, 4a, 5a, 6a, and 7a) were compulsory, as were short response questions 6b and 7b; the remaining questions (3b, 4b and 5b) had optional responses. The multiple-choice questions were allocated a single option with the choice to select 'other' and provide a short text response. The survey participants were anonymous and no demographic or personal information was collected from the survey.

Patterns of shared meaning were developed from the participants' responses and central themes were defined as a result of this process. These themes are not discrete categories, but overlap; however, for the sake of analysis they will be discussed separately. The central themes include:

1. Historical Research (drawn mostly from Question 3)

2. Modding (drawn mostly from Question 4)

3. Multiplayer (drawn mostly from Question 5)

4. Historical Accuracy (drawn mostly from Question 6)

5. Gameplay and History (drawn mostly from Question 6)

6. Nation Management and Governance (drawn mostly from Question 7)

7. Gameplay and Nation Management and Governance (drawn mostly from Question 7)

Themes 4-7 have been further divided into sub-themes (e.g. Theme 4c), while Themes 1-3 did not have many clear branching opinions and have not been further sub-divided. Themes and sub-themes were devised through an inductive thematic coding process (Braun & Clarke, 2006). Themes and sub-themes were determined based on the number of participants' comments on a given theme. The themes were determined in relation to the research question and overall aim of the research that specifically revolves around the historical knowledge in *EUIV* and learning history using *EUIV*.

5.2 Participant Introduction to Game

The first question the forum survey asked participants was: *What got you interested in playing Europa Universalis IV?* Participant responses to this question are shown in *Figure 5.1*. The majority of participants (144/331 or 43.50%) chose "history" as the main reason they were initially interested in *EUIV*. The second largest number of participants chose "video games" (124/331 or 37.46%), and "wargaming, tabletop games and board games" was selected by fewer participants (17/331 or 5.14%). Seventeen participants noted their interest in *EUIV* came from a variety of sources, specifying both "history" and "video games". Other participants chose the "other" option and provided a short response, with five participants explaining that all three of the survey options were reasons why they started playing the game (46/331 or 13.90%). Eight of the participants who chose this option noted they became interested in the game due to friends' recommendations, while others noted they became interested in *EUIV* through AARs (n2), from YouTube videos (n4) and other strategy games (n5). This data indicates most of the participants had an interest in both history and, to a

lesser extent, video games (268/331 or 81%). The higher weighting of interest in history

could explain why participants might have had certain expectations about historical accuracy

in *EUIV*, as will be examined throughout the chapter.

Q1 1. What got you interested in playing Europa Universalis IV?

Answered: 331   Skipped: 0

Answer Choices	Responses	
History	43.50%	144
Video games	37.46%	124
Wargaming, tabletop games or board games	5.14%	17
Other (please specify)	13.90%	46
Total		331
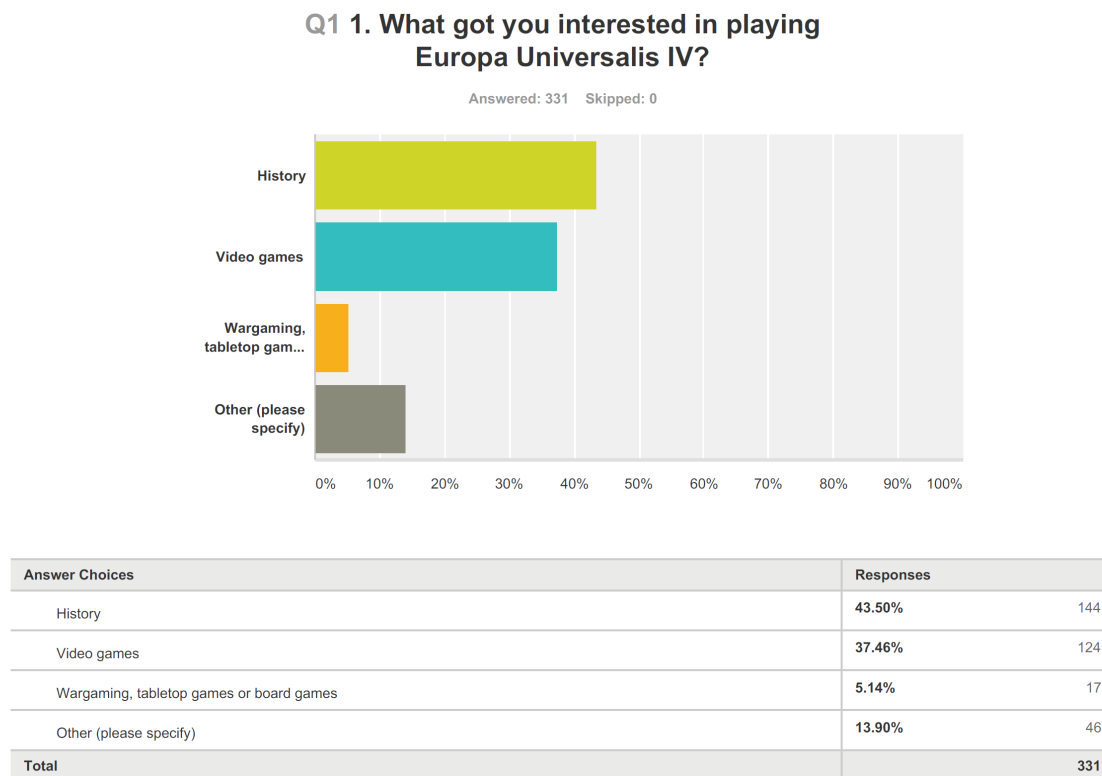
Figure 5.1. Participant responses to survey question 1: *What got you interested in playing Europa Universalis IV?*

5.3 The Most Useful Game Features for Learning History

As illustrated in *Figure 5.2*, question 2 asked participants: *What do you think is the most useful game feature to learn about history in Europa Universalis IV*? The majority of participants (146/331 or 44.11%) believed they learnt the most about history through the events described in pop-up boxes in-game. While many historical events portrayed in *EUIV* are generic and related to a nation's governance issues, a significant number of events are nation-specific and unique to the history of that specific nation. For example, there are in-game events that occur for the nation of Spain/Castile that often reflect aspects of the Spanish inquisition. The events described in pop-up boxes are quite historically accurate, even within

a flexible game timeframe. Pop-up boxes appear when certain game conditions occur, and typically provide information about factual historical periods, events and conditions. Even if the trigger date for the pop-up boxes to occur are not totally accurate, as the trigger is randomised, they tend to list specific and accurate historical dates, actors and actions. While text pop-up boxes are of course part of the game, these elements are also similar to the most traditional forms of teaching history – i.e. their text describes historical events. However, this does not necessarily mean they are the most pedagogically valuable aspects of the game. Similarly, maps are a pedagogical tool already used in history education. Yet while pop-up text events and maps might be the most informationally detailed aspects of the game, the comments from survey participants suggest it was playing and creating their own stories (such as through game interactions and counterfactuals) that made for the most engaging and exciting learning experiences. These game interactions and counterfactuals are only available through gameplay and cannot be provided through traditional textbooks and maps.

Q2 2. What do you think is the most useful game feature to learn about history in Europa Universalis IV?

Answered: 331   Skipped: 0
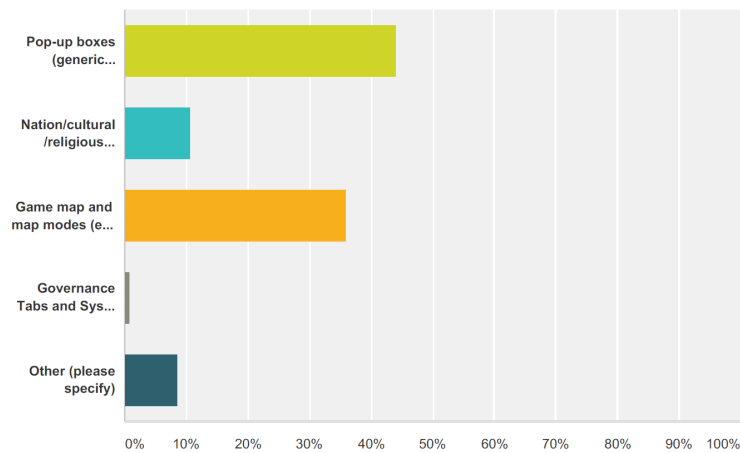
Answer Choices	Responses	
Pop-up boxes (generic events, historical events, etc)	44.11%	146
Nation/cultural/religious specific game mechanics (e.g. treasure ships, parliament, nahuatl mechanic, etc)	10.57%	35
Game map and map modes (e.g. resource map mode, province details, religious map mode)	35.95%	119
Governance Tabs and System (e.g. trade tab, military tab, technology tab, etc)	0.91%	3
Other (please specify)	8.46%	28
Total		331

Figure 5.2. Participant responses to question 2: *What do you think is the most useful game feature to learn about history in Europa Universalis IV?*

The second largest group of participants (119/331 or 35.95%) believed the most useful game feature for historical learning was the game map and map modes, which were explained in Chapter 4 (additional details are located in *Appendix A)*. While the map modes tend to change over the course of the game, many sections of the maps remain the same regardless of player or game AI intervention. These include the terrain map mode, province names, the goods map mode (depicting the different goods produced in each region), and, to a lesser extent, the religious map, cultural and development map modes. These game map modes are useful for informing the player about geography, demographics and geopolitics around the world.

The third largest group of participants (35/331 or 10.57%) indicated they had learnt the most through nation-specific game mechanics. This low percentage could relate to a perceived limited number of nation-specific mechanics or lack of complexity of these mechanics in terms of how they reflect the different governance, religious or cultural systems of the world (Formal Analysis Additional Materials at *Appendix A*). The weakest response was to the generic governance tabs and systems where only three participants (0.91%) nominated it as the most useful game feature to learn about history.

Of participants who selected the "other" option, 14 specified they had learnt from all options; two indicated they learnt about history from the national ideas tab (explained in chapter 4), and two believed they did not learn anything about history at all. Based on these findings, *EUIV*'s pop-up boxes and map modes were deemed to be the most useful game features for learning history. These were therefore considered pedagogically suitable game mechanics to implement in the university case study.

5.4 Theme 1: A Catalyst for Historical Research and Informal Learning

As presented in *Figure 5.3*, the survey asked participants: *Does gameplay encourage you to seek out more information about history?* An overwhelming majority of participants (316/331 or 95.47%) said playing *EUIV* acted as a catalyst for further research into historical events (Theme 1). The survey then asked the participants what sources they sought out to find more information about history. The responses to this question are represented in *Figure 5.4*.

Q3 3a. Does game play encourage you to seek out more information about history?

Answered: 331   Skipped: 0
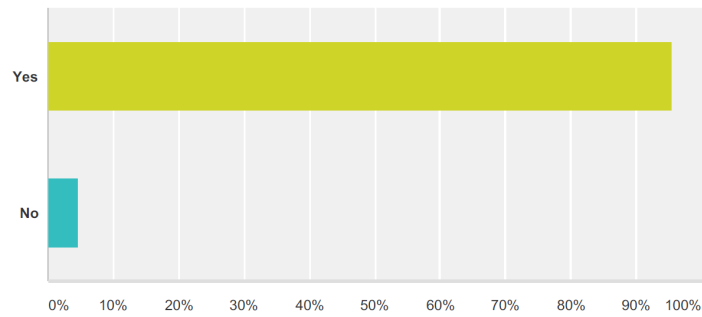
Answer Choices	Responses	
Yes	**95.47%**	316
No	**4.53%**	15
Total		331

Figure 5.3. Participant responses to survey question 3a: *Does game play encourage you to seek out more information about history?*

Q4 3b. If so, what other sources do you seek out?

Answered: 319   Skipped: 12
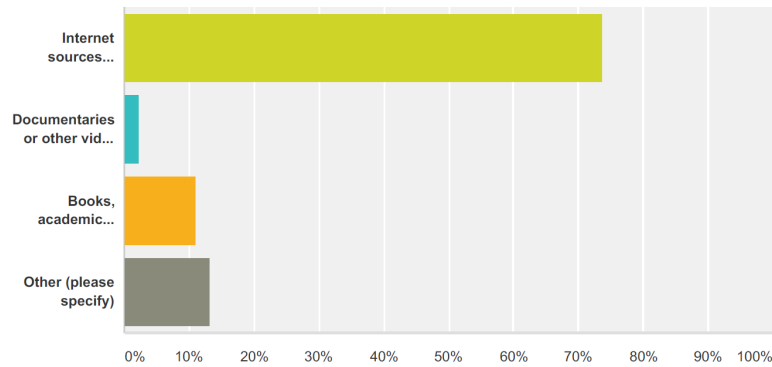
Answer Choices	Responses	
Internet sources (history websites, Wikipedia or other webpages)	**73.67%**	235
Documentaries or other videos (including Youtube)	**2.19%**	7
Books, academic articles or historical documents	**10.97%**	35
Other (please specify)	**13.17%**	42
Total		319

Figure 5.4. Participant responses to survey question 3b: *If so, what other sources do you seek out?*

In answering question 3b, participants indicated they primarily (235/331 or 73.67%) sought out further historical information from internet sources. The next largest group of participants (35/331 or 10.97%) indicated they learnt history from written sources such as books, academic articles and historical documents, while only seven participants (2.19%) said they primarily learnt from documentaries and other video sources such as YouTube. Notably, 32 participants specified, through the "other" option, that they learnt about history from all the sources listed in the survey. Another five participants said they learnt from a combination of books and internet sources, while a further three indicated they had learnt from the internet and documentaries/videos. In the digital age, it is not surprising participants primarily accessed digital platforms to seek out further historical information. This data shows that interest in and learning about history does not just involve reading text, academic articles, historic documents or books. Rather, historical engagement is an interwoven connection between different media types, including games. It was evident from the survey data that playing *EUIV* prompts the player to seek out further information from outside the game that then vitalises their interest in the historical subject matter. This process can be cyclic as the player often returns to the game to learn more while playing before starting the cycle over again. Hence, the informal learning that occurs through gameplay is not just a different way to learn about history, but also has the potential to ignite the player's interest in further historical research.

5.5 Theme 2: Modding

As shown in *Figure 5.5*, question 4a asked participants: *Have you ever modded Europa Universalis IV?* While the majority (182/331 or 54.98%) of participants had not modded *EUIV*, a substantial number (149/331 or 45.02%) had modded the game in some form (Theme 2). These numbers indicate modding is a common practice within the *EUIV* community, and that it plays an important and significant role. The data also suggests

engagement with games similar to *EUIV* occurs not just through gameplay, but also through game content creation. These findings indicate that many players not only play the game, but also shape the environments in which they play. The educational implications of these modding practices relate to the opportunities for players to learn about a subject not just by playing games but also through the design and content creation of those games. Modding and content creation could therefore present valuable forms of gamified learning and an alternative method for expressing critical analysis and creativity.

Q5 4a. Have you ever modded Europa Universalis IV?

Answered: 331   Skipped: 0

Answer Choices	Responses	
Yes	45.02%	149
No	54.98%	182
Total		331
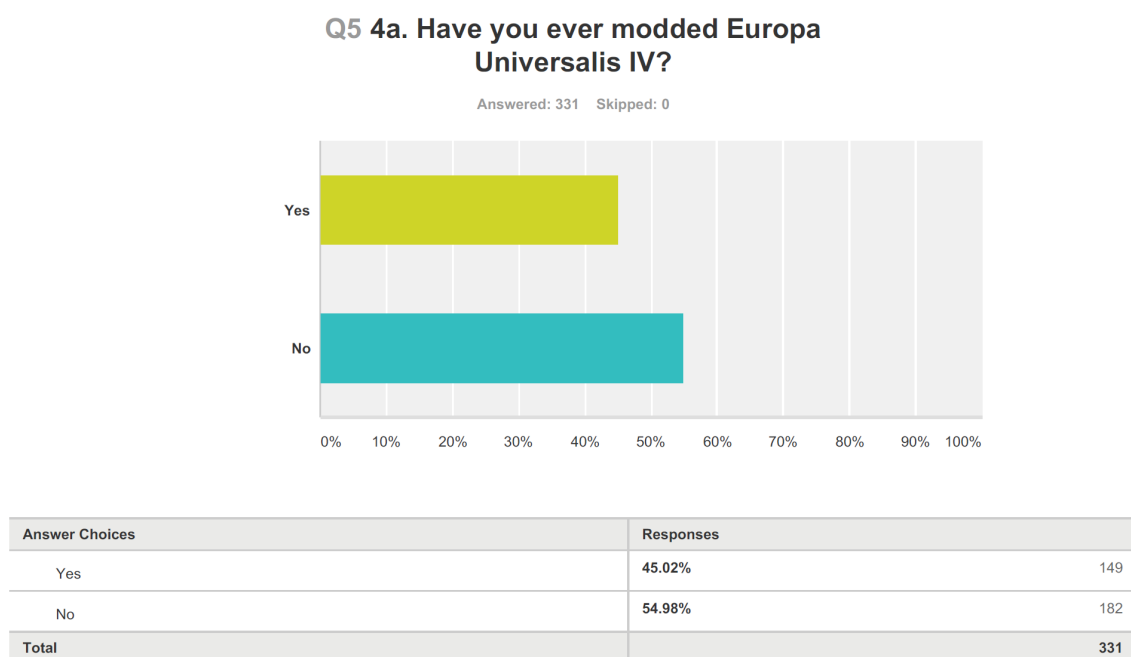
Figure 5.5. Participant responses to survey question 4a: Have you ever modded *Europa Universalis IV*?

Question 4b then asked participants to expand upon their answers and explain if they found modding a useful exercise. This question was optional; however, 125 participants responded. As well as making their own mods, 86 of the 125 (68.8%) participants comment that they had learnt about history from the process of modding. These participants explained they had learnt history from modding because they needed to engage in research about the different histories or geographies of various nations to complete their mods. As one participant explained: "I'm an author of a major *EUIV* mod and I consider the historical

accuracy of the mod to be of utmost importance. While researching for the mod I have learned a great deal about history". Other survey responses provided a more in-depth portrayal of precisely what was learnt in the modding process. As one participant stated:

> As a university student who studies Ancient History, I'm always more than willing to learn more about certain regions. Since I focus on European history, *EUIV*'s depiction of other areas, notably African or Asian states has led me to start to research more about those regions, which I hadn't focused on previously. When modding I've come across information which I mightn't have read otherwise. I feel that in many cases some regions seem to have little attention given to them. Like how many, when they think of Italy in an historical context, think of the Romans, many wouldn't know of cultures like the Gauls of Northern Italy or the Etruscans of Etruria. The first stage of making a mod for a strategy game based in history is research. I've learnt many new facts and discovered new information in researching for my mods I've made, or am making. (Anonymous Forum Survey Participant)[33]

This comment demonstrates how the limitations associated with certain aspects of historical information and depictions in the game encouraged them to create mods that focused on the nations the game's developers tended to neglect. More generally, there was a common theme in the participants' comments, where players who created mods learnt more about the histories of nations and cultures that were less well-known to them. *EUIV* evidently ignited their curiosity about these nations and cultures, leading them to conduct further research that intersected with their modding practices.

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[33] All survey participant responses were anonymous and, to reduce repetition, all block quotes will not have a source, but can be assumed to be an Anonymous Forum Survey Participant.

The survey responses also showed the type of history participants learnt while modding varied. For example, two participants believed modding helped them to learn geography as well as history. As one of these participants said:

> It certainly improved my geography, as well as giving me a good hint on what things were where in the early modern era, how various states expanded or shrunk, the causes of massive political declines of India and China by 1800 and onwards (they had been leaders of world in every aspect until then), how religions spread and reasons they were adopted...too much to detail in fact. In short, Paradox [Interactive's] games and other series like CA's *Total War* and others helped me tremendously in learning history and geography.

This response demonstrates players may learn history in *EUIV* not just from written information, but from visualisations of maps, such as those referred to by the participant that show the expansion and shrinking of nations over time.

The responses to question 4a indicate modding was a valuable, if informal, way to learn about history. This may have occurred through creating mods of well-known histories, marginalised histories or even counterfactual histories. These results show that modders do not just change the content of the game; rather, the modding process also involves researching, analysing, writing, correcting and altering history as the players engage with the game. The survey responses demonstrated participants were able to engage with history in very diverse ways, with some making mods to expand on various aspects of history they found particularly interesting, while others even created fantasy mods that were grounded in historical themes and influences rather than in any specific historical event. These strong results from the forum survey influenced the researcher's decision to focus on a modding exercise in the subsequent university case study. They also informed discussions and analyses of modding as a key theme of this thesis, which will be further explored in Chapters 6 and 9.

5.6 Theme 3: Multiplayer Gaming Practices in *EUIV*

As illustrated in *Figure 5.6*, question 5a of the survey asked participants: *How often do you play multiplayer in EUIV?* The majority of participants (146/331 or 44.11%) had never played multiplayer in *EUIV*; another group (81/331 or 24.47% or) had only played once or twice; and a third group (55/331 or 16.62%) played multiplayer every few months. A small group of participants (17/331 or 5.14%), played once a month while another group (24/331 or 7.25%) played multiplayer once a week. Only 8 participants (2.42%) played multiplayer consistently every time they played *EUIV*.

Answer Choices	Responses	
Never (never played multiplayer before)	44.11%	146
Very rarely (only played multiplayer once or twice)	24.47%	81
Sometimes (once every few months)	16.62%	55
Often (once a month)	5.14%	17
Very often (once a week)	7.25%	24
Whenever I play Europa Universalis IV	2.42%	8
Total		331
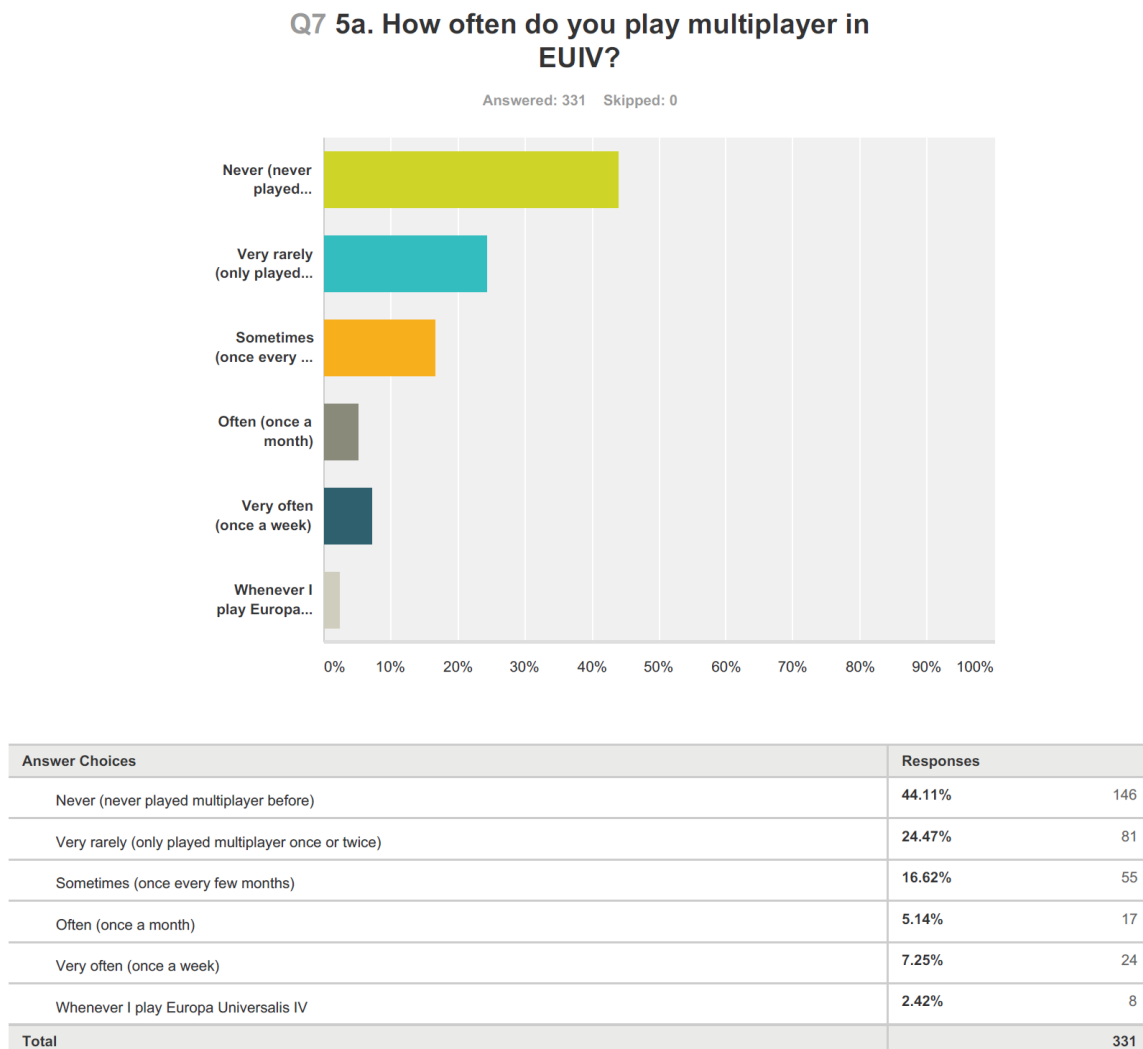
Figure 5.6. Participant responses to survey question 5a: *How often do you play multiplayer in EUIV?*

The participants were then asked to elaborate on their responses to question 5a; this was optional, and 143 (43.2%) participants answered the question. The data revealed that 93 participants thought multiplayer had improved their *EUIV* gaming experience (Theme 3) while six participants responded neutrally. In contrast to the majority perception that multiplayer improved the gaming experience, eleven participants said multiplayer had a negative effect on their *EUIV* experience. The reasons given related to players abusing the game mechanics or its AI, and the difficulties they associated with historical roleplaying. The issue here could be that participants have their own unique play style, goals and perceptions of what should happen in both the game and history that may be incompatible with the play styles, goals and perceptions of other players.

Six participants who believed multiplayer was no better or worse than single-player said there was a trade-off between the slow pace of playing as a single player, whereby they could absorb historical content in their own time, and the fast tempo of multiplayer, which made the game more strategic and realistic. Several participants described how poor internet connections, computer limitations and time zone synchronisation issues negatively impacted upon their multiplayer gaming experience. Others noted it was hard to find people to join and engage with them in a game. These responses show that multiplayer could be hard to implement worldwide, which has implications if implementing in a formal educational setting. Therefore, it may be better to hold a multiplayer session locally where players interact both in and outside at a designated time and place as this research will do in the case study.

The 93 respondents who believed multiplayer improved their *EUIV* experience provided a range of reasons. Of these, 22 participants said multiplayer enhanced the "strategic complexity" of the game, while 32 participants believed *EUIV* was more social when they played with their friends, increasing their enjoyment of the game. One participant

specified that multiplayer was a good way to introduce *EUIV* to friends who may not have previously been interested in the game. Several participants enjoyed multiplayer because it made *EUIV* an easier, more cooperative experience, while others enjoyed the increasingly competitive stakes of playing against other real players. One participant said they had made great friends through multiplayer:

> The pace of *EUIV* allows you to talk and get to know the people you're playing with, especially in voice. In my last sessions, I have met great friends who also love the game. We share strategies, help each other, talk about our life... etc. Other games, which maybe require more action or focus, don't allow friends to talk in such a way that they do in an easy, slow and quiet game of Europa Universalis!

The above statement is interesting as it suggests the comparatively slow pace of the game creates an atmosphere that is conducive to forming deeper social interactions than other games. It contrasts with the responses from other participants who found multiplayer to be too fast to absorb the historical details of the game, showing that there are different ways to play and experience *EUIV* in multiplayer mode.

While 32 participants enjoyed the social elements, other participants felt multiplayer helped them learn history. One participant stated "when we are playing together we speak about history, the countries we are playing". Another said "it enables you to engage in the realpolitik of quid pro quo arrangements between powers like actually happened in history". Furthermore, several participants noted multiplayer provided the opportunity to roleplay with others as different nations. Historical roleplaying in *EUIV* is an interesting practice because it requires the player to act out their role as a certain nation within a historical context. For example, a player playing as Spain may choose to historically rebuild the Spanish Empire through colonial conquest in the Americas (Zimmerman, 1931) and the expansion of the Habsburg Dynasty (Kann, 1974). Such forms of roleplaying could have pedagogical

applications for students learning history and is another factor that impacted the design of the subsequent university case study. However, it is also evident that when considering how best to learn history through *EUIV*, it is important to note that different players will have different experiences of the same aspects of the game. For instance, one participant believed they learnt more about history by playing *EUIV* in single player mode, rather than the other way around:

> [Multiplayer] improves the gameplay experience, but I will say it has not helped me learn about history. Playing multiple countries around the world in single player has taught me so much more.

As this comment suggests, while the same number of nations can be played in both single-player and multiplayer modes, single player may provide better opportunities to consider strategies and actions within their historical contexts. The responses show that if *EUIV* is to be utilised pedagogically, some students may learn history more effectively in single-player mode, and others in multiplayer mode. These flexible modes may therefore provide great potential for educating different types of students who learn differently from one another.

Some players noted multiplayer enhanced the diplomatic, political and negotiation aspects of the game[34]. Some believed multiplayer unlocked the full potential of *EUIV* because they were required to deal with a higher level of strategic complexity. A total of 22 participants provided comments to this effect. For example, one said that multiplayer mode improved their *EUIV* experience:

> because it allows me to cooperate and compete with other human players who are more aggressive about pursuing their interests. It also allows for much more in-depth

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[34] These participant responses are discussed in researcher's published paper, "Digitising Diplomacy: Grand Strategy Video Games as an Introductory Tool for Learning Diplomacy and International Relations" (Loban, 2017).

diplomacy as I have to consider the opinions of an actual person and their own goals, much like the monarchs of Europe and great diplomats of the age did.

Multiplayer evidently made the game more realistic and interesting for this player because it involves real actors with their own motivations and goals, a type of play that is not possible when playing against the game AI in single-player mode. Some survey participants also believed multiplayer gameplay and engagement with other players could be either a help or hindrance, depending on the actions and behaviours of those other players. Some participants had such a good understanding of the game and had become so attuned to the behaviours of the AI (which the player could learn and exploit) that multiplayer was a refreshing experience as it was a challenge to play against other players, whose typical behaviours were unknown to them. As one survey participant commented, "Since the AI is programmed in a certain way to do certain stuff, after 3000 hours you can get a grasp of what they're going to do and when, and the values associated with your move." Other participants echoed this response, believing multiplayer presented an added challenge because it enhanced the diplomacy and strategy aspects of *EUIV*. Other responses also suggested multiplayer added to players' historical experiences of the game because it created a more believable environment in which there were real allies and opponents.

In contrast, 10 participants believed multiplayer mode did not improve their *EUIV* experience. Some said this was because other players were able to exploit the AI or game mechanics that still operated in multiplayer mode, consequently affecting the gameplay and making it easier for those players to predict AI behaviour and win the game. Four participants believed they would be forced to adopt "gamey" strategies to compete with others as opposed to playing against the AI. Examples of "gamey" strategies could include abusing AI logic/behaviour by finding the best options to expand quickly without triggering a backlash from the AI, or earning as much money as possible through stacking game bonuses. For

example, one survey participant stated: "I would think multiplayer would be all about maximizing your army and gaming the system with no regard for historical roleplaying". This response shows that some players may see the game purely from an algorithmic perspective and exploit the AI without regard for the historical content. The adoption of gamey strategies may present an issue in terms of the educational value of the game, as students who choose to adopt them might not properly engage with the historical and cultural perspectives present in the game. Frank (2012, pp. 1-2) who conducted a wargaming exercise with 40 military cadets, also found that a pattern emerged where cadets would "game the game". They would enter gamer mode and this, he found, had an adverse impact on the educational objectives and outcomes of the exercise. Another factor that might impact the educational value of multiplayer mode is its potential to negatively impact upon opportunities to perform historical roleplay in-game. Two participants commented on this, with one stating:

> [In multiplayer] human players tend to distort historic reality even further and all sort of absurdities rise (like England owning Iceland in 1470) that make me cringe. At least the AI keeps it realistic (at times...) which satisfies my need to learn history from the game.

These responses show there are potential barriers to learning history through *EUIV* that relate to how players engage with the game, and illustrates the importance of understanding players' perceptions of the game in order to apply it to educational settings. Different players have differing play styles and goals that can frequently work in opposition, consequently impacting on the potential educational outcomes experienced by players. *EUIV* could therefore be perceived by a player as code or AI to be mastered (Galloway, (2006, p. 103) Friedman, (1999, p. 164), or as a "blackbox" (Winner, 1993, p. 365), as discussed in Chapter 2. In the latter instance, the player interacts with the game's historical narrative

inputs and outputs, rather than by manipulating internal game mechanisms to achieve the desired result of winning the game.

While some participants were concerned about players' actions affecting the historical accuracy of the game, four participants were concerned about how multiplayer affected the game speed. Four participants believed that the set speed of multiplayer mode made gameplay too fast or too slow, making the game less enjoyable. As one participant noted: "[In multiplayer] you're dependent on other people to determine game speed, and alliances with humans can make it harder to get alliances with NPCs [non-player characters]". In another comment, perhaps more related to history, one participant said that although multiplayer improved gameplay, the speed did not help historical learning, as "you don't have time to pause and read" information in the pop-up boxes. This issue is particularly critical as *EUIV*'s pop-up boxes contain valuable and factual historical knowledge. The speed of multiplayer is therefore another factor that could impact upon the educational value of the game because players have less time to read about history and must instead focus on the other elements of gameplay.

In summary, 185/331 or 55.89% of participants had played multiplayer to some degree. For some of these participants multiplayer improved gameplay because it increased the complexity of the game, encouraged social interactions (typically with friends), provided the opportunity to roleplay historical scenarios with other real actors and heightened diplomacy and intrigue. In contrast, participants who believed multiplayer had a negative impact on gameplay usually cited the exploitation of AI and player actions and interventions as the reasons. In total, 93 participants were positive about multiplayer, compared to 10 participants who responded negatively. The findings indicate that multiplayer can improve the player's *EUIV* experience, especially in terms of historical roleplay and improved diplomacy. This finding guided the design of the multiplayer historical roleplay simulation

used in the university case study. It should be acknowledged that the largest group of

participants report spending most of their time in single player. One reason for players not

engaging in multiplayer could be the difficulty of setting up the time to play a game with

other players: a *EUIV* game is often played over many days, weeks or in some cases months.

Other reasons for not playing multiplayer might include finding roleplaying difficult in

multiplayer games or not enjoying the way other players can abuse the gaming system which

could be at odds with your own playstyle. However, these issues do not necessarily invalidate

the value or utility of *EUIV* multiplayer for educators. As survey results show, for those who

do play multiplayer mode there are educational benefits to be gained from its social and

competitive gameplay.

5.7 History in *EUIV*

As shown in *Figure 5.7*, question 6a of the survey asked: *How accurately does

Europa Universalis IV reflect and simulate history?* This was intended to elicit participant

responses about the historical accuracy of *EUIV* ranging from "very accurate" to "not

accurate at all", with an "other" option for answers that did not fit into these categories.

Reponses showed the majority of participants (176/331 or 53.17%) believed *EUIV*

"somewhat accurately" reflected and simulated history, while 75/331 or 22.66% of

participants believed *EUIV* "quite accurately" reflected and simulated history. Only 0.60% or

2 participants thought *EUIV* was "very" historically accurate. There were 51/331 or 15.41%

participants who considered *EUIV* to be "quite inaccurate," and 15/331 participants or 4.53%

believed *EUIV* was "not accurate at all". Therefore, 253/331 or 76.40% of the forum

participants believed *EUIV* reflected and simulated a level of historical accuracy to some

degree.

6a. How accurately does Europa Universalis IV reflect and simulate history?

Answered: 331   Skipped: 0
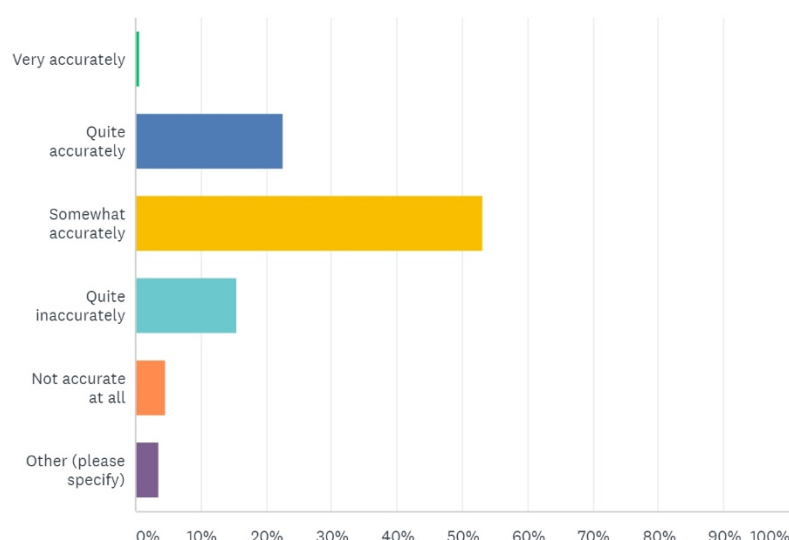
ANSWER CHOICES		RESPONSES	
▼ Very accurately		0.60%	2
▼ Quite accurately		22.66%	75
▼ Somewhat accurately		53.17%	176
▼ Quite inaccurately		15.41%	51
▼ Not accurate at all		4.53%	15
▼ Other (please specify)	Responses	3.63%	12
TOTAL			331

Figure 5.7. Participant responses to survey question 6a: *How accurately does Europa Universalis IV reflect and simulate history?*

The "other" responses to this question were mixed. Some participants said they were unable to comment on the matter of historical accuracy, or were unsure whether the game was accurate. Other participants said they believed historical accuracy only occurred in particular situations within the game, and therefore could not comment on its presence within the game as a whole. Other participants made distinctions between whether the game reflected or simulated history. With hindsight the terms "reflect and simulate" in question 6a should have been separated as it created a double-barrelled question. However, question 6b provided a wealth of in-depth data on historical accuracy that mitigated the poor wording of question 6a by asking: "*Please explain your answer*". This presented an opportunity for all

331 participants[35] to provide rich and deep insights about the game's reflection or simulation of history. Participants gave several reasons for their responses about the accuracy of *EUIV*. Given the volume and length of responses to this and the next short response questions (survey question 6b and 7b), the comments have been clustered into themes and subthemes. These clusters were developed through analysis of the open-ended participant responses. Only the most relevant and noteworthy themes and sub-themes will be detailed in this section. For the complete list of themes and sub-themes please see *Appendix C.*

5.7.1 Theme 4: Historical Accuracy in EUIV

Some participants (42/331 or 12.6%) believed that *EUIV* was historically accurate when they first started to play the game, but indicated that as play continued the game became increasingly inaccurate (Theme 4g). For example, one participant said: "*EUIV* is completely historical until the moment you hit play. Everything that happens after you start is determined by you, the people you play with, and the AI. Not history". Other participants noted that it would be difficult for the game to reflect or simulate history completely accurately, but that they still believed *EUIV* managed to reflect and simulate to at least some extent the early modern period of history. A group of 36 participants commented on this subtheme (Theme 4h). For example one said:

> The problem tackled by *EUIV* is actually harder than that of *CK2*, *Vic2* or *HOI4* [*Crusader Kings 2, Victoria 2 or Hearts of Iron 4*]. The timespan is longer, the technology is constantly advancing, but at radically different pace in different parts of world. [The modern era] was an era of changes and an era of inequality. So it's very hard to even try to represent that in a game. Based on that reasoning, I think *EUIV* has done its job right and is at least somewhat accurate.

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[35] The number of participants (n331) who respond and completed the survey, shows how engaged and deeply interested players are with the EUIV, history and the game's depiction of history.

Here the participant understands the difficulties of depicting everything in history especially given the scale and time covered by the game. In a similar vein, another participant commented on how hard it is to reflect and simulate everything in history when there are so many available perspectives:

> There are so many variables in history and in the game that might be different from true history. And this game is not designed to create perfect history, that way it would go the same every time. It's different every time. And how we see history depends on whose eyes you look through. So there is no one true history. There are a lot of different versions of the same historic event, and all can be true.

This quote reinforces the idea that *EUIV* may be educationally valuable because it encourages players to engage in deep thinking and evaluate representations of history by becoming immersed in the game and understanding the variety of perspectives that have influenced historical narratives. In terms of pedagogical application, players could take on and play out different points of view of the same history thus learning new knowledge from each perspective, thus illustrating the multi-perspective nature of history.

While some participants noted the game diverged from accurate portrayals of history, and others believed *EUIV* could not simulate a detailed version of history at all, a group of 22 participants (Theme 4o) believed it could simulate general representations of broader historical change. As one participant explained: "While quite accurate, *EUIV* is not real history, however I always thought that *EUIV* simulates the (for lack of a better word) rhythms of history, the rise and fall of empires and nations and so on". In a similar vein, participants believed that while *EUIV* did not provide a completely accurate version of history, that it was historically inspired and presented counterfactuals that had their foundation in real historical events. For example, one survey participant said:

From my understanding of history it seems that the game starts off as reasonably

historically accurate (within the limitations of game mechanics) but it quickly goes off

the historical rails. I don't think this is a bad thing as it does offer you several "what

if?" scenarios.

Likewise, several participants believed *EUIV* often produced scenarios that were quite

plausible if not entirely accurate. As one participant explained:

Even though the game is "Grand Strategy" and not a "Historical Simulator", it still is

perhaps one of the only strategy games out there that can have even somewhat

accurate things happen. Sure, the game's motto at this point is that it stops being

historical the moment the game is first unpaused, but that doesn't mean that some of

the things that happen aren't plausible and the things that happened in real life can

certainly happen if the circumstances line up like they did in real life.

It is evident from this response that even if *EUIV* does not simulate history accurately, that it

is couched deeply enough in history to reflect a variety of historical factors, giving the feeling

of plausibility.

In contrast, 14 participants believed *EUIV* is historically inaccurate in many ways. For

example, one said "I don't feel that *Europa Universalis* accurately portrays Feudalism in the

early game era, where it is so important, such as with the Burgundy Inheritance and Iberian

Wedding events. Personal Unions are also quite gamey". Personal Unions are two countries

who share the same monarch, but, according to this participant, the personal union game

system could be abused as minor player nations could gain control over powerful nations if

they play the system correctly. The connections between gamey aspects of playing *EUIV* and

inaccuracy might be the result of the developers' aim to make the game more playable.

5.8 *Theme 5: The Relationship Between Gameplay and Historical Accuracy*

Although many participants believed *EUIV* often diverged from accurate representations of history, this divergence was not viewed as occurring by accident. Rather, participants believed that there was a tension between balancing factual history with accessible historical narratives. Participants recognised that in order to offer players agency and choice, *EUIV* needed to be historically inaccurate to a certain extent because a balance was needed with engaging gameplay. In total 27 participants (Theme 5d) commented on this subtheme. For example, one said:

> *EUIV* has, and most likely always will, placed playability before accuracy. In addition to feasibility concerns, this has limited the accurate representation of internal conflicts and mechanically limits player & AI in terms of expansion. Furthermore the game does not "railroad" the progress of the game enough to reliably produce historical milestone events occurring some considerable time after the default starting date of 1444, e.g. the establishment of the Qing dynasty, the War of Spanish succession and the subjugation of the Aztecs & Incas by the Spanish or the subjugation of the Mamluk Sultanate by the Ottomans.

As another participant noted:

> It has breadth, in that it covers the whole world, but little depth (only about nations, and small differences between cultures). The random events provide the most information. The game obviously has to strike a balance between historical accuracy and playability limiting the accuracy of the simulation.

These comments demonstrate that many players have a reflexive understanding of how the game performs this balance, with these two participants clearly acknowledging their actions in-game were creative representations of traditional understandings of history. Metzger and Paxton (2016) outline a framework of deployments of historical games and their different

utilities (e.g. counterfactuals which they call Wishstory). Their framework focuses more on how games can teach historical representations, generalisations and narratives than on specific historical information. This framework may help us to better understand us to better understand the fluid nature of games and how they can be broadly applied to teach historical representations, generalisations and narratives. Metzger and Paxton (2016, p. 557) also suggest players can interpret games differently depending on their own identity and experience. Therefore, different histories and messages can be received by individual players playing the same game. However, the different game-based deployments of historical representations, generalisations and narratives can be broadly implemented to teach certain aspects of history. understand history within games like *EUIV* to clarify how history and gameplay are negotiated by developers and navigated by players.

Other participants had a very different take on the game's relationship between gameplay and historical accuracy, believing *EUIV* was more about the manipulation of variables than accurate historical reflections. Theme 5c was apparent in 21 participants' responses, who also believed that playing *EUIV* involved constant calculations and mathematic formulations to help them play the game with maximum efficiency. These responses showed that as participants' played the game they focused on exploiting the game system rather than on the historical content. This focus arguably decontextualised the relationship between the processes of play and the historical information presented in the game, consequently minimising participants' engagement with the latter. For example, one participant said: "The player can be a cold optimizing machine with no bounded rationality, while in history rulers and populations were limited (as we are also nowadays) by their worldviews". In contrast, 23 participants thought *EUIV* and its AI purposely worked against the historical accuracy of the game (Theme 5b), causing it to diverge from history. For example, as one participant stated: "Most of the time [*EUIV*] gets the broad strokes right.

Weird things CAN and DO happen, but I find that this is mostly, somehow, due to player involvement." Another participant said "there are many "quirks" in *EUIV*. Historical events happening too early or too late, Ottomans colonising Oceania, Poland partitioning Germany etc". From these responses it is evident that the game AI will often make decisions that do not align with the historical behaviours and politics of the time. In terms of *EUIV*'s application in educational contexts this may be an issue, because it means that students may not necessarily be learning "real" history but a series of counterfactuals that in fact vastly diverge from accuracies around distances, time, politics and interactions between various nations. Many of the survey participants show a degree of critical reflection in terms of the game's depiction of historical authenticity, suggesting some parts are more historically 'accurate' than other elements, i.e. written text is more accurate than visual game mechanics. However, many also acknowledge that 'it is a game' and therefore its depiction of history will be different or less specific than a textbook, especially in regard to game processes. Copplestone (2017, pp. 434-435) conducted a study involving 156 interviews of members of the videogame industry, gamers and cultural-heritage professionals. Copplestone's study (2017, p. 429) points out that 42% of gamer interviewees believed accurate depiction of cultural-heritage correlated with what they had learnt or read in class. There was a difference in the way historical/cultural information had been typically consumed by her interviewees in the past (i.e., learnt or read in class) as opposed to how information was consumed through playing digital games. Copplestone's study may help us understand why, in the survey data, the pop-text boxes were considered the most historically accurate, being closer to traditional historical mediums than the visual and other game elements of *EUIV*.

In summary, it is evident that issues around the historical accuracy of *EUIV* stem from the game's playability, and participants recognised the game's abstraction of history and its counterfactuals were the result of entertaining gameplay. As such, while many believed *EUIV*

was able to accurately convey wider themes about history (if not specific events and timelines), they also understood how mechanics and gameplay limited engagement with factual history. Awareness of these limitations could likely be important in utilising *EUIV* in educational settings, and teachers cognisant of the required balance between historical accuracy and gameplay could inform students as to these aspects of the game.

5.9 Nation Governance and Management in *Europa Universalis IV*

As shown in *Figure 5.8*, question 7a asked: *How accurately does Europa Universalis IV reflect and simulate nation governance and management?* Nation management and governance refers to the general tasks of guiding a nation's actions within the game and dealing with any issues encountered that affect that nation's progress. This question was intended to elicit information about players' perceptions of the accuracy of this aspects of the game as one of the centrepieces of *EUIV* gameplay. In total, 182/331 or 54.99 % of participants believed *EUIV* reflected and simulated nation governance and management with some level of accuracy. The majority of participants (136/331 or 41.09%) thought that *EUIV* "somewhat accurately" reflected and simulated nation governance and management, but the next largest group of participants (96/331 or 29.00%) believed the game "quite inaccurately" did so. A smaller number of participants (44/331 or 13.29%) believed the game was "not at all accurate" in this respect, while a slightly smaller group (41/331 or 12.39%) thought the game was "quite accurate" when it came to nation management and governance. Of those who selected "other (please specify)", 15 participants said they did not know whether the game was accurate in this regard, with some participants specifying that they did not feel they were qualified to answer. As a whole, participants believed nation management and governance was less accurately reflected in *EUIV* compared to history itself.

7a. How accurately does Europa Universalis IV reflect and simulate nation governance and management?

Answered: 331   Skipped: 0
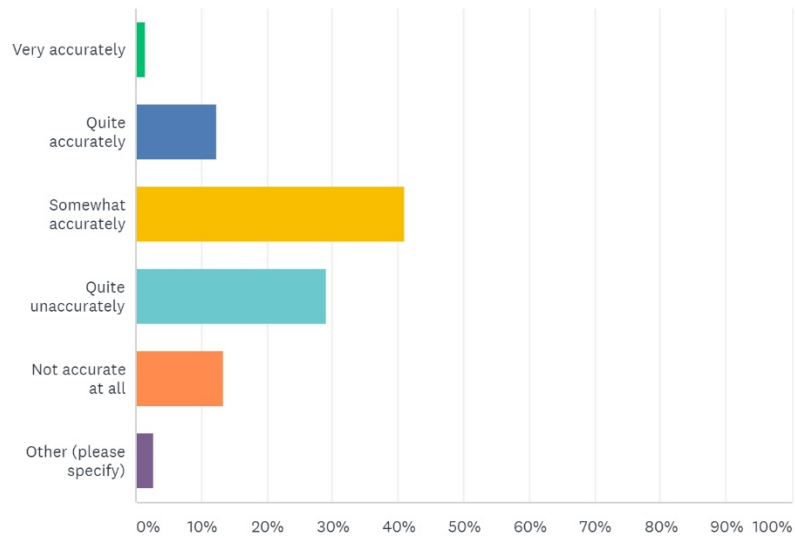
ANSWER CHOICES		RESPONSES	
▼ Very accurately		1.51%	5
▼ Quite accurately		12.39%	41
▼ Somewhat accurately		41.09%	136
▼ Quite unaccurately		29.00%	96
▼ Not accurate at all		13.29%	44
▼ Other (please specify)	Responses	2.72%	9
TOTAL			331

Figure 5.8. Participant responses to survey question 7a: *How accurately does Europa Universalis IV reflect and simulate nation governance and management?*

In their extended responses to question 7b participants cited several reasons for believing *EUIV* was not entirely accurate in reflecting and simulating nation management and governance. Given the volume and length of responses for this question the comments have been grouped into two themes and a number of sub-themes. The full list of these themes and sub-themes can be seen in *Appendix C*.

5.9.1 Theme 6: Accuracy of Nation Management and Governance in EUIV

There were 75 respondents who commented on Theme 6. Similar to the responses about historical accuracy, some participants believed the game mechanics were designed to

create a streamlined gameplay experience and therefore a relatively simple simulation of nation governance and management. Participants reasoned that it would potentially be too complex for designers to simulate everything to do with this aspect of history. A group of 75 participants commented on this subtheme (Theme 6i). For example, one said:

> From a management, economical point of view you know very few things. You get a fixed income each month, a trade income each month and they fluctuate far less than they historically did. You have no data about the goods produced; the rise of capitalism and the decline of serfdom are almost not at all represented; you cannot levy new taxes, have no control over the currency, the national debt is a joke. As for governance, it's way too simplistic. You have a king, an heir and three advisors. And that is all through the game (unless you go for a republic).

This criticism of the game relates to its lack of complexity, with the participant evidently noting some of the limitations of the game in terms of how players can engage with nation management and governance. Evidently, for this participant, this diminished the historical accuracy of the game.

Many participants were able to specifically identify the design elements within the game they believed introduced inaccuracies, abstractions or simplifications. A group of 23 participants (Theme 6j) singled out the game's point systems[36], which is used to measure and manage various factors such as the stability system (where stability can be improved instantaneously using in-game points) as being too "game-like". Eight participants jokingly referred to the points system as "mana"[37], meaning that the currency points had no concrete connection to the ideas they represented and were thus fantasy. Seemingly, the participants

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[36] As a reminder, the point systems, many of which are used through the governance tabs, are explained in the Formal Analysis at chapter 4 with the actual points/currencies used in the systems further explained at *Appendix A*.

[37] The term "mana" is used to refer to magical powers, such as those found in fantasy-themed digital games like *World of Warcraft* (Blizzard Entertainment, 2004).

believed the points system served game design purposes more than representing nation management or governance systems. Participants also noted the ahistorical nature of instantaneous actions and decisions executed in-game using the various points systems. For example, as one participant explained:

> You can't pay for stability with whatever the heck admin points are in real life. You can't just go around using military points to end resistance. In real life, some battles are never really won (Afghanistan, Vietnam, and other guerrilla campaigns). The notion of a core province in this game is vague and makes little sense.

It can be surmised from this response that the instantaneous and crude nature of the points-based governing system does not reflect the complexities of real-life governance, thereby revealing another limitation of the game in terms of its historical accuracy.

Another 26 participants (Theme 6e) believed the game mechanics related to nation management and governance were too simplistic because the game provides all the information the player needs to make top-down decisions. For instance, some game features allow the player to operate as an omnipotent and god-like controller, which some players perceived as an ahistorical representation. For example, one participant said:

> To put simply, in *Europa* you do not govern a nation, you play as the nation. You play almost as a hive mind, where the goals and ideals of the entire nation work towards a single goal. This very rarely happened in history, and many times lesser nobles, family members, or generals could be the biggest thorn in a ruler's side. This is not shown at all in the game.

It is evident that because the player represents the spirit of the nation they play, they deal more with matters of higher-level organisations than internal politics and specific historical perspectives.

5.9.2 Theme 7: The Relationship Between Gameplay and Nation Management and Governance

Similar to participants' perceptions of the balance between historical accuracy and gameplay, 33 participants believed *EUIV* prioritised governance gameplay over accuracy (Theme 7). For example, as one explained:

> I think the three main areas of Administrative, Diplomatic, and Military development for ruler ability and province value are a sensible shorthand for combining the many aspects that are abstracted for game mechanics purposes. The recent addition of Estates, States and Territories better reflects the internal difficulties that a ruler would have had, albeit again abstracted for game mechanics purposes.

This response shows that while the game's governance system is based on abstractions, players still recognised the processes associated with nation management and governance in *EUIV*. The participant's understanding of what "a ruler would have had" shows evidence of sophisticated analytical thinking about nation management and governance in the historical period the game encapsulates, and an understanding of the degree of accuracy nonetheless present in the game's systems.

Irrespective of these abstractions, 18 participants believed *EUIV* focuses on simulating conquest and expansion rather than nation management and governance, which are less well represented in the game. As one participant explained:

> *EUIV* is a war game and as such does not allow complex nation management. Indeed the many confusing and poorly explained mechanics behind things such as the trade network force mean players largely ignore such things. In addition many of the governance mechanics, such as stability for example, tend to be solved with a simple click of a button in an abstract way. This is as a result of the classic gameplay>realism balance in gaming.

As another participant commented: "*EUIV* is still too much a 'map-painting simulator' to properly reflect [history]. Most of the wars result in big chunks of territory being transferred from one country to another, whereas this wasn't the case historically". This comment relates to the fact that *EUIV* players may often focus too much on conquest, and "paint" the map in the colour that represents their nation. While this focus on conquest will not completely dictate how the game is played, it may limit opportunities for learning, especially about nation management and governance as historical processes.

In summary, participants highlighted a number of themes and subthemes around nation management and governance. Although many believed *EUIV* represented different elements of nation management and governance with some degree of accuracy, for many these elements were too abstracted to be meaningful representations. Nonetheless, many players understood that such abstraction played an important function within *EUIV*: it worked to balance engaging gameplay with representations of actual historical processes and systems.

5.10 Results Summary

Collectively, the forum survey results provide insights into the different ways history can be learnt from *EUIV* and the limitations that impact upon these historical learnings. Participants indicated that they preferred to engage with the game in single-player or multiplayer mode, while others modded the game to create their own historical content. These different forms of player engagement point to different pedagogical opportunities for history education. The responses showed that players play for a variety of reasons; they might play for enjoyment, to experience history, for social engagement, to undertake a strategic/puzzle challenge, or to specifically learn about history. Sometimes participants created their own counterfactual history during gameplay, while others engaged with history by following and recreating real events and themes. In other instances, participants developed understandings of history and used this knowledge to benefit their game strategy, while

others modded the game to enhance, correct or change history as they saw fit. However, the survey results also show potential ways in which *EUIV* history is limited in terms of historical in-game depictions, abstraction and behaviours. These game history issues limit the educational value of *EUIV*, and should be considered when players engage and learn with *EUIV*. The survey participants understood history and its depiction in *EUIV* in a number of ways, ranging from very strict traditional understandings (e.g. factual forms) to partial historical truths and biases within the game (e.g. its Eurocentric focus) to complex historical understandings (e.g. history can be represented by themes and influences). These understandings are represented on a continuum in *Figure 5.9*. Many of these will be discussed in more detail in Chapters 7 and 8. *Figure 5.9* does not represent all participants' historical understandings; however, it does highlight the spectrum of views about the historical content depicted in *EUIV* and its pedagogical implications.

EUIV is Mostly Historically Inaccurate...

EUIV is to a Degree Historically Accurate...

EUIV is Mostly Historically Accurate...

Except When it is Telling Factual History in Pop-up Boxes

Because it Abstracts, Misrepresents and Omits History

Because the Game Mechanics and Currencies are Ahistorical Representations

Because it is not a Historical Perspective Rather it is a Birdseye and Semi-Omniscient Perspective

As the Player and AI Actions are not in Keeping with the Historical Period

Because it Focuses on War and Empire Building

Because of its Eurocentric Focus

As it is a Counterfactual or Alternate Reality

As there is a Impossibility of Replicating History

As the Game History seems believable and authentic

Because it Reflects the Historical Trends, Themes, Ideas and Influences

Figure 5.9. Continuum of participants' understandings of historical accuracy in *EUIV*[38].

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[38] Icons made by Freepik, Becris, Dave Gandy, Gregor Cresnar, Surang from www.flaticon.com.

5.11 Conclusion

The responses from the forum survey revealed a number of key findings about how *EUIV* works as a tool for learning history. It was evident that participants usually played *EUIV* due to interests in history or video games, and they overwhelmingly (316/331 or 95.47%) believed that playing *EUIV* was a significant motivator for developing further historical interest and a catalyst for conducting research into history. While only 0.60% or 2 participants thought *EUIV* was "very" historically accurate, many participants (75/331 or 22.66%) believed *EUIV* depicted and/or simulated history quite accurately, with most suggesting *EUIV* was at least somewhat historically accurate (176/331 or 53.17%). Holistically, 253/331 or 76.40% of participants believed *EUIV* reflected and simulated a level of historical accuracy. Almost half (149/331 or 45.02%) the participants had modded the game in some form with 86 of the 125 (68.8%) voluntary responses indicating they had learnt about history from the process of modding. Nevertheless, the participants also noted the game was not able to accurately reflect and simulate nation management and governance. Although many participants had never or rarely played in multiplayer mode, there was generally positive feedback (93 positive comments compared to 10 negative) about multiplayer and how it facilitated social and learning interactions. These findings add weight to the argument that *EUIV* will be useful for learning history because it shows the popularity and positive learning experiences associated not with only generic single player experiences but also other GBL forms such as modding and multiplayer. The survey findings suggest that case study learning exercises based around modding or multiplayer gameplay could produce fruitful results in educational contexts. Furthermore, because most participants believed the best features for learning about history in-game were the pop-up boxes (146/331 or 44.11%) and game maps (119/331 or 35.95%), case study exercises developed around pop-up boxes (potentially centred on modding) or game maps (centred on a historical roleplay simulation

and the inclusion of a visual pre/post-test) may be pedagogically ideal. These provided the

foundation for the university case study. The next chapter will explain how a number of the

forum survey participants' historical perceptions also interlinked with case study findings.

Chapter 6: Case Study Data and Interpretation

6.1 Introduction

This chapter reviews and interprets the data collected during the university case study the researcher conducted in March 2017. In total, 18 university students participated in the case study[39] and were required to commit five hours over the course of a week to exercises designed by the researcher. The case study was held at the University of New South Wales (UNSW) in Sydney, Australia with students from a range of different disciplines and backgrounds. The conditions of the case study replicated those of a formal learning scenario, whereby learning "occurs in an organised and structured environment…and is explicitly designated as learning" (Cedefop-European Centre for the Development of Vocational Training, 2014, p. 99). In the initial phase of the case study the participants completed written and visual pre-tests and a demographic form. The participants then learnt how to play *EUIV* using the in-game tutorial. Participants were then randomly placed into two groups of nine to undertake the case study exercises. This process is described in full in Chapter 3, and further details of the case study design can be found in *Appendices D, E, F* and *G*. One group created their own historical event mod, while the other group engaged in a historical roleplay simulation[40]. The historical roleplay simulation group members were assigned to perform the exercise either as individuals or in tandem with other participants. After completing the simulation and the modding exercises, each participant took part in a written post-test, visual post-test and a structured interview. All pre/post-tests, demographic forms and interview questions were the same for each participant, regardless of the exercise in which they took

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[39] Prior to participation, the participants signed a consent form agreeing to their involvement and to have their data collected. The study was conducted under UNSW ethics approval HC16139.

[40] In the historical roleplay simulation exercise, participants played either as the Spanish empire, the Aztec empire or one other Central American nation involved in the Aztec-Spanish Conflict. Each participant in the historical roleplay simulation was given a nation brief on the historical context and objectives of the nation they played.

part. While the case study provided insightful findings, a limitation was the number of participants (n18). Greater participant numbers would strengthen the validity of the quantitative results; however, this issue is mitigated by being able to compare the case study results against the larger *EUIV* online forum survey (n331) findings.

The first section of this chapter compares the written pre and post-test results and participants' demographics and experiences. The second section presents the visual pre and post-test results. The third section summarises the results from the participant interviews and researcher observation notes. The final section examines the historical mods created by the modding group participants. It should be noted there is no section dedicated to the historical roleplay simulation in this chapter; the findings from this part of the case study will be integrated into other sections in this chapter and thesis. This is because the findings from the simulation were weaker both statistically and qualitatively compared to the findings from the modding exercise. As a result, this chapter will focus on the strong findings from the modding exercise, which will be further discussed in Chapters 7, 8 and 9. The data obtained from this case study provides written and illustrative materials that triangulate with the *EUIV* online forum survey in Chapter 5, the thick description of *EUIV* in Chapter 4, and the researcher's mod, to be discussed in Chapter 9. Triangulating the case study results with the other thesis findings will provide a more holistic understanding of the relationship between informal gaming practices when applied in a formal learning context.

6.2 Participant Demographics and Experience Comparison: Written Pre and Post-Tests

This section compares the case study participants' written pre/post-test results and presents data on their demographics, levels of gameplay and IT experience, areas of study, interest in history and strategy/non-strategy games. See *Appendix D* for the Case Study Demographic Participant Form and see *Appendix E* for the written and visual pre/post-tests. The written pre and post-tests asked participants about their general historical knowledge of

the Aztec-Spanish Conflict and its actors, events, timeframes and other related historical information. All participants except one (Ben) showed improvements between their written pre and post-test scores. The scores for each participant as well as their assigned case study group are outlined in *Table 6.1*. All case study participants have been given pseudonyms to maintain their confidentiality. The participants' demographic information and experiences are outlined in *Table 6.2*. As a whole, the participants' scores improved by an average 3.11 points between the written pre and post-test.

Next, a statistical test, the Mann-Whitney U test[41], was used to compare the written pre and post-test scores to find any statistically significant[42] differences. The test was applied and calculated using SPSS (IBM, 2015). The Mann-Whitney U test was applied to only two different sets of score data. One dataset presented the differences between pre and post-test scores of the case study participants as a whole. The other dataset presented the differences between pre and post-test scores for the modding and historical roleplay simulation groups. The other datasets (e.g. gender dataset) showed unequal distributions of participant demographic numbers and experiences, and therefore were deemed not to have produced any statistically meaningful results.

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[41] This test is used to compare differences between two independent groups when the variable is ordinal, but not parametric. The Mann-Whitney U test was also outlined in Chapter 3.
[42] In this instance, a statistically significant result is a difference in score result that is attributed to more than just chance.

Table 6.1. *Individual and Overall University Case Study Participant Pre-test and Post-test Scores.*

Participant Number and Pseudonym	Case Study Group	Participant Pre-Case Study Test Score	Participant Post-Case Study Test Score	Score Difference
1: Brad	Historical Roleplay Simulation (HRS)	3	8	5
3: Jacob	HRS	0	4.5	4.5
5: Alex	HRS	4	5	1
7: Oliver	HRS	1	3.75	2.75
9: Jane	HRS	1	5.25	4.25
11: Ben	HRS	0.5	0	-0.5
13: William	HRS	4.25	6	1.75
15: Susan	HRS	1	5	4
17: Jack	HRS	3	5.25	2.25
2: Paul	Modding	2.75	7.5	4.75
4: Ethan	Modding	5.25	7.5	2.25
6: Beth	Modding	0	5.75	5.75
8: John	Modding	6	8	2
10: Peter	Modding	2	8	6
12: Anna	Modding	0.75	5.25	4.5
14: Nathan	Modding	5	6	1
16: Henry	Modding	4.25	8	3.75
18: James	Modding	4	5	1
Group Total Average Score Difference		2.65	5.76	3.11

Table 6.2. *University Case Study Participant Demographics and Experience.*

Participant number and pseudonym	Age	Gender	Subject Area of Study	Nationality	Previous IT Experience	Previous Game Experiences	Video Game Genre of Interest	Interest in History
1: Brad	27	Male	Engineering	Australian	Quite Proficient	Plays often	Strategy	Somewhat Interested
3: Jacob	21	Male	Arts/Media	Chinese	Proficient	Plays often	Non-Strategy	Not Interested
5: Alex	21	Male	Engineering	Malaysian	Quite Proficient	Occasionally	Strategy	Somewhat Interested
7: Oliver	22	Male	Business	Malaysian	Not proficient	Plays often	Non-Strategy	Somewhat Interested
9: Jane	22	Female	Engineering	Malaysian	Proficient	Occasionally	Non-Strategy	Not Interested
11: Ben	21	Male	Business	Malaysian	Proficient	Occasionally	Non-Strategy	Not Interested
13: William	20	Male	Business	Australian	Proficient	Plays often	Non-Strategy	Somewhat Interested
15: Susan	32	Female	Business	Chinese	Proficient	Plays often	Non-Strategy	Quite Interested
17: Jack	19	Male	Engineering	Chinese	Proficient	Plays often	Strategy	Somewhat Interested
2: Paul	21	Male	Science	New Zealand	Proficient	Occasionally	Strategy	Not Interested
4: Ethan	27	Male	Arts/Media	Singaporean	Proficient	Plays often	Strategy	Not Interested
6: Beth	23	Female	Science	Australian	Quite Proficient	Plays often	Non-Strategy	Not Interested
8: John	27	Male	Engineering	Australian	Quite Proficient	Plays often	Strategy	Quite Interested
10: Peter	22	Male	Engineering	Chinese	Quite Proficient	Occasionally	Non-Strategy	Quite Interested
12: Anna	24	Female	Science	Philippines	Quite Proficient	Occasionally	Non-Strategy	Somewhat Interested
14: Nathan	17	Male	Arts/Media	Australian	Proficient	Plays often	Strategy	Quite Interested
16: Henry	30	Male	Arts/Media	Australian	Proficient	Plays often	Strategy	Quite Interested
18: James	25	Male	Arts/Media	Australian	Proficient	Rarely	Strategy	Quite Interested

The overall pre and post-test score differences were not significant ($U = 33$, $z = -.664$, $p = .506$). The data for pre and post-tests scores for the historical roleplay simulation and modding groups are compared in *Figure 6.1*. The historical roleplay simulation group pre and post-test scores improved by an average of 2.78 points, while scores for the modding group improved by an average of 3.45 points. The modding group score improvement was an average of 0.67 points greater than the historical roleplay simulation group. The modding group scored an average of 2.03 points more on the post-test than the historical roleplay simulation group. A Mann-Whitney U test was conducted on pre and post-test scores for the historical roleplay simulation and modding groups at an alpha (.05). While there were no significant differences at pre-test ($U = 25.5$, $z = -1.33$, $p = .184$), there was a significant difference at post-test ($U = 15.5$, $z = -2.28$, $p = .023$) indicating a modding group advantage. This significant result suggests that further exploration is warranted for modding as a form of GBL, a topic that will be further explored and discussed in Chapter 9.
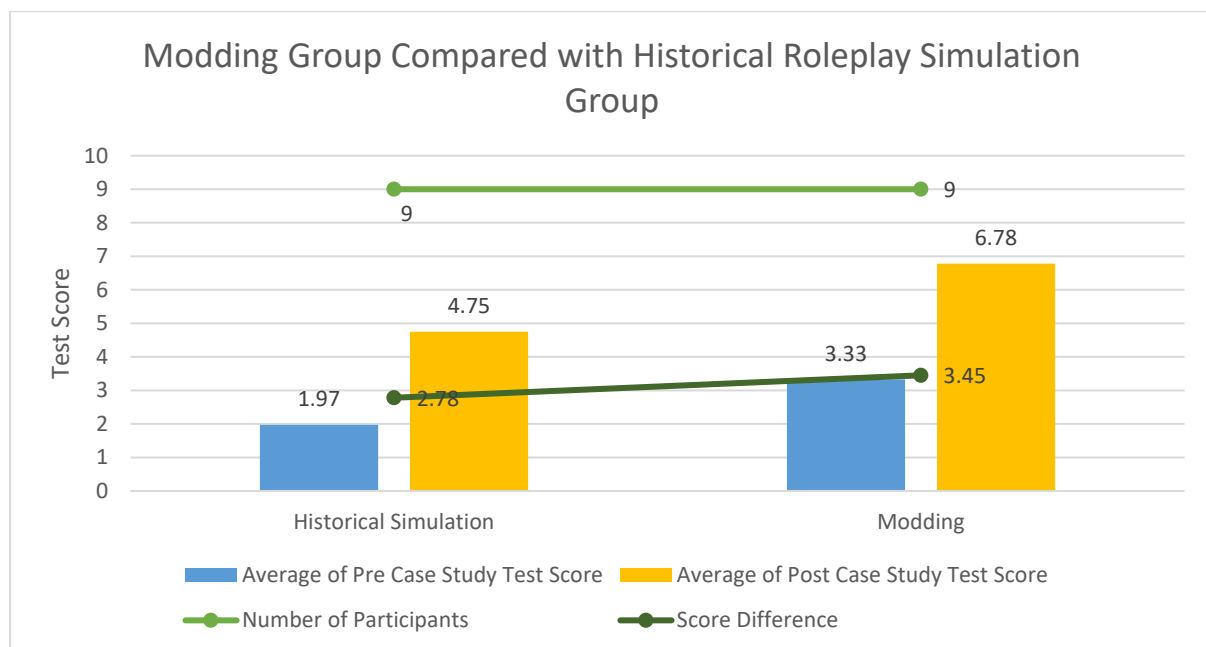
Figure 6.1. Pre-test and post-test score averages and case study exercise.

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In comparison, weaker findings were evident for the pre-test and post-test scores and the participants' gender, as represented in *Figure 6.2*. Male participants commenced with a higher pre-test score than female participants, with the post-test scores recording a marginal average score difference (.58) between the genders in favour of males. The small sample size (n18) and unequal distribution of male and female participants meant this data did not reveal any significant findings.
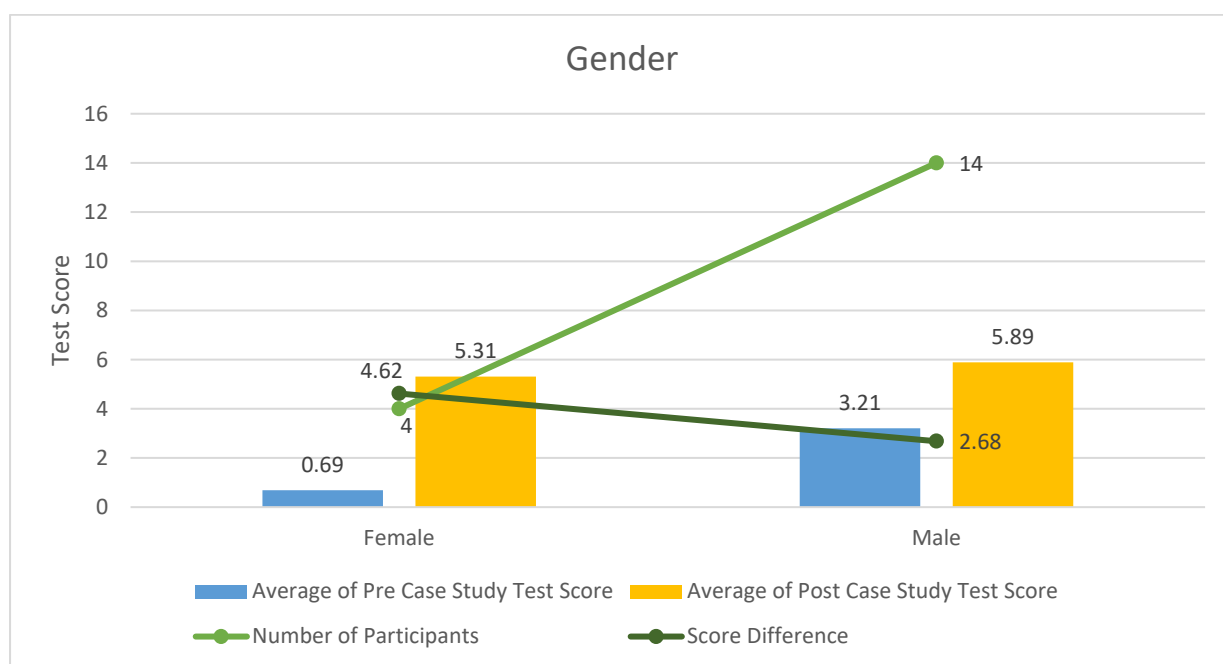
Figure 6.2. Pre-test and post-test score averages and participants' gender.

The pre and post-tests and age graph represented in *Figure 6.3* also show weaker data. This graph shows that 17-19 year-old participants improved an average of 1.63 points between pre and post-tests, 20-22 year-olds improved an average of 3.06 points, 23-25 year-olds improved an average of 3.75 points, 26-28 year-olds improved an average of 3.08 points, and 29-32 year-olds improved an average of 3.87 points. In most instances, each increase in age interval shows a slight increase in historical interest between the written pre and post-test. However, the sample numbers for each age group are unequal and the sample is small. Therefore, other than a slight trend associated with higher ages and higher scores, no strong conclusions can be drawn from this data.
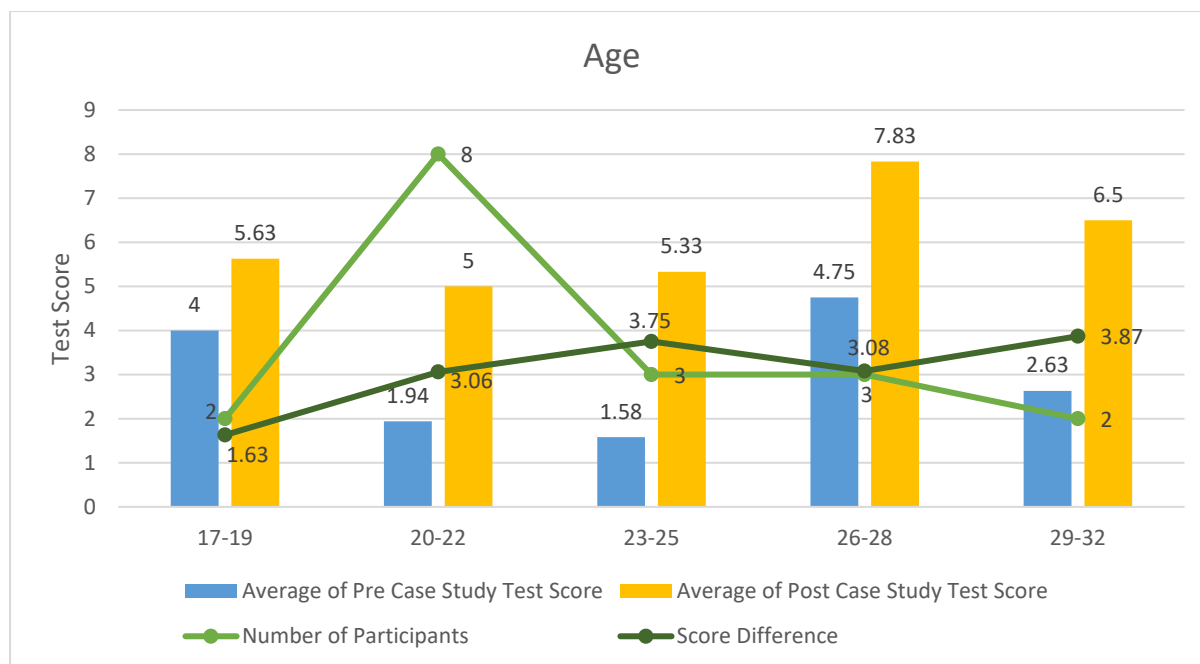
Figure 6.3. Pre-test and post-test score averages and participants' age groups.

Another comparison explored pre/post-test scores and participants' nationalities, represented in *Figure 6.4*. The graph shows that Singaporean participants and those from New Zealand scored the highest, while Malaysians overall scored the lowest. Australians scored the second highest, followed by Chinese participants and one from the Philippines. While the sample size was too small to be able to draw any inferences, the data may provide some insight into the differences, or lack of, between the different nationalities in terms of GBL. For example, one difference that could have impacted on the results was the level of English proficiency of participants, many who spoke English as a second language. Schools in some of the participants' nation of origin teach English as a second language (ESL) in their education system, e.g. China and Malaysia (Azman, 2016, pp. 65-66; Bolton, 2008), which may have impacted on different levels of proficiency. Nevertheless, the written pre/post-test results show that nearly all participants, regardless of their nationality and level of English language proficiency, improved their historical knowledge through playing *EUIV*. This suggests *EUIV* may provide an avenue for ESL learners who find it challenging learning from traditional historical sources such as textbooks to learn through *EUIV*'s visual and interactive

elements. However, given the limited number of participants, unequal distribution and lack of other metrics (such as testing participants' English proficiency), more research is needed to show a conclusive connection between ESL and the visual elements of the game.
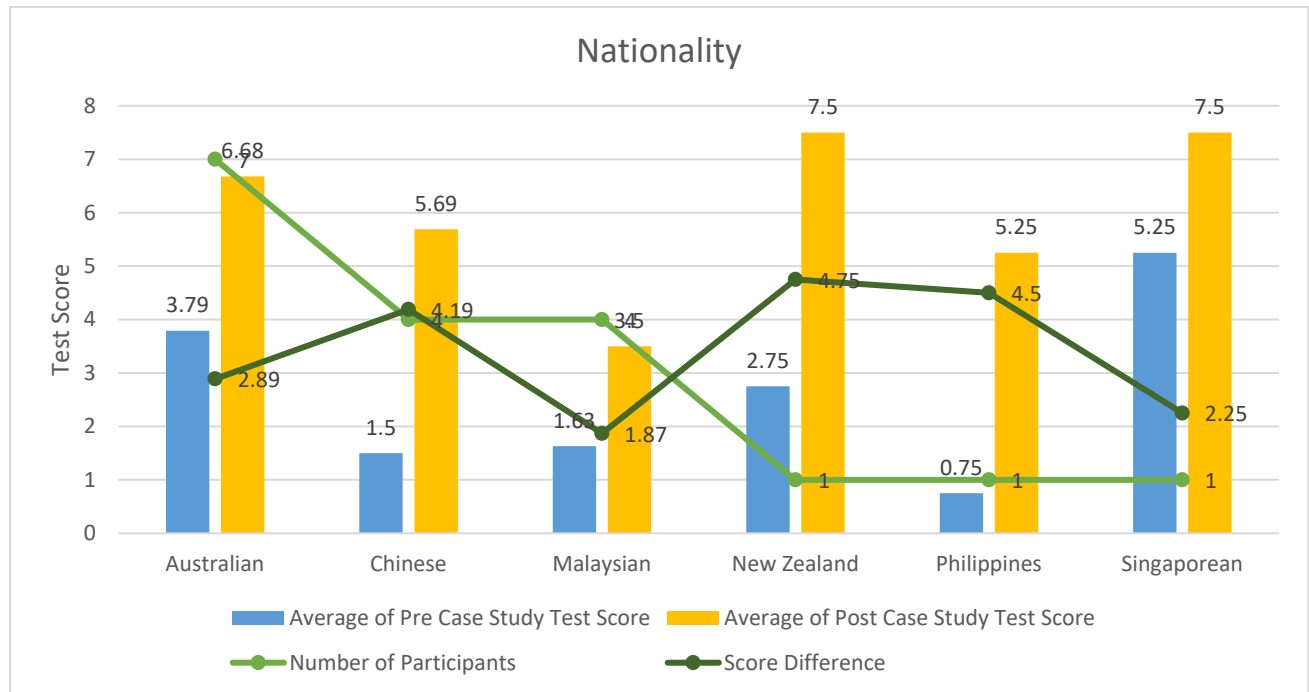
Figure 6.4. Pre-test and post-test score averages and participants' nationalities.

Different levels of information technology (IT) proficiency affected the pre and post-test scores, as shown in *Figure 6.5*. Although all participants, regardless of their IT proficiency, improved on the post-test, participants who were proficient or very proficient in IT typically had higher scores on the post-test than those who were not proficient. Less proficient participants also typically had lower pre-test scores. Overall this less proficient group showed an average 2.75 point improvement. Those who were IT proficient improved an average 2.63 points, while those who were quite proficient improved an average 4.04 points. These results suggest IT proficiency could be an important factor that may facilitate learning from *EUIV*. They also suggest that having basic or novice IT skills and proficiencies may have impeded some of the participants' learning process. It could be surmised that participants who were quite proficient in IT may have learnt how to play *EUIV* and its

different game elements faster given their previous experience in programming languages and/or complex scientific/engineering software.
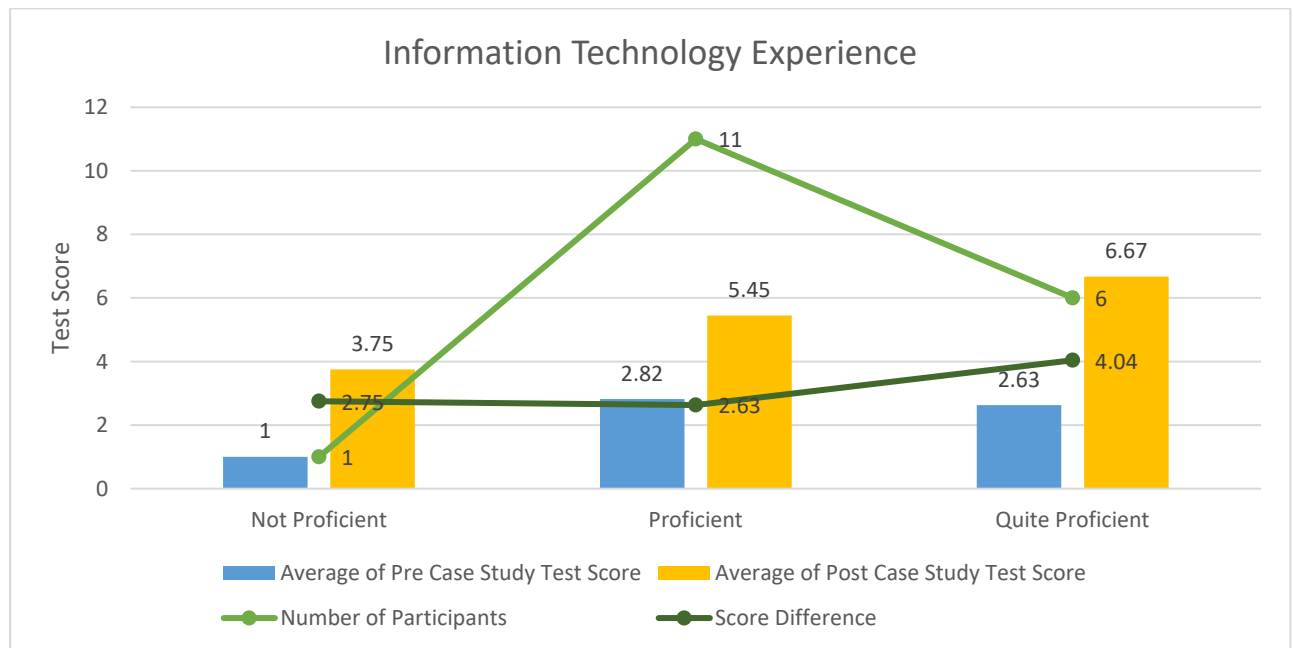
Figure 6.5. Pre-test and post-test score averages and previous information technology experience.

Different levels of gaming experience also appeared to affect how much participants learnt from the game and how they fared on the pre and post-tests, shown in *Figure 6.6*. Participants who played video games occasionally and those who played often showed the greatest increase in their pre and post-test scores. Those who played video games often increased their scores by an average of 3.18 points, while those who played occasionally increased their scores by an average of 3.34 points. The single participant who rarely played video games started with a higher pre-test score average than other game experience groups. However, this participant only improved by one point on the written post-test. Similar to the results for IT proficiency, familiarity with gaming practices may have meant those who game often master the game's interfaces, mechanics and currencies more quickly, and better understand how these features operate and are interlinked. It should also be acknowledged that those players who were less IT proficient performed to a lower standard on the written

history test than those who were IT proficient, suggesting a potential limitation with GBL when used with less IT proficient students. Hence the participants' gaming knowledge may have allowed them to adapt to the game quickly and absorb the historical content more readily, which could have pedagogical implications.
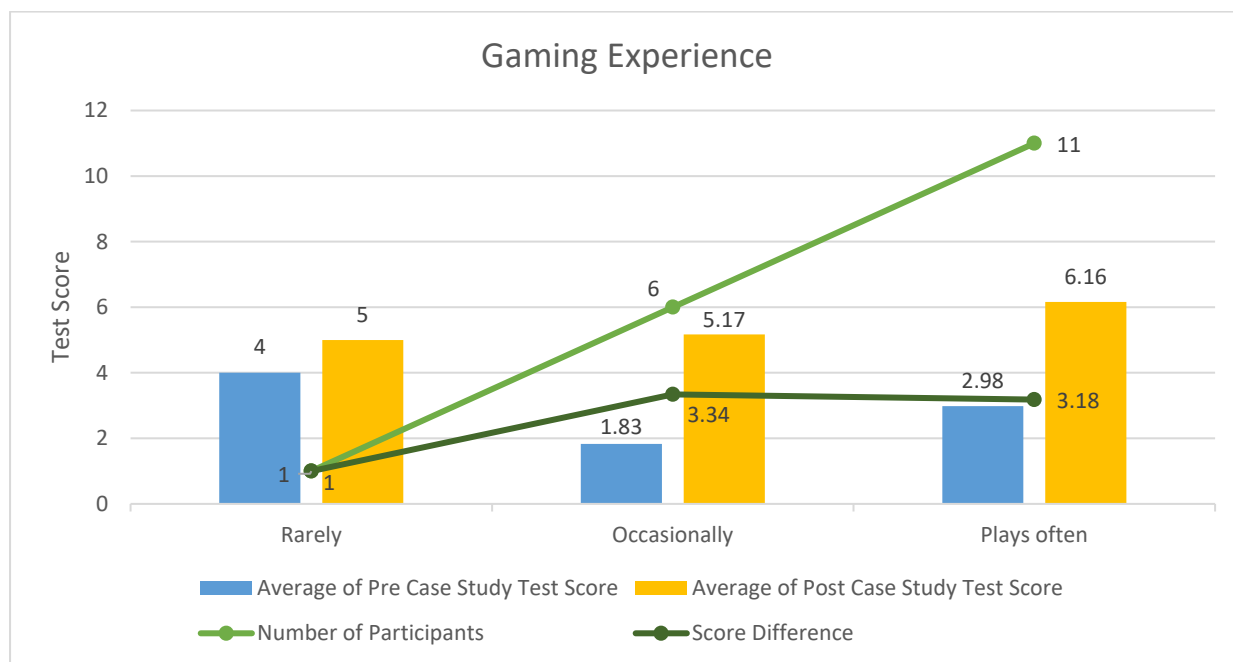
Figure 6.6. Pre-test and post-test score averages and previous gaming experience.

Another comparison drawn during analysis was between pre/post-test results and participants' interest in history, shown in *Figure 6.7*. When comparing total scores in both the pre and post-tests, participants who were quite interested in history scored the highest, followed by those who were only somewhat interested, and then those who were not at all interested in history. The comparison indicated participants who were not interested in history showed the most improvement between their pre and post-test scores by an average of 3.5 points. Those who were quite interested in history improved by an average of 2.96 points. Furthermore, those who were somewhat interested in history improved by an average of 2.87 points. In both the pre and post-tests, those who were quite interested in history scored the highest, followed by those who were only somewhat interested, and then those who were not at all interested in history. These results showed a greater interest in history was associated

with higher pre-test scores. However, the comparison between the three interest level groups also showed that improvements in pre and post-test scores were quite similar, suggesting all participants learnt from the game regardless of their level of interest in history.
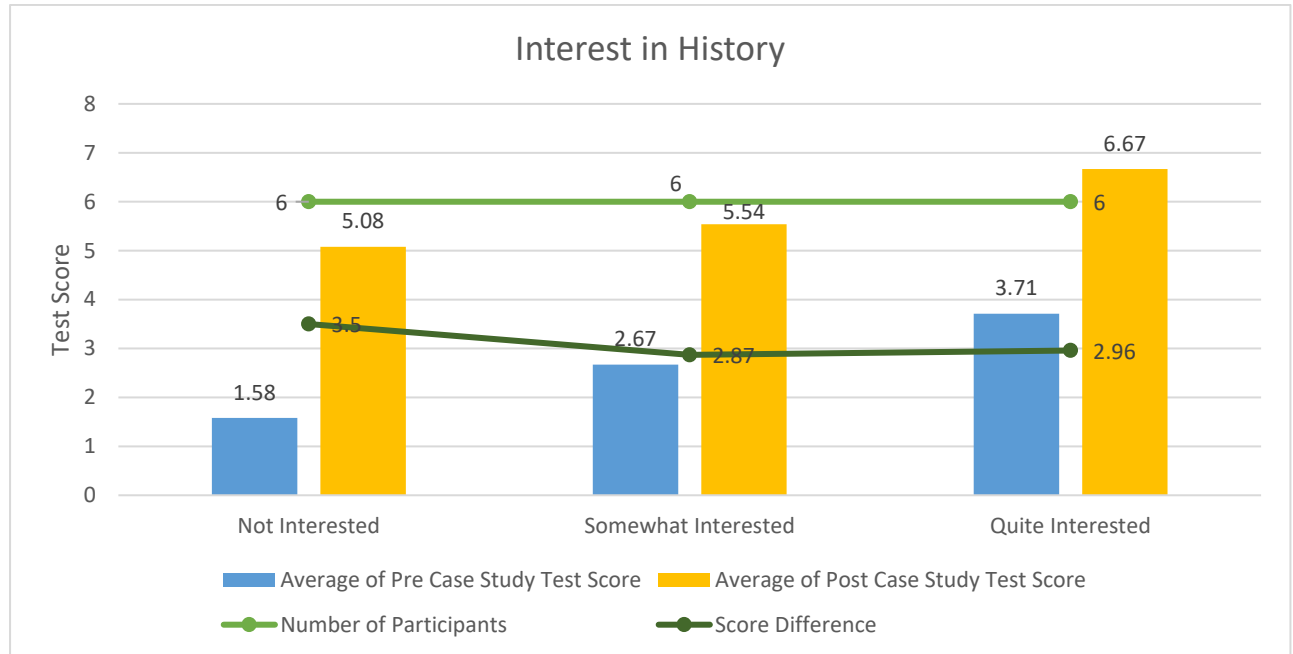
Figure 6.7. Pre-test and post-test score averages and interest in history.

The participants' area of study at university was revealed to be a factor that could influence their actions during the modding and historical roleplay simulation exercises. *Figure 6.8* compares participants' scores across areas of study and shows considerable variations in improvement between the average pre and post-test scores. Science students improved an average 5 points, engineering students an average 3.17 points, arts students an average 2.5 points, and business students an average 2 points. Interestingly, engineering (6.58 points), media/arts (6.20 points) and science (6.17 points) students all scored within the 6 point range (out of a possible 8 points), while business students scored within the 3 point range (3.69 points). The low average post-test score of business students could be explained in terms of the business related paradigms they applied to the game (i.e. focusing on income and money over other nation management aspects), which are further described in section 6.4 below, regarding the participant interviews.
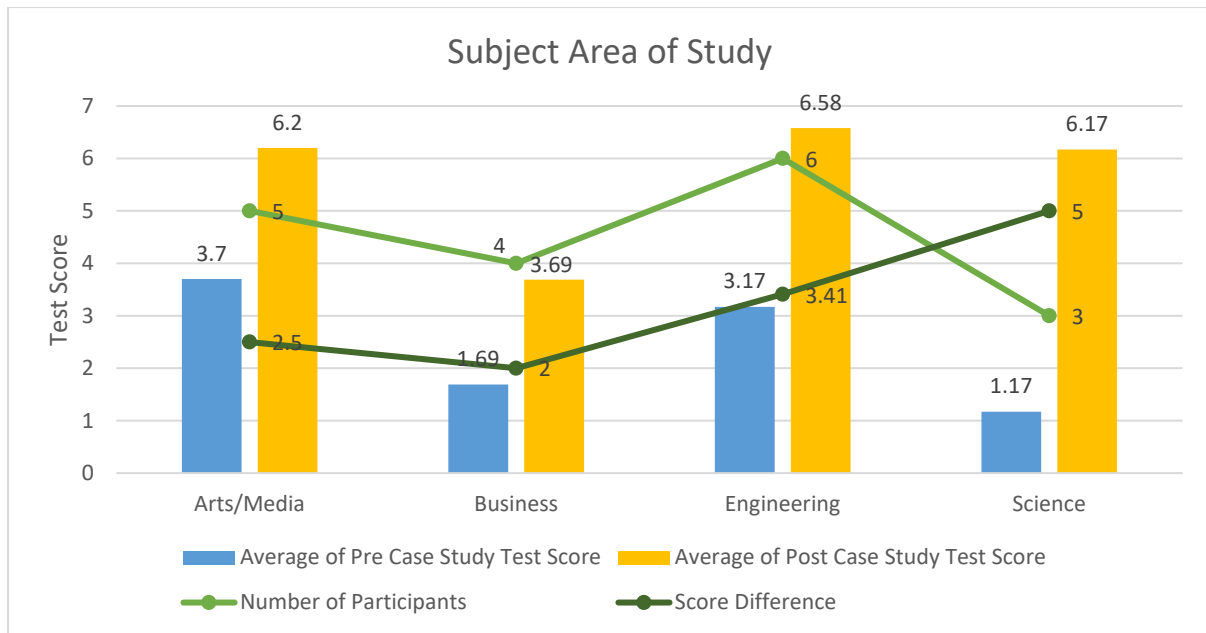
Figure 6.8. Pre-test and post-test score averages and the subject area of study.

Finally, the data on pre and post-tests for non-strategy gamers (n9) was compared with strategy gamers (n9). This comparison is depicted in *Figure 6.9*, which shows that participants who did not play strategy games improved the most in their post-test scores by an average of 3.66 points, compared to strategy gamers who improved by an average of 2.55 points. However, strategy gamers scored higher than non-strategy gamers on the pre-test by an average of 2.97 points and post-test by an average of 1.86 points. Familiarity with the strategy genre may have helped strategy gamers to better navigate *EUIV*. While an interest in the strategy genre (which often deals with history) may have helped strategy gamers initially on the pre-test and with their overall scores, non-strategy gamers improved the most, suggesting strategy game experience may not impact learning history from *EUIV*.
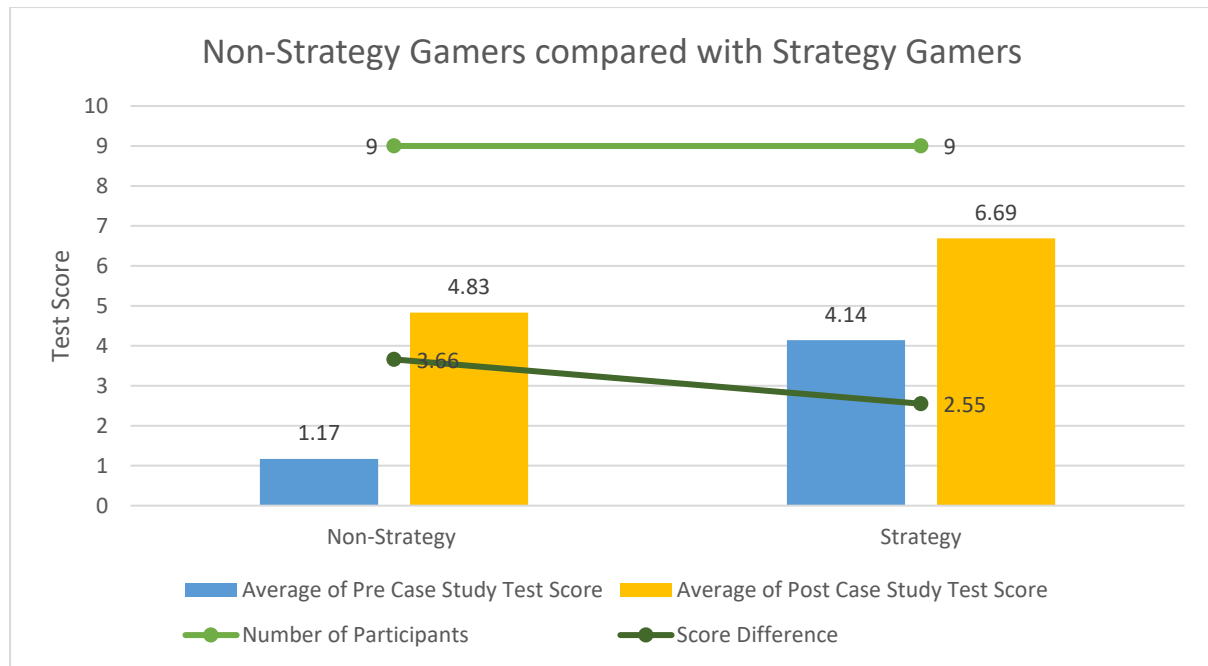
Figure 6.9. Pre-test and post-test score averages and whether the players are strategy or non-strategy gamers.

As a group, participants in the case study evidently learnt about the Aztec-Spanish Conflict through the *EUIV* gaming exercises because they improved an average of 3.11 points overall. While this improvement was not statistically significant, the Mann-Whitney U test that was applied to the comparison between the modding and historical roleplay simulation group showed the modding group had a statistical advantage[43]. These results indicate further exploration of the pedagogical use of modding is merited; this will be discussed in Chapters 7, 8 and 9. While the results suggested historical learning occurred during the course of the case study, these tentative results needed to be further corroborated with qualitative and visual data. The next section will further analyse the visual learning elements and qualitative findings from the university case study.

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[43] A group has a statistical advantage if that group has a comparatively statistically significant result, meaning that something more than chance is causing a difference between the group scores (Henkel, 1976, p. 10).

6.3 Participant Visual Pre and Post-Tests

In conjunction with the written pre and post-tests detailed in the previous section, all participants were provided with a visual pre and post-test to assess their geographical knowledge of the locations of the Spanish and Aztec nations. The results of these visual tests are represented in *Figures 6.10*, *6.11*, *6.12* and *6.13*. Following their *EUIV* game session all participants' scores on these geographical tests improved, particularly in terms of their ability to locate the Aztec Empire on the world map. In the figures below, the Spanish state is highlighted in yellow while the Aztec state is highlighted in red, with black dots[44] representing participants' marked nation locations. As Figure *6.10* shows, the majority of participants (n14) were able to locate Spain on the world map in their visual pre-test. Others incorrectly placed Spain in eastern or southern Europe, or the Middle East. Following the historical roleplay simulation and modding sessions, participants were better able to locate Spain, with only two of the 18 participants placing Spain outside of its actual borders (*Figure 6.11*).

Before their *EUIV* game sessions, many of the participants did not know of the existence and geographical location of the Aztec Empire. During the pre-test no participant was able to identify the geographical location of the Aztec Empire (*Figure 6.12*); participants believed it was located in South America, Europe or Africa. Following the simulation and modding exercises, eight participants demonstrated considerable improvement and were able to accurately locate the Aztec Empire on the world map, as shown in *Figure 6.13*. Almost consistently, with the exception of one participant (who placed the Aztecs in South America), all other participants (n17) placed the Aztecs very close to their actual location in the Central American region. The number of participants identifying Spain's location compared to the

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[44] Some of the dots marked by participants were very close together or superimposed on top of another participant's marked location, thus causing the appearance of black clumps or fewer dots than participants.

Aztecs shows a considerable contrast and may illustrate an imbalance in historical

understanding and appreciation of different nations and cultures over time.
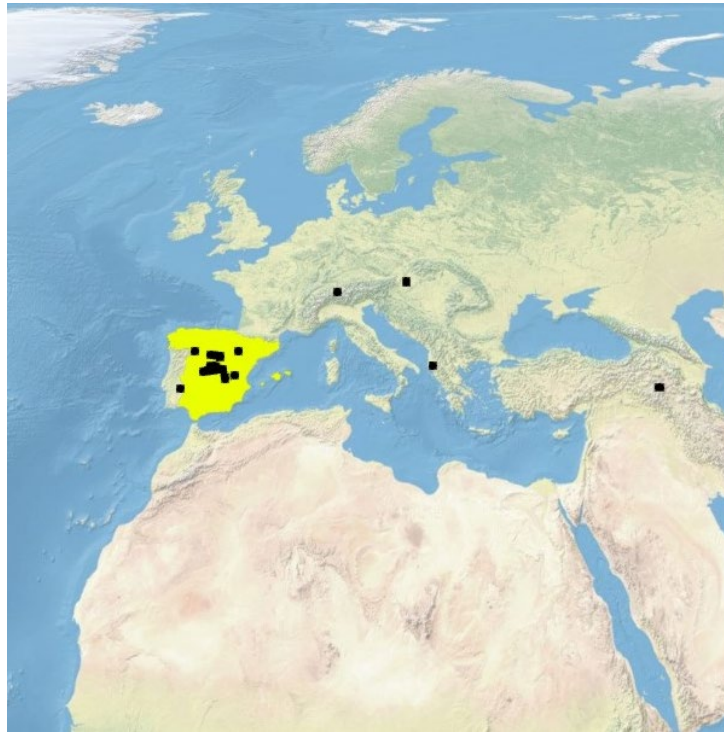
Figure 6.10. Participants' marked locations of Spain (yellow) in pre-test.
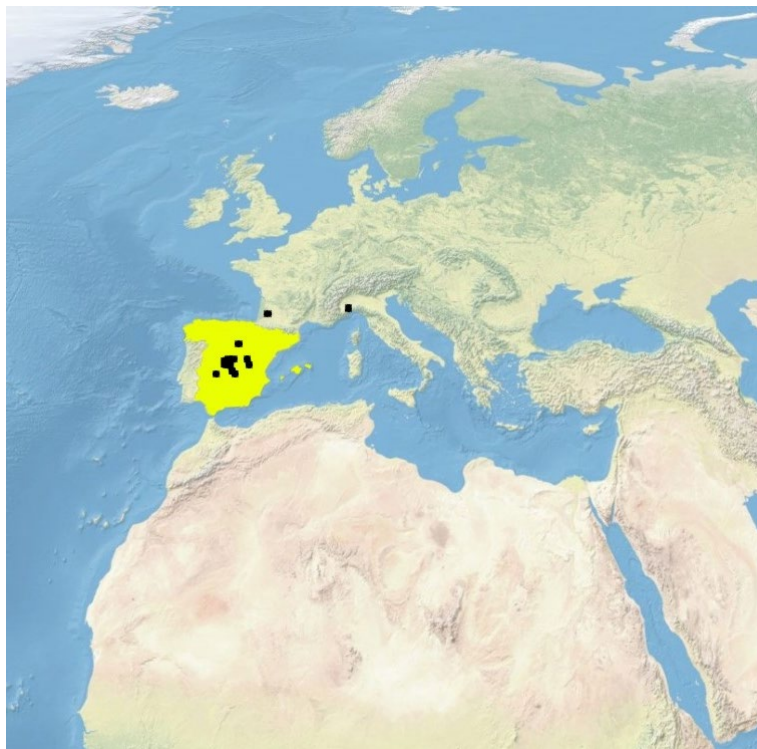
Figure 6.11. Participants' marked location of Spain (yellow) in post-test.
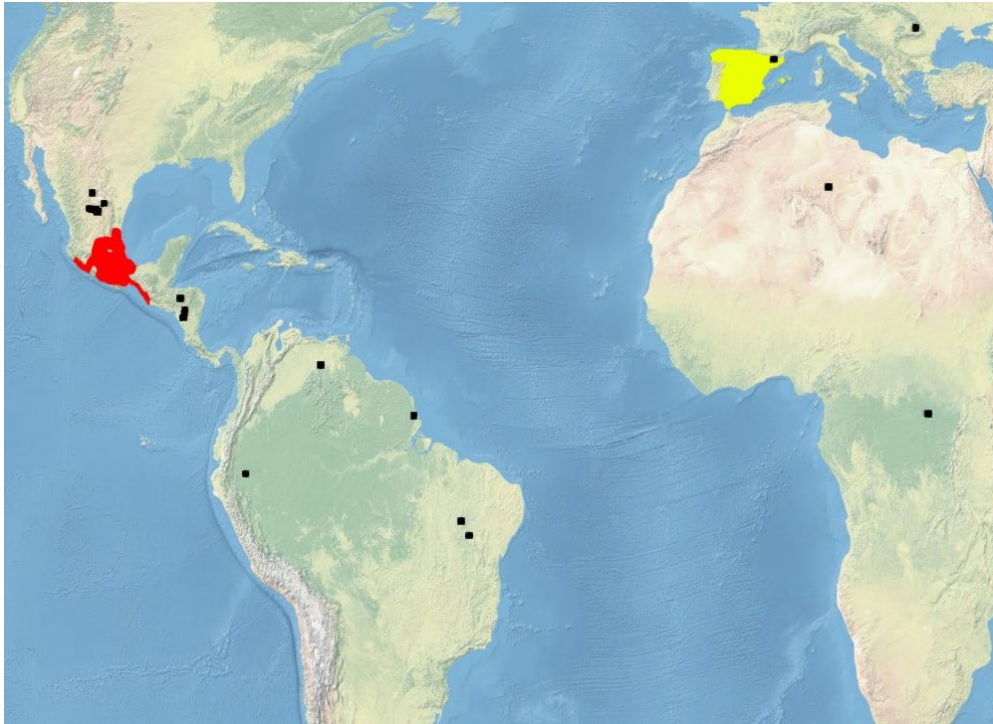
Figure 6.12. Participants' marked location of the Aztec Empire (Spain in yellow, Aztec Empire in red) in pre-test.
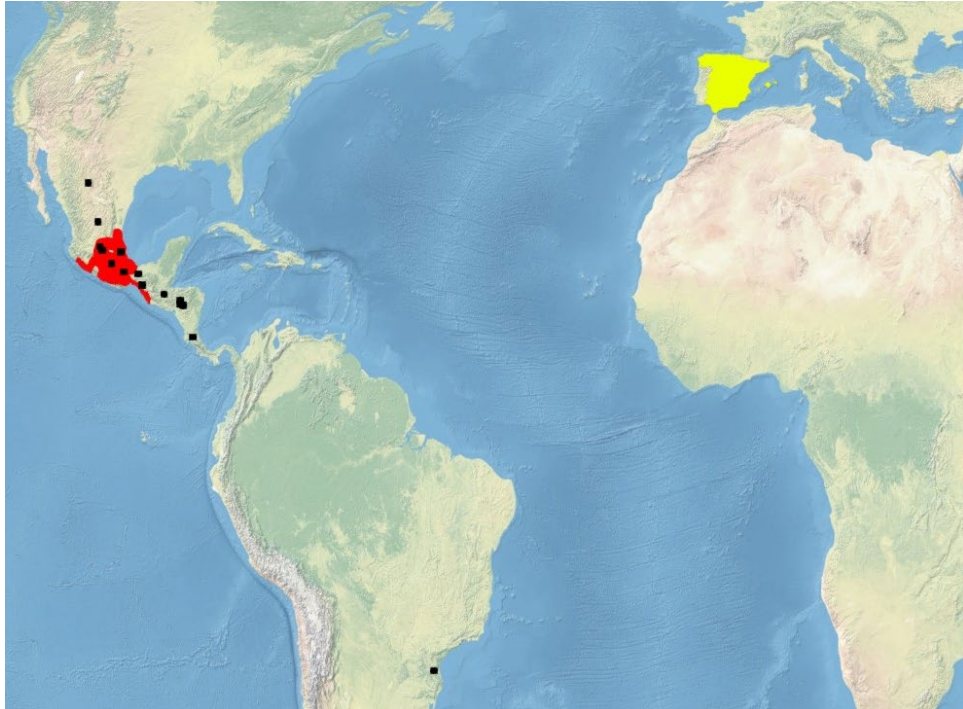
Figure 6.13. Participants' marked location of the Aztec Empire (Spain in yellow, Aztec Empire in red) in post-test.

It may seem that the learning in-game is limited when comparing the historical roleplay simulation exercise written test results with the modding exercise written test results, as the modding exercise involved more external historical research relating to the game's historical content. However, the map test results indicate that nearly all participants improved in terms of their geographical understanding. In this sense, maps, especially interactive maps with demographic and political details may have helped participants learn historical geography.

6.4 Interview Data, Researcher's Observation Notes and Interpretation

This section reports on the themes that emerged from the participant interviews conducted after the case study exercises and the researcher's observations during the exercises. The latter have been integrated into this section to provide support for the themes that were derived from the interviews. The interviews revealed the participants' thoughts about the *EUIV* gaming sessions and whether they believed the exercises were worthwhile in terms of learning history. The interviews were audio recorded and the researcher also took notes as the interviews progressed. Participants were asked the same seven interview questions (*Appendix G*), and probing questions were used to clarify responses when necessary. Following the content analysis of the interview data, several themes and subthemes emerged that documented the range of participant experiences playing *EUIV* and learning history through the game. A table containing the interview themes[45], subthemes and the number of participants who contributed to each is detailed in *Appendix I*. A selection of significant themes and subthemes will be discussed here. Similar to the *EUIV* online forum survey themes and subthemes, those in the case study were not designed as rigid groupings, and thus there is overlap between them.

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[45] The themes relate to the case study data and not the survey data and theme which are chapter 5.

6.4.1 Theme 1: Difficulty During the Gaming Sessions

During the case study interviews, 11 participants commented on the complexity and difficulty of playing *EUIV*. One participant, Jack, said that "the game was pretty hard", while Paul said "the game was pretty complex". Four of the 11 participants mentioned the complex interface of the game, with Beth stating the user interface "was very different to the user interfaces that I'm used to [in other games]". Additionally, five participants stated they had difficulty keeping track of the vast number of variables and functions in the game. One participant, Brad, said:

> In terms of all the kinds of diplomacy and all these kinds of options, I really didn't know what I could do. I think someone who is a bit more familiar with the range of options that you have in the game would be able to develop more sophisticated and more varied strategies.

Another four participants found the historical roleplay simulation in the first session difficult to follow, three of the four participants believed part of the issue lay with the in-game tutorial. These participants perceived the tutorial to be hard, buggy and not very streamlined. Eight participants commented they found managing everything in the game difficult. These participants indicated they were unsure of or did understand the different functions of the game. The educational implications for these difficulties means that *EUIV* may take an extended period of time to fully understand and thus access *EUIV*'s historical knowledge and experiences.

6.4.2 Theme 2: Learning Benefits of Game or GBL activities

Eight participants commented on the benefits of the "interactivity" of video games as a learning medium, noting that games are more interactive than books or documentaries. As Susan commented: "You feel like you are part of the history and you get more involved, whereas reading from the book, you're an outsider". In comparison to books and traditional

history research methods, two participants felt they did not have to try and memorise historical information to play *EUIV*, and that it required a less conscious effort to absorb information. Furthermore, six participants considered the gaming exercises useful for learning world geography, locating certain well-known nations, and discovering smaller or less well-known nations. For instance, two participants, Susan and Brad, commented on finding out about the size of nations, in particular the Spanish Empire. Susan commented "I didn't know that Spain has that much land in Europe, I didn't know they actually ruled Italy or you know other country in Europe [Netherlands]" while Brad stated "I didn't realise that Spain had so much control over the Americas".

Furthermore, eight participants believed *EUIV* allowed them to learn considerable historical detail. Three participants noted the game was a catalyst for developing further interest in history and conducting additional research. For example, Ethan said that while he learnt history from the game, he discovered darker, unpleasant, depressing and more morbid elements of history "only through the research, not through the direct game". Ethan's response provides interesting insight into how GBL can encourage players to discover a different side of history through their own independent research.

The modding process was intended to help participants focus on historical research and learning, and a number of participants commented on this aspect of the exercise. Two participants believed that modding contributed to effective learning because they needed to seek out specific historical information to complete their mods, not just technical information relating to the modding process. As John explained: "Modding forced me to look up stuff about computer programming as well, but still a decent amount of the research involved was just purely historical". Henry also stated "the actual research actually proved to be perhaps the most fruitful…I didn't play much of the scenario itself but the process of actually creating the mod actually helped me to learn a lot more about the history". Beth explained "the

modding exercise I felt made me...[learn] a lot of knowledge in a short space of time". The researcher observed John used Wikipedia during the modding session to search for information on Spanish and Aztec history. These findings, similar to those from the *EUIV* online forum survey, indicate the utility of the modding process in terms of it prompting the player to research and consequently learn about history.

The game also acted as a point of comparison between various perspectives of history for one participant with prior historical knowledge. Brad, who participated in the historical roleplay simulation, was observed to be distracted with many problems occurring in-game in Europe during session, meaning he could not focus on the Aztec-Spanish Conflict. While playing and during his interview, Brad commented that *EUIV* was able to effectively simulate the difficulties of managing a large empire and reflecting the resources at the empire's disposal. Brad also noted overextension[46] was implicitly tied into the processes of empire management, which also operated as a game variable that affected the stability of an empire. He further explained this idea by using the example of the Roman Empire and how it suffered from overextension due to its vastness. Brad's experience shows how *EUIV* players might combine their own prior historical knowledge with the historical knowledge presented in the game, providing the means for them to recognise certain historical themes and understand how they operate under various historical circumstances, such as in the case of overextension. The educational potential here is that the player is exposed, through the game, to the feeling and experience of the historical idea of overextension through gameplay, yet more importantly they also have the opportunity to compare, contrast and interconnect different pieces of historical knowledge to see wider themes and influences that were consistent throughout history.

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[46] In this context, overextension is the difficulty of managing and maintaining an empire over several different locations. Most empires such as the Roman, Spanish and British Empires suffered from these difficulties.

6.4.3 Theme 3: Participant Game Strategies

As discussed earlier in this chapter, there were differences between the written pre/post-test scores of students studying business and those of non-business students. The latter scored an average of 6 out of 8 points, while business students scored an average 3.69 out of 8 points. Possible reasons for this substantial difference were revealed in discussions during the gaming sessions and in comments made during participant interviews. For example, Ben, a business student, said in his interview the most difficult aspect of the game was "to actually just earn money enough for you to build anything". He then went on to say: "I just had to wait for a few years or a few decades to get a handful more money". William, another business student, explained the hardest aspect of the game was "finding sources of income". These responses indicate the business students focused their efforts on improving their nation's economy, income or finances. They suggest business students may have been dissatisfied with the slow and indirect ways of earning money in-game, and may have applied their own subject matter paradigms to the game by focusing on income and profit, rather than on a complex range of political, social and financial factors that are all interconnected.

A game strategy applied by one participant, John, involved integrating historical understandings into his game strategy and even re-enacting history through gameplay. John explained that he tended to avoid costly conquests in Europe and instead opted to expand into Africa, Asia and the Americas. He specifically targeted "provinces that have valuable things like gold, silk, ivory, porcelain". John also commented that he aimed to "recreate the territory that my nation historically had". John thereby used historical information to formulate his strategy as well as attempting to re-enact history in-game. By practically linking and utlising previous historical knowledge in *EUIV*'s historical setting, John is further reinforcing his historical understanding and extending it (map details e.g. specific location of resources) through active experiential learning.

6.4.4 Theme 4: Participants' Understanding of Historical Representations in EUIV

Susan believed the game gave them a new perspective on history when they learnt about the multi-faceted factors that impacted history and made it a complex narrative shaped by a variety of influences. For instance, she described how the Aztec Empire fell not just because of the Spanish conquest, but due to other factors including the diseases brought by the Spanish. The consequences of these diseases were also reflected in-game; for instance, the researcher observed that Jacob, who was playing as the Aztecs in the historical roleplay simulation, experienced a pop-up event while playing that gave his provinces smallpox, and then another event that signalled that his society was collapsing. These events evidently had many negative governance and military modifiers which made the game more difficult for Jacob, causing rebellions and economic collapse within the Aztec empire.

Two participants indicated that distinguishing between accurate and inaccurate historical information in *EUIV* was a challenge. Interestingly, John explained he would rather know nothing about history than be ill-informed. Another participant, Jacob, noted the Aztecs generated only small amounts of money in-game, but he had seen a documentary that showed the Aztecs were one of the most populated and wealthy nations in the Americas at the time. Jacob thereby noted a disparity between the portrayal of the Aztecs in-game and in the documentary. This is a useful usual example of deeper thinking about history as Jacob is not automatically accepting the game's narrative but critically analysing and comparing, contrasting and interlinking with his previous historical knowledge of the subject. Another participant, Ben, realised there were limitations to playing a Native American nation because Indigenous nations in-game are prevented from expanding at the same rate as European nations for economic and technological reasons. This historical depiction and subsequent game mechanics thereby limited the participant's gameplay options and avenues for winning.

6.4.5 Theme 5: Learning History from EUIV Compared to Other Mediums and Video Games

In terms of comparing *EUIV* to other historical mediums, two participants believed books were a better source of historical detail. These participants critiqued *EUIV* for not adequately explaining history in more detail. In contrast, one participant, Brad, was satisfied with the interpretation of history in the game and commented that if he were particularly interested in a topic, he would seek out other sources of information. Another participant noted the usefulness of other mediums for learning history including documentaries, articles and books, particularly when they searched for different historical sources to undertake research for their mod.

Several participants also compared the historical representations in *EUIV* with those in other video games. Two participants found *EUIV* to be more complex than other strategy games they had played. One participant believed that compared to the *Age of Empires* series (Ensemble Studios, 1997, 1999, 2005) *EUIV* conveyed a broader scope of history, but lacked the detail of *Age of Empires*, such as specific scenarios centred on historical events or actors. One participant expected the game to be slower, similar to turn-based games like *Civilization* series (Firaxis Games, 2005, 2010, 2016), and found the real-time rhythms of playing *EUIV* too fast-paced to absorb historical information.

Overall, across the five case study themes there was a range of positive and negative views about the educational value of *EUIV*. Six participants said their familiarity with *EUIV* and the layout of strategy games helped them play the game and learn history while doing so. Other participants grappled with the game's complexity and with the process of managing their nation, which could have impacted on whether they learnt history from the game. Participants were positive about the level of detail, the interface, and the quality of the maps in *EUIV* as aspects that taught them about history. One participant also integrated their own

historical knowledge and learnings into their game strategies, and roleplayed a historical nation within the game. Three participants enjoyed conducted research outside the game to seek further information, which helped them to complete mods. They then compared, contrasted and synthesised their own historical knowledge and research with the historical depictions in-game. Some of the case study participants explained how the game helped them discover unknown or marginalised nations, adding to their knowledge base. Collectively, there was a sense that the interactive nature of video games was helpful for learning about history, especially when compared to engagement with other less interactive mediums such as books or documentaries.

6.5 Participant Mod Outlines and History Event Description

This section discusses the *EUIV* mods created by the participants, which provided the most interesting and promising results from the case study and gameplay sessions. Examining the mods as the final products of the learning process proved to be a sound indicator and expression of the depth of the participants' creativity, historical research and critical analysis. As this section will demonstrate, the historical research participants undertook to create their mods was expressed in how they named and described their mods and the design/mechanics they used to provide detail on the historical or counterfactual events their mods represented.

Each of the nine participants in the modding exercise created their mod based on the Aztec-Spanish Conflict, and was given the freedom to choose a part of the history surrounding the conflict in which they were personally interested. The nine participant mods varied; some focused on broader and overarching narrative descriptions of the conflict, others on specific events, and others on individuals involved in the conflict. All the mods touched on the major historical themes associated with interactions between the Spanish and Aztecs, such as the European focus on finding wealth and resources (e.g. gold), the devastation of the Americas (e.g. through massacres and diseases), and the spread of Christianity at the expense

of Native American beliefs. In their mods participants were able to describe these facets of history in considerable detail, while also providing in-depth information about important historical actors such as Hernan Cortes, Moctezuma and Malinche. The mods illustrated in *Figure 6.15* and *6.16* as well as in Chapters 3 and 9 and *Appendix H* which show outlines of the mods rather than the code used to create the mods. These provide insights into the computational thinking[47] and historical knowledge contained in the mods. Participants used these outlines as blueprint documents, and transposed the game design and historical knowledge in those documents into modding code.

In order to avoid repetition, discussion about the most notable mods will be reserved for the modding practice discussion in Chapter 9. All mod outlines can be found in *Appendix H* except for one mod/mod outline by John, which was incomplete due to the participant's time constraints and has therefore been omitted. Nonetheless, the rest of the case study data from John still indicated he learnt about history throughout the modding process. All completed mods will be very briefly described in this section, and two mods will be discussed and illustrated in more depth.

While all the mods focused on the Aztec-Spanish Conflict, they all varied in terms of how they represented the event. For example, Peter's mod explained how a smaller Indigenous group in Mexico, the Tlaxcalans, encountered the Spanish and deliberated as to whether to declare war on the invaders. Anna's mod focused on the expulsion of Spanish forces from the Aztec capital, Technotitlan, after the death of the Aztec emperor Moctezuma II. James' mod described the massacre of Cholula, the second largest Aztec city, where the Spanish killed thousands of unarmed Aztec noblemen and priests. Paul's mod briefly referenced another massacre, but he mainly focused on the devastating diseases brought to

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[47] Computational thinking can be defined as "an approach to problem-solving, designing systems and understanding human behaviour that draws on concepts fundamental to computing" (Wing, 2008, p. 3717). In the case of video games, computational thinking is used to transform intangible ideas and behaviours into digital representations.

the New World by the Spanish. Nathan's mod included his own contemporary historical analysis of the topic of disease, whereby he suggested the Spanish weaponised the diseases used to devastate the Aztecs, drawing a different and interesting conclusion that differs from historical consensus. The historical consensus was that the disease was spread by accident when the Spanish arrived in the Americas (Campbell, 2008a, p. 5). In contrast to other participants, who focused primarily on conflicts and events, Beth chose to focus her mod on Malinche, an important actor in the Aztec-Spanish Conflict, and explained the shift in modern day language as a result of Malinche's historical actions whereby a Malinchista is someone who prefers foreign goods in reference to Malinche's perceived betrayal of Indigenous people.

Henry's mod outline, shown below in *Figure 6.14*, is a good example of a mod that explains historical themes and issues through a counterfactual that is based on a specific historical context. In his mod outline, Henry describes the Spanish discovery of Tenochtitlan, focusing on the overarching narratives of the conflict, and discussing cultural, religious and ideological differences as well as the main historical actors involved in the event. In Henry's game content, shown under the "Options" heading, it is clear that he adapted computational thinking to express the factual historical narrative ("stop the practice") and a counterfactual narrative ("let the practice continue"), each with their own in-game consequences. Through the modding practice, Henry thereby took his conceptual understandings of history and reflected them as in-game representations.

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Henry's mod

Trigger:

Spanish discovering Tenochtitlan and after May 4 1519

Options:

- Let the practice continue - Become friendly with Aztecs (vassal), receive gold, penalty with Catholic nations (--piety)

- Stop the practice - Declare war on Aztecs (casus belli colonialism), friendly with Catholic nations (++piety)

Description:

A Clash of Cultures

When the Spanish met the Aztecs in 1519, they were confronted by the Aztec practice of human sacrifice. In Aztec religion, the gods had sacrificed themselves in order to give life to humanity. Nanauatl gave himself to become the sun, while the other gods sacrificed themselves to form the wind that moved the sun in the sky. In turn, humans gave their blood to repay and sustain the gods as they kept the sun moving. The sacrifice to the gods was an important part of Aztec culture - the temple called Hueyi Teocalli, dedicated to two gods, Huitzilopochtli, god of war, and Tlaloc, god of rain and agriculture, occupied a large part of the Sacred Precinct in the capital Tenochtitlan.

Hernan Cortes, leader of the Spanish expedition to what was termed the New World, was appalled at the custom, and saw the practice of human sacrifice as abhorrent. Arguably, this was one of the factors that led to the conflict between the Spanish and the Aztecs, and formed a powerful justification for the Spanish Conquest. Further, surrounding Mesoamerican city-states, like Tlaxcala, whom had a number of its people sacrificed in the aftermath of wars with Tenochtitlan, allied with the Spanish against the Aztecs.

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Figure 6.14. Henry's mod presents a sophisticated understanding of a specific historical event and its wider context. The mod allows the player to engage in a counterfactual embedded within that context.

Ethan's mod, shown in *Figure 6.15*, demonstrates his understanding of the interactions between the Aztecs and the Spanish. What is notable about Ethan's mod is his

efforts to encourage the player to change history. During the play sessions and in his interview, Ethan commented that he found history to be quite morbid and dark. To combat this, he created a mod with a reward and punishment system that encouraged the player to find a peaceful resolution to the Aztec-Spanish Conflict, and which punished aggressive behaviour. Ethan's mod is a great example of how a participant who has learnt about history might create a counterfactual by developing specific game elements that change history and shape it in the modder's vision.

Ethan's mod

Trigger:

Discovering new nation after colonising Cuba in Mexico/south America

Options:

Mission

Score 60-74: Gain Trade, Establish new Trade Node, regular tribute

Score 75-100: Solidify alliance (no decay) increased trade/tribute (+20%) regional stability+ political stability + Diplomatic resource. Conversion does not impact public stability. Tolerance does not impact public stability

Mission Failure

50-59: Nation takes hostile stance against you, and is more likely to join alliances opposing you.

0-49: Nation declares war on you.

Description:

Winning Hearts and Minds

In an unfamiliar and hostile land, who better to guide your expedition than the locals? The lay of the land is hidden in dark yet beautiful forests that conceal bountiful treasures of wealth, resources and intangible value if you know where to look. Developing a relationship with the locals might just help you to uncover these secrets, least of all, the fabled land of gold.

Figure 6.15. Ethan's mod encourages the player to focus on peaceful interactions and expansion in the New World and punishes aggressive player behaviour.Collectively, the participants' mods show a range of different approaches to learning about history and creating historical narratives. They also show how each participant drew on their own experiences, interests and interpretations of history to reflect their own historical analyses and perspectives. The mods also illustrate that participants gained substantial historical knowledge through modding, expressed in their adaptation of historical events, their

incorporation of certain important actors into their mods, and their overarching ideas about history and its themes with respect to the conflict between the Spanish and the Aztecs. A useful concept to illustrate the utility of modding is transfer of learning (Perkins & Salomon, 1992, pp. 2-3), which describes how "learning in one context or with one set of materials impacts on performance in another context or with other related materials". In light of the thesis results, opportunity for transfer may exist in terms of the research skills and process learnt from modding activity. These learnt research skills could equally be applied in terms of other conventional modes of expression and assessment, such as in essays.

6.6 Conclusion

The case study findings revealed that participants in both the modding and historical roleplay simulation groups had learnt about history from playing *EUIV*. These findings were supported by the visual pre/post-tests, in which no participant accurately located the Aztec nation pre-test, but all except one placed the Aztecs very close to their actual location in the Central American region post-test. Indeed, eight participants pinpointed the exact location of the Aztec Empire in the post-test. This shows *EUIV* has strong visual and map-based pedagogical affordances, which helped participants to learn about historical geography. These findings were further supported by many of the participants' comments during the case study interviews. These indicated the participants did not just learn the location of nations on a map, but that they also meaningfully evaluated historical knowledge and used it in-game, especially in mods. They did so either by using historical knowledge they already had, or applied knowledge they had gained while conducting research during the course of the case study. Some participants were evidently able to compare, contrast and interpret their own historical knowledge in relation to the in-game history. In some cases, participants' historical understandings influenced their game strategy and even prompted them to re-enact history. The processes of learning, analysis and synthesis of historical information revealed in the

case study are supported by similar findings in the *EUIV* online forum survey result, for example both studies showed participants learnt geographical information through the game's maps as well as a learning about marginalised histories and cultures.

Arguably, the most significant findings from the case study were generated by the modding group. The Mann-Whitney U results indicated a statistical advantage for this group, which was also supported by the qualitative findings from the mod outlines the group produced. These outlines showed the modding group participants understood many of the important themes, events and actors of the Aztec-Spanish Conflict, and that the modders engaged with history through modding in various ways, each which illustrated the depth of their historical knowledge. These compelling findings about modding will be discussed in-depth in Chapter 9, as they confirm and strengthen similar findings about modding in the *EUIV* forum survey, thereby illustrating how informal gaming practices might be implemented in a formal learning context. The next chapter will triangulate the survey and case study results and provide further insights into this potential.

Rhett Loban

Chapter 7: Geographical Affordances of *EUIV*: Play, Discovery and Research

7.1 Introduction

Some years ago, I was engaged in a discussion with a friend from Oman, a nation located on the Arabian Peninsula. We were talking about the Middle Eastern lifestyle and Omani culture. I asked him if he was an Ibadi Muslim, and he responded with an astonished "Yes!", astounded I knew about this relatively small religious denomination. He asked where had I learnt this information, and I responded: "In a video game". That game was *EUIV*. While this may be considered a trivial anecdote, it highlights the educational potential of video games like *EUIV*, which allow players to discover the world's complex and unique histories, nations and cultures. As the player explores *EUIV*, they uncover new historical knowledge, encounter historical nations in their specific contexts and are immersed in history on a much grander scale that involves a breadth of historical perspectives.

Analysing *EUIV*'s depiction of historical events raises several interconnected issues that are explored in this chapter. First, the chapter considers empire building in the context of *EUIV's* Eurocentric focus. This Western bias overshadows the inclusion of non-military and non-Western histories, and in doing so could limit the game's utility for teaching history. Second, the chapter explores how players have used the game as a tool for discovering marginalised histories that were previously unknown to them. Third, the chapter examines how these historical encounters in *EUIV* ignite the player's desire to embark upon further historical research outside the game. Finally, the chapter shows how the geography of the game and its map-based game mechanics, including the presentation of historical/demographic information on the game map, influences a player's historical inquiry and consequential learning outcomes. Through the gaming process and by playing through representations of geographical elements and the fate of nations, the player is provided with an opportunity to understand these nations in broader global, geopolitical and geographic contexts. Holistically, *EUIV* promotes a

meaningful learning process through play, discovery and research that oscillates inside and outside of the game.

7.2 Empire Building and *EUIV*'s Eurocentric Focus

Despite the various significant learning opportunities of *EUIV*, similar to those in other historical strategy games, such as the *Civilisation* series *(Firaxis Games, 2005, 2010; MicroProse, 1996)* and the *Total War* series (Creative Assembly, 2002, 2006, 2013), *EUIV* is centred on building a global empire based on European models. This in-game activity is frequently pursued and achieved through conquest, which players often regard as the most efficient form of "progress". Several of the survey forum participants jokingly referred to the game as a "map-painting simulator". Nations are represented on the world map in particular colours, and when a player's nation expands and conquerors new lands, the player covers, or "paints" the world map in the colour of their nation. The military focus and expansionist strategies required to win the game, or at least become the most powerful or dominant nation, are thereby represented through the process of painting the map in the victor's own colours. Players appear to, consciously or/and subconsciously, understand this in-built imperialistic code as it constrains or compels their experience of play. When asked about nation governance in *EUIV*[48], 18 of the survey participants commented on the game's focus on war and conquest. One survey participant shared: "*EUIV* is still too much a 'map-painting simulator'… Most of the wars result in big chunks of territory being transferred from one country to another, whereas this wasn't the case historically". Another survey participant explained "*EUIV* is a good map painter simulator…It's simply too complicated to reflect all the [non-military] changes on a city/province/region throughout the course of the game". Another survey participant believed this imperialistic approach was embedded in the AI,

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[48] Unless otherwise stated by participants or the researcher, discussions of gameplay refer to the "vanilla" or unmodified version of *EUIV*.

causing the game to consistently promote war and conquest to create larger, dominant

nations. The player thereby needs to compete with the AI to maintain their strategic position

and win the game, as opposed to engaging in another type of journey and learning about

history outside of imperialism and war. However, as the Formal Analysis (discussed in

Chapter 4) showed, the empire building nature of *EUIV* can nonetheless also offer more

viable peacetime gameplay when different strategy options are available that challenge the

colonial discourse.

Other scholars (Dillon, 2008; Ford, 2016; Mukherjee, 2017) identified similar forms

of ideological gameplay embodied in strategy games. As Ford (2016) points out, in the 4X

genre, non-player nations, particularly those that are Indigenous, merely serve to be

conquered and subjugated. This ideology of acquiring territory, building and expansion is

paramount to the goal of becoming an empire. Ford (2016) suggests that while all nations

might become an imperial power in-game, including Native American and Asian nations,

they cannot do anything else other than empire building. Dillon (2008, p. 132) arrives at

similar conclusions in her analysis of *Age of Empires III: WarChiefs (Ensemble Studios,*

2006) in which the player as a Native American nation can use a firepit to add positive

modifiers to build their nation and to further their colonial and imperialist strategy. However,

the in-game firepit might not necessarily simulate the spirit of dance or the real use of a

firepit, or even have any genuine Native American significance. Rather, the firepit is

deployed as a mechanic of war and conquest. This favours certain ideologies and historical

courses of action that are comparable to those recorded about colonial European powers.

Mukherjee (2017, p. 96) notes the roles of colonisers and Indigenous people can be reversed

in these sorts of games; for example, the Marathi Empire (an empire that dominated the

Indian Subcontinent) can invade and take over Europe, turning imperialism as we know it on

its head. However, empire building remains the end game. In *EUIV*, most central processes

and structures force the player to re-enact imperial historical narratives akin to those centred on European expansion. Hence, the gameplay suggests empire building is a positive attribute, even for non-Western nations.

Ford (2016) cautions that when playing the *Civilisation* series (Firaxis Games, 2010) for educational purposes, the player should be aware of the imperial ideology heavily embedded in the game. The colonial narrative in *Civilisation* can hinder the player from engaging with other storylines, thereby preventing them from gaining a well-rounded education in global history. Ford (2016) does concede that despite these issues, *Civilisation* has value as an artefact to be studied as it can be used to dissect dominant historical narratives and develop discussions on the issues of empire building and post-colonialism. However, from an educational standpoint, any study should note that imperialistic gameplay may mean the player can only truly become immersed in one historical perspective at the expense of others.

The imperial focus generally eclipses more authentic depictions of regional populations, cultures and histories in *EUIV*. Several forum survey participants noted the omission of historical details relating to culture, religion, trade and other non-military aspects of society. As one survey participant explained: "Parts of the maps don't seem right and they have lumped peoples together. They have people from one culture under the banner of another culture". Another survey participant commented: "Many aspects are under-represented, such as demographics, culture or society. We mustn't forget it's just a game though". Another participant suggested the game provided "no accurate reflection of a province, true culture, religion and class. But instead each province has merely one religion, one culture and shows no different classes". Another survey participant stated:

> Provinces are of a certain size, for many they are too big. They are of one culture and
> religion, so any minorities do not play a role within the province … Leaving behind

the "winner takes all" mentality and instead showing proportionally the classes,

religions and cultures in each province would improve the game a lot, and make it

more historical.

Another forum survey participant noted they recognised this type of historical distortion and

oversight when playing smaller nations such as Bosnia and Albania, which were either

overlooked or described using incorrect information. In this case, it is evident that minority

European nations are also overshadowed by their imperial counterparts. Generalisations

about small nations can misinform players about particular cultural groups and their

relationships to one another. Apperley (2018, p. 14) notes similar issues in *EUII*, and explains

that interest groups have advocated for new or redrawn maps to illustrate more realistic

borders and demographic distributions. The grouping and abstractions of these minority

histories and cultures is pedagogically detrimental as it homogenises diverse and unique

histories and cultures. This homogenisation ultimately plays into the idea of empire building

where a society or place with a unique history and culture is presented as just another region

or ethnic group in a global empire.

It is important to acknowledge the imperialistic and Eurocentric nature of *EUIV* in

order to understand the game's limitations when using the game to teach history. The Formal

Analysis (Chapter 4) detailed the ways the core game mechanics as well as the developer

depictions (or lack thereof) of nations are often patently skewed towards Western history.

Academic analyses conducted by Apperley (2006); Dillon (2008); Ford (2016); Friedman

(1999); Mukherjee (2017) align with observations shared by the survey participants

concerning the nature of the game. The Formal Analysis also revealed an almost complete

absence of many Indigenous cultures within *EUIV*, which is of concern to players interested

in marginalised peoples and aware of the implications of excluding them from history. The

game mechanics and gameplay based on the themes of Western "superiority", colonialism,

imperialism, conquest and empire building thereby supplant any alternative explorations of historical narratives. In addition, instances of non-imperialistic narratives in the game generally only support elements of further conquest and imperialistic narratives, showing the centrality of imperialism to all aspects of the game.

EUIV's bias against non-military and non-Western histories arguably diminishes both its historical and educational value. Nonetheless, despite the game's skewed historical representations, *EUIV* still presents some valuable historical insights for the player. For example, through empire building players will interact with other peoples, even if mainly through subjugation. This results in forced encounters and exploitation, but might also lead to exploration of those other cultures. Such exploration and interactions with other nations around the globe is geopolitically important and advantageous in-game for gaining resources, subjects and alliances. These actions can spark the player's curiosity to consider and, in some cases, take on the perspective of the "other". As such, despite its imperialistic, Eurocentric focus, *EUIV* may actually help the player discover traditionally marginalised histories and cultures.

7.3 Discovering Unknown and Marginalised Histories

EUIV's vast content allows the player to discover many histories, sometimes by chance. For example, in response to the question "How accurately does *Europa Universalis IV* reflect and simulate history?", one forum survey participant explained:

> By reading the descriptions or the events, I have got to know things about Ethiopia in my current campaign. Now I know about Prester John's kingdom, the Coptic faith, the Jewish province in the African kingdom, the traditions of the Ethiopians, and a lot more. I never asked for it, but I got it and now I feel that my knowledge about history is even greater!

It is evident that *EUIV* can expose players to histories they knew little about, or even those they did not know existed. In the university case study, many participants were not aware of the existence of the Aztecs and other Central American nations. Indeed, six of the 18 case study participants commented in their interviews they had learnt about world history, geography, and the locations and nations they had not previously known. *EUIV* and similar map-based games provide a wide variety of historical material for players to explore.

The game's extensive knowledge base allows the player to discover new areas of personal historical interest, to reconnect with previous formal and informal learning outcomes, and uncover previously unknown histories. This process of discovery in-game is highly repeatable with Vella (2015) suggesting that one player cannot ever truly gain complete knowledge or mastery of a game, which requires many play throughs. In the case of *EUIV*, the game's vast content, as well as the player/AI actions mean the game will always play differently, even with the same player, who is able to discover new information about history, geography and individual nations with each play through often from different perspectives. The player's awareness and knowledge of historical information in *EUIV* is illustrated in a concept called the "Johari Window Model of Awareness" (Courtney, Kirkland, & Viguerie, 1997, p. 3; Luft & Ingham, 1961, p. 34). Also known simply as "the Johari window"[49], the concept is used to teach self-awareness, allowing the individual to understand the knowledge they have about themselves and the knowledge others have about them. Applied in a gaming context, Grand Strategy games like *EUIV* allow the player not just to discover and understand what the player knows exists, but also to uncover, through gameplay and discovery, what the player does not know exists. A modified Johari Window for Historical Knowledge and Awareness in *EUIV* is outlined in *Figure 7.1*.

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[49] The Johari window is often applied in therapy contexts for self-improvement, but is also implemented in security contexts for understanding intelligence blind spots and opportunities.

Figure 7.1. Modified Johari Window for Historical Knowledge in *EUIV*.

This modified Johari Window shows the history the player is aware of and the knowledge the player has about that history. There are four potential relationships in this adapted model between the player and historical knowledge, those being:

1. History the player is aware of and has knowledge of.

2. History the player is aware of, but has no knowledge of.

3. History the player is not fully aware of, but subconsciously has knowledge of.

4. History the player is neither aware of, nor has knowledge of (the most valuable and where the player discovers different histories by chance).

In this model, a player of *EUIV* will encounter historical knowledge they have and are already aware of, which can reinforce that knowledge. The game can also afford the three other types of historical knowledge. One, whereby the player is aware of a history, but has no intimate knowledge of it. Another where the player can rediscover history they have knowledge of, but which they had not consciously considered or had forgotten about. Lastly, *EUIV* can help the player discover histories, almost by chance, of which they had no previous awareness or knowledge. This last form of historical learning is important because, through the player's spontaneous exploration, encounters and interactions, they can discover some of the world's marginalised and unique histories and cultures. These discoveries of historical unknowns can challenge dominant historical perspectives and provide real opportunities for players to expand and reassess their historical understands based on new perspectives. The Johari window also reveals the fluid nature of knowledge and how, through active exploration of history and different historical perspectives, historical knowledge can be discovered or even seen in a different but valuable way. Hence, the game presents a significant learning opportunity through playful discovery, because it exposes the player to new historical knowledge. This type of informal learning can subsequently lead to supplementary historical research outside of the game, as will be discussed in the next section.

7.4 Catalyst for Historical Interest and Research

EUIV affords a unique form of playful discovery and learning which often draws the player's attention to marginalised and Indigenous cultures represented in the game in the Americas, Africa and Asia (but not in Oceania). When players discover these unknown or marginalised cultures, they may feel inspired or motivated to conduct further research into their histories. The forum survey data (316/331 or 95.47%), as presented in *Figure 7.2*, shows the game acted as a catalyst for historical interest and research. This external research could

also be a result of wanting to know more about a history, to reconfirm the game's depiction or even to better understand the context of the game's history. This data suggests *EUIV* gave players an appetite for history, prompting them to look further afield for historical information.

Q3 3a. Does game play encourage you to seek out more information about history?

Answered: 331 Skipped: 0

Answer Choices	Responses	
Yes	95.47%	316
No	4.53%	15
Total		331
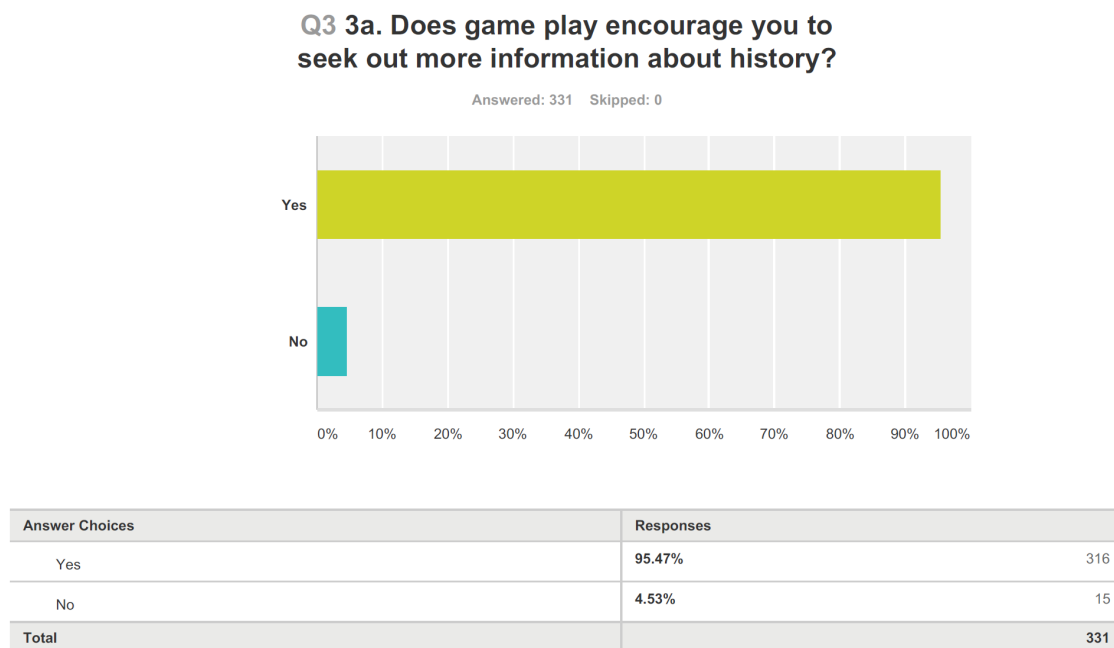
Figure 7.2. Does game play encourage you to seek out more information about history?

This data is further supported by comments provided by four case study participants who indicated the game was a motivational trigger for them to conduct formal historical research. Additionally, three case study participants suggested the game would be an effective way to introduce history to audiences who would otherwise be uninterested in the topic. *EUIV* may have kindled a dormant interest in history, sparked a new interest or reinforced their historical knowledge. In any case, the game seems to have driven players to conduct further research into a given history. Hence, as a baseline utility, the data very strongly suggests *EUIV* on the whole inspires players to seek out further information about history.

The forum survey asked participants to elaborate on their research processes and to describe the resources they sought during or after playing *EUIV*. A majority of participants (235/331 or 73.67%) indicated they primarily sought out additional information from digital and internet resources rather than from books or documentaries. The data suggests the *EUIV* community is a digitally active population as they both play and research via computer. Comments from the forum survey and the case study, as well as those from participants in another similar research study (O'Neill & Feenstra, 2016) suggest their participants did not trust historical information in games, specifically *Medal of Honor* (DreamWorks Interactive, 1999), was accurate. Interestingly, the thesis survey participants sought out information from the digital sphere in search of accuracy; however, it is possible that many internet sources and websites may be inaccurate or incomplete, including in relation to purportedly factual historical resources (Cohen, 2005; Yoshioka & Loban, 2015). Nonetheless, players can and do discover unfamiliar and marginalised histories through playing the game, leading them to undertake a journey of learning by utilising multiple forms of digital media and resources.

EUIV's Eurocentric focus prompted one forum survey participant to research non-European and American regions:

> As a university student who studies Ancient History, I'm always more than willing to learn more about certain regions. Since I focus on European history, *EUIV*'s depiction of other areas, notably African or Asian states has led me to start to research more about those regions which I hadn't focused on previously.

While for some players the game may serve as a catalyst for further research into unknown regions, others might be satisfied with how the game depicts history. Indeed, one case study participant explained that he was happy with the game content and did not tend to conduct further research or delve more deeply into the history of the narratives he engaged with. This comment aligned with the view of another case study participant, who accepted the game as

an accurate and legitimate source of historical information. These differences of opinion show how *EUIV* might either prompt further inquiry into other knowledge sources while also acting as a useful source of knowledge in and of itself.

In light of the survey, it is clear the game helps players discover different histories through a variety of elements of research and play. The game interaction is more of a multimedia learning journey than simply an engagement with the game itself. In this way, other media and historical sources supplement and/or contrast with the game's representation of history. The player, through playful experiences, thereby continues to learn about history outside of the game at their own behest. The player can then take this refined knowledge of history back to the game. While *EUIV* could serve as tool for highlighting new histories and/or as a catalyst for igniting further research into history, the game evidently can do considerably more than this because it allows the player to visualise history in unique and pedagogically useful ways.

7.5 Learning History through Geography and Game-Based Maps

Data collected from the forum survey and the case study demonstrated a strong connection between the visual presentation of the game and the geographic and geopolitical knowledge precipitated from gameplay. The map component highlights the potential for Grand Strategy games to act as learning tools within formal education, particularly in terms of visualising historical information. Within a formal education setting, *EUIV* could therefore complement other written, visual and interactive historical content resources. There are several affordances associated with these map-based histories, including:

- Familiarisation with and immersion into simulations of global locations while understanding the shifting characteristics of nations, cultures, religions, resources and other geographic and demographic information represented in the game

- Deep experience of and engagement with global map-based concepts and sentiments such as empire building, discovery and overextension (further discussed below)

- Linkage and integration of map-based understandings and historical knowledge with game strategy and re-enactments of history.

In the forum survey poll (*Figure 7.3*) participants were asked "What do you think is the most useful game feature to learn about history in *Europa Universalis IV*?" The highest percentage of participants (146/331 or 44.11%) said pop-up text boxes were the most historically informative and valuable features[50]. The next highest percentage (119/331 or 35.95%) reported the most useful features were the game map and the different map modes. While map modes tend to change over the course of the game, many sections of the map tend to remain the same, without player or AI intervention. The Formal Analysis in Chapter 4 showed these map modes were historically informative and include the terrain map mode, the goods map mode, the religious map mode, province names and more.

These historical map modes are useful for presenting information on the specific details of individual provinces and representations of broader historical changes and dynamics. Several survey participants commented on the use of *EUIV* as a geographical learning tool rather than a historical one. These comments correlate with other survey participants who learnt geography through modding by researching and evaluating maps and online history sources to create custom-made events. One participant stated *EUIV* helped them to understand the significant events of the Early Modern era, including "how various states expanded or shrank … how religions spread and reasons they were adopted".

The survey participants' views are supported by results from the case study. For example, case study participant Peter, a 25-year-old Engineering PhD student, found the

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[50] Pop-up boxes were discussed in Chapters 4 which examined opportunities to learn about factual historical information from *EUIV*. These will be further examined from a modding perspective in Chapter 9.

game was a "good platform for seeing how the geography changed borders over time, like on the visual map". Andrew, a 24-year-old Education student, also felt his geographical knowledge had improved over the course of the study, especially about nations and their locations in Central America. This data suggests *EUIV* may be utilised as a resource or tool in higher education to help visualise history through geographical map depictions.

Figure 7.3. What do you think is the most useful game feature to learn about history in *Europa Universalis IV*?

The survey and case study comments about learning geography are substantiated by the case study's visual pre-and post-tests. These results showed significant improvements in terms of visualising geographic history, especially with regards to locating the Aztec Empire and Spain. These results demonstrate that map-based depictions and experiences, at least in the short term, can help players to understand concepts and histories around locations and

national boundaries in a wider global context. When players understand the locations of nations, this could also importantly provide them with knowledge about the features and uniqueness of different nations. *EUIV*'s map thereby provides detailed regional characteristics that present players with opportunities to learn about history and to meaningfully capitalise on these learnings and integrate them into their gameplay strategy.

7.5.1 Map Characteristics, Game Strategy and Linking with History

Research by Haylot and Wesp (2009) on the game *Everquest* (a massively multiplayer online role-playing game) noted its use of game art to represent different places in the mythical world of Norrath. As players perform different activities in each city represented in the game they learn about the city's specific history, culture and environment. Similarly, in *EUIV*, map modes teach players about the spread of culture, religion, technology, development and other demographic information. One participant explained how maps helped them understand aspects of geography, more so than history:

> I was helping a friend with the region and area system after they were added to the game. Although there are historical arguments for why patches of land are associated with each other, I looked more for maps and terrain to learn more.

Other forum survey participants also acknowledged the game helped improve their understanding of geography and maps. They pointed out the names and groupings of provinces into their respective regions and explained their historical significance in relation to regional cultures, religions and terrain. The Formal Analysis (Chapter 4) showed how the names of regions changed to reflect the culture of the ruling nation, which underlines the historical and cultural significance behind region names that players could draw on to understand more about how demographics, regions and nations change over time. One survey participant noted they had learnt not only about the rise and decline of states, but also about the spread of religion, which transcends borders. The Formal Analysis showed the spread of

religion is represented in *EUIV* in a variety of ways; the most prominent of these are the Protestant Reformation and the 30 Years War. In the game, the 30 Years War is depicted as a game mechanic and a series of events where nations convert from Catholicism to Protestantism. This shift in religion creates hostilities between Catholics and Protestants and thus simulates events that actually occurred in the war. The Formal Analysis also revealed how *EUIV* depicts the Arab trade influence of the Malay Archipelago, whereby a Muslim nation with a large trade influence used its power to convert certain provinces to Islam. This mechanic thereby simulates and explains the spread of Islam across Southeast Asia. Such mechanics shift the focus away from the Eurocentric nature of the game by highlighting the significance of historical dynamics in other regions. In doing so, the game presents informal learning opportunities whereby players might gain knowledge about histories and demographics through map characteristics and utilise and integrate this information in long and short-term play strategies.

As Calleja (2011, p. 92) notes, many regions and locations represented in games frequently contain resources that help the player to progress towards the game's end. Often these regions grant advantages and unique bonuses to the player; for example, in *EUIV* different provinces have valuable trade resources such as gold. Finding and using these resources then turns the game map into a tactical map, where space, locations and geography become important, and understanding the layout is not only advantageous but necessary. This is true for *EUIV* and supports the comments made by John, the Engineering PhD student, during his debriefing interview. John described how he used the map and geography-based strategies to gain a swath of territory without diplomatic repercussions by weakening his enemies and conquering profitable areas outside of Europe. These areas had valuable resources such as gold, silk and ivory, and were held by less militarily advanced nations who were easier to conquer. John's personal game objective was to recreate historical borders and

territories of those nations. In the process, he realised that his strategy goals aligned with the historical actions of many nations, such as Great Britain. A forum survey participant similarly commented that through the roleplay aspect of *EUIV* they emulated the historical actions of the nation they were playing. It is evident both the survey and case study participants were able to meaningfully integrate geography into their strategy and use maps as canvases to recreate history. Participants connected various elements of history, geography and gameplay together, and in doing so learnt that various provinces were characterised by different cultures, religions, terrains and other individual traits. These historical and geographic understandings of the world were integrated into their short and long-term game strategies. Such processes could be viewed as having pedagogical significance, with the historical concepts and sentiments around global map interactions and relationships presented in *EUIV* offering potentials for use in both history and geography education.

7.5.2 Visualising and Experiencing Global Map Concepts

In a study of global politics in games, Salter (2011, pp. 359-360) notes games such as *Civilisation* (Firaxis Games, 2010, 2016) and *Diplomacy* (Calhamer, 1959) are based on the geographical mechanics of territory and control of border conflicts (Salter, 2011, pp. 359-360). By combining these geographical mechanics with global issues and politics, these games arguably produce geopolitical representations (Salter, 2011, p. 363). This is certainly true for *EUIV*, where geopolitics and strategy inevitably come into play as the player navigates their nation through the ages and expands their domain. The thesis data revealed participants developed understandings of geopolitical issues and strategy by analysing global map concepts. For instance, Susan, a 32-year-old Finance student and case study participant commented in her debriefing interview that she felt *EUIV*'s maps and geographical elements gave her a "real visualisation" of history, especially due to the global scale of empires represented on the maps, and the locations of nations and resources. Before playing the game,

Susan felt she did not know much about European history and nations. However, while playing as the Spanish empire, she learnt new information via the game map. For instance, she discovered that Spain expanded considerably from the 14th to 16th century, and could see all the land and colonies owned by Spain. She was surprised to learn how extensive the Spanish Empire was and how it occupied areas across Europe such as Italy and the Netherlands, which she had not previously known. It is evident that Susan found there was great potential in understanding geography and maps when managing her nation and empire, and she appreciated the strategies that became apparent to her as a result. For Susan, playing *EUIV* was a more direct way of learning and was relatively straightforward, she stated "you feel like you are part of the history and you get more involved whereas reading from the book, you're an outsider". The game thereby helps players to actively connect history with geography, and to learn about the multitude of factors that change the character of nation and their borders over time.

While playing, Susan also learnt about rebellions, the difficulty of managing a nation, especially one that was an overextended territory, and the need to multitask several play actions at multiple locations. Susan explained Spain had "ruled Italy or other countries in Europe" and she had "lots of trouble managing all the navy and the soldiers in the Netherlands". She also explained "I think [Spain] has to manage lots of things, where they can't even manage their colonies in the Americas or different rebellions in the European mainland". Susan encountered rebellions during gameplay by regional nationalists, which drew attention to the differences between otherwise seemingly uniform provinces. Through play and engagement with *EUIV*, Susan believed she had learnt about global empires, regional nationalism and nation management, particularly in European and North American contexts. Similar to some of the participants in Squire's research (2011, pp. 134-135), Susan realised geography was important for obtaining wealth and maintaining trade, both critical

forms of power. As Susan managed her extended nation over many different continents, she learnt that certain strategic locations were valuable due to their resources or trade potential. The game design established geography and geopolitics as important for competing with other global empires to win the game. However, Susan also learnt that due to the scale of her empire, the game became difficult to manage and navigate, replicating the realistic dilemma attached to managing an overextended empire.

Brad, a 28-year-old Engineering student, also experienced the difficulty of managing an overextended empire. In his debriefing interview, Brad said he had discovered and learnt about different locations in the world and the different nations involved in various events and conflicts, including the Aztec Empire. Just as in Susan's experience, Brad also mentioned he learnt about national borders and geographical locations by playing *EUIV*. He did not realise the Spanish empire was so extensive in the Early Modern period, and noted that he was interested in the concept of overextension, which he saw as reflected in *EUIV* in two ways:

- In the game mechanics, where the player manages overextension as a variable which affects other variables such as social unrest and rebellions; and
- In the gaming experience, whereby the game increasingly becomes about issues related to being overextended as a nation operating its empire in several different geographic locations.

Brad commented that he understood overextension as being a common issue affecting empires, and mentioned his existing knowledge about the Roman Empire, which he saw as being quite similar to the Spanish Empire in terms of overextension. He also connected the concept to the explicit in-game variables that contribute to the overall burden of managing an empire. Importantly, Brad was able to compare his *EUIV* game experience with his own historical knowledge of the Roman Empire and the factors that led to its decline. *EUIV*

evidently allowed him to experience this historical concept in-game, reinforcing his understanding of the rise and fall of empires throughout history.

Similarly, Simon, a 23-year-old Medical student, found the gameplay and modding exercises a challenging experience because of the complex world map which requires players to keep track of different places, details and variables. Despite Simon's difficulty with the maps, he did find *EUIV* more engaging than other mediums to learn about history. Susan, Brad and Simon's experiences suggest players can see the logistical difficulty of managing an empire and the important roles geography, maps and locations play in management. Hence, the concept of overextension is reflected both in the game as a variable, but also more meaningfully through a player's experience of having to manage many places, people and even armies on a global scale, under ever-fragile conditions.

In a similar way to how participants viewed the concept of overextension, Chris King, a senior game designer at Paradox Interactive, (GDC, 2016) explains that even ahistorical map-based elements of games communicate historical concepts or narratives. King discusses the New World Randomiser, a *EUIV* game feature that allows the player to create ahistorical, fantasy continents and landmasses in North and South America (GDC, 2016). Despite its lack of historical accuracy, he notes the feature allows players to experience the feelings of discovery and exploring the unknown, simulating the experiences of explorers through history. Thus, even in counterfactual histories *EUIV* can still communicate important concepts like overextension, discovery and exploration.

In sum, *EUIV*'s base game features, including the world map, do more than just illustrate the geographic locations of different nations and peoples. The map provides the foundation for complex player interactions such as nation management and empire building, providing participants with experiences of global power.

7.5.3 Geographic Distortions, Abstraction and Bias

It is clear that by actively engaging with *EUIV*'s map that players can learn about the history it represents. However, a number of the geographic elements of the map are distorted and abstracted, which can affect how players might understand certain regions and histories. As one forum survey participant explained:

> Things like the development levels are wildly inaccurate, portraying Europe as vastly overdeveloped relative to the rest of the world compared to how it was, which I think can be pretty destructive to people's understandings of the value of those places.

Europe's depiction as more economically developed, evidently arises from its possession of higher value provinces than other nations. Higher developed provinces are represented in green and yellow, which could lead to a positive association with these colours and regions, while many parts of the rest of the world are depicted in red and orange, which in turn could hold a negative association (Aslam, 2006, p. 19; Pravossoudovitch, Cury, Young, & Elliot, 2014, pp. 507-508). This simplified depiction may give the impression there was no wealth or civilisation in particular provinces, rendering them as of lesser value or importance both in terms of gameplay for strategic value and world history itself. Conquering less developed provinces is easier and less costly compared to conquering those that are more developed. This aspect of the gameplay perpetuates *EUIV*'s imperialistic, Eurocentric bias, prompting the player to place more importance on some regions and nations than others. Consequently, these abstracted depictions may distort player perceptions of regions and influence their interactions and engagement with particular historical nations, regions and cultures. These historical depictions could therefore affect a player's overall evaluation of a nation's historical and cultural worth in comparison to those with seemingly more privileged histories and cultures. This once again points to the issue of imperialism within the game, which could impact upon how *EUIV* might be used pedagogically.

Adding to this issue of distortion is the Mercator map[51], which, when applied in *EUIV,* allows for the creation of additional provinces in Europe and North America, creating room for further expansion and increased wealth and activity within these regions. The Formal Analysis in Chapter 4 concluded that in the *EUIV* map, significant areas of Africa, Australia and Papua New Guinea are represented as uninhabitable wastelands, unable to support human activity and incapable of producing wealth. Notably, significant areas of far North America and Russia (Eurasia) are also wastelands in *EUIV*. However, the depiction of habitable land is still disproportionately in favour of the Northern hemisphere. This design choice makes Europe, and to an extent North America the focuses of activity and wealth in the game. However, later expansions such as the *Mandate of Heaven* (Paradox Development Studio, 2017), that focus on East Asia, and *Dharma* (Paradox Development Studio, 2018), that focus on Indian Subcontinent have added greater character and unique game elements with regard to these regions of the *EUIV* map (Paradox Development Studio, 2017, 2018). While there are certain regions in *EUIV* that have a high province count, such as Central America, China and India, these maps are distorted for gameplay purposes and remain somewhat Eurocentric given the size, wealth, gameplay activity and overall developer attention to the European continent. Consequently, this distortion misinforms the player about the actual geography of these places and the historical events that occurred in that region.

Collectively, the case study data indicated that the gaming exercises contributed strongly to participants' knowledge of non-Western nations, with the world map in particular helping them to discover and learn about histories that are either marginalised or were previously unknown to them. The case study participants' recognition of geography and maps had improved in the short-term through play and modding of the game. The game was

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[51] The Mercator map (Snyder, 1987, p. 40) was historically used in navigation, and preserved the vertical and horizontal lines that divide a map in a cylindrical shape. The Mercator map stretches land masses further from the equator, meaning that regions such as Europe and North America are seemingly much larger than nations such as Australia or Africa, even though this is not really the case.

evidently useful for allowing players to see the locations of different nations, the size of

certain empires, the sites from which they derived their resources, the different religions and

cultures of regions, the names of regions and provinces (and changes to those names), as well

as providing them with a general understanding of global geography. The participants'

responses showed they recognised the dynamic connections between geography and history

that were dependent on the expansion and decline of empires, changes in societies (e.g. the

Protestant Reformation) and other global events. Players also made meaningful use of the

map and map-modes to plan their short and long-term strategies while looking for valuable

resources or isolated nations to conquer. In some cases, players role-played to recreate the

historical borders of different nations.

The interconnected themes and perspectives discussed in this chapter are illustrated in

Figure 7.4. This shows how a learning process develops from the interactions between play,

discovery and research. The diagram illustrates how players engage with *EUIV* by

discovering new histories, nations and cultures. These discoveries evidently spark interest

and prompt further historical research outside of the game. After the players have developed

a better understanding of history from both the game and external sources, they can then

return to the game to further engage with, compare and link the history presented in *EUIV* to

what they know and have learnt outside of play. In some cases, players might integrate these

in-game and outside learnings into their game strategies and modes of engagement. Thus,

EUIV acts as a platform for engaging with history and as a catalyst for further research

outside of the game.
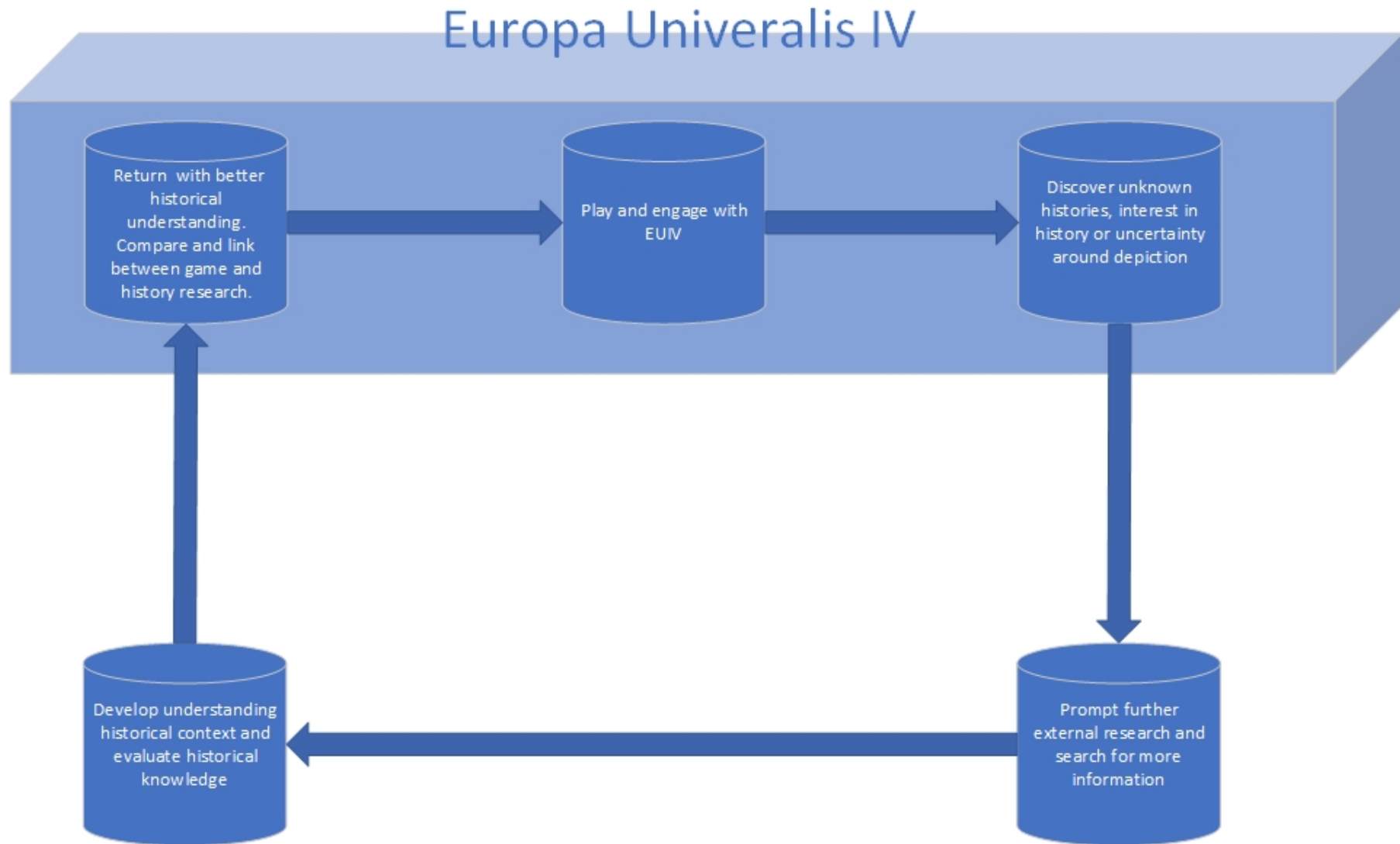
Figure 7.4. EUIV learning process of play, discovery and research.

7.6 Conclusion

As the Roman Statesman Marcus Tullius Cicero proclaimed, "the causes of events are ever more interesting than the events themselves" (Gaither & Cavazos-Gaither, 2012, p. 332). This statement resonates with many history enthusiasts, and is the basis for the historical insights in *EUIV*, which explains the events and other influences that shape history through geographical depictions. The game's histories are to some extent biased, as they are presented primarily through a Eurocentric lens and thus favour imperialism. However, this is not necessarily to the exclusion of valuable learnings or insights about the histories of different nations or cultures.

EUIV's game maps and geography-based mechanics afford players many opportunities to learn about the causes and details of historical events in very different ways to how they would if they consulted a more traditional resource. Despite *EUIV*'s Eurocentric framework and imperial ideology, the data shows participants in both the survey and case study learnt about nations, cultures, religions and resources through the game that are typically marginalised, both outside the game and within it. The data collected from the forum survey, case study and Formal Analysis indicated the vast historical visual game content available to players allowed them to learn about these little known histories and cultures. These sorts of discoveries and the players' appetite for history, inspired many players to undertake further research into history through other traditional mediums.

EUIV goes further than just being a catalyst for research and learning. Players acquire knowledge of historical maps, locations and changing demographics, but most importantly, the game encourages them to adopt a sophisticated practice by integrating their out of game findings with their in-game strategy. These strategic considerations include empire-building concepts such as overextension, rebellions and nation management, though newer versions and DLCs of the game also make non-imperialistic strategies more viable; indeed, this is

encouraged for some nations. Collectively, the GBL experience of playing *EUIV* allows the player to carry out a cycle of play, discovery and research throughout gameplay, while consulting other historical sources. Players then compare, contrast and link these elements, revaluating their own understanding of history before returning to the game with a greater knowledge of the gamified historical context. This facilitates a deeper engagement with the *EUIV* world and its historical content. The learning cycle can then start afresh with each game, with each step in this interactive play cycle further reinforcing historical learnings.

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Chapter 8: *Europa Universalis IV* as a Learning Tool for Higher Education Implementation

8.1 Introduction

In the year 1670 our tall ships have sailed past jungles and arid lands to pull into a bay inhabited by a people speaking a strange language. The Dutch had discovered this continent before calling it New Holland, but we cannot yet communicate with the locals. This land is also inhabited by strange hopping mammals and birds that sound almost like they are laughing. While there may be an untouched beauty to this land, the emperor is always looking for new subjects and lands with resources. We proclaim these lands Nueva Extremadura in the name of Fernando of España.

The fantasy scenario presented above is in the style of an After-Action Report (AAR). It may seem like a bizarre story. It may even be historically misleading. But this kind of storytelling in *EUIV* is common. *EUIV* frequently presents alternative histories, and the story above differs from factual historical accounts of the British "discovery" of Australia. As previously discussed, this type of storytelling is known as a "counterfactual" (Ferguson, 1997, p. 2). The above counterfactual explains "big picture" historical concepts and narratives of discovery, exploration and colonisation that have occurred throughout the world in the past, just without factual details.

To non-players, counterfactuals may seem meaningless when compared to grounded historical accounts. Nevertheless, when players engage with history mediated by games, counterfactuals are almost a given, as games are defined by player agency[52]. The in-game choices allow players to reflect, learn and make meaningful decisions. In this sense, gamified history is in clear contrast to traditional understandings of history because it is contingent on

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[52] Agency is defined as "the capacity of individuals to act independently and to make their own free choices" (Houngnikpo, 2015).

player choice, while traditional history is static. Nonetheless, history games can clearly afford new ways of discovering, learning about and understanding history. Educators could capitalise on this power of gaming, but to do so they must understand the tensions between the portrayal of factual history and the gameplay elements in *EUIV,* which present both opportunities for and challenges to the game's implementation as a pedagogical tool. This chapter will explore this tension through several different points. First, it will examine responses to the *EUIV* online forum survey on the importance of balancing gameplay and historical accuracy, both of which are considered important in the development of believable yet engaging historical worlds. Second, the chapter will explore the inclusion of misinformation, abstraction and omission and the challenges these pose to the accurate representation of history in games. Third, it will discuss how both player and AI engagement within the game further distort historical facts. Fourth, the chapter will examine how the counterfactuals that regularly occur in *EUIV* can teach the player about historical themes and influences. Fifth, the chapter will explore how the game history can communicate broad historical themes and influences in a meaningful way. Finally, the chapter will discuss how the game's historical themes and influences might synchronise with deeper modes of learning in a formal education context. This chapter argues that despite *EUIV's* limitations, the game can still be effective in communicating broader and deeper understandings of important aspects of history through complex but playful experiences. It is this broader understanding that can be capitalised on and applied within a formal education setting.

8.2 Gameplay vs Historical Accuracy

As discussed in Chapter 2, a recurring theme in the discourse around Grand Strategy video games is the balance between historical accuracy and gameplay. Because choice is a defining feature of games (Juul, 2011), traditional notions of history involving delineated sequences of factual events can be at odds with the interactive choices that give the player

agency during gameplay. Player agency often poses a challenge to the traditional understanding of a particular history in *EUIV* because it can change the timeline of events. Conversely, traditional history, if implemented in a game too precisely, can limit or extinguish player agency and compromise the very element that makes *EUIV* powerful, engaging and informative for players.

The tension between effective and pleasurable gameplay and the accuracy of historical elements within *EUIV* was one of the most significant themes raised in the *EUIV* online forum survey. Over half of participants (53.17% or 176/331) thought *EUIV* simulated history "somewhat accurately" because the gameplay did not result in a completely accurate reflection of history. In fact, 27 participants commented on the need to balance both gameplay and historical accuracy. These participants frequently noted that gameplay rather than accuracy was the primary focus of *EUIV,* shaping the ways historical information was depicted in the game. As one survey participant stated, the role of gameplay in *EUIV*'s design is "to make it enjoyable to play", with the game mechanics "merely mak[ing] a nod to their historical roots". Some participants framed their understanding of the relationship between gameplay and historical accuracy by the design philosophy of the Paradox Interactive development team. As one survey participant commented, "gameplay trumps realism"; they also explained that certain mechanics would never be implemented if they were too realistic and threatened to "reduce [the] fun" of the game. These comments show that *EUIV* players in general have mature understandings of approaches to game design and the challenges of using historically accurate material in entertainment software.

There were similarly considered and nuanced responses from other participants on the progress of history and its representation in *EUIV*. For example, one participant cited the example of the Holy Roman Empire, a political faction in Europe that typically gets stronger as the game progresses, when, in reality, the empire was in serious decline during this time in

history (Wilson, 2011). This example shows how the game design prioritises interesting features, such as empire consolidation, over the factual historical events of an empire's dissolution (Wilson, 2011). Another survey participant noted how in-game history may differ depending on from whose perspective it is being told:

> This game is not designed to create perfect history, that way it would go the same every time. It's different every time … we see history depends on whose eyes you look through. So, there is no one true history. There are a lot of different versions of the same historic event, and all can be true.

This and similar observations reveal how participants may reject the idea of a monolithic, singular version of "correct" history. As each new game begins, the player not only re-engages in history, but relives it from a different point of view. The player may therefore be able to uncover new fragments of information from the same historical narrative by playing from different perspectives and even on different counterfactual timelines[53].

The forum survey results show that *EUIV* players have high standards about the representations of authentic history in the game while also acknowledging that *EUIV* gameplay at times conflicts with the factual history it is trying to represent. They recognised these differences could be reconciled through a balance between gameplay and historical accuracy, even if the game design favours the former.

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[53] An example of this concept may be found in the book *Dark Emu* (Pascoe, 2014), in which the author discovers "new" facts in historical accounts that were, in reality, not new but suppressed, and uses these previously suppressed facts to dramatically rethink the nature of Australian history.

Figure 8.1. Balance between history and gameplay

The survey participants' views on the balance between the history and game features are represented in *Figure 8.1*. On one side, history is represented through historical accuracy and realism[54], or at least what is deemed realistic and thus believable (Apperley, 2013; O'Neill & Feenstra, 2016). However, on balance, this representation is in tension with choice and engaging gameplay[55], player enjoyment[56] and the practicality of reflecting history[57]. A game that is excessively realistic would be far too complex, overwhelming and ultimately uninteresting for the player, while also being impractical for the creator to design (GDC, 2016; Wackerfuss, pp. 241-244). However, the results show this tension can be useful in contributing to learning historical themes, influences and understanding the contingent nature of history itself.

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[54] Realism, in this context, relates to how believable an object is or how plausible an action might be to occur given the context.
[55] Gameplay is the product of actions, behaviours and strategies that emerge when playing the game.
[56] Player enjoyment is the pleasure derived by the player from playing the game.
[57] The practicality of reflecting history refers to the possibility and even usefulness of reflecting history in-game.

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In addition to considering the importance of a balance between history and gameplay in *EUIV*, it is important to examine not only how history is depicted in the game, but also how players comprehend that history, how they distinguish between what is historically factual and what is not, and how they learn from understanding this difference. By adopting a nuanced understanding of history, the player can adjust (to some extent) and look past the historical inaccuracies in the game to still gain valuable knowledge. If the player can achieve this, they can then adeptly deal with issues such as misinformation, abstraction and omission of historical information and ultimately counterfactual histories.

8.3 Misinformation and the Abstraction and Omission of History

While consumers of media and history have usually trusted the accuracy of sources such as nonfiction books and institutes of knowledge such as museums (Rosenzweig & Thelen, 1998, pp. 21-22), research has shown there is little trust in new digital media, specifically video games (O'Neill & Feenstra, 2016). Although these games have utility as motivational material for historical inquiry (discussed in Chapter 7), evidence also shows young people still do not take the content of video games seriously (O'Neill & Feenstra, 2016), which could impact on what lessons, if any, they might take from a game. According to research (O'Neill & Feenstra, 2016), young people disregarded video games as a potential source of historical knowledge as they believed games presented unreliable, fantastic or distorted versions of history. This research revealed these same young people were suspicious of the commercial motivation of the developers and therefore distrusted the game's depictions of history (O'Neill & Feenstra, 2016).

In O'Neill and Feenstra's (2016) research, participants were asked about historical depictions in the game *Medal of Honor* (DreamWorks Interactive, 1999). Participants remained sceptical about these depictions, even after being informed that the exact historical facts aligned with those presented in-game. In their critique of the game's abstractions and

representations of history, they described the lack of "gore" and the inclusion of

"instantaneous healing medikits" as unrealistic (O'Neill & Feenstra, 2016). Similarly, 22 of

the *EUIV* online forum survey participants considered the representation of history within

EUIV (specifically, nation management) as too abstracted, unrealistic and incorrect. One

survey participant commented on the contradiction between "your king spending one quarter

of the national budget on jewels and not having a standing army". Another survey participant

complained the replication of governance was over-simplified, with many actions "done in an

instant". While another participant indicated that governance and management were three

variants of "spellcraft" which is a mocking comment about the apparent inaccurate historical

representation of in-game currencies. Clearly, some survey participants would have preferred

more precise representations of historical nation management within *EUIV*, and did not think

EUIV's historical representations were a "true" picture of history. They also believed the

disproportionate numerical and currency representations in-game and instant actions to be

ahistorical distortions.

Participants also had strong opinions about what historical elements were "real" and

what were not. For example, one participant commented that "some aspects are very accurate

… while others are either plain wrong or wrong due to abstraction", giving the example of a

mercury mine being abstracted as a gold mine in-game. In this case, the participant

recognised gold was a proxy for another metal (mercury) of strategic value, and that history

was therefore being shaped to fit into the game's system and currencies. The issue for this

participant was evidently that this abstraction misinformed them about the actual details of

history.

While these issues around details seem to be important to players, in the grand

scheme it is worth asking whether slight inaccuracies truly affect their understandings of

history. The survey results overwhelmingly indicated (95.47% or 316/331) that gameplay

frequently encouraged players to seek further historical information outside the game (full results in Chapter 5 and 7). The players could compare the game with information provided from external sources to counteract or balance the incorrect, abstracted or counterfactual gameplay lessons. It is likely, therefore, that *EUIV* players are not in danger of learning falsehoods through gameplay *if* they engage in historical research outside of the game. It was also apparent from the survey results that many players understood the historical depictions in the game were not a complete history and did not completely do justice to its complexity.

While some participants noticed historical misrepresentations, others saw shades of historical accuracy within the game. The survey indicated a participant consensus (253/331 or 76.40%) that *EUIV* simulated at least some degree of historical accuracy. Perhaps more interestingly, the forum survey participants said complete factual accuracy was neither necessary nor desirable, with 36 specifically commenting that it was not possible to reflect every detail of history. Rather, abstraction was seen as necessary for the players to grasp the deeper meanings behind these historical events, with one participant stating the game's "abstractions make sense", while another said *EUIV* was "necessarily abstracted, it attempts to give a general idea of the complexities and difficulties". Therefore, there may be more value to be found in abstracted and engaging interactions that present overarching historical themes than in those offered by an approach hung-up on technical or historical accuracy. However, players do need to take on a more complex understanding of history in order to distinguish between factual and fictional histories and to gain knowledge from the latter, which are still essentially informative. As the next section will explain, these types of historical divergences are often the result of player and AI intervention that changes the course of the game's history and at times creates outlandish historical scenarios.

8.4 Ahistorical Player and AI Behaviour

In *EUIV*, the choices made by players result in a multitude of different game histories. Some players approach the game as a system to explore, expand, exploit and subsequently exterminate (4X)[58] nations with limited regard for history. Such players target and manipulate in-game variables to win; their focus is not on reflecting or simulating a "real" or even believable history[59]. In the forum survey data, 21 participants acknowledged players worked against historical accuracy by playing to beat the game, causing the narrative to diverge from factual history. For example, one survey participant stated that *EUIV* "uses a mathematical formula" and that some players engage in "min-maxing" [60] instead of trying to understand "human sentiment and contextual situations". Participants with similar views mentioned "optimising", aiming to "blob"[61] and being able to "mathematically calculate" efficient strategies to win the game. As a result of these strategies, a player acts without concern for the factual historical timeframe and intentionally compromises the perceived historical authenticity of the game world. Similarly, some participants focussed on expanding their empire as quickly as possible as a means of winning the game. They sought out the most effective strategy for winning quickly, often describing this as a "meta" or "metagame" approach (Boluk & LeMieux, 2017, p. 1; Donaldson, 2016, p. 1). Such an approach is widespread in competitive gaming scenes and among dedicated fan bases. However, by adopting this approach in *EUIV*, players may ignore historical and cultural perspectives completely and could mostly play the algorithm.

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[58] 4X games typically focus on empire building with the player using economics, technology, politics and their military to expand their empire.

[59] Arguably, just because their focus is not on simulating history this does not mean they do not learn history.

[60] Min-maxing is a strategy to maximise the desirable variables of the player nation; however, to do so means minimising other variables. In this process, the player creates a nation highly specialised in certain strategies. In the context of *EUIV*, the player will usually min-max variables that allow them to quickly conquer as much land as possible without incurring severe penalties.

[61] Blobbing is another name of map painting where the player creates a 'blob' of their colour over the map and absorbs other nations into their 'blob'.

One survey participant suggested that while the game's broader historical dynamics were generally correct, player involvement often resulted in strange and unlikely outcomes. Another survey participant suggested that an *EUIV* run through in "observation mode" (where only the AI plays and the player is not involved) produced a more accurate reflection of history than just a regular "play through" with the player. This participant believed the player's nation could quite easily become the most powerful and advanced nation, regardless of which nation they had selected. This perspective is not unfounded as the game encourages players to complete in-game achievements that are based around building small or weak nations into greatness or carrying out a world conquest. Here, farfetched player interventions in history are not only possible options for gameplay, but are often encouraged, typically at the cost of historical authenticity.

Many of these issues align with concerns raised by Galloway (2006, p. 103) who postulates these games are more about players learning the algorithm processes rather than genuine aspects of history and culture. Similar ideas were raised by participants in the *EUIV* online forum survey. They described how play that focused on the metagame came at the expense of learning about history. For example, participants said that targeting in-game award systems, such as forming multiple nations to claim large sections of land, worked against the historical depictions in the game. Moreover, many of *EUIV*'s in-game achievements often required players to perform ahistorical conquests and feats. Hence, to complete the game, the game mechanics and achievements encourage or even require players to exploit the game system to win at the expense of realising outcomes that are more historically accurate.

One participant suggested the player's exploitation of game mechanics also impacted the game's depiction of historical concepts/theories. They noted the player's actions can break historical concepts, such as that of the "balance of power", whereby a counter

balancing force will oppose the changes enforced by the conquering nation and prevent it developing hegemony in the region (Loban, 2017, p. 7)[62]. The balance of power is a consistent feature and theme in *EUIV* and typically prevents in-game empires from quickly completing world conquests. One survey participant explained how the player's strong influence on their area of the map skewed the game's historical context and further affected the balance of power, making the simulations seem particularly ahistorical. In this way, the player is breaking from the historical or political norms of that time. However, in contrast, another player commented that the game mechanics and the AI correctly simulate the historical European international setting and balance of power.

Another critique of *EUIV* by survey participants is that the AI nations (the algorithmic dynamics of the game) rather than the player's choices are responsible for producing inaccurate reflections of the actions of certain nations or the timing of various events. For example, one survey participant suggested *EUIV* had many "quirks", whereby historical events appeared too early or too late in the game, or were completely ahistorical. The participant cited ahistorical examples of the "Ottomans colonising Oceania, Poland partitioning Germany etc". Another participant described how history could go off track due to the actions of the AI, but also connected this to player behaviour: "AI won't do what real people did in that period of the time, and you – as the player – won't either". Moreover, another participant noted when the AI was in control, England would not perform well on the world stage during the Early Modern era, in contrast to its actual global dominance at the time. The participant noted that in their experience of the game, the AI influenced England in such a way that made it unable to effectively control or manage the English Channel, an important strategic point for England as a nation. In total, 23 participants suggested the game

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[62] A section of this chapter has been published in a conference paper: Loban, R. (2017). Digitising Diplomacy: Grand Strategy Video Games as an Introductory Tool for Learning Diplomacy and International Relations. Paper presented at the Digital Games Research Association Conference 2017, Melbourne.

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AI worked against historical accuracy. Hence, for some players the issue of historical accuracy was not necessarily due to player-driven counterfactual divergences, but rather the behaviour of the AI.

A concept that can be used to analyse these comments on AI behaviour is that of "black boxing"[63] (Winner, 1993, p. 365), as discussed in Chapter 2. Galloway (2010) sees a beneficial side to black boxing as it hides the inner workings of the game mechanics and thus enables the player to focus on gameplay and more genuinely engage with the historical narrative and related inputs and outputs. The concept of black boxing is represented in *Figure 8.2*, with the strategies of gameplay shown as an input and gamified history and experience as outputs. In contrast to meta-gamers, many players who focus on roleplaying may choose to play and interact with the game as a black box. However, while this approach to *EUIV* can help the player focus on history, the extent to which they do so will always be dependent on how that player approaches the game.

Player strategies → The game as a black box → Gamified history

Figure 8.2. The game black box process.

This section has shown that both the player and the game AI can shape the *EUIV* world in ahistorical ways, whether through the game's quirky AI, the player's strategic exploitation of the mechanics and code, or merely due to player choice taking history off track. For some players, these ahistorical actions can impact the historical value of the game;

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[63] As discussed in Chapter 2, a black box is a device or system that, for convenience, is described solely in terms of its inputs and outputs. In terms of black boxing, one need not understand anything about what goes on inside black boxes; rather, one simply brackets them as instruments that perform certain valuable functions (Winner, 1993, p. 365).

however, as discussed, a player may choose to take a black box approach to the game and focus on history through roleplay. In such a case, even if counterfactuals result, these are still grounded in history and therefore reflect a semblance of accuracy.

8.5 Counterfactuals and the Underlying Trends and Influences of History

Counterfactual history[64] is a growing genre of game fantasy that explores alternative trajectories of the past. Scholars and educators consider counterfactuals to be useful for learning history as they show what could have happened based on actual historical themes, influences and relative probability (Apperley, 2013; Ferguson, 1997, pp. 85, 89-90). Chapman (2016, p. 233) discusses how some games might be counterfactual, but do not necessarily allow counterfactual history*ing* whereby the player makes the decision to diverge from the traditional historical narrative. Other authors such as Ferguson (1999, p. 2), and Tetlock and Belkin (1996, p. 6) point out the importance of counterfactuals as they can help us make future decisions by understanding the hypothetical consequences of a counterfactual timeline. By understanding the consequences in the counterfactual timeline, people can make more informed decisions in the future and in their own timeline. Fergusson argues counterfactuals are a legitimate historical practice as long as they are based on a degree of factual history and are situated within the realm of relative probability and attend to other strong themes and influences in the historical timeline (1997, pp. 85, 89-90). Many of the survey participants indicated that counterfactuals were useful for learning history and appreciated the counterfactual depictions of history in *EUIV*. Twenty-two participants believed the game was inspired by history and quite often offered plausible counterfactual trajectories. In a similar argument to Ferguson (1997, pp. 89-90), one survey participant noted: "*EUIV* is a very good way to understand the factors, ideas, concepts and problems of

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[64] Counterfactual histories are sometimes also known as "alternate realities" within the gaming world.

history". Another participant explained that the game reflects the "trends and forces that shaped the time period", but also cautioned that the game "should not be used to teach about what really happened". These participants thereby acknowledged that complete historical accuracy is not achieved in *EUIV*. Nonetheless, they were satisfied with the game's historical accuracy as long as the game seemed "real", had some degree of authenticity, or at the very least the appearance of authenticity or historic verisimilitude (Apperley, 2013). These participants evidently believed counterfactuals could present authentic and informative ideas about the world and were therefore a useful means to understand the underlying influences that have driven historical narratives in particular directions. The participants also acknowledged that these counterfactuals were not outlandish or senseless in their depiction because there was a possibility they could have occurred. Hence, participants with nuanced understandings of history may still find historical value in *EUIV* by understanding the historical parameters in which the game operates as being somewhat flexible, but nonetheless largely probable.

Some participants explained that *EUIV* contained many events, mechanics and other introduced elements that railroaded players towards a particular historical path. This was seen as providing balance between steering players towards a more accurate historical timeline and allowing the player to exercise agency and write their own version of history. One survey participant described how this balance occurred during gameplay:

> *EUIV* being a sandbox game is as accurate as it can be at the start of the game. However, as you continue with the game further into the timeline a divergence can occur from a historical accuracy standpoint. *EUIV* uses many events and decisions along your journey playing your nation and many of them contain information relating to the history of the nation … These events, mechanics and decisions help to

guide not just the player but also the AI in maintaining at least a semblance of

historical accuracy, whilst maintaining a level of interesting alternate history.

Another survey participant shared this view, noting the game often became less historically

accurate over time, slowly diverging into something utterly different from factual history and

reflecting what they called the "butterfly effect". The "butterfly effect" (Lorenz, 2000, p. 91)

occurs when one event has a domino effect that could result in a radically different history

compared to the original history; that is, the effect relies on a sensitive dependence on initial

conditions. Another participant commented on how much of history, both in reality and in-

game, occurred by chance through a series of events, rather than due to any clear influences:

> *EUIV* is not a history simulator. It is inspired by history but the moment you select a
>
> country and press play, a completely new context is born. Take Prussia for example.
>
> In real life it was essentially a fluke that happened through a bunch of random events,
>
> and this sort of thing is not really possible to accurately recreate.

This comment illustrates how, through gameplay, *EUIV* players can be exposed to the idea of

contingency and the role of elements of chance in history. Apperley (2017), in his

examination of George Perec's book *Life A User's Manual* (Perec, 1987), notes the

importance of contingency in terms of discovering chance encounters of relationships and

patterns between "various ideas, people, objects and events". He suggests that contingency

could be used in structured but playful environments such as games. For Apperley,

contingency allows players to experience and encounter new pieces of knowledge through

games. The notion of contingency underlines the usefulness of counterfactuals for history

education, which could be used as points of comparison to reveal that the events they depict

might have been just as likely to have occurred as those in widely accepted versions of

history. For example, the July Crisis leading up to WWI was precipitated by a series of

unusual events that led to the assassination of Arch-Duke Franz Ferdinand, where by chance,

the assassin was in the right place at the right time (Otte, 2014). However, another view suggests some form of conflict of the nature of WWI was inevitable, given the vying interest and interconnected alliances of the nations involved (Clark, 2012, p. 11). Counterfactuals are therefore useful for revealing how strong historical influences affect events, but also how chance plays a major role. In this way, *EUIV* may teach players about the important historical themes and influences that shape larger historical narratives, rather than just about the factual details of historical events themselves.

Another issue raised by one survey participant was that *EUIV* did not reflect uncertainties:

> While *EUIV* can reflect history, it fails to simulate certain parts of the uncertainty of history. The most obvious example is technology, which is entirely linear, when in fact certain countries developed certain technologies in a very different order.

This comment presents an interesting rejection of teleology, "a mode of explanation in which the presence, occurrence, or nature of some phenomenon is explained by the end to which it contributes" (Walsh, 2008). Here, the participant suggests understanding the outcome of influences is not the most important lesson; rather the lesson is on *how* the historical event occurred. For this participant, it was evidently not enough for the game to only show the emergence of new technology. Rather, they believed the game should also simulate how the processes of technology development are sporadic and often occur by chance.

Although a small number of participants thought the absence of chance in-game was problematic, there were strong results that showed the game's mechanics can prompt players to reflect on the influences that affect historical events. Players often learn from counterfactuals when they contrast, compare and interconnect in-game history with their factual historical research outside of the game. The survey results showed that the

counterfactuals within *EUIV* gameplay taught participants about these themes and influences, thereby contributing to the development of a big picture understanding of history.

8.6 Broader Themes and Influences of History

According to Chris King, a senior designer at Paradox Interactive, history is full of "edge cases" and "throws up weird things" (GDC, 2016). His comment echoes some of the above discussion about chance in history. However, King also points out that when designing games, not everything in history should be simulated; rather, what is more important is a focus on designing and depicting the specific history central to a game (GDC, 2016). King believes that historical exceptions outside the norm are distractions within a game (GDC, 2016). Grand Strategy game design, King says, is about trying to capture the broader elements of history within game mechanics (GDC, 2016). He recommends that designers should create abstractions of historical themes and influences as these can be difficult to capture precisely in general game mechanics (GDC, 2016). He even discusses the importance of "shopping around for the right historian for you", suggesting not all versions of history fitted the *EUIV* design team's objectives. King explains that, from a design perspective, certain parts of history must be ignored if they do not fall within the scope of the game (GDC, 2016). King's comments echo some of the survey participants' responses, such as one who described *EUIV* as not "a real history" but "quite accurate", simulating the "rhythms of history, the rise and fall of empires and nations and so on". Similarly, another survey participant said *EUIV* was "necessarily abstracted, but generally tries to as faithfully as possible represent the 'broader strokes', so to speak, and the general trends of the period". Another survey participant explained that the game was able to "produce a surprising amount of historical trends" including "the rise of the Ottoman Empire (and its decline), the Protestant Reformation and the emergence of Russia and France as regional superpowers". However, this participant conceded that outside of Europe, the game tends to be "very

inaccurate". Moreover, as noted in chapter 2, Kapell and Elliott (2013), Dow (2013) and Wackerfuss (2013) indicate in their research that games often effectively communicate broader historical themes and process. The common thread here is that while *EUIV* may be abstracted and counterfactual in its simulations, it excels at representing broad historical themes and influences. While many of the forum survey and case study participants did not discuss the exact details of historical events, they were able to articulate and often name the broader changes that shaped European and world history, showing the outcome of this aspect of the game's design.

These broader historical changes frequently occur in *EUIV* regardless of player or AI behaviour. The AI behaviour (despite some participants' beliefs) does in fact often balance the game and pushes *EUIV* to change in certain ways to approximate factual history, simulating historical patterns or at least creating a believable timeline with historical verisimilitude. For example, in-game Europe has a tendency to continue playing a believable alternate reality where large empires form, religions divide (Catholics vs Protestants) and the New World is colonised. However, outside of Europe, there is less attention to historical detail and the AI behaviour tends to be more random, resulting in historical divergences. This is another example of how the game's Eurocentric bias may affect player understandings of global and regional historical themes and influences outside of Europe.

In contrast to their views on the game's success at depicting and simulating the bigger picture, participants voiced concerns about how the details of history can play out inaccurately in-game. One survey participant explained that they believed *EUIV* simulated a lot of important historical changes, but that these were not always expressed precisely, using the example of Portugal colonising Siberia as an example. Similarly, another survey participant commented:

The basic set ups and larger events do present a pretty good picture but the actual

gameplay doesn't always "flow" realistically; as in it's a bit too easy for really small

countries to conquer vast amounts of territory while large ones tend to be worse than

they actually were (like how the Ottomans can't conquer the Mamelukes in one go).

As these participants point out, the Portuguese never colonised Siberia, nor did the Ottomans

acquire Mameluke territory through a series of separate wars and land concessions.

Nonetheless, *EUIV* does demonstrate larger themes such as Portuguese global colonisation

and the influence of the Ottomans in their region[65]. As these responses show, counterfactuals

clearly serve as points of comparison and contrast to connect in-game events with factual

history.

Another survey participant, using current events as a comparison, described *EUIV*'s

depictions as being too broad, meaning significant events could seem like footnotes,

unimportant in history:

The game is way too broad to be able to accurately simulate history. There are only so

many events in the game, and each with the same outcome each time. I feel like

nearly all aspects of history are touched on, but very few are really delved into. An

issue with a country in real life that would shake up the entire country and/or world

are often reflected with a button giving +2 unrest, for a couple years. Something such

as Black Lives Matter in the US right now, as well as US mass shootings, or ISIS in

the Middle East, are current issues that are dominating news, politics and world

relations. Yet in-game, they might not even be large enough issues to warrant a small

event trigger. If they were, Black Lives Matter would be +1 unrest for US. I don't

know how mass shootings could be reflected in-game, but ISIS could be nothing more

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[65] One could equate *EUIV*'s thematic and conceptual learnings to that of Monopoly, which teaches players the basic dynamics of capitalism even while containing low-level counterfactuals in regards to streets, properties and game rules.

than some rebels occupying a couple provinces and giving some bad CBs [war

justification] that aren't worth using. Everything is so massive and expansive in

EUIV, that important smaller parts of history could, and are, easily looked over.

By representing historical events broadly, the game is in danger of doing a disservice to the

historical significance of some events by reducing them to a modifier rather than something

that warrants greater attention. Details and specifics of history are lost to the grander

narrative, and in this way the pedagogical value of the game may be reduced, because it does

not attend to some of the most influential aspects of history. Arguably, this is because the

game mechanics, as King (GDC, 2016) notes, define the scope of the game. For example,

EUIV is about states, monarchies and the expansion of empires, while *Victoria II* (Paradox

Development Studio, 2010) is about the movement of people, identities and the free market.

Within each scope, only certain events can effectively be represented. Thus, while one might

say that Black Lives Matter, as an event, may be represented as +1 unrest in a game, the

event would likely form a part of a larger civil or social rights movement, requiring a specific

mechanic to specifically deal with them that would result in a very different game. Similarly,

mass shootings may be a product of certain issues around arms control, while ISIS might

develop alongside the rise of non-state actors and extremism, both requiring different sorts of

game mechanics. As King explains, *EUIV* and other Grand Strategy games are only capable

of portraying events at a higher level, with more detailed, humanistic and individual elements

being best left for another medium or game type (GDC, 2016).

While the current events described above have a very real impact on the individuals

that experience them, they are still defined by a series of similar events and dynamics that

changed our societies and nations, not necessarily by singular occurrences or the actions of

individuals or small groups. *EUIV* cannot consistently represent smaller, seemingly isolated

events; rather, it places players on a trajectory towards a better understanding of the themes

and influences that shaped history. Through deep and meaningful engagements with the game mechanics and the histories they represent, players can inhabit and learn history from a believable game world that is specifically designed to portray higher level historical narratives.

8.7 Surface and Deep Learning in *EUIV*

As shown in the previous section, survey participants were able to distinguish between the broad and detailed historical understandings they experienced during *EUIV* gameplay. These two understandings of history can be related to the educational concepts of "deep" and "surface" learning (Houghton, 2004, pp. 9-11; Marton & Säljö, 1976, p. 7; Ramsden, 2003, pp. 42-43). Surface learning promotes the unchallenging acceptance of new information, such as when a learner rote learns or memorises facts, not necessarily understanding how these fit into the bigger picture or being able to link them with other pieces of information. In contrast, deep learning involves linking these broader, more general ideas and concepts together, leading to longer-term retention and a more meaningful understanding of those ideas (Houghton, 2004, pp. 9-11; Ramsden, 2003, pp. 42-43). Deep learning also involves focusing on central arguments and concepts rather than on specific examples or independent facts. The forum survey and case study results show *EUIV* can promote deeper forms of historical learning through the game's mechanics, which can teach expansive themes and influences around the Early Modern era. While *EUIV* does present factual historical examples (e.g. pop-up boxes), it also contains an abundance of counterfactual examples, which embody many of the same concepts found in factual historical narratives. This chapter opened with an ahistorical, fantasy scenario where Spain colonised Australia instead of Britain. Although inaccurate, the vignette still references core historical ideas of the era, including exploration, colonisation and global empire building. These counterfactuals foster deep learning by presenting central historical arguments and

concepts rather than on specific examples or independent facts. Hence, these counterfactual stories contain valuable historical understandings and promote deeper forms of learning.

Deep forms of learning also allow the learner to make mistakes without penalty, or reward their learning efforts (Houghton, 2004, pp. 9-11; Ramsden, 2003, pp. 42-43). Games provide this potential by allowing players to learn through trial and error, productive failures (Kapur, 2008) and rewards systems. Other forms of deep learning include dispelling misconceptions and having students compare, contrast and interconnect previous knowledge with new knowledge (Houghton, 2004, pp. 9-11; Ramsden, 2003, pp. 42-43). As discussed in Chapter 7, through a cycle of play, discovery and research the player compares, contrasts and builds on their original knowledge, ultimately constructing new understandings from the learning process. In deep forms of learning, the learner has a clear interest in and curiosity about the subject matter (Houghton, 2004, pp. 9-11; Ramsden, 2003, pp. 42-43). As discussed in Chapter 7, *EUIV* does this because it ignites further interest in and research into history. Deep learning principles staunchly reject learning just for the sake of passing tests or undertaking assessments as this encourages surface learning behaviour, which can lead to the reduced retention of information, an absence of big picture understandings and/or too great a focus on a single context or idea (Houghton, 2004, pp. 9-11; Marton & Säljö, 1976, p. 7; Ramsden, 2003, pp. 42-43). Interestingly, while games like *EUIV* are played for leisure, they intrinsically motivate players to engage with the game system and subject matter, and thereby afford many of the deeper learning principles for learning history so often sought after in education (Gee, 2009, p. 65).

Figure 8.3 illustrates the sorts of deep and surface historical learning that can occur within *EUIV* gameplay. The analogy of the iceberg shows how history is divided into broader concepts and ideas (deep level learnings) and historical facts (surface level learnings). The survey and case study results show *EUIV* can teach precise surface level learnings through

certain game features such as map modes (119/331 or 35.95%) or pop-up events (146/331 or 44.11%). Indeed, the Formal Analysis in Chapter 4 also showed that many surface level histories (i.e. historical details) can be explored and learnt through *EUIV*'s mechanics. However, many of *EUIV*'s more fundamental and interactive gameplay elements are not suited to teaching surface level history. As the thesis has shown, playing *EUIV* can successfully teach many overarching historical themes and influences of the Early Modern era. The iceberg thus represents how the facts and details of history are usually apparent and visible on the surface, but that the more important, valuable and meaningful forces of history are often below the surface and invisible. The surface history is supported by the deeper history to create a meaningful whole. The survey and case study results showed that even if the player perceives *EUIV*'s surface history as false or only partially true, the valuable broader understandings and meanings of history can still be uncovered upon deeper examination and reflection. The deeper elements of history communicate valuable comprehensive meanings of how and why history happened and the results show that *EUIV* gameplay produces this type of deep learning.
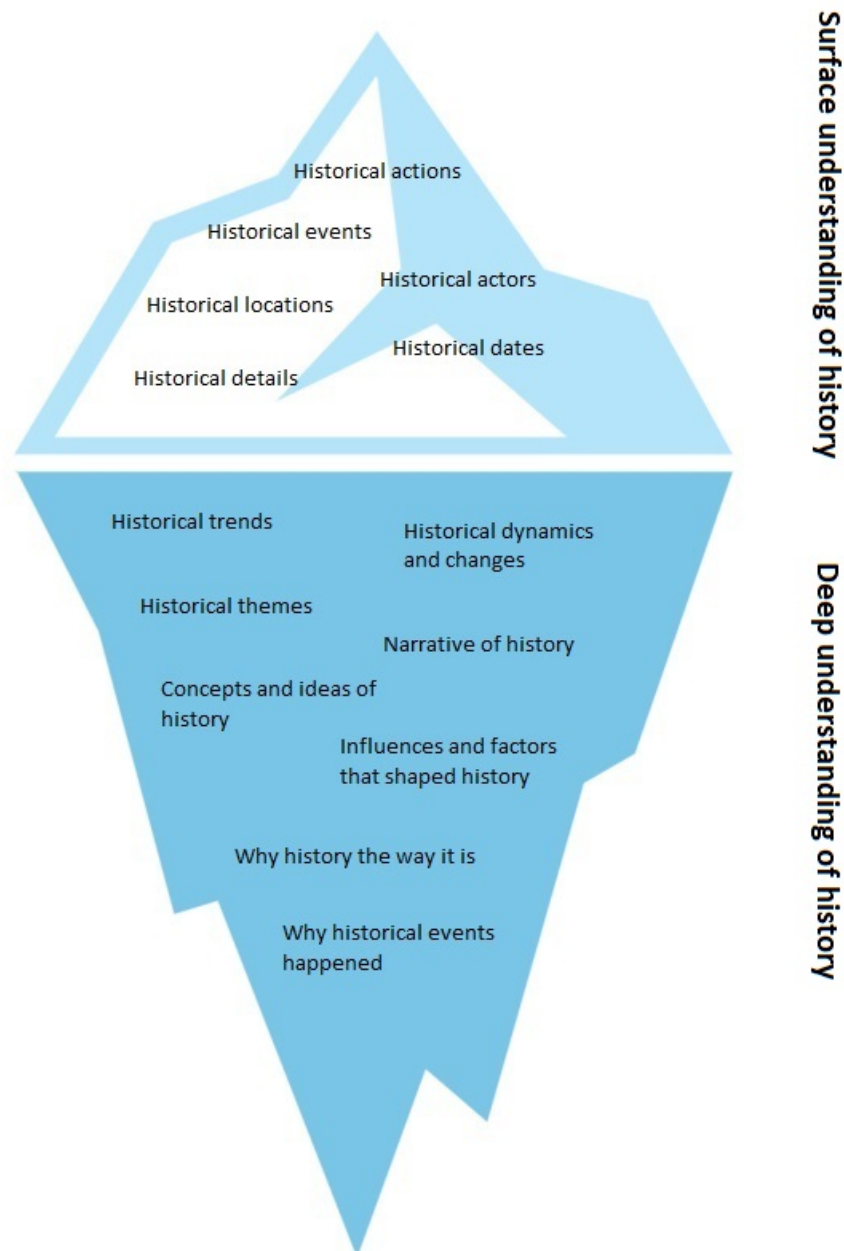
Figure 8.3. The analogy of the iceberg shows how different forms of historical knowledge are either on or below the surface[66]. *EUIV* can help players to gain both surface and deeper understandings of history.

During *EUIV* gameplay, a player does not just absorb surface history but looks deeper into the game's content, analysing it and linking different histories and concepts to make meaning. This process could also be compared to Hemingway's Iceberg theory (1999, p.

[66] The illustration is based on the system's thinking process iceberg model (Gürdür Broo & Törngren, 2018).

103), which suggests that a deeper story can be learnt from a text, even if the deeper story is not explicitly explained. Rather, the deeper story is implicit and communicated through various surface elements (Hemingway, 1999, p. 103). In a similar way, a *EUIV* player can unwittingly learn many overarching historical themes and influences even if they are not explicitly explained in the game. Deep and surface learning manifests in *EUIV* in two ways. First, the game mechanics communicate surface and deep histories, as shown in *Figure 8.3*, with deeper forms of historical understandings being more prevalent. Second, the game affords deeper forms of learning through meaningful, playful and educational engagements with game content. Hence, while *EUIV* is limited in terms of the surface history it can communicate to players, it strongly promotes deep forms of learning and understandings of history that could be applied in a higher education context.

8.8 Potential Implementation in Higher Education

The survey and case study results show that educators could capitalise on *EUIV*'s historical content in the classroom, using it to engage learners in deeper understandings of history through the interactive elements of the game. However, the results have also identified several potential issues around the abstraction of history and the counterfactual nature of the game. Many of these issues can be addressed by treating the game as one single source of information, which, when combined with other sources, forms a comprehensive historical platform. In this way, because playing the game can convey a deeper understanding of history, it can serve to connect and reinforce more loosely related knowledge the student may have about the particular history they are studying. For example, a student may know of events that occurred around the time of Australia's colonisation, but not understand why those events happened or how they fit into wider patterns of global colonisation and trade. Gameplay may be able to give context to these events, showing how they fit into a more comprehensive picture of history. Playing the game can also reveal the gravity of specific

events by illustrating the consequences of those that are similar events, and demonstrating how wider trends in history are responsible for various outcomes. Through counterfactuals, the game can also show the player why certain historical themes and influences were dominant at certain times. As such, *EUIV* has considerable educational potential, but must be used within a context that includes reference to many kinds of historical sources. As shown in Chapter 7, the game helps this type of multi-source teaching by sparking players' interests in researching history outside of the game, which helps to validate and reinforce the player's historical understandings. *Table 8.1* summarises the issues associated with *EUIV* as a learning tool, and outlines the potential solutions and applications for using the game in teaching history in higher education. It could potentially be suggested that participants might learn information through traditional teaching methods such as a lecture in a much shorter time. Yet games remain a more active and intricate form of learning for hands-on learners, as we saw in our discussion of the learning benefits of games in chapter 1, 2 and 4.

Table 8.1. *EUIV as a Learning Tool: Obstacles, Solutions/Compromises and Applications.*

Learning Tool Obstacle	Solution/Compromise	Educational Setting Application
Abstraction, Misinformation and Omission of History	Other mediums may be able to resolve the issues of abstraction, misinformation and omission and fill knowledge gaps. The data indicated 95% of participants conducted further research into history from other sources.	Use *EUIV* to accentuate historical themes of the Early Modern era. Other sources can inform the details or specific instances of historical events. The student will need to research more broadly to gain a better understanding and interlink the game with other historical sources.
Counterfactual Scenarios	Despite depicting and simulating counterfactual histories, these fictional scenarios can still teach the underlying themes and influences of history.	Use *EUIV* counterfactuals to highlight underlying themes and influences of history. Compare, contrast and interconnect with factual history.
Ahistorical Player and AI	View the game as a black box with strategy inputs for historical gameplay outputs.	Use *EUIV* as an interactive and experiential medium to represent and learn about history while raising awareness of the exploitable nature of *EUIV*.
Eurocentric, War and Conquest Focus of Game (Chapter 7)	Understand the perspective of *EUIV* is primarily Eurocentric and war-focused. Use other historical sources to fill the in the gaps.	Use *EUIV* in conjunction with other sources and other types of games to explain other perspectives. *EUIV* can be used to show geopolitics in history.

A final issue related to learning from *EUIV* raised by many of the case study participants was the complexity and difficulty of playing the game. This issue was particularly relevant for new players to the Grand Strategy genre. Four of the 18 case study participants commented on the difficulty of managing some of the more involved aspects of game play. Several case study participants commented on the complex interface of the game, while others referred to the vast number of variables and functions they needed to keep track

of during gameplay. Eight case study participants found *EUIV* difficult to follow and interact with, while three believed the difficulties they experienced were due to the in-game tutorial, which was perceived as difficult to understand, "buggy" and not streamlined. Additionally, not all case study participants understood all the game currencies (such as the different monarch power points) and the uses of these currencies with the game mechanics. This shows that many of the aspects of history in *EUIV* can only truly be understood by more experienced players. Berg Marklund (2013, p. 85) also outlines several problems teachers can encounter when implementing games. These problems include, for example, the logistics of implementing games with 20-30 students and needing to have students get into the 'flow' of the game before they can learn from it. These issues related to logistics and learning 'flow' of GBL would be exacerbated with more complex games like *EUIV*. Compared to other forms of engagement such as readings, a lecture or discussion, the game is more difficult to grasp initially. However, part of engaging through the game is learning the game's intricacies and, in the process, learning about history. Thus, player expertise is a key element to be considered when implementing *EUIV* in an educational setting.

Several course outlines at different universities in Australia show learning outcomes that could be fulfilled by *EUIV* (University of Melbourne, 2018; University of New South Wales, 2016a, 2016b). In the course "Age of Empires" (University of Melbourne, 2018), not to be confused with the game, one of the learning outcomes is based on the "periodisation of history" which refers to a theme that defined that period e.g. age of discovery refers to the European discovery and exploration of the Americas. Such periodisation within *EUIV* has been noted by several scholars (Koabel, 2017; Kuran et al., 2018). The Formal Analysis (Chapter 4) also revealed that periodisation is present in *EUIV* both overtly and subtly, with the game timeline and progress being divided into different "ages". Each age presents different goals for the player to achieve, and new game mechanics are unlocked as the game

continues. For example, colonisers are particularly valuable at the beginning of the game because they allow the player to conquer the world and simulate the ages of exploration. However, the game's historical focus can shift, with absolutism – the concept of monarchs holding the most power – becoming increasingly important as the game progresses.

Similarly, a course (University of New South Wales, 2016a), entitled "Concepts of Europe", details a learning outcome where the student should develop the ability to "display developed knowledge of the key events, ideas and processes that have shaped modern Europe". As previously discussed, understanding broader historical themes and influences is one of the key achievements of *EUIV* gameplay, and could arguably also help in achieving this outcome. Another course at UNSW entitled "Europe in Turmoil: From Renaissance to Revolutions" (University of New South Wales, 2016b), lists certain graduate attributes that might be beyond the scope of games like *EUIV* when used as a learning tool. In this course, the desired graduate attributes are to:

1. Demonstrate an understanding of at least one period or culture of the past

2. Identify and interpret a wide variety of secondary and primary materials

3. Analyse historical evidence, scholarship and changing representations of the past

4. Construct an evidence-based argument or narrative in audio, digital, oral, visual or written form

5. Demonstrate effective written communication skills and the ability to express these effectively in intercultural contexts.

The first two of these graduate attributes touch on historical knowledge and informational competencies that could be addressed by *EUIV*; however the other three would not likely be mastered using the game alone. Rather, the game could be implemented alongside other mediums and platforms to achieve these requirements. As the case study showed, the practice of modding, to be discussed in detail in the next chapter, could be one way to provide an

analytical and creative platform for students to express their views on history and fulfil all of these course graduate attributes.

8.9 Conclusion

EUIV's depiction and expression of historical knowledge can be visualised using the Torres Strait Islander Cultural Tree. In the Torres Strait Islands in the Far North of Australia, culture is viewed as a tree whose roots represent deeply embedded traditions and histories, while its growing branches represent new expressions of those traditions and histories (Loban, 2018, p. 165). As depicted in *Figure 8.4* these branches might take the form of new interpretations of Torres Strait art, music and other modes of cultural expression handed down through the generations. These new forms are legitimate expressions of Torres Strait culture in their own right, but are given context and meaning through their connections with the past. *EUIV* could be seen in a similar light, not as an exact replica of histories and traditions, but a new digital version that can still convey similar messages and ideas about the past. *EUIV* is an alternative learning medium in which a player is not just an observer of history, but is immersed in history, shapes history and experiences a certain perspective. *EUIV* gaming practices also fit into and draw from a multitude of historical sources and communicate a deeper meaning of history to the player. If educators recognise this, we may be able to acknowledge the game as a legitimate form of historical representation and engage with it as a pedagogical tool.
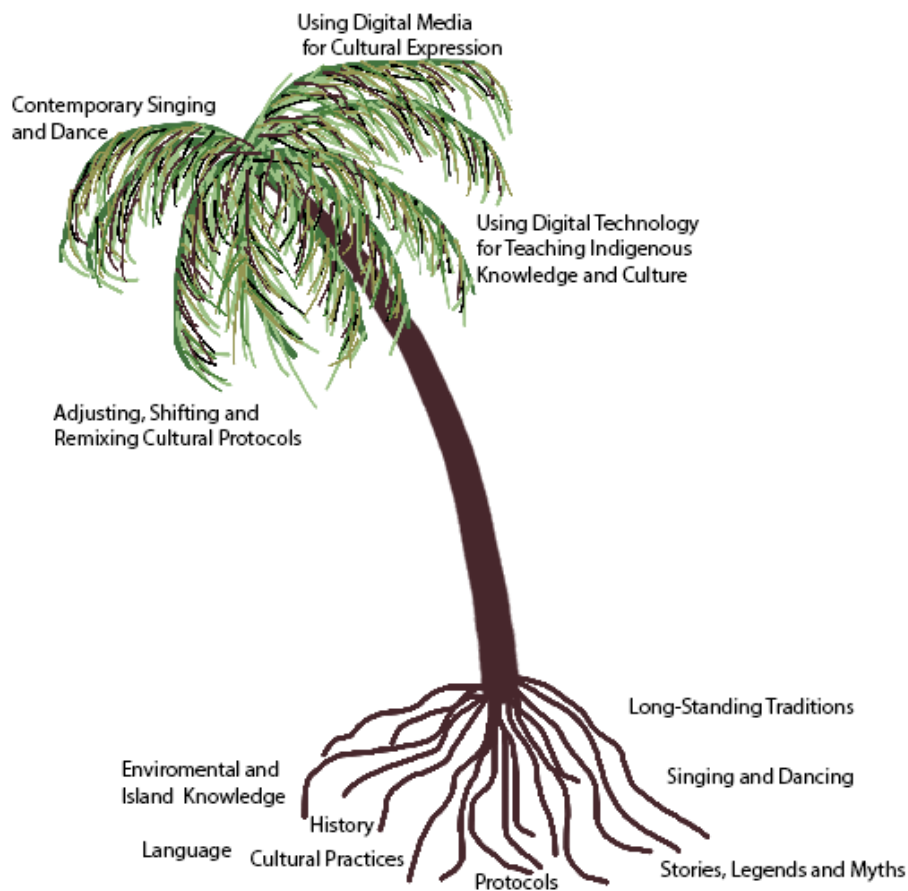
Figure 8.4. Torres Strait Islander Cultural Tree.

When players interact with *EUIV*, they both engage with a game and learn about history. While a balance between the two experiences is ideal, the scale is tipped towards engrossing and meaningful gameplay rather than historical realism and accuracy. As a result, the history within *EUIV* can be abstracted or can provide misinformation. This history can be further warped by player and AI actions in the game, especially if the player engages metagame strategies. An alternative is the black box approach, which focuses on the game's historical content and may suit historical role-players. At the same time, players may find great value in playing counterfactuals, which may inspire them to compare and contrast these alternate realities with factual history as a means to discover new histories from a variety of perspectives. Consequently, the type of historical learning within *EUIV* gameplay is one that embraces multi-perspectives and the exploration of broad historical themes. By navigating

the game's processes, the player develops an understanding of the influences that shaped historical events, the ideas that changed societies and the issues that determined the course of nations. As a result, although the surface level history within the game is often compromised by inaccuracies and abstractions, there are still valuable deep historical insights to be gained from *EUIV*'s playful experiences. In a higher education context, *EUIV* might address common history course outcomes, deal with specific content requirements and be implemented to meet particular graduate attributes. Yet the single most significant benefit *EUIV* can provide is to promote deep and interactive forms of learning through engagement in complex historical depictions. Players can truly unlock *EUIV*'s potential if they apply a nuanced understanding of history in their gameplay and recognise what might be untrue in historical minutiae, is in fact "true" in terms of the broader story of history. As such, they are not recreating an exact history, but shaping it according to their own understandings.

English writer Gilbert K Chesterton wrote: "Fable is more historical than fact, because fact tells us about one man and fable tells us about a million men" (p. 201). In accordance, we might believe distorted history replete with misinformation to be a fable, while an accurate historical representation is a fact. In a fable, truths are stretched, details are left out and information is substituted. However, these issues are irrelevant when there is a greater moral to be drawn from the story. Therefore, while game play in *EUIV* may often be historically incorrect, the fables it tells and the morals it reveals may often be quite accurate, informative and valuable.

Chapter 9: Modding: An Informal Gaming Practice Transposed into a Formal Learning Setting

9.1 Introduction

Edsger Dijkstra, Dutch programmer and early pioneer of computer science, was attributed with saying: "Computer Science is no more about computers than astronomy is about telescopes" (Haines, 1993, p. 4). Comparably, the informal gaming practice of modding is more about developing new game content than simply being a computational practice. This chapter argues that the practice of modding has significant educational benefits, aligning with existing scholarship that has linked modding to the informal and formal learning, mainly of computing skills (El-Nasr & Smith, 2006, pp. 17-19; Yucel et al., 2006, pp. 144, 154-155). This chapter advances this existing research by examining how modding supports historical analysis and learning in *EUIV* while also providing the opportunity for modders and gamers to reflect upon history.

This chapter will illustrate the educational utility of modding by first examining the practice as a skillset that operates within gaming communities as a popular form of game engagement. As has been discussed in chapters 5 and 6, the research data indicated a significant level of interest in modding by *EUIV* players, where the practice appeared to allow modders to engage more deeply with history than they would have if simply playing the game. Second, the chapter will explore the practice of modding and its requirements in terms of software, skills and knowledge. It will use the researcher's own *Indigenous People of Oceania* (IPO) mod as an exemplar of this practice. This mod was created during the course of the research project to better understand the modding process, clarifying fundamental concepts around the practice and highlighting its limitations, particularly in terms of historical depictions. Next, the chapter will examine the educational utility of creating and playing mods for learning history. To do this, it will use evidence from the *EUIV*

online forum survey and university case study to illustrate the value of using modding for learning and expressing history. Finally, the chapter will consider the versatility of learning through modding with participants from the case study using their mods as platforms to express their historical analysis in unique and individualised ways, drawing on their own interests, values and understandings to communicate their interpretations of and perspectives on history. The modding documents created by the participants can be found in *Appendix F*, and the mod outlines in *Appendix H*. The chapter concludes that the informal learning practices of modding and the popularity of the practice could be capitalised on in a formal education setting to help students learn history and express their historical understanding.

9.2 The Popularity of Modding

Scacchi (2010, p. 2) defines modding as the practice of customising, tailoring and remixing gaming objects such as content, software or hardware. Mods are the products of this process, and are popular in the Grand Strategy games published by Paradox Interactive because many of these games allow players with little computer programming knowledge to easily create, publish and share mods. However, while playing a mod requires no initial training, certain aspects of modding itself do require specific skills. These are not just relevant to gaming or modding culture, but could be applied in other settings, such as education (Apperley & Walsh, 2012, pp. 115-122). The modding process is one of the elements of gaming culture some educators identify as occurring in a unique space where unofficial but nonetheless work-relevant literacies are developed, which arguably is the purpose of education (Apperley & Walsh, 2012, pp. 115-122; Hong & Chen, 2014, pp. 302-303).

Chapman (2016) suggests that while playing an unmodified game, player-historians[67] can to some degree customise history (p. 22 & 222). However, he also explains that players who are also modders can escape the constraints of the game to a much greater extent and alter content as they see fit. For example, a modder of *EUIV* may incorporate new nations and historical content into the game, which is a significant step towards becoming what Chapman terms a "developer-historian"[68] (2016, p. 38). Chapman's (2016) work does not discuss the emergence of modder-historians within gaming, but his concepts of developer-historians and player-historians are relevant in this research context as they show the possibilities for players to actively create historical content, whether more factual or counterfactual. The thesis data suggests modding is popular in the *EUIV* community, with modder-historians actively participating in reshaping the game to suit their own viewpoints and perspectives on history. Modder-historians could therefore be defined as players who reconfigure a game beyond its existing parameters to communicate different ideas about history. The modder-historian's alterations are still limited by many facets of the existing game structures; for example, *EUIV* may have accessible scripts, but is also based on deeper, more inaccessible code that cannot be modified. While a modder can radically change some sections of the game by editing scripts, they may not be able to alter the fundamental game mechanics and structures in the game's deeper level of code. Consequently, this presents challenges in terms of altering the game to fully reflect the modder-historian's version of history.

Despite these limitations, game design initiatives have emerged to make games more individualised and moddable. One notable aspect of this design initiative is the ability to mod games that are inclusive of marginalised cultures, including Indigenous communities. This is a particularly notable aspect of gaming when members of those marginalised communities

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[67]Chapman (2016) explains that player-historians could be those "participating in [digital-ludic re-enactment] experiences and their surrounding practices" (p. 222). Ludic refers to playful behaviour.
[68] Chapman (2016, p. 15) refers to developer-historian as individuals who "make meaning about the past through the form of digital games".

mod content, presenting the means for cultural expression. For instance, work by LaPensée, Lewis, and Fragnito (2010) examined how Native American youths in Canada became involved in developing a new game to depict the histories of the Iroquois. By persuading the Native American community in Montreal to become involved, Mohawk youths were able to convey their families' stories in a creative, respectful and culturally sensitive manner. The initiative allowed the youths to learn programming skills, which are often the terrain of non-Indigenous populations due to issues around accessibility and computer skills education LaPensée et al. (2010). This is one example that demonstrates that game design and, by extension, modding, could be used as learning exercises for studying certain historical subjects. To an even greater extent, mods provide a platform to communicate an individual's understanding of the subject through the creation of an end product. Here, modding extends beyond the parameters of computer skills education and directly connects modders to the study of history. Hence, the modding process may be capitalised on in formal education settings, used as a means to both learn and communicate history.

Before examining the various elements of modding as a practice, it is important to establish how modding communities operate and the involvement of game developers in related processes. Developers' stances on modding tend to vary, with some developers, like Blizzard, banning community mods and add-ons outright for certain games e.g. *Diablo III* (Blizzard Entertainment, 2012; Sotamaa, 2003, p. 25; 2010, p. 252). Other developers like Paradox Interactive fully embrace mods and design their games to be highly moddable, meaning that *EUIV* has a strong and vibrant modding culture, as was shown in the *EUIV* online forum survey data. Modding practices can also differ between countries. Comparative research of modding communities in China and the US revealed marked differences in practices (Kow & Nardi, 2010, p. 39). The US modding communities were shown to work together with commercial gaming companies, but were to some level absorbed by them,

while Chinese modders remained isolated and distrusting of commercial gaming companies (Kow & Nardi, 2010, p. 39). Hence, modding as a practice varies between gaming contexts, cultures and countries.

The responses from the *EUIV* forum survey question that related to modding showed that while the majority of participants (182/331 or 54.98%) had not modded *EUIV*, a significant number (149/331 or 45.02%) had in some form. These figures reveal a sizeable group of gamers well-versed in modding practices. The popularity of modding may indicate that it may potentially be transferable as a skill to be used in a formal education context. As Apperley (2014, p. 49) explains, educators might capitalise on this element of popular culture and implement these informal gaming practices in formal education settings. Apperley (2014, p. 49) argues educators should genuinely acknowledge the skillsets required to play and master these games as legitimate forms of learning that, at least in some cases, will have real utility within a variety of disciplines (Apperley, 2014, p. 49).

In the *EUIV* gaming community, modding is perceived as a legitimate skill for players to express their views through the game. This could be considered similar to how students express their historical knowledge and understanding through written essays. Educators could utilise the modding skillset that requires computational thinking, creative thinking, analytical thinking and scripting proficiencies to allow students to express their analysis of history through a gamified experience. Although some students in higher education may not have modding skills, the uptake of this practice in the *EUIV* gaming community is testament to the access and ease of modding. Irrespective of their gaming skills, students could potentially learn the modding skillset quite quickly and create mods that apply to different classroom situations and different subject areas. Modding may therefore provide a unique educational opportunity for teachers and students because mods have legitimate utility to help students learn and express history that teachers can then assess.

Although the *EUIV* online forum survey participants who practiced modding were not in the majority, the numbers nonetheless indicated the practice is certainly common. The numbers indicate modding, at least for the *EUIV* gaming community, is a regular practice that occurs as a function of engaging with the game. The popularity of the practice as a part of gaming culture aligns with research that indicates modding is increasingly being viewed as a professional skill (Hong & Chen, 2014, pp. 302-303; Sotamaa, 2010, p. 253). For instance, a study by Hong and Chen (2014, pp. 302-303) showed that several months after a job interview with a gaming company, a modder was offered a position based on their modding skills, indicating a growing acceptance of modders as professional developers with professional skills. Moreover, in recent years different gaming companies such as Boss Key have hired modders to work on their projects (Calvin, 2015). Paradox Interactive also hired a *Victoria* game modder and subsequently integrated their mod into the new version of the game, *Victoria II* (Paradox Interactive, 2010). Paradox Interactive's job advertisements specify modding experience using their games is a "major plus" (Paradox Interactive, 2019). These examples illustrate that the modding skillset has a legitimate real-world utility beyond being simply a personal hobby.

The *EUIV* online survey data (149/331 participants) suggests there is more to modding than both its popularity and its growing professionalisation. The data revealed modding is a form of media consumption and creation, whereby players can learn and communicate perspectives and knowledge using mods. In a study by Postigo (2010, p. 7), similar user behaviours were analysed in terms of engagement with other digital media such as social media platforms like Facebook. Just as a user may set up a Facebook page and create their own content (Postigo, 2010, p. 7), the modder can actively create their own media content within the game, though with more technical expertise as modding does require them to access scripts in a way posting on social media does not. Moreover, as consumers of social

media shape and influence their platform, so too do modders influence both their game and gaming communities. This influence has become apparent to Paradox Interactive, which facilitates modding culture by releasing various tools, guides, demonstration videos and wikis to help players to mod. Additionally, Paradox Interactive continues to shift most of its unique and detailed historical content into the easily accessible and editable scripts that modders utilise for content creation. Only the most essential mechanics and game structures remain inaccessible to players. These actions indicate a shift towards accommodating modding as a legitimate form of game engagement that requires a particular skillset that is more complex than other skills required for gaming. The educational implications of this show that, as a baseline, educators can capitalise on these informal pedagogical gaming practices by working to develop these unique skills in the context of learning history.

9.3 The Practice of Modding *EUIV*

To understand how modding *EUIV* can facilitate educational outcomes, it is essential to first understand the modding process itself. Mods in *EUIV* can vary from simple mods that change a few variables and adjust the balance of the game, to complete overhauls that replace the game scenario with a completely different setting (Loban & Apperley, 2019)[69]. For example, the *Song of Ice and Fire Mod* (Xylozi, zitres, & Vauvin, 2014) is a complete overhaul mod that turns *EUIV* into the *Game of Thrones* universe. In *EUIV* and other Paradox Interactive games, it is more common for modders to simply adjust the existing game to meet the levels of historical realism and accuracy they desire, or even to develop a certain counterfactual (Apperley, 2013, 2018).

EUIV modding typically takes the form of adding new data to existing game mechanics and datasets, as opposed to creating entirely new functions. Paradox Interactive

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[69] Part of this thesis chapter has been published in a book chapter: Loban, R., & Apperley, T. (2019). Eurocentric values at play: modding the colonial from the Indigenous perspective. In P. Penix-Tadsen (Ed.), *Video games and the Global South*. Pittsburgh, PA: Carnegie Mellon University: ETC Press.

draws modding expertise from the *EUIV* community, which the developers then use in subsequent iterations of the game (Trin Tragula, 2017)[70]. The modding tools Paradox Interactive provides for modders include "Modder Mode" in *Hearts of Iron IV* (Paradox Development Studio, 2016b), an in-game interface that allows the user to reshape game aspects (e.g. province importance), and the "Clausewitz Maya Exporter" (Paradox Development Studio, 2016a), which allows the modder to export 3D models from Maya (Autodesk, 2019) (a computer graphics software) into Paradox Interactive games. Highly accessible modding tools are also built into the game interfaces of other strategy games, such as the *Age of Empires* "Scenario Editor" (Ensemble Studios, 1997) and the *Warcraft III* "World Editor" (Blizzard Entertainment, 2002), both which allow for the creation of shareable and playable maps (Loban & Apperley, 2019).

In the specific case of *EUIV*, the tools typically used include:

- the *EUIV* software;

- a code editing program, or text editor such as notepad++:

- specific tools like the Clausewitz Maya Exporter; and

- access to the internet for historical research and modding guides.

As previously discussed, typically when modifying a file, *EUIV* modders change only the more accessible script files rather than the deeper level code that makes up the core functions of the game (Loban & Apperley, 2019). However, these tools allow modders to extensively access and alter most of the graphical interfaces and models as well as variables/datasets and in-game texts. This shows there are many aspects of modding that can be utilised and learned from computational skills with scripts to cognitive skills utilising data and texts.

The process of creating a mod for *EUIV* differs from other forms of modding as it often requires additional historical research. One *EUIV* content designer known as Trin

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[70] Trin Tragula is a pseudonym of a content designer at Paradox Interactive.

Tragula (2017) describes in a developer diary how the *EUIV* development team undertook historical research during game development, which they divided into two categories, those being:

- <u>Database/Setup Research,</u> which relates to game mechanics (such as content about religion) and pop-up boxes about history; and

- <u>Background/Content Research,</u> which entails the initial historical condition of the game and the variables of each province or nation.

These two categories are the typical points where modders will mod the game, unless modders intend to develop completely new in-game mechanics (Loban & Apperley, 2019). As modders often create mods to "correct" perceived inaccuracies, conducting thorough research is of considerable importance and will be discussed in more detail later in the chapter. The *EUIV* online forum survey data (235/331 or 73.67%) showed the internet has the most readily available and accessible information that can be used by players, but that books and documentaries were also useful (35/331 or 10.97%), showing the scope of resources consulted. In the case of the *IPO* mod created by the researcher, oral accounts from family and other members of the Torres Strait Islander community were an important source of information used to develop new content. The researcher found this provided unique insights into different histories and cultures that were not otherwise available, which could be used to confirm information derived from other sources, or to provide an important variation of history that diverged from these sources.

After gaining familiarity with the necessary tools, the modder inserts the historical and cultural information into the game that they have obtained during the course of their research. Inserting this new content into *EUIV* can occur in several ways, the simplest method being through creating pop-up boxes or other text-based aspects of the game such as Dynamic Historical Events or national ideas (Loban & Apperley, 2019). These short pieces

of text convey valuable information about the new perspective on history being created; for instance, pop-up boxes might outline significant events in certain renderings of history, and are usually accompanied by choices players can make that lead to positive or negative modifiers (Loban & Apperley, 2019). The creation of content in the IPO mod was directed at challenging the Eurocentric nature of *EUIV*, with the researcher intent on creating playable Indigenous Oceanic nations in places where the game depicted areas without any information or significance to the game. To ensure a comparable level of detail to existing playable nations, a significant volume of research was required to fully depict Indigenous nations and their histories. These details included national flags, images, national ideas, provincial information and extra mechanics, as shown in *Figure 9.1*.

Figure 9.1. The Tombstone Opening is one of many ideas (in-game bonuses) unique to the Torres Strait Islander nation of Mabuiag.

Other significants elements of modding include game design and computational thinking. In modding, information about a nation must be integrated within a digital framework (Barr & Stephenson, 2011; Wing, 2008). This does not only require the modder to engage in scripting, file system operations and necessary digital competencies, but involves taking abstract ideas, historical events and other intangible concepts and quantifying them into a gamified form. From the researcher's perspective, this process includes a number of steps that could likely be incorporated into educational settings, those being:

1. Identifying historical ideas and interests: The educator or student identifies a historical topic for mod creation based on the curriculum or their own interest. The educator should consider the time investment and mod viability given the constraints of the game's coding structure.

2. Research and information collection: The student undertakes research on their topic. They must seek and evaluate different resources to acquire relevant information, including books, videos, websites or even their own experiences.

3. Historical analysis and evaluation: The student collates, analyses and synthesises the collected information to produce their own historical analysis. The student might store a written analysis in a Microsoft Word document for later insertion into the game.

4. Translating analysis into game content: The student inserts their historical analysis into *EUIV*, creating new game content. The in-game representation of the student's analysis could vary from graphical changes to written analysis to more interactive mechanics. Most mods require some written analysis as well as different modifiers that feed into the game systems. The student needs to consider how their more abstract analysis will translate into a gamified form. Educators and students must understand the file structure of *EUIV* to know where to insert the historical

information as well as the different elements of a mod event (trigger, option, description). The mod event structures were previously discussed in Chapters 3 and 6.

5. <u>Quality assurance and tweaks:</u> Once implemented in *EUIV*, the student can begin the process of refining the mod and correcting any glitches in the game content. Following refinement, the modder may return to stage 1 and expand their mod by adding new content.

Figure 9.2 highlights the process of modding *EUIV* where the modder conceives a mod idea, researches the topic, formulates a historical analysis, translates this analysis into gamified content and then further tweaks their mod. The modder may continue to expand the features of the mod, consistently building upon and improving it. The modding process will vary from mod to mod, but there will be similarities between them, each of which is based on these elements.
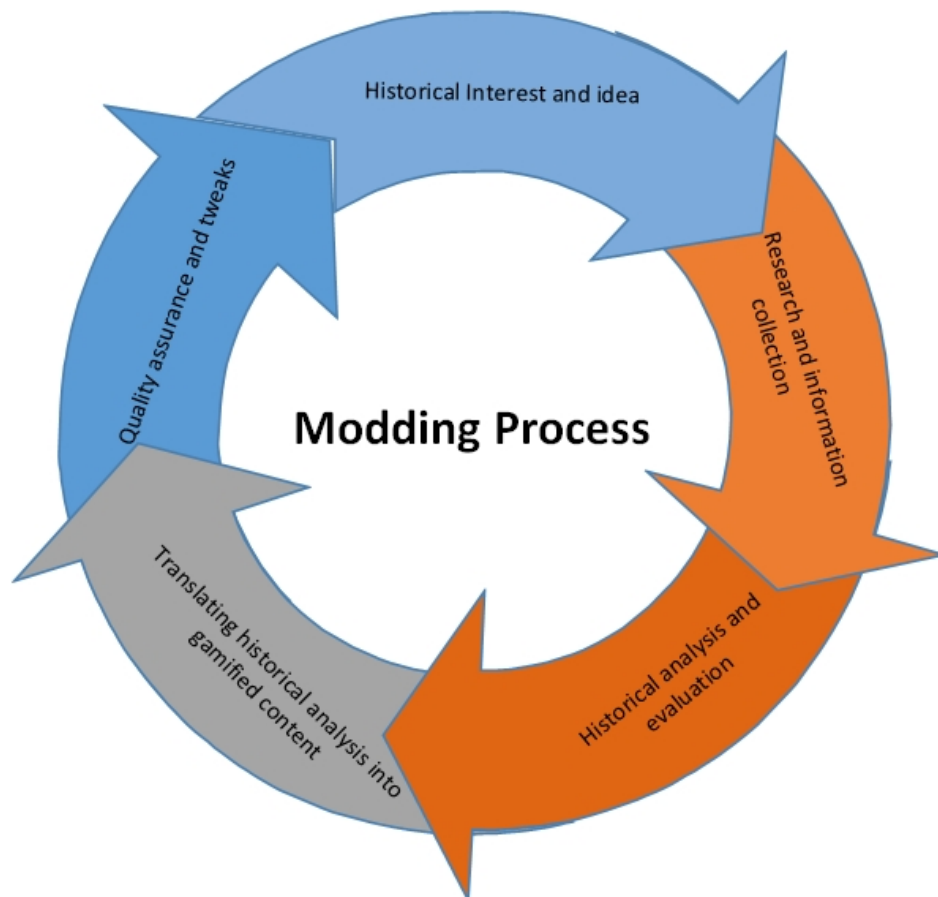
Figure 9.2. The process for creating historically-based *EUIV* mods.

The *IPO* mod involved modding techniques used to create new technology groups that reflected the different lifestyles (land-based or seafaring) of the Oceanic peoples (Loban & Apperley, 2019). Additionally, several unrepresented Indigenous Pacific nations were inserted into the game, including Mabuiag, Fiji, Hawai'i, Ngāi Tahu, Asaro and Gubbi Gubbi, to name but a few. Each nation (or nation group) had their own ideas, related in-game bonuses and information about the history of the nations and their religions. A comparison between the original *EUIV* map and the IPO mod map shows the inclusion of several cultural groups in the Pacific region (*Figure 9.3* and *9.4*). The mod is far from perfect, but nonetheless provides an Indigenous perspective on the region's history that is not otherwise available in *EUIV*.

Figure 9.3. EUIV original map showing Oceania as empty, undeveloped land.

Figure 9.4. The *IPO* mod map showing a region populated by Indigenous Oceanic nations that are now playable.

Using aesthetics, gameplay, written text and historical narratives, some strategy games, including *EUIV* to some extent, have attempted to portray Indigenous people as autonomous with rich cultural heritages. The diversification of this game content was achieved through the use of targeted downloadable content that add playable Native American Nations (Paradox Development Studio, 2013b, 2017), which provided finer grained detail on regional Indigenous cultures. The mod content diversification provided the basis for players to create their own game content, showing the potential for modding to be used as an expressive tool by Indigenous people to portray their own perspectives of history (Cosmosis7, 2016). However, unlike developing a game from its inception, crucial problems may arise when attempting to mod Indigenous nations and histories due to the Western concepts that pervade the game. As discussed in Chapter 7, states, empires and colonialism are central to the design, mechanics and code of *EUIV*, and modding *EUIV* to include Indigenous perspectives meant Indigenous peoples must embody and act out the very concepts and practices used by European colonial powers to remove them from their land. As

Dillon (2008, pp. 132) and Mukherjee (2017, p. 96) point out, although the game can be played from the perspective of marginalised peoples, these playable Indigenous nations must still fit into a Westernised framework, showing the limitations of incorporating Indigenous perspectives fully into the mod. In terms of educational implications, this means that mods need to conform to the deeper level themes of the game even while altering the content to reflect a new perspective. This is not just an issue related to the creation of mods that represent Indigenous history, but applies to any modded history that diverges from the core historical foundations of *EUIV*. Although this restriction is a considerable drawback for modding marginalised histories and nations, there is still educational value to the modding practice, which will be the focus of the next section.

9.4 Learning History through Mods and Modding

Previous research into modding has found it to be a useful tool for largely teaching and learning information technology (IT), but also history. In one particular case, researchers used modding to teach IT proficiencies to female students in middle to high school (Yucel et al., 2006, p. 154). It was found that modding helped improve the students' motivation and self-efficiency with computers and improved their IT skills. A similar case study found modding promoted learning about programming, geometry, modelling, animation and even architectural design (El-Nasr & Smith, 2006, pp. 18-19). These learning outcomes were shaped by the skills and knowledge that was required to design the game mod. Research by Squire (2011) also found students learnt about history through modding and will be discussed further in the chapter. The findings from the *EUIV* online forum survey and university case study similarly explored how learning took place through modding by focusing on acquiring historical knowledge rather than the technical and programming skills. The survey data revealed that forum members thought modding facilitated learning, with participants (n59) explaining how they had learned about history, geography or other subjects through the

process of modding and the research undertaken to produce the new content. As one

participant commented: "Research done towards mod content led to an enriched

understanding of a historical topic". Another survey participant stated: "I had to read

references to create the text, and the context for the triggers", while another participant

revealed that modding "encouraged significant delving into the history of large swathes of the

world, and more importantly, why history happened how it did". These comments suggest

that creating or playing mods requires a degree of balanced and thoughtful understanding of

the researched topic, and that undertaking thorough research was an important or even

essential step in the modding process.

Two survey participants who started creating mods ultimately found modding

required substantial work and therefore discontinued the process. Nonetheless, these

participants still commented that modding provided a worthwhile experience for learning

about history. As one survey participant stated: "I spent a while reading about historical

events that I thought I could add to the game. The mod didn't work but the reading and

learning was fun". One survey participant similarly said they "tried to make a Friesian mod",

but learnt that Friesian history was "so complex" that they abandoned the project. In cases

where the mod was discontinued or did not function, survey participants evidently still learnt

about history, relating findings to those by Anderson, Dalsen, Kumar, Berland, and

Steinkuehler (2018) who found that initial failures in-game still resulted in considerable

learning gains for the player, outcomes they called "productive failures".

Modding also helped survey participants understand and gain knowledge of specific

histories of the world, and often those less well understood from a Western perspective.

Several survey participants mentioned modding had encouraged them to research and reflect

on very specific and local histories. As one survey participant stated: "I tried making a mod

for ancient China, and did extensive research on the provincial system of the Three

Kingdoms period". Another survey participant commented that creating a mod on India "has been my motivation for purchasing a number of books on Indian history from university publishers". An additional survey participant revealed:

> I've done a couple of private mods that enhance the Native American aspect of the game. I made it to where all tribes slowly grow on their own, and where there was no colonisation from tribes until a certain point in the game. I didn't like how whenever I played an American Tribe, the gameplay was based completely on colonising as much as I could, as fast as possible.

These participants' mods were evidently limited by the broader framework of imperialism and colonial logic of *EUIV*, but despite this Eurocentric focus, participants evidently found there was nonetheless an opportunity to discover marginalised histories, ideas and facts that would have been otherwise unknown to them. Squire's research (2011, pp. 177-178) reported a similar finding, whereby participants learnt about different nations and history through creating their own mod. It was evident from the forum survey data that this kind of discovery was also possible in a historical period such as the Roman era, which is outside the Early Modern era represented in *EUIV*. The following quote, first presented in Chapter 5, is relevant again here:

> When modding I've come across information I mightn't have read otherwise. I feel that in many cases some regions seem to have little attention given to them. Like how for many, when they think of Italy in an historical context, think of the Romans, many wouldn't know of cultures like the Gauls of Northern Italy or the Etruscans of Etruria. The first stage of making a mod for a strategy game based in history is research. I've learnt many new facts and discovered new information in researching for my mods I've made, or are making.

This participant's response shows their awareness of the marginalised status of certain historical groups, but also that they were able, through the modding process, to discover and learn about these marginalised histories. Together these examples show that through modding participants were able to create new game content that reflected the contributions to their knowledge obtained through undertaking research, which participants evidently found to be a worthwhile learning exercise.

There were similar findings in the case study, which also showed participants learnt about history through the technical aspects of the *EUIV* mod design process. For example, Anna, a 24-year-old Computer Science student, chose to focus her mod on a pivotal event in the Spanish conquest of Mexico (*Figure 9.5*). Anna's mod event was the death of the Aztec King Moctezuma II and the ensuing repercussions. The mod also detailed the Spanish retreat from Tenochtitlan and the relatively significant losses of Spanish soldiers. The event was known as "La Noche Triste" (The Night of Sorrows) by the Spanish. Anna's mod demonstrates the level of research and thought necessary for creating the historical event in-game, which included the detailed information she needed to acquire before converting the content into the *EUIV* file format and script code.

Anna's mod

Trigger:

Death of Aztec king Moctezuma II

Options:

Retreat to Tlaxcala!

Description:

On the night of June 30th 1520, the Spanish conquistadors decided to escape from Technotitlan following the death of the Aztec king Moctezuma II, whom they had been holding hostage. But before they could reach the exit of the Aztec city they were spotted by angered locals, who rallied their warriors to attack. A violent battle ensued and the Spaniards, being outnumbered by the Mexica army, lost a great number of their own soldiers (more than 500 men - made up of both Spanish and Aztec allies). A lot of their resources were also lost such as food, gunpowder and treasure. The Spaniards referred to this night as "la noche triste", which translated to 'the night of sorrows'.

Figure 9.5. Anna's mod relays the narrative of "La Noche Triste", the significant defeat of the Spanish at the hands of the Aztecs.

Anna's mod cites certain important information: a date, a specific location, an important character, the nations involved in the event, the size of armies, the goods lost in the conflict and the name of the event. To create a mod with this kind of historical detail, Anna needed to conduct in-depth research on the event, which consequently led to her learning about history through mod construction. Collectively, the survey, case study and the researcher's IPO mod show that mods are beneficial for learning history because the modding process necessitates research and thus prompted participants to find, read and reference history. It was revealed the modding process was useful for learning about Western and non-Western histories and that it was a useful learning exercise for history even when mods were not completed. There is therefore evidence that the educational importance of modding may

be more about the historical research than the creation of the mod itself, even though the two were intertwined in the modding process in *EUIV*.

9.5 Importance of Historical Research

Despite the tendency towards creating counterfactuals in *EUIV*, the survey participants still believed in the importance of rigorous historical research. Several mentioned that more research and historical authenticity resulted in a better mod, with one survey participant stating: "I'm an author of a major *EUIV* mod and I consider the historical accuracy of the mod to be of utmost importance. While researching for the mod I have learned a great deal about history". This participant and those with similar views saw research as an important part of the mod creation process, and they appeared to view the process of developing an accurate and authentic history as a valuable skill. The research they conducted, included locating and evaluating historical sources, and producing a historical analysis. This process evidently required a very similar skillset to that used in assessment tasks in the educational domain. The development of these research and analytical skills by the modding participants highlights the educational potential of the gaming practice.

One participant made an interesting comment about the importance of historical research to more accurately depict marginalised nations and cultures. While believing they were not "learning anything new", the participant also explained that they "changed some things about a region poorly represented back then", that being South America. Arguably, despite thinking they did not learn from the process, it is clear that some level of historical learning must have occurred considering the participant's ability to reshape this aspect of history. By correcting perceived inaccuracies in the history portrayed in *EUIV*, the participant engaged in a valuable and meaningful activity to provide another perspective on history. In Chapman's (2016) examination of modding culture for games such as *Rome Total War II* and

Battlefield 2, he indicates modders were motivated to correct history through modding as they were dissatisfied with the current content (pp. 38-39).

Indeed, historical authenticity and research forms a highly important part of modding with one survey participant noting that if a mod was not well-researched, other players in the community would point out the mod's inaccuracies and misinformation: "You have to do research, otherwise people come and point it out at the mod's page". In this instance, social pressures, expectations and exchanges within the broader gaming community remind contributors to be more vigilant in the quality of the historical content of their mod. Hence, mods do not exist in isolation, but form part of the processes of shared content creation and community engagement. In this way, there is a wider community ready to offer critiques and support to improve the historical experience and value of the game for both modders and players.

9.5.1 Playing with Mods

From the *EUIV* online forum survey it was evident that playing other people's mods formed a significant part of the modding culture and community. Survey participants stated that because mods are more accurate and informative than "vanilla" (unmodded) *EUIV*, they provide authentic simulations and a better gaming experience. As one participant explained, they especially liked the *MEIOU and Taxes* mod "because it encourages historically plausible outcomes (unlike vanilla *EUIV*)", while another stated that the same mod "is far better at simulating history". *MEIOU & Taxes* is a popular *EUIV* mod with a 5/5 star rating and over 27,278 Steam downloads (Steam, 2018). The mod originated in *EUIII* and was created out of a merger between the *MEIOU (Mihi est imperare orbi universe)* mod and *Death & Taxes* mod (*EUIV* Wiki). Features of *MEIOU & Taxes* include a new and vast historical map, an expanded timeline, new trade and religious systems, a rework of graphics and a new musical score, all created specifically for the mod. Sub-mods added to *MEIOU & Taxes* include

regional overhauls and technical changes that allow players to use different keyboard shortcuts. For these participants, it was evident that *MEIOU & Taxes* added an additional layer of historical complexity and authenticity that met participants' expectations of what history should look like, meaning they could more meaningfully engage with the game's content.

Other survey participants found mods historically informative when they added content about nations and histories that was not otherwise included in the game. Participants often mentioned mods that extended or changed the official *EUIV* timeline by adding new information about events that occurred outside the timeline, including additional game features which, for some participants, made the game feel more historically authentic. As one survey participant commented: "The *Veritas et Fortitudo* mod expanded the timeline, pointing out some historical spots I was not acquainted with before". Another stated:

> There are mods that take the game's starting dates to earlier and/or later dates than what the base game would allow. Without these mods, I likely wouldn't have even known some of those nations existed and likely wouldn't have searched the internet about them.

In other instances, participants who played mods commented on how they learnt about more detailed geography and region-specific histories through the process. For example, one survey participant recounted: "I used different mods that changed the map, so I learned more details of the geography", while another explained: "I played several region-specific mods that added more events and mechanics, and through these I would search up to know more about them". These map-based learnings are consistent with the findings in Chapter 7, where participants learnt geography through play with the unmodified game. Similarly, mods seemed to spark further historical interest for participants, prompting them to undertake research, creating a cyclical effect of historical interest, research and play. As such, many

participants indicated that because they were more historically informative, mods were more interesting and engaging to play than the unmodified version of the game. It was evident the dynamics between mod creation and play raised the quality of the mods' historical content overall, leading to different learning outcomes that may have implications for the use of mods in educational contexts. There may be a number of different opportunities for players and modders to explore a variety of subject matter and to utilise modding to express different historical perspectives and understandings, as will be discussed in the next section.

9.6 Versatility of Learning through Modding

Analysis of the research data in both the survey and case study showed modding helped participants to learn about history from different perspectives and often in unexpected ways, revealing the versatility of the practice and the scope of its potential learning outcomes. Different participants expressed quite varied examples of this. For instance, one survey participant modded the game in an effort to balance the gameplay. However, he discovered though modding that nations had different modifiers to represent historical understandings. As discussed in Chapter 4, modifiers are typically linked to historical information; for instance, a nation may be famed for their army discipline, naval superiority or economic savviness, all of which are represented as modifiers that affect gameplay as that nation. Through modding, the participant learnt about the history which these modifiers represented and ultimately the reason for the game's design choices.

A similar modding project prompted one survey participant to research the names of historical places in other languages, stating the process "taught me a lot". These learnings are comparable to those found in Chapter 7, whereby a participant learnt about different regions and the historical reasons for the names of those regions. On this occasion, the participant encountered interesting linguistic or language learning opportunities through modding. Another interesting learning opportunity occurred when a survey participant realised while

modding the game and conducting research that his preconceived theories about history were incorrect:

> You can't create an event chain emulating historical development without conducting proper research before. Often I find that my previous theory on the reasons why such and such events occurred is only partially true, or sometimes outright false.

Through the modding process, the participant evidently gained a different, more informed insight into the causes of historical events.

The examples above show that when modders expand upon information contained in the game, or alter or improve certain historical depictions, that mods can be used to confirm what modders and players already know about history, expand their knowledge on a variety of topics, or even challenge their misconceptions. It was clear the participants in the study did not use any one approach to discover, research and learn history through modding, but engaged in a number of different related processes, each appeared to have educational value and encourage historical learnings. Some of the ways in which the participants achieved this will be discussed in the following sections.

9.6.1 Counterfactual Mods and Scenarios to Learn about History

The survey results showed that while many participants were concerned with historical accuracy in mods, some participants who modded *EUIV* intentionally created counterfactuals. Previous research has found similar counterfactual engagement using mods (Apperley, 2013), while other research has indicated mods were used primarily as a means to create a more historically authentic game (Chapman, 2016, pp. 38-39). It was however evident that despite their counterfactual nature, the mods still helped the thesis participants to learn about factual history. Each mod had its own specific historical focus upon which the counterfactual was built, and required research into different historical elements. One survey participant wanted to develop a counterfactual mod where the Carthaginian Empire, from the

Roman era, was a formable nation within the game, that is, playable after certain achievements were met. The Early Modern era of *EUIV*'s timeframe and the Roman Era are thousands of years apart; however, developing this ahistorical mod required the modder to research a significant body of information on the Carthaginian Empire to then be applied to the mod. Through modding this counterfactual, the participant thereby learnt about an entire area of history not covered by the unmodified game.

In another similar example, a participant learnt about the heralds of the nation Aragon (a historical nation located on the Iberian Peninsula) while creating a counterfactual mod. As they explained:

> I'm not modding *EUIV* for historical accuracy. Rather, I am modding *EUIV* for alt-historical accuracy. That is, if Aragon formed Spain, the flag should be different. So I researched a bit about heraldry and produced an alternative flag for Spain. So it's still related to history, but from a very different angle.

Another participant learnt about the distribution of different demographics in the world by creating a counterfactual mod: "I was modding an alternative history scenario, and in so doing I familiarised myself with historical maps. It was useful for learning about historic distributions of ethnicities, religions, etc". In yet another case, a participant learnt about cultural titles and names while developing a fantasy mod: "I made a fantasy nation but rooted in history, so I had to look up traditional names and titles from the culture it was based on". These examples clearly show that even modding counterfactuals are valuable for developing an understanding of factual history.

A similar finding emerged from the case study. Henry, a 31-year-old political science PhD student, created a branching event mod with a counterfactual option about the interaction between the Aztecs and the Spanish, previously discussed in Chapter 3 and *Figure 6.15* and displayed again here at *Figure 9.6* for the purpose of further discussion.

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Henry's mod

Trigger:

Spanish discovering Tenochtitlan and after May 4 1519

Options:

- Let the practice continue - Become friendly with Aztecs (vassal), receive gold, penalty with Catholic nations (--piety)

- Stop the practice - Declare war on Aztecs (casus belli colonialism), friendly with Catholic nations (++piety)

Description:

A Clash of Cultures

When the Spanish met the Aztecs in 1519, they were confronted by the Aztec practice of human sacrifice. In Aztec religion, the gods had sacrificed themselves in order to give life to humanity. Nanauatl gave himself to become the sun, while the other gods sacrificed themselves to form the wind that moved the sun in the sky. In turn, humans gave their blood to repay and sustain the gods as they kept the sun moving. The sacrifice to the gods was an important part of Aztec culture - the temple called Hueyi Teocalli, dedicated to two gods, Huitzilopochtli, god of war, and Tlaloc, god of rain and agriculture, occupied a large part of the Sacred Precinct in the capital Tenochtitlan.

Hernan Cortes, leader of the Spanish expedition to what was termed the New World, was appalled at the custom, and saw the practice of human sacrifice as abhorrent. Arguably, this was one of the factors that led to the conflict between the Spanish and the Aztecs, and formed a powerful justification for the Spanish Conquest. Further, surrounding Mesoamerican city-states, like Tlaxcala, whom had a number of its people sacrificed in the aftermath of wars with Tenochtitlan, allied with the Spanish against the Aztecs.

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Figure 9.6. Henry's mod illustrates a well-researched piece of analysis that allows the player to choose the factual historical outcome or a historically informed counterfactual.

Henry's mod encapsulates many of the themes and influences of the Aztec-Spanish conflict, even as a counterfactual. For example, the options to either stop the Aztecs from

conducting human sacrifice (an apparent Aztec religious custom) or allowing the practice to continue have different modifiers and bonuses attached to each choice. Allowing the religious practice to continue, which is the counterfactual choice, negatively affects the relationship between the Spanish and Christian nations and thus lowers piety, while stopping the practice will create conflict with the Aztecs. This type of gamified process around decision-making embodies the religious and cultural climate of the time, in which spreading the word of God and Christian values and beliefs were core to the Spanish expedition. If the player chooses the traditional historical option, the player gets a *casus belli* (war justification) of colonialism, allowing the player to declare war and take land without any significant penalty. Henry's mod also details the reasons for Aztec religious sacrifice and the Aztec's perceived importance of their rituals. These pieces of information provide insight into the causes and ideas behind historical events and cultures, rather than acting simply as a recount of the event itself. Interestingly, there is an eerie similarity between the sacrifice of Christ and that of the Aztec Gods for humanity; however, the concept of sacrifice was understood differently between the cultures. Hence, as the title of Henry's mod suggests, these cultural differences created a "Clash of Cultures".

Henry's mod shows a measured analysis and expression of the Aztec-Spanish conflict and some of the religious and cultural differences that led to the event occurring. Written in similar prose to an essay, Henry's description of his mod articulates the influencing factors and their eventual outcome as a historical event that is playable in-game. The mod encapsulates a slice of history while also alluding to a much larger historical theme and the underlying factors that led not only to the conflict itself but to the entire relationship between the Spanish and the Aztecs.

The example of Henry's mod shows that a counterfactual (in this case, the Spanish allowing Aztec human sacrifice to continue), while factually incorrect, is still grounded in a

plausible historical context. The player who lets the practice of human sacrifice continue suffers negative consequences in the form of in-game modifiers, which in many ways reflect the fervour of the Spanish about spreading the word of God. Letting the practice continue goes against those principles, and are therefore reinterpreted as negative modifiers in-game. Hence, this counterfactual option still communicates valuable underlying themes and influences of the era and the climate of the time. This proposition is consistent with Chapman's (2016, p. 256) view of counterfactuals and the findings in Chapter 8 of this thesis, and shows that while counterfactual mods usually change a specific historical event, they ground it in a simulation of authenticity.

9.6.2 A Counterfactual Mod as a Rejection of Empire Building

Modding exercise participant Ethan, a 27-year-old Education student, took an alternative approach to modding *EUIV* to Henry. He constructed his outcomes into a mission format (another game mechanic whereby the player completes certain objectives to receive a reward), as shown in *Figure 6.16* and here in *Figure 9.7*. Technically, the code did not work because it did not fit into the game's data structures. However, in his unique perspective, Ethan rejected the idea of a rigid win or lose scenario, and showed a more constructive and peaceful view of history. In his post-modding interview, Ethan commented that he discovered the "dark side" of history while conducting research for his mod. In response, he tried to create a mission-based mod where the player could have colonised Cuba and expanded into Central and South American territories unknown to the Spanish. As *Figure 9.7* shows, the mission suggests locals and natives are those best placed to help the Spanish, and aims to encourage the player to pursue a peaceful means of expansion into the New World. The mod rewards the player for establishing trade relations with Native American nations or grants greater rewards to the player for securing alliances with nations in the region. Failure to do

either of these actions results in hostile relations developing with Indigenous nations, and the lowest scores result in all-out war with Indigenous nations.

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Ethan's mod

Trigger:

Discovering new nation after colonising Cuba in Mexico/south America

Options:

Mission

Score 60-74: Gain Trade, Establish new Trade Node, regular tribute

Score 75-100: Solidify alliance (no decay) increased trade/tribute (+20%) regional stability+ political stability + Diplomatic resource. Conversion does not impact public stability. Tolerance does not impact public stability

Mission Failure

50-59: Nation takes hostile stance against you, and is more likely to join alliances opposing you.

0-49: Nation declares war on you.

Description:

Winning Hearts and Minds

In an unfamiliar and hostile land, who better to guide your expedition than the locals? The lay of the land is hidden in dark yet beautiful forests that conceal bountiful treasures of wealth, resources and intangible value if you know where to look. Developing a relationship with the locals might just help you to uncover these secrets, least of all, the fabled land of gold.

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Figure 9.7. Ethan's mod encourages the player to focus on peaceful interactions and expansion in the New World, and punishes aggressive player behaviour.

Ethan's mission mod touches on the importance of trade and the quest for gold in Central America as the main reasons for European expansion. In this sense, it reflects well-

known themes in history. However, Ethan's emphasis on prosperous relations with Indigenous nations and expansion through peaceful means is a refreshing take and a creative alternative to the typical colonial gameplay of *EUIV*. The mod attempts to work in complete opposition to the Eurocentric, imperialist mechanics that often drive and direct the gameplay in *EUIV* and in various strategy games (Dillon, 2008; Mukherjee, 2017). The mod is a prime example of Bogost's (2007, pp. 28-29) notion of procedural rhetoric, whereby Ethan used the modding process to create a scenario which influences the player to play in a certain way that reflects a specific ideology. Consequently, through his mod, Ethan created a counterfactual history that conveys his own critique of events and ideas, shaping and redeveloping content to work in opposition to the game's underlying themes and mechanics. In this unique way, Ethan was able to share his own perspective while also gaining significant historical knowledge in the process.

9.6.3 Modding Personal Interests and Expertise into the Game

In another case, one participant used his knowledge from his discipline of study and personal interests to inform the creation of his mod. Paul, a 25-year-old Medical student, was also tasked with creating a mod about the Spanish conquest of Mexico. Paul drew upon his medical expertise and interest in diseases to create a mod about the spread of disease that coincided with the Spanish invasion. He even listed the symptoms of smallpox in true medical fashion, as shown in *Figure 9.8*. Paul's mod highlights the flexibility of modding and again shows how modding practices can facilitate learning about histories from multiple perspectives. This type of approach could allow for a more personalised, meaningful and interesting learning experiences for any player.

Paul's mod

Trigger:

Spanish forces annex Tenochtitlan (Aztec Empire)

Options:

Doomed by fate

Description:

Smallpox strikes the Aztecs

After the massacre at Tenochtitlan, the Aztecs cleaned the temple courtyards and again celebrated their fiestas in the traditional way. But by the end of September 1520, people started to die of a mysterious and alien illness that had horrifying symptoms of "racking coughs and painful burning sores." The pestilence, smallpox, spread soon crossed the causeways into Tenochtitlán. It lasted 70 days, until late November, and killed a vast number of people.

Doomed by fate

Figure 9.8. Paul's mod reflects his medical interest and expertise as he focuses on the European diseases brought to the Americas, citing the symptoms of smallpox in true medical fashion.

In Squire's research (2011, pp. 177-178), students who played *Civillisation III* became experts in areas of the game and history. In contrast, in this study Paul brought his own subject matter expertise into the game to influence and enhance his mod. Paul's expression of history reflects the false dichotomy that arguably occurs in educational contexts between what we need to learn and what we would like to learn. In terms of educational outcomes, Paul's mod shows us that modding might be a way for students to gain knowledge about a particular subject area through the expression of their own interest. Thiel (2018) also points out how the creativity of games mods allows players to radically transform game

settings into entirely new ones. For example, modders transformed the bloody first-person shooter, *Unreal Tournament* (Epic Games and Digital Extremes, 1999) into a dance-floor arena. In terms of education, this means even games that seem to offer only a small slice of history could be modded to communicate a vast number of historical perspectives, with modders shaping the game to best represent their historical knowledge. Rather than choosing what students are to learn, educators who use modding to teach history might grant their students creative licence to allow them to engage with subject matter in which they are interested, with creative and educational results.

9.6.4 Revaluating History

Nathan, an 18-year-old Media student, also chose to focus on disease, this time the smallpox, measles and mumps brought by the Europeans to the Native Americans, causing them great harm (*Figure 9.9*). Interestingly, Nathan described the spread of disease as an intentional event rather than an accidental one. The predominant historical perspective describes the spread of disease among the Aztecs as having been accidental (Campbell, 2008a, p. 5), although such diseases were later weaponised against other native peoples in history (Lane & Summer, 2009, pp. 155-156). Nathan's mod shows how he combined his understanding or interpretation of the circumstances around the devastation caused by disease while also touching on the wealth of the Aztecs and the role it played in the resulting historical event. He also describes the Aztec origin story in some detail.

Nathan's mod

Trigger:

Player is Castile or Spain and he/she has discovered the Aztec nation.

Options:

Take their gold and infect them with small pox!

-3000 manpower from the Aztecs, add 10 prestige, Spain receives 10000 in Ducats, the Aztec leader dies.

Description:

You Have Discovered The Aztecs

Hernan Cortez has discovered the Aztecs, who probably originated as a nomadic tribe in northern Mexico, arrived in Mesoamerica around the beginning of the 13th century. From their magnificent capital city, Tenochtitlan, the Aztecs emerged as the dominant force in central Mexico. Their lands are plentiful of gold and their people have not been exposed to any European diseases like small pox, measels[sic] or mumps. Biological warfare would surely destroy them, leaving their gold all to us.

Figure 9.9. Nathan's mod illustrates a contemporary analysis of the event whereby the Spanish weaponised the diseases they brought to the New World, as opposed to the traditional narrative of the diseases accidently decimating the Aztec people.

Nathan's assessment and portrayal of history, while not in-keeping with the dominant perspective of accounts of the Aztec-Spanish conflict, nonetheless reflect the major themes of the event and also the imperialistic elements of *EUIV* gameplay. Through his mod, Nathan thereby critically evaluated the historic events and developed a narrative based on his own contemporary analysis and interpretation of historical facts. In doing so, Nathan created his own version or analysis of history, much like any other historian might do. This finding shows that students of history who learn through modding may engage in analytical processes

in which they constantly revaluate history in the light of new information and ideas and their own interpretation of them.

9.6.5 History and the Present

Although many of the case study participants chose to focus on larger historical events or narratives associated with the Aztec-Spanish conflict, one student developed her mod based on one specific individual. Beth, a 26-year-old Food Science student, focused on Malintzin, also known as La Malinche, a translator and advisor for the Spanish, and mistress to Hernán Cortés (*Figure 9.10*). Malintzin played a pivotal role in Spanish and Aztec interactions and some Spanish soldiers held her in high esteem. However, the Aztecs and the Indigenous people of Mexico saw Malintzin as a traitor who chose the Spanish over her own people. Beth included a modern-day understanding of the role Malintzin played in the conflict in her mod, noting the use of the term "Malinchista" in Mexican culture, and showing a sophisticated understanding of history by linking past events to modern day connotations. A Malinchista is a derogatory term which refers to a person who prefers foreign goods or culture over their own nation's goods or culture, a term which derives from Malinche's supposed betrayal. By tracing the history of the contemporary Mexican insult back to the Aztec-Spanish conflict, Beth's mod helps the player to understand the history of Mexico, which has been subject to foreign invasion and colonial settlement. The mod also relates this history to a modern-day context, showing how the influx of foreign goods into Mexico had economic and societal implications for the country. Additionally, Beth's mod highlights how language often carries historical meaning. This type of historical analysis evidently helped Beth to recall the past and apply it to the present day context, showing how important historical events have shaped modern world views.

Beth's mod

Trigger:

Player is Castile or Spain and the year is not before 1519.

Options:

500 Admin points, 50 prestige and option to hire Malintzin as an advisor.

Description:

Malintzin

Malintzin, a woman of intelligence and grace, would prove to be invaluable in Cortés' mission to colonize Mexico. Abandoned by her family in the Maya, and given away to people in Xicalango, she is well versed in the languages of both Mayan and Nahuatl. She was able to communicate with the Spaniards via a priest by the name of Geronimo de Aguilar. Aguilar picked up Mayan from when he was in captivity for a period of time in the area. In modern Mexican Spanish, Malinchista (from La Malinche, another name for Malintzin) is used as an insult for people who prefer foreign goods, alluding to how she betrayed her own people for the benefit of the Spaniards.

Figure 9.10. Beth's mod focuses on the historical figure, Malintzin, who played a pivotal role in the Aztec-Spanish conflict.

9.6.6 Modding as a New Form of GBL and Expression

As this section has shown, while participants were all assigned the same modding task, there were differences in their historical focuses and perceptions, as well as in the ways they implemented their mods. The mods reflected specific events in the Aztec-Spanish conflict while also describing the overarching historical narrative, and participants depicted events and individuals and their influence on contemporary society based on their own interests. They integrated their experiences and knowledge into their mods while also using them to reshape history and present their own perspectives and ideologies. While each participant took a different historical view and created a different mod, each was based on the main themes of the Early Modern era, the colonisation of the New World and the conflict

between the Spanish and the Aztecs. Although the task and general topic was the same for all participants, similar to typical written assessment tasks, the critical analysis and creative outputs were widely different, yet equally valid. The versatility of the participants' approaches indicates there may be potential to implement mods as a form of expression and learning, similar to how video games have been used more generally for educational purposes (Loh & Byun, 2009, p. 422; Squire, 2011). Modding is a design-orientated form of learning that allows players to represent history through game processes, mechanics and visuals rather than with just words. As such, modding may for some students be an easier and more appealing way of learning and, most importantly, expressing that learning than traditional written forms of textbooks and assessment. Furthermore, when players are modding they need to enter a mindset, much like researching for an essay, in order to construct a narrative to communicate to the person playing the mod. The narrative will include elements of historical cause and effect, various historical factors (political, economic, social, etc), and a number of historical themes. However, in addition to essay research type skills, modders can represent historical narratives in games in a larger variety of ways such as through different game mechanics, character interactions, objectives of the player, game processes, rewards, player strategies, etc. Moreover, games also have the added element of physical historical representations from clothing to architecture, something which is hard to communicate through written works. These different forms of game representation provide the player with a large suite of tools he/she can use to creatively represent history compared to a written text. Moreover, the modding process may allow research and analysis of historical information (e.g. architecture, cloths, weapons, foods) that would also be hard to research and communicate through written text.

The educational value of mods is twofold. First, the process of modding provides a different avenue for experiential learning, whereby a student developing a mod learns about

certain elements of history. The modding process, similar to other forms of GBL, exhibits many of the principles of deep learning (Houghton, 2004, pp. 9-11; Ramsden, 2003, pp. 42-43), such as active interactions, linking knowledge together, linking knowledge to real life, looking for meaning in content, etc. Moshirnia (2007) also notes that when users mod they are engaging in higher-order thinking skills as they analyse, synthesize, evaluate and revise an existing game. These processes are involved in deep learning which requires critical engagement, analysis and other higher-order thinking attributes.

The mods in this research clearly exhibited sophisticated and critical understandings of the history they portrayed. Second, mods provide an avenue for expressing critical historical analysis. It was evident all participants understood the major historical concepts and themes of the Aztec-Spanish conflict while also producing mods from completely different perspectives and with different implications for gameplay. The case study mods showed genuine historical and educational value as the perspectives expressed through them demonstrated the participants were evaluating established historical themes as well as historical content beyond the parameters of dominant historical narratives. Consequently, modding provided participants with considerable flexibility to express critical and creative thinking around the given topic. Moreover, as in the *EUIV* community, modders in an educational setting would be able to share their mod with others, further building upon it based on critiques or play-testing, and could ultimately have their mod assessed by the GBL educator. Student modding as an educational tool could therefore operate within a collaborative GBL community that promotes a highly social and engaging approach to a seemingly solitary practice.

The model depicted in *Figure 9.11* shows how these versatile modes of learning are related to the other ways *EUIV* may be used within historical pedagogy. Educators could capitalise on the deep interest students might have in history and in gaming, as well as on the

game's potential to foster informal ways of learning history within the gaming community, especially through the modding process. This opportunity coincides with the popularity of modding and ease of modding Grand Strategy games. Educators could further benefit from using the standard *EUIV* modding practices that are promoted through the accessible scripts to implement these practices in a formal learning context. Consequently, modding *EUIV* presents a viable new method for learning and expressing history.
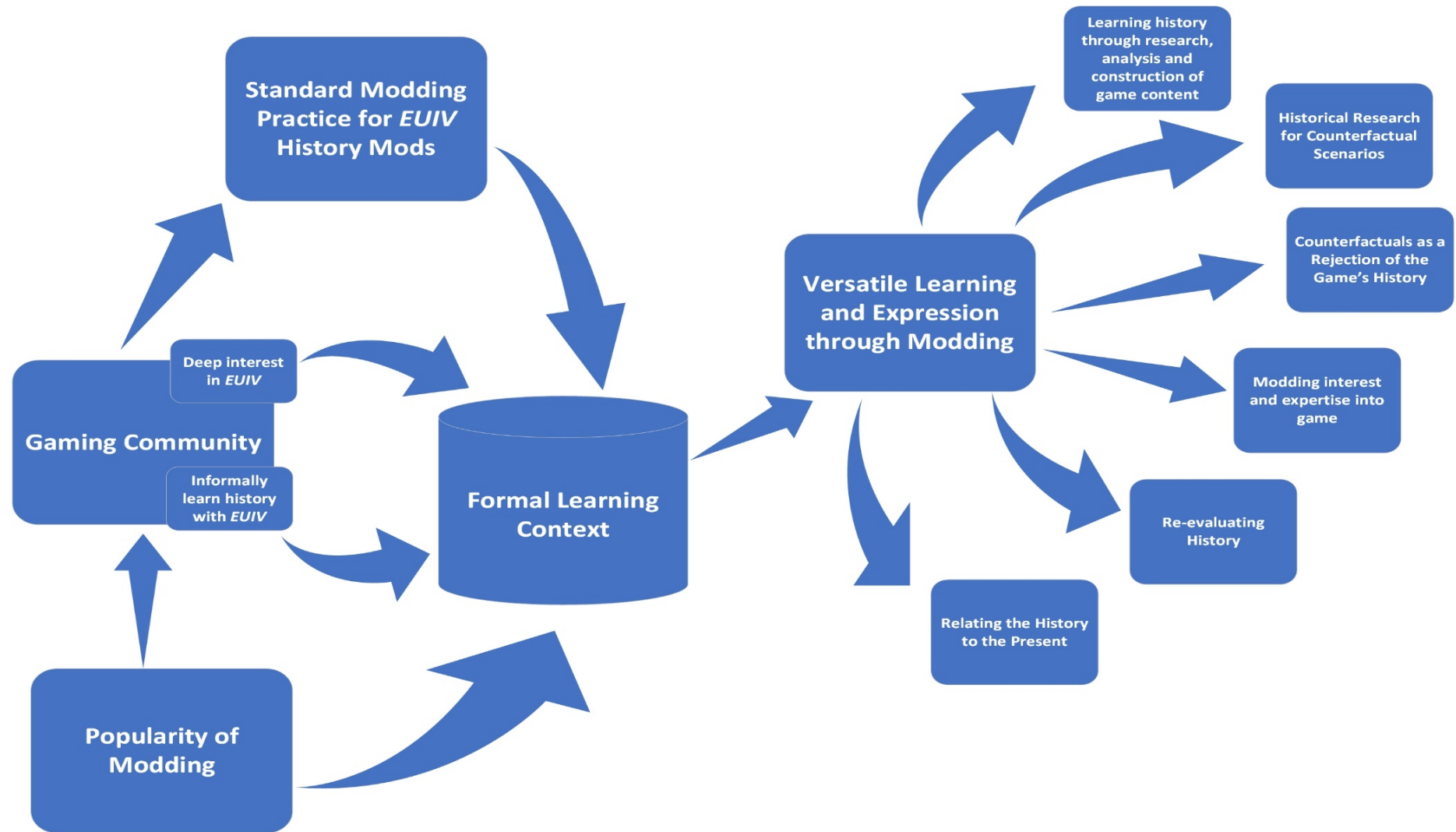
Figure 9.11. Many of the informal gaming practices and interests utilised by players and modders can be implemented or capitalised on in a formal learning context, which can then subsequently be utilised by students to learn about and express history.

9.7 Conclusion

This chapter first briefly explored the popularity of modding within the *EUIV* gaming community, with a particular focus on how educators might capitalise on students' interests in modding and informal ways of learning. Second, the chapter explained the general practice of modding and explained the process using the researcher's IPO mod as an exemplar of the practice. Third, the chapter explored modding in *EUIV* and survey participants' views of modding as a useful process for learning history. Finally, the chapter explored the different ways the participants from the case study learnt about and expressed history through modding *EUIV*.

Many participants in the forum survey and university case study indicated a strong interest in games, and games appeared to play a prominent role in their media consumption. Equally so, within gaming communities modding has become mainstream and even professionalised as it provides entrance opportunities into employment with gaming companies. A game's modding potential is now integrated into its structure, and is considered by developers as the game is being created. Modding can be viewed as requiring a gaming skillset similar to mastering other elements of *EUIV,* and while it can be a solitary activity to some extent, more often modding promotes wider community engagement amongst gaming peers while also encouraging rigorous research to develop historically accurate mods. This presents a significant opportunity for educators to capitalise on the passions of gamers and the informal methods through which they learn. Doing so could provide more flexible ways for educators to engage with younger, digitally proficient generations of students. Hence, educators should acknowledge and utilise gaming practices such as modding as valid classroom learning practices with genuinely valuable outcomes for learning history. While the thesis has examined the educational use of modding for history, many participants

integrated subject matter from other disciplines into their mods. This practice signals a wider potential use for modding across different disciplines.

Modding could leverage student motivation and interest in informal learning to develop engaging educational practices that promote a collaborative culture within the classroom. Students would be able to share their mods, add to their mods after feedback from peers, and/or have their mods assessed by their teachers. Modding involves analytical, critical, creative and computational thinking, some of the key skills required in university environments. The New South Wales State Government (2020) in Australia identified creative, critical and computational thinking as key thinking skills for the 21st century. Ellerton (2018) also suggests that critical thinking is useful for developing greater comprehension of complex ideas and understanding with different perspectives. Ritter and Mostert (2017) explain that creative thinking is imperative in an ever-changing world and their study of 32 university students showed that it can be facilitated through training. Furthermore, Wing (2019) points out the importance of computational thinking in the realm of the arts where even historic artefacts can be digitised. modding, students could learn how to analyse abstract historical ideas and consider how best to represent their analysis in a gamified framework. The modding process could also provide different avenues to learn and express historical analysis for students who find more traditional speaking, reading and writing assessments a challenge. This is particularly relevant in the Humanities and Social Sciences, where essay writing is the primary form of expression and assessment. The modding process may thereby offer many benefits in terms of improving learning outcomes beyond more traditional classroom activities.

While some teachers and students have been sceptical about GBL (Egenfeldt-Nielsen, 2006), this research shows that the GBL practice of modding provides quite radical avenues for student engagement and learning that would have very positive outcomes. Educators and

students could blend and interlink mods with other learning resources to target syllabus and learning outcomes. Even in *EUIV*, which has certain restrictions and a limited discourse of history, modding participants still found ways to change the course of history, find peaceful resolutions, learn about important individuals and explore and create different factual or counterfactual historical narratives. Modding holds a special utility in terms of GBL because mods allow players to critically and creatively express history in ways not achievable in more traditional game forms. After a student has played through a game, a teacher may assume the student has learnt from the game. However, without other GBL activities a teacher cannot measure the student's understanding of the game's subject content. In the case study, participants used mods as an analytical and creative outlet and produced significantly different understandings of history, with each mod having its own unique perspective and game content. Yet all the participants' mods still contained fundamental themes and understandings of the Aztec-Spanish conflict, despite these deviations. Thus, the mods themselves revealed the depth of the participants' understanding of the topic. Therefore, by using mods within the classroom, educators might direct students to learn relevant history while still allowing them the freedom to pursue and express historical perspectives and their own personal interests.

Chapter 10: Conclusion
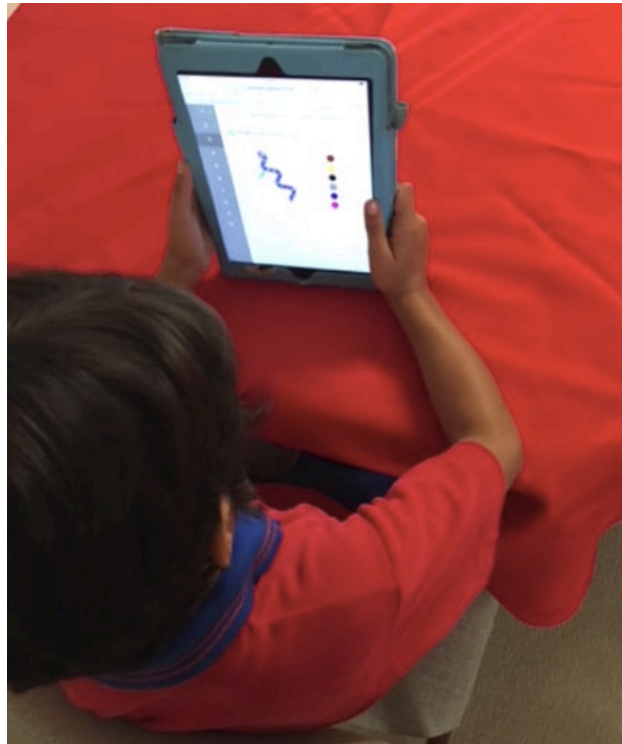
Figure 10.1. My six year old nephew using his tablet to learn mathematics.

10.1 Introduction

The photograph above shows my nephew, who is six years of age and in grade one at an Australian primary school, using a video game on his tablet to learn about mathematics for homework (*Figure 10.1*). At his school, textbooks are rarely used for classwork; instead, students use digital technologies to learn a variety of subjects, guided by their teacher. In 12 years my nephew will enter university having experienced a very different way of learning to the generations of students before him. His school's transition from using more traditional pedagogical tools like textbooks to incorporating digital technologies is indicative of a paradigm shift in how educational content is presented to and consumed by students, which will ultimately influence their skillsets as they grow older and move into higher education and the workplace (Bullen & Morgan, 2016, p. 61; Coombes, 2009). The development of

digital proficiencies amongst the younger generations marks a new age in education in which digital technologies are being integrated at a rapid rate. In recognition of this phenomenon and the growing potential of these technologies to revolutionise education, research that analyses how various forms of digital technologies can be used as educational interventions is important. In this vein, this study of video games to teach and learn history in higher education presents a unique investigation into the educational potentials of these technologies and will pave the way for the development of new pedagogical tools.

This research has argued that *EUIV* and other Grand Strategy games provide positive, deep learning experiences for players. Educators increasingly recognise the merit in using educational video games within the classroom, and the value in using elements of popular culture to engage students (Maguth, List, & Wunderle, 2015; Sáez-López, Miller, Vázquez-Cano, & Domínguez-Garrido, 2015; Stieler-Hunt & Jones, 2015; Watson & Yang, 2016). The value of video games lies in their ability to communicate information on a number of different subjects, similar to history, which in games like *EUIV* shapes the player's in-game experience. Further, as the thesis has shown, games can do more than just communicate history; they also encourage players to immerse themselves in historical events and themes. This immersion could also be seen in a study by Loup, Serna, Iksal, and George (2016) where 57 high school students played an in-house developed serious game and 'immersion' in the game played a significant role in learning transfer between game and real-life activities relating to science and ecology. Responses from the participants in this research clearly showed *EUIV* players are able to engage in historical discovery. The participants made choices about what historical events and themes to investigate and shape by conducting their own research and using practices like modding. Consequentially, the player's actions both in-game and outside of the game are made meaningful and promote a deeper understanding of the historical content they consume.

The preceding chapters have shown that these interesting aspects of informal learning, associated with playing Grand Strategy games like *EUIV* can be capitalised on in formal learning settings. This concluding chapter will summarise the thesis research with a specific focus on reinforcing the value of the findings and their contribution to the field of GBL. The chapter will first describe how the study addressed the primary research question. Next, the chapter will outline the research's key contributions to knowledge in the domain of GBL, with a specific focus on how players of Grand Strategy video games engage with history. The chapter will compare the findings of this research with previous literature in the field and will draw connections between various studies. It will then outline the implications of this research before addressing its limitations. Finally, the chapter will provide recommendations for future research that could build on the work of this thesis.

10.2 Answering the Research Question

The research question posed in this thesis was: *What can a study of Europa Universalis IV reveal about how Grand Strategy video games can be utilised in higher education to teach history?* Several sub-questions were also posed, those being:

1. How are Grand Strategy video games, and video games in general, currently used for formal adult learning of history?

2. What are the current attitudes of *EUIV* players to the use of video games for learning history?

3. How does *EUIV* engage with history and how do players perceive this engagement?

4. How do Grand Strategy video games promote experiential and visual learning of history, and how does this compare with player's perceptions of other forms of learning history?

5. How does a player's technology use, video game play experience and knowledge of history impact on the effectiveness of *EUIV* as a formal adult tool for learning history?

6. How do different GBL implementations of *EUIV* influence its effectiveness as a formal adult educational tool for learning history?

In order to answer these questions, the thesis explored a number of topics, including the type of historical knowledge players gain when playing *EUIV*, the *EUIV* community's deep interest in history, the informal learning of history that occurs as an outcome of this interest, the limitations of *EUIV* as a pedagogical tool, and the various forms of GBL activities that are popular within the *EUIV* community, with a specific focus on modding. The thesis investigated the research question using three methods: a Formal Analysis of *EUIV* and the researcher's *Indigenous People of Oceania* (*IPO*) mod, an online survey of *EUIV* forum participants, and a university case study of a group of students engaged in modding and another in a historical roleplay simulation. The Formal Analysis described how the game mechanics of *EUIV* communicate historical knowledge to the player and showed the historical gaming context in which players engage and play. Reflection by the researcher of the *IPO* mod construction process provided an outline of the modding process and context for the forum survey and university case study, both of which investigated participants' experiences creating mods and playing mods that were designed by others. The survey findings showed how members of the *EUIV* online community learnt new information about history by playing the game, and contributes to the discussion about how this form of informal learning could be translated for use in a formal learning context.

The thesis study found *EUIV* could be used in several ways as a tool to teach history in higher education as it encouraged learning by:

- **Promoting an interest in history and in researching historical events outside of the game.** The findings showed playing *EUIV* prompted players to engage in research processes that involved accessing and examining other history sources such as books, videos and websites to confirm, contest and meaningfully engage with the historical content presented in the game.

- **Allowing the player to discover, encounter and learn about histories they might not otherwise have encountered in the game.** These included less mainstream historical narratives and the histories of marginalised peoples and nations. Accessing information about these histories may have been outside the players' everyday understandings of history, geography and world events, and indeed general understandings of history that often take a Western perspective.

- **Depicting history through maps to provide a macro-level view of historical changes.** These maps show the expansion and decline of empires, strategic and geopolitical influences, and the importance of resources and trade in shaping world history. The research showed players integrated the geographic knowledge learnt from maps into their game strategies and re-enactments of history within the game.

- **Highlighting the larger historical themes and influences of the Early Modern period.** By focusing on the processes and stories of history rather than the factual outcome of history, players were able to identify some of these themes and influences and even apply this knowledge to their gameplay.

- **Allowing players to mod *EUIV*.** Modding was found to have a dual educational function:

    (a) Modding provided the player with the opportunity to learn history by developing a mod; and

(b) Modding positioned the user as a historian in their own right. This allowed
the player to research, write, design and implement their own analysis and
creative interpretation of history.

In addition to these key findings, this thesis identified two different forms of learning history that are relevant to the gaming context: 1) surface learning; and 2) deep learning, both of which were discussed in Chapter 8. The potential *EUIV* offers in terms of deep learning was of particular note in this thesis, because deep learning gives students the opportunity to think critically and creatively and be involved in their own learning and to manipulate information in productive ways to evaluate and redefine history. *Table 10.1* provides a summary of how each of the key findings supports different deep learning principles (Houghton, 2004, pp. 9-11; Marton & Säljö, 1976, p. 7; Ramsden, 2003, pp. 42-43). The links between these principles and *EUIV*'s GBL outcomes further illustrates how *EUIV* may be used as a pedagogical tool in higher education to achieve deep learning outcomes.

Table 10.1. *Deep Learning and GBL.*

Deep Learning Principles	GBL in EUIV
Focus on the central argument or concepts needed to solve a problem	Chapter 7 showed *EUIV* players develop understandings of history by reading and interpreting maps inside and outside the game, and in doing so they could apply and re-enact historical understandings learnt about in this process to win the game. For instance, this could involve applying historical geopolitical strategies (e.g. conquest of locations with valuable trade goods) against the game systems to progress and consolidate their position in the *EUIV* world.

	Chapter 8 showed how *EUIV* communicates information about history though the game's mechanics and gameplay. It also showed participants are able to manipulate the system to solve problems that arise in the game or address challenges that present themselves within different historical settings.
	Chapter 9 showed that although participants created radically different mods that each nonetheless understood key themes of the Aztec-Spanish conflict.
Actively interact	Games by their very nature are interactive and convey certain ideas to the player through the gaming process (Bogost, 2007). Chapters 4, 7, 8 and 9 each showed that the game's mechanics were complex, and required consistent and thoughtful interactions by the player to win or progress in the game. In *EUIV*, the player makes choices and the system responds to those choices, presenting a variety of options for the player to choose from to continue the game. In turn, this requires the player to react to these options with an appropriate counter response, which generates highly active cycles of interaction.
Distinguish between argument and evidence	As shown in Chapter 8, the game is designed to simulate certain historical themes and influences rather than specific historical events. These can be understood as counterfactuals that do not represent historical facts but rather embody aspects of broader historical narratives. An evaluation of what is factual and what is counterfactual provides the player with an opportunity to compare, contrast and connect historical arguments with historical evidence.

Make connections between different components	*EUIV* presents different information about various components of history, such as war, peace and nation governance, and shows the connections between them. The player needs to understand these connections in order to manage the nation they represent and win the game. These sorts of connections are discussed in Chapter 4 and further explored through participants' reflections on their strategies in Chapter 7.
Relate new and previous knowledge	Chapter 7 illustrates a learning cycle where the player uses in-game resources and external historical sources to inform their historical understanding. As discussed in Chapter 9, activities like modding encourage players to relate new and existing knowledge to present their own interpretation of history.
Link course content to real life	In *EUIV*, the player comprehends geographical and geopolitical events that have shaped the contemporary world in which we live, through activities like map-based learning. Chapters 4 and 7 discussed how the game depicts and participants understood history, geopolitics or demographics through playing the game. Chapter 9 explained how the participants drew on elements of their own historical knowledge that they modded into the game, some of which related to the past and some to the present.
Allow mistakes without penalty and rewarding effort	*EUIV* allows for playful experiences where the player learns through failure and is rewarded for success. Chapters 7 and 8 showed how participants learnt from their in-game mistakes (productive failures) and successes, which affected (or did not affect) the course of history. Burgos, Tattersall, and Koper (2007, p. 9) discuss how games allow players to

	"play, try, make mistakes and learn". This concept also ties into the idea of productive failures and how mistakes can be a useful learning experience (Kapur, 2008).
Interest in and curiosity in subject	Chapters 7, 8 and 9 showed *EUIV* players were dedicated to and deeply interested in the game. Separately, many also had an avid interest in history. Evidently these interests promoted a deep engagement with *EUIV* and the history it represents, which had important learning outcomes.
Look for meaning in the content	Chapter 7 showed players used maps and purposively learnt about other cultures to meaningfully engage with history. Chapter 8 discussed how participants drew meaning from broader historical dynamics and counterfactuals in the game to ultimately shape their larger understandings of history. Chapter 9 explained how participants used mods to create their own versions of historical events by making game choices and attributing value to those historical events that were ultimately meaningful to them.

10.3 Research's Contribution to Knowledge

The key findings of this thesis contribute to the fields of GBL and history education through two primary outcomes. The first outcome relates to issues around historical accuracy in *EUIV*; the second to the issue of inclusivity in *EUIV*, the depiction of marginalised histories and cultures, and the role of modding in overcoming this issue. Both will be discussed in detail in this section. Two conceptualisations of *EUIV* gameplay will then be presented, one that visualises *EUIV* gaming practices as places in a connected city, and the other as a toolbox for learning history.

10.3.1 Historical Accuracy

Research studies that have considered the issue of historical accuracy in video games, raise pressing points that serve as a comparison for this thesis. For example, O'Neill and Feenstra's (2016) study showed players did not trust the accuracy of the historical depictions in video games, and these same players believed games developers distorted and sensationalised history to create a more interesting and profitable game. Similarly, Egenfeldt-Nielsen's (2005) study of *Europa Universalis II* (*EUII*) also highlighted the issue of historical inaccuracy and its impact on the player's ability to learn history from the game (p. 193). As discussed throughout this thesis, this research shares some commonalities with Egenfeldt-Nielsen's (2005) study, which found students believed *EUII* lacked historical authenticity and was therefore unable to provide significant opportunities in terms of discovering or learning facts about history (p. 193). The research in this thesis also showed participants in both the *EUIV* forum survey and the university case study were sceptical about the game's ability to present complete historical accuracy. Many (53.17% or 176/331) believed *EUIV* only somewhat accurately reflected and simulated history while a much smaller group (22.66% or 75/331) thought *EUIV* quite accurately depicted and simulated history. However, as has been discussed, *EUIV* is not intended to portray historical events as they occurred; rather, the simulations it contains provide players with the means to interpret and shape history according to their own interests while at the same time learning about various historical themes and influences that have their roots in historically accurate knowledge. It was also apparent that participants who were sceptical about historical accuracy were nonetheless cognisant of this feature of the game and its ability to reflect history rather than provide a fully accurate rendering of it. This is an important factor to consider when drawing comparisons between this study and Egenfeldt-Nielsen's (2005, p. 204). It should also be noted that thesis survey respondents were far more likely to have greater expertise in the

game and have spent longer playing it than Egenfeldt-Nielsen's participants. While there were differences between this thesis' and Egenfeldt-Nielsen's (2005, p. 204) study in research design, sample population and recency of the research, his study serves as a valuable predecessor to compare with the thesis findings (p. 204). Egenfeldt-Nielsen (2005, p. 204) found students did not "appreciate" or "explore" history in the game, or "link" the gameplay with historical information (p. 204). For instance, one student in his study did not "appreciate" the game's historical content in the form of game variables including crown loyalty, religion, culture, and infrastructure and other historical variables, all of which affected the meaning of the in-game action (Egenfeldt-Nielsen, 2005, p. 205). Conversely, even though many of the participants in this study felt *EUIV* did not present history entirely accurately, there was clear evidence that participants were learning about the sorts of variables that do influence history, whether that be new cultures, religions, location of valuable goods, strategic trade locations, etc. Furthermore, they used these new historical learnings and integrated them into play and the formulation of their game strategies. Many players' comments indicated that while some historical details (such as religion or culture) did not change significantly from factual history, other details (such as province ownership) could in fact radically change. Hence, the participants in this thesis tended to have a more flexible and sophisticated appreciation of the overall historical value of these games than those in Egenfeldt-Nielsen's (2005, pp. 210-211) study.

Egenfeldt-Nielsen's (2005) study also showed that his students typically did not "explore" history in *EUII* with one student believing the outcome of a war between Sweden and Denmark where Denmark won to be historically inaccurate, but did not consider the reasons why Denmark had won the war, and did not conduct any further enquiry on the topic (pp. 210-211). In contrast, an overwhelming majority (95.47% or 316/331) of survey participants in this research sought out more information about history, with the majority

(73.67% or 235/331) of this group reporting they explored internet sources to find out more about the historical context of the game. Indeed, this further exploration of history outside of the game appeared to be central to the *EUIV* gaming experience. Furthermore, while many participants acknowledged the counterfactuals in the game, they also recognised the historical themes and influences underlying the gaming experience. This arguably demonstrates a more mature exploration of history through the game than Egenfeldt-Nielsen's (2005) students, likely connected to the involvement of adult participants as opposed to solely adolescents.

Participants in Egenfeldt-Nielsen's (2005) study were also unable to "link" in-game content with actual historical events (pp. 212-214). Students who developed a game strategy to invade England by exploiting the nation's weaknesses and conceiving their own strategy that aligned with historical events, did not make the connection between the two (Egenfeldt-Nielsen, 2005, pp. 212-214). In contrast, participants in this thesis, to differing degrees, were able to link their gameplay to real historical events. For example, 12 of the 22 survey participants who commented on the utility of *EUIV* as a tool to understand historical trends and factors mentioned specific historical trends in the game which were linked to textbook history (e.g. the rise of the Ottomans). Furthermore, John, a 27-year-old engineering PhD student, used map and geography-based strategies in *EUIV* to gain substantially more territory without diplomatic repercussions, weakening enemies and conquering profitable areas. He also tried to recreate historical borders and territories, and was interested to discover his game strategies and goals aligned with actual historical conflicts. As such, John's in-game experience was his own simulation of historical events, based on his ability to interpret and utilise historical understandings to win the game. John's learning experience aligned with findings from the rest of the case study and the written pre/post-tests, as well as the historical learnings expressed in the case study mods. The ability to link content in *EUIV* with factual history also shows that adult players appeared better able to develop and utilise

historical understandings compared to the younger students in Egenfeldt-Nielsen's (2005) study. By following on from Egenfeldt-Nielsen's (2005, pp. 212-214) research, the thesis shows the pedagogical potential of the newer iterations of the *Europa Universalis* series' as a tool for historical learning for adults with a focus on a variety of GBL activities.

Some of the focus on historical accuracy in this study related to instances of counterfactuals in the game, which often arose as the result of actions taken by both the AI and players themselves. While counterfactuals diverge from factual historical narratives, they still have more in common with real history than other genres of fantasy games (Clute & Grant, 1999; D'ammassa, 2014; Ferguson, 1999; Stableford, 2005) as shown in *Figure 10.2*. However, the existence of counterfactuals was one of the reasons survey and case study participants dismissed the educational value of the game as well as seeing the game's historical representations as abstracted or inaccurate. Yet many survey participants thought that although the game was not necessarily faithful to history, *EUIV* was nonetheless able to simulate what could be termed "historical verisimilitude" (Apperley, 2013, p. 42), or the appearance of being historically authentic. Counterfactuals were seen as occurring within realistic parameters and depicting elements of "real" history, and survey participants believed *EUIV* was inspired by history, historically themed and potential plausible, even if not entirely accurate. The case study's written pre/post-test, geography pre/post-test and mods, supported this finding and showed how case study participants still learnt history while engaging in counterfactual gameplay and creating counterfactual mods. Indeed, the game's counterfactual histories also served as points of contrast, comparison and connection for player research into the factual history outside the game.

High Fantasy	Set in a different world to our own, and does not obey the same laws as our world (e.g. magic) E.g. *Warcraft* game series which includes magic, Orcs, Elves, Undead.
Low Fantasy	Set in our world, but does not obey the same laws as our world E.g. Harry Potter.
Historical Fantasy	Set in our world, and may not obey the same laws as our world (may contain some supernatural forces or beings), but represents elements of historical events. E.g. Arthurian Legends, or War of the Three Kingdoms.
Counterfactuals	Replicates history except with one or more key historical events occurring differently. These event differences send the timeline on an alternate historical trajectory. E.g. What if the Axis had won WWII?
History	The representation of historical accounts of real-world events that are widely accepted by historians. E.g. the Allies won WWII.

Figure 10.2. Fictional sub-genres such as low fantasy and historical fantasy contain accurate elements of history; however, counterfactuals such as those that appear in *EUIV* are more accurate.

Interestingly, some survey participants believed counterfactuals were genuine attempts by the developers to create a more enjoyable and functioning game. This reflects the balance between historical accuracy and gameplay that exists along a continuum in games like *EUIV*. On one end of this continuum, a game that follows history too precisely would be tedious and would limit player agency and consequent learning opportunities, while at the opposite end, considerable sections of history are abstracted, incorrect or omitted. However, while games that lie somewhere towards the more abstracted end could be seen as presenting inaccuracies, the thesis data showed many survey participants preferred engaging gameplay over precise history, and thus enjoyed the counterfactuals. As I have argued in this thesis, *EUIV* provides players with opportunities to understand historical information, reflect on

historical choices in-game and ultimately engage in deeper learning. This process can also be supported by research conducted outside of the game, and provides the player with a deeper understanding of the forces at play in history, even if the history presented is not precisely accurate. As such, counterfactuals are inherently important to the learning experience because they explain why historical events happened and can be used by players to compare, contrast and connect factual history with counterfactual history.

10.3.2 Inclusion of Marginalised Histories through Modding

One of the most important findings of the thesis was that while *EUIV* has significant potential as a pedagogical tool, its Eurocentric focus may subvert some of its educational utility. The game often excludes non-European nations and cultures, and dominant mechanics of war and colonisation tend to emphasise the imperial history of European powers and conquest as the conventional means of winning. The game design could therefore be perceived as discounting socio-cultural issues and advancements that are arguably just as important as military matters. These problematic elements of *EUIV* are consistent with previous published research on video games and cultural inclusivity (Apperley, 2006; Dillon, 2008; Ford, 2016; Mukherjee, 2017). For instance, Apperley (2006) highlighted the poor depiction of Indigenous people in Oceania in *Europa Universalis II*. This study has found that 13 years later, in many ways little has changed. Similar to studies by Ford (2016), Dillion (2008) and Mukherjee (2017), the thesis study found that while many non-Western nations are playable in-game, these nations must still conform to typical empire building and colonial styles of strategies and play. Nevertheless, there are more options for peaceful and trade-based strategies in the newer version of *EUIV* (Paradox Development Studio, 2013a). The thesis revealed limitations around cultural inclusivity can be overcome by modding *EUIV*. This practice was shown to allow new Indigenous content to be inserted into the accessible

levels of *EUIV* through the researcher's IPO mod (Loban & Apperley, 2019). However, the researcher was unable to change *EUIV*'s fundamental mechanics and gameplay elements, meaning a newly inserted Indigenous nation must still ultimately impose colonial rule or be subject to it.

The research also showed that modding provided players with the means not just to engage with the game, but to undertake research outside of the game to create content to include those marginalised histories, such as the *IPO* mod or the example of Henry's mod, reproduced in-game as shown in *Figure 10.3*. The popularity of modding among *EUIV* gamers showed the relative ease of modding and that the practice could be utilised by educators interested in implementing GBL in a formal educational setting. The findings of the university case study were particularly pertinent because they showed that higher education students from a range of disciplines and academic backgrounds were able to make a playable mod when provided with the appropriate scaffolding and support. These mods creatively expressed the players' interpretations of history while also incorporating their own interests in, knowledge and perspectives of historical events and themes.

Figure 10.3. The event pop-up in Henry's mod that occurred in-game placed the player at a crossroads between stopping the Aztecs' supposed sacrificial practices or letting the practice continue.

As discussed in the previous section, playing *EUIV* can encourage deep learning, with modding forming a crucial element of that learning process. If applied to the history classroom, modding might help students learn about history by fostering the development of the higher order critical analysis and creative thinking skills needed to interpret historical sources and create content based on those sources. When a student creates a mod, they have produced an artefact that is a playable version of their interpretation of history. This demonstrates a form of analysis and interpretation similar to other traditional forms of assessment such as essays or oral presentations; thus, educators could assess modding content as the outcomes of learning processes. In formal educational contexts, students who create playable mods would need to articulate and express their own historical analysis while also

perhaps critically evaluating dominant historical narratives. By modding and playing mods, students have the chance to view history from different perspectives and learn about the complex factors that lead to the occurrence of historical events. This game engagement with history relies on students recognising historical events as being contingent on a number of variables, to engage in an analysis of these variables, and express their understanding of them within the framework of the game. This kind of engagement could therefore equip students with the tools to express analytical thinking in creative and innovative forms of output.

Further comparisons can be drawn with Squire's research (2011) on *Civilisation III* (Firaxis Games, 2001), which showed students who engage in modding and game design further developed different and more complex ways of engaging with and learning history (pp. 176, 180 & 181). The thesis findings show similar results with modding seemingly providing greater learning outcomes than generic gameplay. The Mann-Whitney U test in the case study found a statistical advantage of modding over historical roleplay simulation. Both the research in this thesis and Squire's (2011) findings show the potential modding offers as an educational tool, and how educators might capitalise on this popular gaming practice in formal learning contexts. Following Chapman's (2016) conceptualisations of player-historians and developer-historians (p. 2 & 222), this aspect of the research identifies the emergence of modder-historians, who communicate their own historical perspectives through mods. The relationships between players, developers and historians and these resulting hybrids are illustrated in *Figure 10.4*.
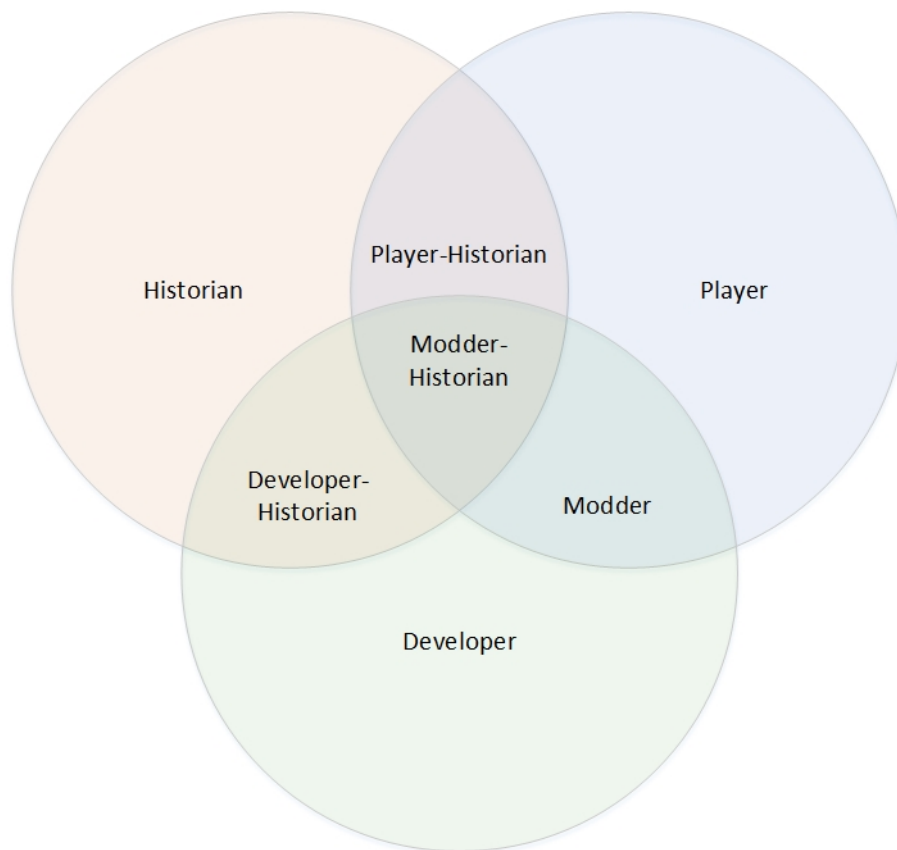
Figure 10.4. The modder-historian is the product of intersections between the player, the developer and the historian, and is a player who has developed an interest in history and uses their modding expertise to express their own perspective of it.

It is important to note that despite their deep involvement in *EUIV*, modder-historians are still restricted from modding certain historical elements in-game, a limitation noted by Squire (2011) that could diminish the educational potential of video games (p. 157). The thesis research revealed the most moddable elements of the game are its accessible scripts, which contain historical details that typically promote a surface understanding of history. However, the findings also showed that modders do learn history in a meaningful way as a result of modding. A key finding from the university case study was that students used modding as a flexible, customisable and engaging tool for learning that allowed them to integrate textual, visual, audio and experiential content drawn from their own research activities. Modding could therefore be viewed as an authentic learning task within a

historically relevant setting that allows students to demonstrate their historical knowledge as they construct their historical mod. Because modding involves digitally reconstructing historical events in a simulation and provides an interactive insight into the historical understanding of the modder, it can be seen as a prime example of "procedural rhetoric" (Bogost, 2007, pp. 28-29) where the modders' perspective influences and informs a player engaging with the mod.

The research strongly suggests that modding could be implemented in a formal learning setting because it does not just involve playing a game but also involves engaging in a variety of activities that could include reading historical texts, visiting museums and historical sites, learning from history experts, holding discussions with other students on historical topics, attending modding workshops, and creating accompanying documents (e.g. AARs) to explain and support the mods they create. Collectively, this process helps the student to compare, contrast and interconnect the different sources of history to reflect their own content and illustrate their historical analysis. An example of how an educator might integrate *EUIV* and modding into a learning and assessment activity is highlighted in *Figure 10.5*. The graph also illustrates the complexity of developing a mod and how some conventional research methods and activities are able to be integrated into the modding exercise in a classroom. It is probable that those who play mods may not learn about history as deeply as modders themselves; however, the research showed that playing mods still captured the interest of participants and improved their historical learning experience, even if they could not change the fundamental mechanics of the game. The thesis findings therefore show the benefits of modding can be experienced by both modder-historians and player-historians, the latter who learn from the creative rendering of history in which modders invest their time, energy and resources.
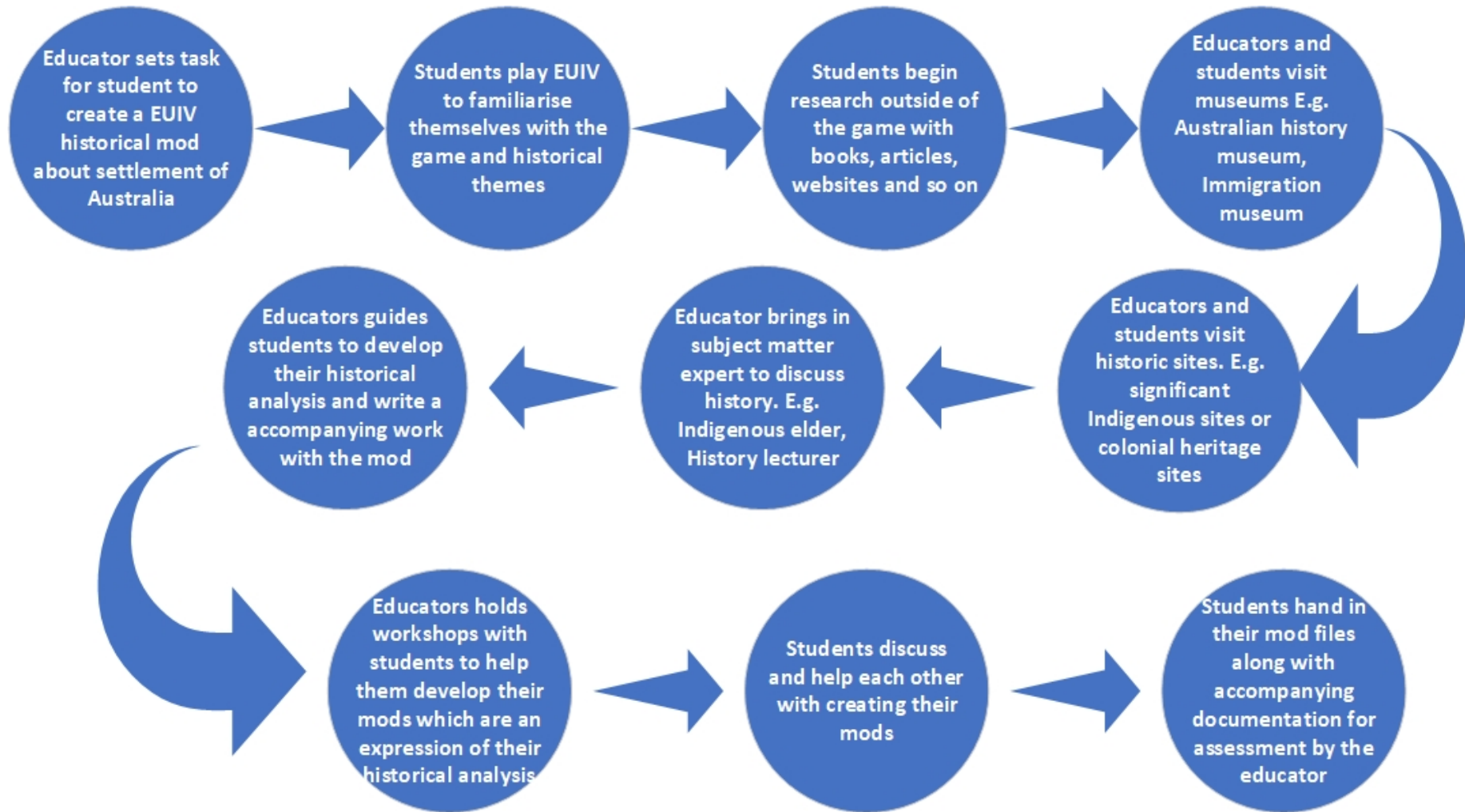
Figure 10.5. An example of how an educator might implement modding in the history classroom, based on learning exercises and assessments on the topic of Australian history.

10.3.3 GBL and EUIV as a Connected City

The informal GBL that occurs through gameplay, modding and other associated activities in *EUIV* may be depicted as a connected city where each place visited by the gamer contributes to its holistic functioning, as shown in *Figure 10.6*. One building represents a single player; another represents modding; another represents historical research, and so on. A player may spend a majority of their time in one part of the city, but will still visit other places within the city to work (e.g. conduct historical research), to socialise (e.g. engage in multiplayer or forum discussions), or to undertake personally meaningful activities (e.g. modding). In other parts of the city, the player will spend very little or no time (e.g. writing AARs); however, each of these places still features on their individualised city map which they can discover later. The construction of each connected city differs depending on the player, and some players might frequent places others do not even know about. In some parts of the city the player is a consumer (e.g. single-player; conducting historical research); in other places the player is productive (e.g. modding); and in specific places the player may engage in mutual exchanges with other players (e.g. forum discussion). Collectively, each place contributes to the player's overall gaming experience; this promotes a deep, multisourced and multi-method approach to GBL of history through playing *EUIV*. As this conceptualisation reveals, *EUIV* is best understood within a wider context of game related activities used for informal learning. Thus, when reproducing informal GBL into a formal learning setting, we must reimagine the pedagogical use of games as more than just the game itself, rather it is a bustling metropolis of various playful educational engagements with historical knowledge both inside and outside the game.
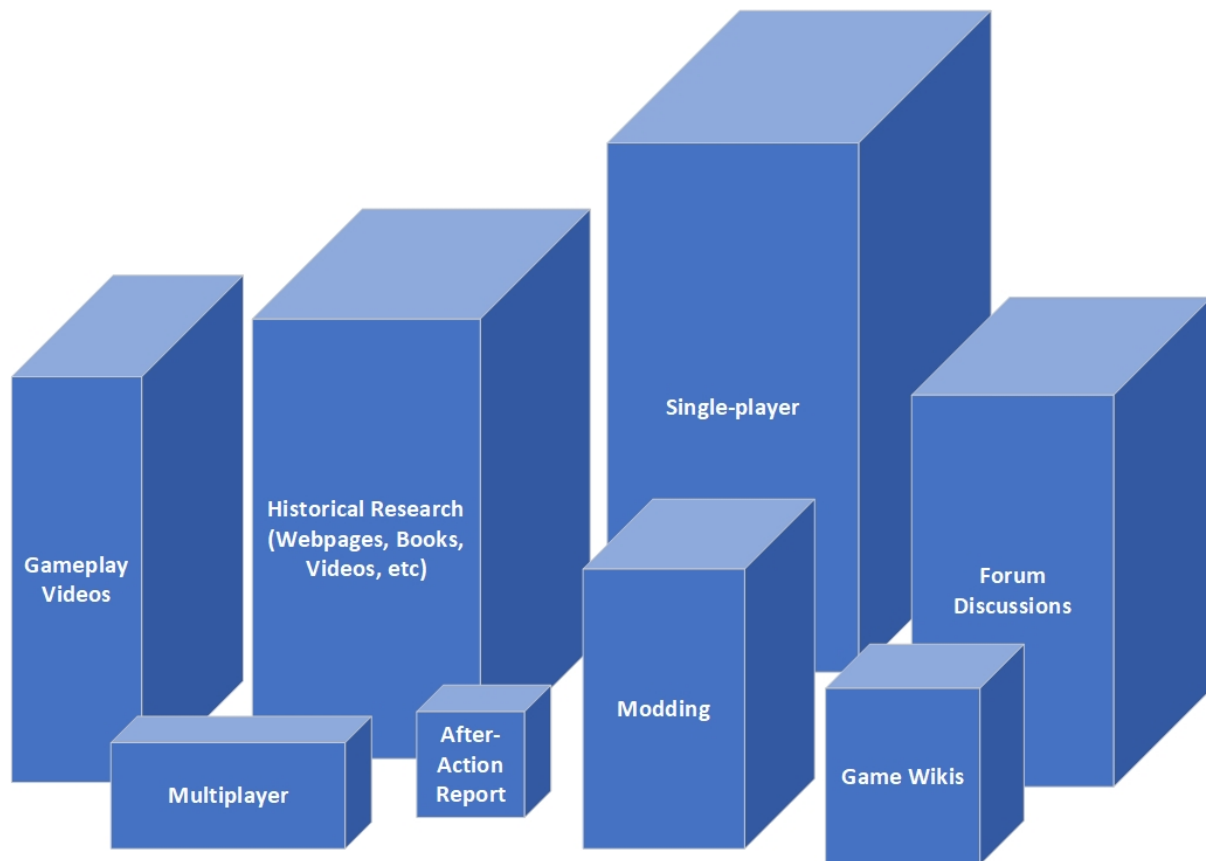
Figure 10.6. Informal GBL in *EUIV* can be visualised as a city where players visit different places that together shape their gaming and learning experience.

10.3.4 The EUIV Toolbox

EUIV can also be contextualised as a toolbox, providing a suite of tools that can be used by the player to help them construct their own understanding of history. This toolbox is illustrated below in *Figure 10.7*, which presents the type of tools in the toolbox and how they can be utilised within the game. However, this toolbox is only useful when these tools are supported by other resources such as websites, books and videos, each of which may present the player with additional information about historical events and themes. When used in conjunction with one another, the player develops new understandings of history and is able to find connections between different pieces of historical knowledge. These *EUIV* pedagogical tools include:

- ***EUIV* as a discovery tool:** can be used to discover and learn about new and unique histories and cultures not known to the player beforehand. This is based on various comments from the survey and case study (6/18 participants) commenting on the game's utility.

- ***EUIV* as a catalytic tool:** can be used as a catalytic tool to ignite the students' interest in history and promote further research. This is based on the overwhelming majority (95.47% or 316/331) of survey participants who carried out research after they had played the game.

- ***EUIV* as a geography tool:** can be used to show students the location of different nations, resources, cultures, trade routes and more. However, students more meaningfully use the *EUIV*'s geography elements to formulate strategies and re-enact histories within the game. This is based on data from the forum survey suggesting (119/331 or 35.95%) participants found this feature the most useful to learn about history, the case study participants locating the Aztec empire precisely (7/18 participants) or within the general central American (17/18 participants) region, and various participant comments from the survey and case study.

- ***EUIV* as a historical narrative tool:** can be used as tool to learn the themes and influences of history through the games various mechanics which are supported by other historical sources and uses of *EUIV* as a tool. This is based on 22 survey participant comments which indicate *EUIV* helped them to discover themes and influences, the improvements on the case study written pre/post-test and the narrative themes contained in the case study mods. Although, only 22 of 331 survey participants specifically commented on these narrative themes, these could be seen as one of the most informative and practical ways to learn from *EUIV*. Therefore, when implementing in a formal educational setting, further reflection and discussion on the

broader historical narratives that the game embodies might be beneficial. For example, students could reflect on the differences and similarities between historical choices and consequences that occurred in the game and those that occurred in real history.

- *EUIV* **modding tool:** can be used to learn history inside and outside the game through a research-based process involving computational, critical and creative thinking. This is based on the popularity of modding from the survey (149/331 or 45.02%), 86 of 125 voluntary survey responses (68.8%) claiming modding was useful learning process, and the Mann-Whitney U test, in the case study, found a statistical advantage of modding over the historical roleplay simulation.

- *EUIV* **as mod communication tool:** can serve as a tool for the student to communicate their understanding of history which the educator can evaluate. This is based on the case study mods (8 mod outlines) which participants used as a tool to communicate their historical understanding.

Thus, the toolbox and resources build a solid foundation for the acquisition of historical knowledge and encourage deep learning.
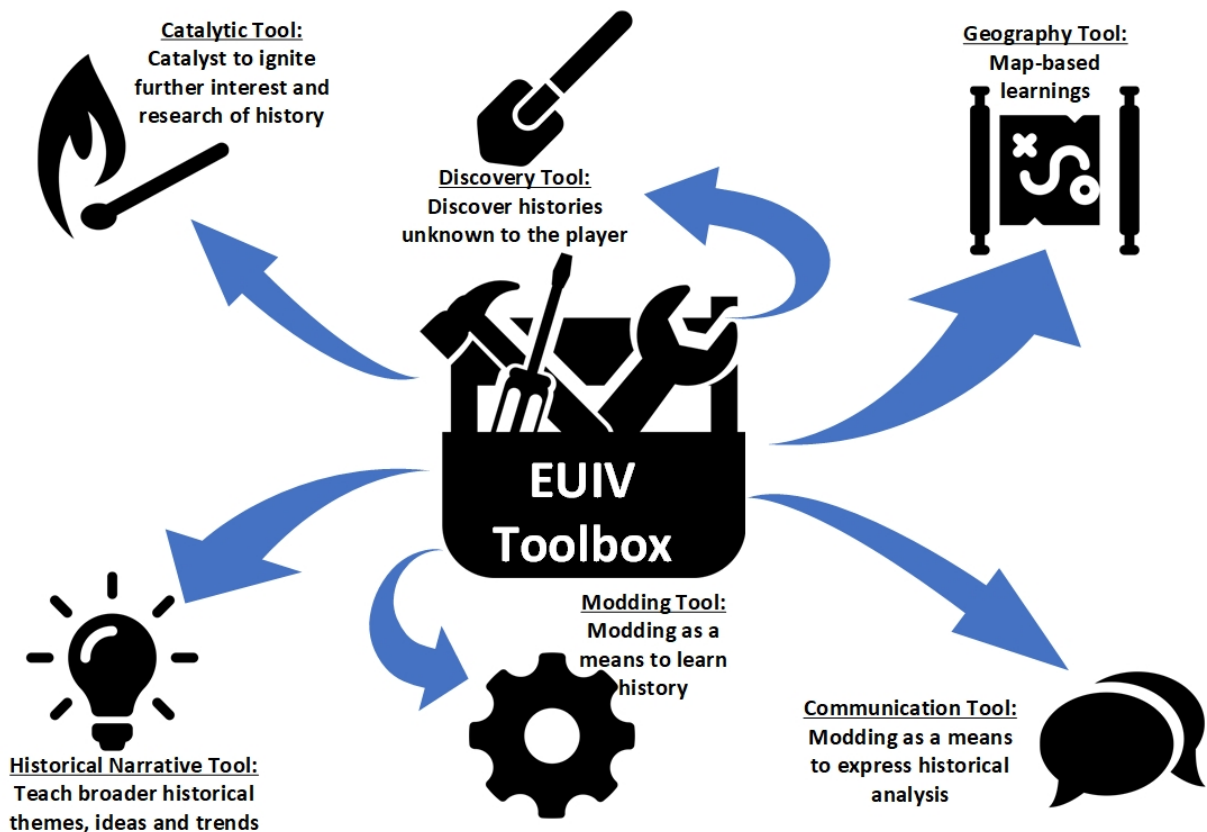
Figure 10.7. The *EUIV* toolbox with different tools educators could utilise to help construct a student's understanding and analysis of history.

10.4 Limitations of the Study

There were a few issues that limited the scope and findings of the research project. Due to resource limitations, the research was unable to access a university history class to implement the case study, which may have given more insightful data on the success of *EUIV* in a formal university setting and as an assessment task. Another limitation was the sample size (n18) of the university case study and the unequal demographic numbers. For instance, there were more male students than female in the study, and analysing gendered differences in gameplay and modding may have provided some interesting comparative data to provide further insight into the actions and views of players of *EUIV*. Also, participants were from a range of disciplines and diverse nationalities, and on a spectrum from undergraduate to PhD level, yet the comparative data that was generated was not quantitatively strong enough to

show correlation. Stronger results might have been used to investigate how these differences may have influenced gameplay and modding. These limitations meant as whole the research was unable to provide strong statistical findings relating to demographics and learning history. Further research would need to be conducted to determine any variances in experiences of *EUIV* gaming and modding among different demographics and experiences of people who likely have different perspectives of history. Moreover, on reflection, it would have been useful to design the case study questions to solicit and prompt higher-order thinking and deep-learning responses rather than the more factual test responses.

Another limitation of the case study involved the findings from the historical simulation roleplay. This activity did not show consistent or strong results compared to the modding exercise. A possible explanation for this deficit was that participants did not have mastery of the game, which can take weeks to learn and comprehend. Due to the case study's short timeframe, the historical simulation participants only had several hours to learn and then play the game; thus, they may not have been fully engaging with and learning from the game. A less positive educational result in the case study involved the findings from the historical simulation roleplay. However, what these results highlight is the important role of teacher instruction and integration of external historical sources to complement the history in-game. Including these elements when implementing historical games in higher education would support earlier arguments for engaging learners with other forms of gaming practices including modding.

A further limitation was the survey question that related to the idea of teaching governance through *EUIV*. The intent of the question was to find out whether *EUIV* participants believed they had learnt about managing a nation and the different institutions that form a government. However, these historical governance representations were found to be too abstract for 22 survey participants as they explained that the game's disproportionate

numerical and currency representations in-game, and instant actions were too distorted to be considered suitable representations. Other Grand Strategy games such as *Crusader Kings II* (Paradox Development Studio, 2012) or *Victoria II* (Paradox Development Studio, 2010) may provide a better gaming alterative for teaching and assessing understandings of governance given their stronger focus on internal nation and population management. The survey data therefore suggests *EUIV* may be less suitable to use to teach nation management and governance than other Grand Strategy games.

Another limitation was the scope and breadth of the survey questions. There were significant and varied responses to these questions that provided a wealth of information; however, in hindsight, more precise questions may have minimised the issue of differing interpretations of the questions. For example, when asked if the game depicted and simulated history, many participants took the question in its most literal sense and held the accuracy of historical depictions to extremely high standards. Explaining what was meant by "depictions" and "simulation" may have clarified the terms; further, separating the two terms into two different questions may have generated more insightful responses. While these limitations reduced the scope of the research, it did not impact upon the strength of the study and the interesting and important findings that emerged from the data and analysis.

10.5 Implications of the Study

The implications of the study primarily relate to the roles of educators in the digital age. The study has shown the pedagogical potential of *EUIV*, and it is therefore evident that educators need to reassess how they teach history to incorporate GBL. In an age when most students are consumers and users of digital content, it is logical that educators should consider integrating video games into classroom activities and assessments. The notion that teachers might not know how to interact with or produce digital content no longer holds

stead, as our growing reliance on and comfort with personal digital devices means most teachers are well-versed in their use. Such teachers would also need to be fully supported by their educational institution, which should also recognise the potentials of GBL and consider investing in its implementation.

Further implications relate to the potential of GBL and games like *EUIV* to be inclusive of different types of learners. Because games like *EUIV* do not communicate historical information in a more traditional, textbook manner, and instead focus on engaging and entertaining gameplay, they may be more accessible to students who struggle to learn using those more traditional resources. When considering the important role educators can play in implementing GBL, it is arguable that there may be some degree of responsibility for teachers with knowledge and experience in the digital sphere to provide a format of education that is flexible for many types of learners, especially those who are inclined to learn visually (Kuntze, Golos, & Enns, 2014, pp. 206-207; Leopold, 2012, p. 98; Mayer & Massa, 2003, p. 833). The interactive nature of *EUIV* may also provide for different types of learners who might require more engaging learning materials to perform well. Further, the creative elements of modding could be drawn upon to engage students who struggle in traditional classes to learn in different and innovative ways. Creating mods allows students to demonstrate their understanding of history in a different format from written works or oral presentations, and may therefore provide opportunities for students who are unable to express themselves eloquently in these more traditional forms of assessment. As such, games like *EUIV* present new avenues of learning for students who are more hands-on and still need to be able to use analytical, critical, and problem-solving skills to express themselves. This approach to learning aligns with important debates about the future of the "digital humanities" (Gold, 2012, p. 9; Jockers, 2013, p. 3) and the growth of "digital methods" (Gold, 2012; Gubrium & Harper, 2016, p. 14; Rieder & Röhle, 2012, p. 67) in the social

sciences including the validity of digital methods, and the transition of culture from the physical to the digital.

10.6 Recommendations for Further Research

Future research is recommended to support the implementation of GBL using *EUIV* or other Grand Strategy games in a university course and classroom setting. Findings from this thesis research could provide the basis for the design of future studies. This study showed the ease of modding with most case study participants, from many different academic disciplines, successfully creating mods. Future research would provide further contextual insights into how students engage in GBL and how educators could best utilise the inherent possibilities for games similar to *EUIV* to act as valuable pedagogical tools. Such studies could also investigate GBL in comparison to, or in conjunction with, other traditional methods for learning and assessment. Implementing these forms of GBL in an assigned university course as a form of assessment would build on this thesis research and provide more environmental validity for the use of GBL as a conventional mode of learning and evaluation. Research should also be undertaken to determine any barriers that restrict the implementation of video games as pedagogical tools in formal learning settings, and how these might be overcome. This would determine how best this study and others like it might inform new educational practices. This thesis examined the pedagogical potential of playing and modding *EUIV*. However, these pedagogical forms of gaming practices and playful learning could be broadly applied to other strategy games and potential non-strategy games, depending on the specific game and focus of the historical content.

This research has also suggested that the learning outcomes associated with GBL and *EUIV* specifically could be experienced in other disciplines aside from history. Studies that explore GBL and/or Grand Strategy games in relation to other subjects could shed light on

their further application in the humanities, social sciences and even in STEM subjects. This could be particularly relevant when considering the potential modding offers for content creation, which would allow students of different disciplines to incorporate their own study and research interests into games like *EUIV*. Because modding reveals the analytical processes of the content creator, it could therefore be used in a variety of disciplines to assess learning outcomes. This thesis has proven that history is a good fit for modding as most of the Grand Strategy games that are moddable are based on history. However, *EUIV* might also provide a historical context for students to explore other facets of past events, such as those relating to human health, international relations, cultural practices and strategic studies. For example, this study showed how a medical student provided details in his mod on the symptoms of smallpox, brought by the Spanish to Mexico. Students in other disciplines could also capitalise on this creative feature of modding. Hence, whilst the modding practices explored in this thesis focused on history, further studies that investigate modding in other disciplines are warranted to understand the phenomenon in more detail. This would provide support for the worthwhile possibilities of using GBL to educate students on a variety of learning content in formal higher education settings.

10.7 Conclusion

The aim of this thesis has been to demonstrate the educational value of the Grand Strategy game *EUIV* and investigate its potential use in higher education to teach history. *EUIV* presents a wealth of unique learning opportunities that allow students to immerse themselves in history in different and actively engaging ways compared to traditional education mediums. By following their own path to engage with and create historical content, *EUIV* players participate in uniquely individual, deep learning experiences, whether these are based on traditional historical narratives or creative counterfactuals. Above all else, the thesis

has argued that the knowledge players' gain from these games is historically informative, legitimate and valuable. *EUIV* does so by encouraging historical interest and research outside the game, helping the player discover marginalised histories, allowing them to engage with and embody historical themes and influences, and presenting them with the opportunity to mod *EUIV* and express their own analysis and creative interpretation of history. The thesis has presented particularly unique and important findings on modding as a useful pedagogical practice, and has developed a process roadmap for educators to implement modding and other gaming practices in formal learning settings. As educators, we need to take advantage of technological shifts, the popularity of gaming and modding, and the increasing trend towards digital creation over digital consumption. By the time my nephew begins university, he will have received much of his knowledge through digital mediums including video games, and higher education institutions will need to cater to digitally fluent students like him. Video games and their future incarnations will provide educators and students with flexible, adaptive and current tools for learning, teaching and expressing history and other subjects.

History is often thought of as being read about in a book, or reimagined by looking at physical artefacts. However, *EUIV* presents history on a grand and complex scale. It portrays the rise and decline of empires, the birth of various modern-day nations and the emergence of the globalised world that we know today. Players of *EUIV* make choices that have consequences that ripple through time and are reflected on a worldwide scale. These games bring history to life and, more than that, make the player a part of history, able to envision and remake it from their own perspective.

Appendix A: *EUIV* Formal Analysis – Additional Materials

A.1 Startup Screen

The startup screen details the starting conditions and historical environment of the player's nation and region. Information may be either generic or specific. For example, the Kingdom of Castile follows the Catholic religion, and the startup screen will provide the player with a generic outline of Catholicism and the game mechanics associated with following that religion. The Country brief displayed on the screen will contain more specific information about the nation and its history. For example, Castile's startup screen (*Figure A.1*) discusses the nation's monarchic Trastamara dynasty (Earenfight, 2010, p. 5), describes the Crown of Castile as a union of many different kingdoms (Nader & Formisano, 2004, p. 141), and explains the looming conquest of the Muslim city Granada (Coleman, 2013, p. 1).

Figure A.8. Startup screen detailing the country's historical situation, its religion, its government and its political environment within the region (in Castile's case, Europe).

A.2 Battle Interfaces and Tactics

Once at war, two opposing armies may engage each other by initiating a battle. This allows the player to access the Battle Interface (*Figure A.2*). This interface shows the two sides involved in battle, the location (e.g. Battle of Murcia) and the leaders or generals involved. There are several variables that affect the outcome of a battle, including:

- leaders' stats (i.e. how well the leader can lead their troops, or bonuses the leader provides to the army)

- army size

- army composition (the number/presence of infantry, cavalry and/or artillery)

- crossing a river/strait or amphibious landing modifiers

- type of terrain (e.g. mountainous terrain penalises the attacking force)

- discipline of the army and its units

- morale of the army

- combat tactics

- army and combat width

- the dice roll (i.e. luck)

- pips of units (attack and defence modifiers) – hidden in interface.

Figure A.9. Battle Interface showing the Battle of Murcia between Castile and Aragon where the battle outcome is affected by the armies involved, their discipline, morale and tactics, as well as terrain of the battlefield.

The After Battle pop-up (*Figure A.3*) shows the victor of the battle as well as related and received bonuses, penalties and statistics, including soldiers lost, war score changes, increases in war exhaustion, gained/lost prestige and increase of military tradition.

Figure A.10. After Battle pop-up showing Castile (the player) lost the battle to Aragon (an AI nation) with great casualties, indicated by the original number of troops (infantry, cavalry and artillery) minus the casualties, with remaining troops displayed.

A.3 Pause and Game Speed Interface

The researcher considers *EUIV* a real-time strategy game with a speed up/down and pause mechanic. The Pause and Game Speed Interface (*Figure A.4*) shows the game speed with speed up (+) and speed down (-) buttons with five increments of game speeds and a pause/play button. It also shows the in-game date, the points the player has earned over the game and their place/score compared to the other nations in the game. An additional information box below the Pause and Game Speed Interface shows the activities of the player's diplomats and merchants as well as the size of their armies and navies.
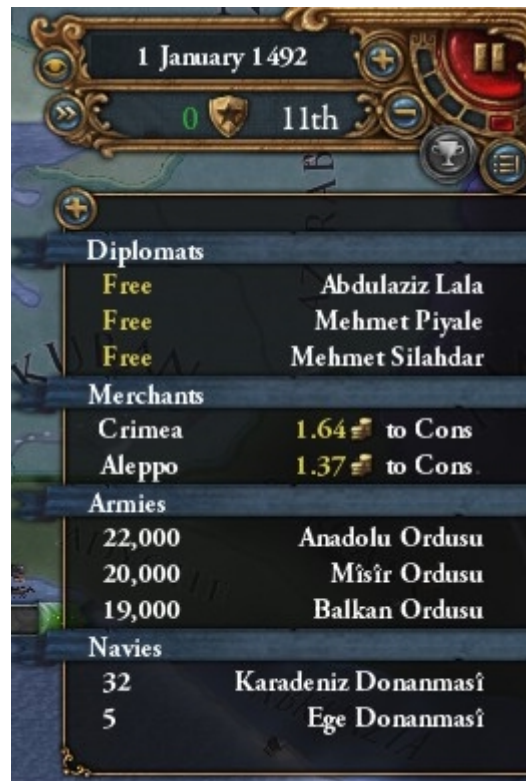
Figure A.11. Pause and Game Speed Interface showing the date 1 January 1492 and that this nation is 11th on the Overall Game Scoreboard.

A.4 Popup Boxes/Messages

Trigger Events. Trigger events occur after certain conditions are met or after a specific action has been executed by a nation, and there is no delay or probability involved in the triggering. *Figure A.5* shows that if the player has circumnavigated the globe with their ships, the condition in the code will be met and the Circumnavigate the Globe Event will trigger in the game.
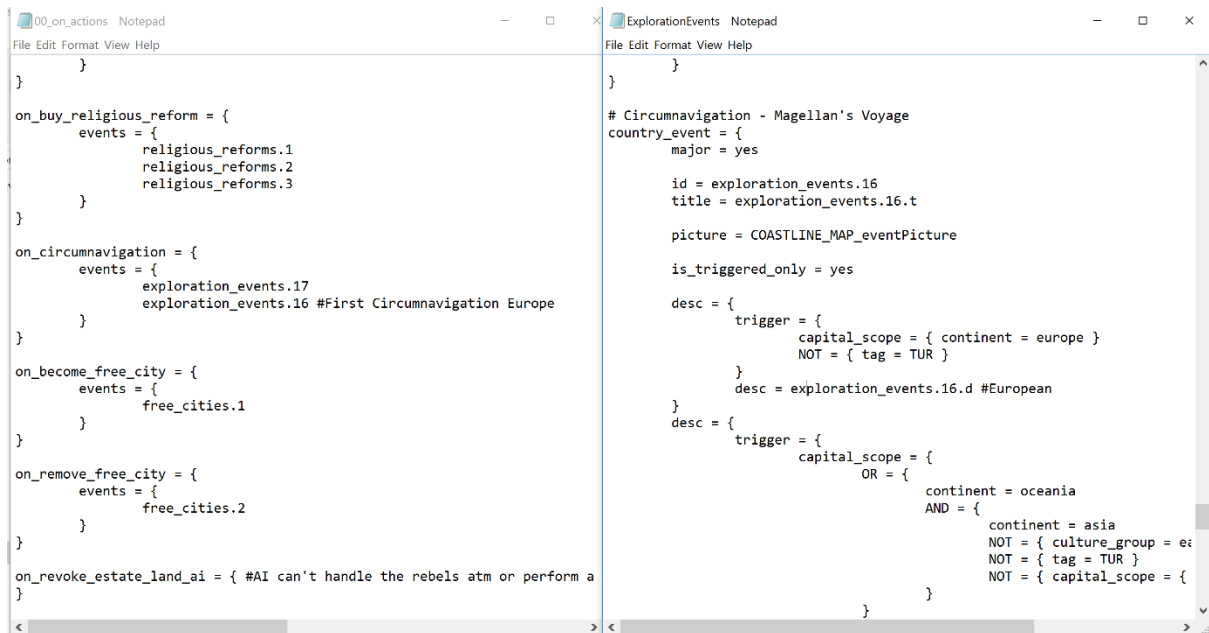
Figure A.12. Circumnavigate the Globe trigger script and event script, found in the *EUIV* files.

Pulse Events. Pulse events occur randomly at regular intervals (from every year to every five years) in the game (*EUIV* Wiki); however, some conditions must still be met for the event to trigger. Pulse events are typically assigned groups, and some events have a greater weight/chance to fire than other pulse events in the same group. At a certain interval the game will pick a random event from a group with other in-game modifiers affecting the chances of different pulse events triggering.

Mean Time to Happen (MTTH) Events. Unlike Triggered Events, MTTH Events will not trigger immediately after certain conditions are met, but rather will fire based on the probability weight of the event (*EUIV* Wiki). See *Figure A.6* and *A.7* for the in-game Lollard Heresy event and the event code showing the MTTH and other trigger conditions. While MTTH events are likely to fire around the specified MTTH, given the nature of probability the event could instantly fire once the conditions are met or far after the specified MTTH. See *Figure A.8* to show the probability of a 365 MTTH Event firing over days passed.

Figure A.13. Lollard Heresy event in-game shows England's options to handle the Lollard Heresy within the realm.

```
# The Lollard Heresy
country_event = {
        id = flavor_eng.9100
        title = "flavor_eng.EVTNAME9100"
        desc = "flavor_eng.EVTDESC9100"
        picture = RELIGION_eventPicture


        fire_only_once = yes


        trigger = {
                tag = ENG
                NOT = { is_year = 1500 }
                num_of_cities = 5
                religion = catholic
        }

        mean_time_to_happen = {
                months = 60
        }

        immediate = {
                hidden_effect = {
                        set_global_flag = lollard_heresy
                        random_owned_province = {
                                limit = {
                                        region = british_isles_region
                                }
                                set_province_flag = lollards
                        }
                        random_owned_province = {
```

Figure A.14. Lollard Heresy event code shows the MTTH for the event to trigger and the trigger conditions for the events to fire.
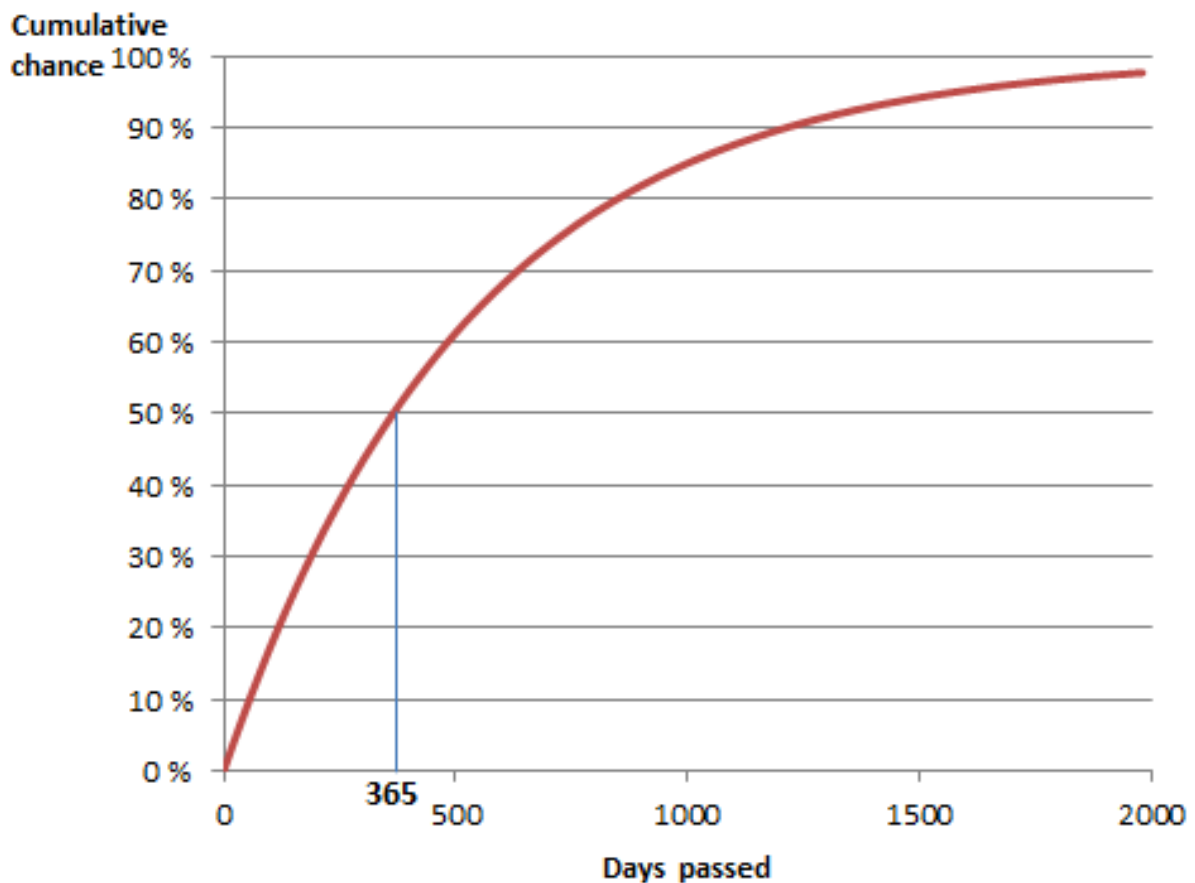
Figure A.15. Probability of a 365 MTTH Event firing over days passed (EUIV Wiki).

A.5 Game Points and Currencies

The Game Points and Currencies Interface (*Figure A.9*) lists many of the game's important

point systems and currencies that the player uses in their various interactions with the game

mechanics. These are described in detail below.

Figure A.16. Top-left game interface showing the most important in-game points and

currencies as well as in-game notifications.

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Monarch Power. These are points used to carry out many actions in the game from advancing in technology to acquiring ideas, changing the player's nation's government, recruiting leaders, increasing stability, and so on. They are divided into three different categories: administrative power, diplomatic power and military power. Points in each category accumulate over time, and the accumulation rate depends on a number of modifiers, including the stats of the nation's leader, the nation's focus, hired advisors and the base amount of points. Each type of Monarch Power has a different focus and use. Administrative Monarch Power points are used for managing the stability and expiation of the player's nation, such as integrating new provinces. Diplomatic Monarch Power points are used to carry out diplomatic actions such as annexing a nation, negotiating and executing a peace deal to end a war, or recruiting admirals/explorers. Military Monarch points are used to delay/quell rebellions, strengthen a nation's government and recruit generals. As well as being used to advance technologies, the points can be used for purchasing ideas (for in-game bonuses) within an idea group (e.g. the influence idea group, which is a diplomatic idea group).

Ducats. These are the monetary and financial currency used in the game. Ducats are received from taxes, production, trade, mining gold, tariffs and tributes from vassals. Ducats can be obtained from diplomatic agreements such as leasing your harbours to a foreign power, war reparations or subsidies from foreign powers. They can also be obtained through military activities, such as from raiding and pillaging enemy provinces or leasing out a nation's army to fight in a foreign war. Ducats are used to pay for expenses such as government advisors, administratively maintaining states, interest from loans, diplomatic expenses such as war reparations or subsidies, maintaining military forts, supporting colonialist settlers and missionary activities, rooting out corruption, and army and fleet maintenance. Ducats can also be used to construct buildings in provinces, in peace

negotiations, to advance an institution technologically, and for a wide range of other in-game actions.

Manpower. This currency is primarily used for the creation of new armies and the reinforcement of existing armies. Manpower will recover over time; however, the recovery speed depends on a number of variables such as the number and development of a nation's provinces and other in-game modifiers.

Sailors. This currency is primarily used to create ships and navies. Sailors will recover over time; however, the recovery speed depends on a number of variables such as the number and development of a nation's coastal provinces and other in-game modifiers.

Stability. This game value is used to represent the stability of a nation and can be manually increased using administrative Monarch Power points. This value ranges from -3 (very unstable) to +3 (very stable). Positive stability gives a nation bonuses and negative stability results in negative modifiers. The bonuses/negative modifiers related to stability include national unrest, legitimacy, corruption, the national tax modifier, and so on.

Corruption. This value represents the spread of corruption throughout a nation, which ranges from 0 (no corruption) to 100 (entirely corrupted). Each point of corruption will increase the negative modifier for foreign spy detection, creating spy networks, autonomy, all Monarch Power points costs and so on. Nations with no corruption have a chance to trigger beneficial events while those with corruption have a chance to trigger negative events. Corruption is increased through having high levels of overextension, religious disunity, a debased currency, and so on. Corruption can be decreased by high stability, being ahead of time in diplomatic and administrative technology, and through manually using the "rooting out corruption" slider in the economy tab.

Prestige. This value represents the glory and honour of a nation and its perception amongst its own people and other nations. The prestige system ranges from -100 (worst) to

100 with 0 being in the middle. 100 will give a wide range of positive modifiers to the player's nation; -100 will give the same modifiers but in reverse (i.e., negative modifiers), while 0 will have no effect. As a default, the value will always tick towards 0, but will also be influenced by other modifiers obtained in the game. The affected prestige modifiers include global trade power, the morale of armies and navies, ruler legitimacy, and so on.

National Unity. This point system ranges from 0 (worst) to 100 (best) and indicates how the people of a player's nation support the government, and whether they view it as legitimate. The lower the value, the more negative modifiers will be imposed on a nation, while higher values will provide the player with in-game bonuses. As a default, the value will always tick towards 100, but is influenced by other modifiers in the game. The national unity currency will be different depending on your government type; for instance, Legitimacy is the currency for monarchies, Republican Tradition for republics, Devotion for theocracies and Horde Unity for steppe hordes.

Power Projection. This value represents the power a player's nation projects in the regional and international arenas. Power Projection is increased based on aggressive actions towards a nation's rivals and is used to encourage conflict between worthy adversaries. Power Projection is increased by continuously having the same rival, embargoing rivals, declaring war on rivals, taking their provinces, and so on. Power Projection is decreased through having no rival, refusing to join wars against rivals, losing provinces to rivals, and so on. The positive effects of having high Power Projection includes increased fort defence, global trade power, army and navy morale, legitimacy, and so on. There are no negative modifiers for having 0 Power Projection.

Nation's Agents. This point system shows the player's available and engaged agents indicated by the number next to the agent's icon (e.g. 1/1). The agents include merchants, colonists, diplomats and missionaries.

Figure A.17. Map mode selection (top), Minimap (centre right) and unique nation mechanics (bottom left). The Minimap shows that only Europe and North Africa have been discovered by the player's nation.

Map Modes. *Figure A.10* shows different map modes that can be selected to inform the player about the overall demographics and layout of the world. Different map modes will show different aspects of the world, including terrain/climates, the political state (i.e. which nations exist), trade flow, the spread of different religions, and so on.

Minimap. *Figure A.10* also shows the Minimap, which displays the entire world map in miniature so that the player can easily view different locations. The player can click a location on the Minimap and will be taken there in the World Map Interface.

Unique Nation Mechanics. Some nations have unique nation mechanics that provide historical flavour (e.g. the English Monarchy government depicts the Constitutional monarchy and parliamentary system of the England). These mechanics allow the player to execute unique actions, and some will provide in-game bonuses or negative modifiers.

Holy Roman Empire Interface. This interface represents the organisation and politics within the Holy Roman Empire, located largely in modern day Germany and northern Italy. It is a collection of numerous nations under the protection of the Holy Roman Emperor (an elected nation). The player can consolidate their control to turn the organisation (and all member nations) into a super state through a series of reforms. These reforms are executed through Imperial Authority (a currency) obtained through actions that protect the interests of the empire, such as protecting member states from non-member states, integrating new territory into the empire, and so on. Conversely, any lack of actions, such as not answering calls of war from member states, cause imperial authority to diminish. This mechanic is also integral in simulating the 30 Years War, a highly significant event both in-game and in the Early Modern era itself.

Factions Mechanic. Some nations do not have estates, but rather use a faction mechanic to represent interest groups in their nation. For example, the Ming nation (or Ming Dynasty, as it is commonly known outside of the game) has three main factions vying for power and influence: the Eunuch Faction, Temple Faction and Bureaucrat Faction, while Merchant republics have the Guild Faction, the Traders Faction and the Aristocrats Faction. Different factions give the player's nation certain bonuses and negative modifiers; typically one faction provides administrative bonuses, one provides diplomatic/trade bonuses and the other provides military bonuses.

Tribal Nation Mechanic. This mechanic is used to depict the Native American tribes of North America. Quite offensively, nations with this mechanic are categorised as "primitive", however they do have access to several unique actions and technologies. For instance, they have the ability to form federations and work together to fight off invaders. Tribes from one province are also able to migrate to a more favourable province, and tribal

nations have access to unique technological advancements and ideas and are able to reform their governments.

Mesoamerican and South American Religions Mechanic. There are three Mesoamerican and South American religious mechanics: Inti (for Andean nations), Mayan (for Mayan nations) and Nahuatl (for the Aztecs). These mechanics represent the different religious characteristics of Mesoamerican and South American nations. For example, the Nahuatl Aztecs must obtain captives and make sacrifices to their gods in order to stave off the apocalypse. This is represented as a Doom timer that gradually accumulates until doom befalls the nation. Doom can be lowered through war and by other means, but if Doom reaches 100, society will collapse and heavy negative modifiers will be imposed on the nation. For each mechanic, different reforms can be passed to obtain bonuses for the player's nation.

Parliament Mechanic. This mechanic is available for Constitutional Monarchies, Constitutional Republics and the English Monarchy, and represents constitutional forms of government. Essentially, provinces are assigned seats that give bonuses to the province; these are involved in debates and often need to be won over with bribes in the form of some cost or currency. Once a debate is successful or has passed, a bonus modifier will be awarded to the player that will expire after 10 years. If it fails, there is a prestige cost to the player and a new debate can begin.

Appendix B: *EUIV* Online Forum Survey Materials

B.1 Online Information Participation Statement

Who is conducting the research?

The research is being conducted by a PhD student at an Australian university. The student researcher is contactable under his Paradox Interactive forum name, Orosirian. Names and personal details have not been disclosed to protect the identity of the project team.

What is the research study about?

You are invited to take part in this online research study. You have been invited because you are a *Europa Universalis IV* forum member.

To participate in this research study you need to meet the following inclusion criteria:

- Have played *Europa Universalis IV*

The research study plans to evaluate the use of Grand Strategy video games as a tool for formal adult learning in history. This study will help determine the viability of implementing video games as a tool for learning.

Do I have to take part in this research study?

Participation in this research is voluntary. If you don't wish to take part, you are under no obligation to do so. Your decision will not affect your relationship with the university conducting the research.

This document tells you about the research study and explains the research tasks involved. Knowing what is involved will help you decide if you want to take part in the research. Please read this information carefully before deciding whether or not to take part.

Rhett Loban

What does participation in this research require, and are there any risks involved?

If you decide to take part in the research study, you need to complete an online questionnaire, which will ask you questions about your experience with *EUIV*, history and learning. We expect this activity to take a few minutes of your time. Submitting your completed questionnaire is an indication of your consent to participate in the study.

Will I be paid to participate in this project?

There are no costs associated with participating in this research study, nor will you be paid.

What are the possible benefits to participation?

We hope to use information we obtain from this research study to help others who are enrolled at university to further enrich their understanding of history through the implementation of video games.

What will happen to information about me?

The research team collecting information from the questionnaire you complete will use the data for a research study and may keep your data for 7 years. It is anticipated that the results of this research study will be published and/or presented in a variety of forums. In any publication and/or presentation where the information will be published, your information will not be individually identifiable.

This project will use an external site to create, collect and analyse data collected in a questionnaire. The site we are using is SurveyMonkey. If you agree to participate in this study, the responses you provide to the questionnaire will be stored on a university host server. No identifiable personal information will be collected in the questionnaire. The data on this server will then be deleted once the study is concluded.

How and when will I find out what the results of the research study are?

You have a right to receive feedback about the overall results of this study. It is likely we will post the results on the Paradox Interactive forums for you to access. This feedback will be in the form of a one-page summary of the results. You will receive this feedback after the study is completed.

What if I want to withdraw from the research study?

Submitting your completed questionnaire is an indication of your consent to participate in the study. You can withdraw your responses any time before you have submitted the questionnaire. Once you have submitted it, your responses cannot be withdrawn because the survey is anonymous, therefore we will not be able to tell which answers are yours.

What should I do if I have further questions about my involvement in the research study?

If you want any further information concerning this project or if you have any problems which may be related to your involvement in the project, you can contact the following member of the research team:

Research Team Contact

Paradox Interactive Forum Name	Orosirian
Position	Student Investigator

Rhett Loban

Contact	Private message by Paradox Interactive forums or at his email: australian.reseacher@hotmail.com

B.2 *EUIV* Online Forum Recruitment Post with Link to Survey

Hi all,

I am a PhD student assisting in a research project at an Australian university. The research study aims to evaluate the use of Grand Strategy video games as a tool for higher education learning in history. This study will help determine the viability of implementing video games as a tool for learning in universities. We are interested in understanding your experience with *EUIV* and ask that you take a few minutes of your time to complete a survey. Your survey responses will inform learning case studies taking place at the university.

Please see the survey link below:

https://www.surveymonkey.com/r/G6QVMGN

Also please see in the post below the online participant information statement which contains details about research study, survey and participation consent. The more input the community gives the better we can shape the second part of the project involving university students playing and modding *EUIV*. Feel free to give even further input via response to this post. Thank you in advance for any comments and support.

Cheers

Orosirian

B.3 *EUIV* Forum Survey Questions

1. What got you interested in playing *Europa Universalis IV*? (choose one only)

- History

- Video games

- Wargaming, tabletop games or board games

- Other (please specify) [text answer]

2. What do you think is the most useful game feature to learn about history in *Europa Universalis IV*? (choose one only)

- Pop-up boxes (generic events, historical events, etc.)

- Nation/cultural/religious specific game mechanics (e.g. treasure ships, parliament, Nahuatl mechanic, etc.)

- Game map and map modes (e.g. resource map mode, province details, religious map mode)

- Governance Tabs and System (e.g. trade tab, military tab, technology tab, etc.)

- Other (please specify) [text answer]

3a. Does gameplay encourage you to seek out more information about history? (choose one only)

- Yes

- No

3b. If so, what other sources do you seek out? (choose one only)

- Internet sources (history websites, Wikipedia or other webpages)

- Documentaries or other videos (including YouTube)

- Books, academic articles or historical documents

- Other (please specify) [text answer]

4a. Have you ever modded *Europa Universalis IV*? (choose one only)

- Yes

- No

4b. If so, was it a useful exercise for learning history? Please explain your answer. [text answer]

5a. How often do you play multiplayer in *EUIV*? (choose one only)

- Never (never played multiplayer before)

- Very rarely (only played multiplayer once or twice)

- Sometimes (once every few months)

- Often (once a month)

- Very often (once a week)

- Whenever I play *Europa Universalis IV*

5b. Does this improve the game experience? Please explain. [text answer]

6a. How accurately does *Europa Universalis IV* reflect and simulate history? (choose one only)

- Very accurately

- Quite accurately

- Somewhat accurately

- Quite inaccurately

- Not accurately at all

- Other (please specify) [text answer]

6b. Please explain your answer. [text answer]

7a. How accurately does *Europa Universalis IV* reflect and simulate nation governance and management? (choose one only)

- Very accurately

- Quite accurately

- Somewhat accurately

- Quite inaccurately

- Not accurately at all

- Other (please specify) [text answer]

7b. Please explain your answer. [text answer]

Appendix C: Forum Survey Questions, Themes and Sub-themes

C.1 Forum Survey Question 6 &7 Themes and Sub-themes Matrix

Themes 1 to 3 (Historical Research, Modding and Multiplayer) did not have many clear branching opinions and were not further sub-divided and have not been listed here. The themes below (themes 4-7) were primarily drawn from "6a. How accurately does *Europa Universalis IV* reflect and simulate history?" where players had to explain their answer (question 6b), and from "7a. How accurately does *Europa Universalis IV* reflect and simulate nation governance and management?" where players had to explain their answer (question 7b).

Question 6 Themes and Sub-themes

1. *EUIV*'s **Historical Accuracy**

    a. The game is historically accurate enough for the player's standard (11 participants).

    b. *EUIV* is currently one of the best (if not the best) historical games and simulators, despite its flaws (8 participants)

    c. The game is useful for helping the player understand political influences and to gain a general understanding of how history happened (4 participants)

    d. The developers attempt, through game design and mechanics and events, to make the game historically railroaded and authentic as possible (11 participants)

    e. *EUIV* tends to be historically accurate in many regards (6 participants)

f. The game focuses more on warfare, conquest and expansion than on how these events emerged and other important non-warfare factors (8 participants)

g. The game is accurate at the start and then begins to diverge (42 participants)

h. It is hard to reflect or simulate everything in history, but the developers generally have made a sound effort (36 participants)

i. *EUIV* is inspired by history and potential historically plausible, but is not factual history (22 participants)

j. The game offers a "what if?" scenario or an alternate version of history (4 participants)

k. The game map and geography specifically are historically accurate and informative (15 participants)

l. Certain regions, parts or aspects of the game are not historically accurate or have little depth; this is in exchange for a potentially large scope of history (12 participants)

m. Historical events and pop-up boxes generally add accurate historical information; however, the rest of the gameplay diverges from what actually happened in history (45 participants)

n. Game mechanics and gameplay do not necessarily reflect or simulate the complexity of all historical factors (16 participants)

o. The game is not a simulator of factual history, but a simulator of broader historical changes and themes in history (22 participants)

2. *EUIV's* **Gameplay and History**

   a. The game is more about targeting in-game objects and the manipulation of variables than reflecting real situations and sentiments (6 participants)

   b. The game's AI (and some of the game mechanics) work against the game's historical accuracy and causes it to diverge from history (23 participants)

   c. The player or players work against the game's historical accuracy and cause the game to diverge from history (21 participants)

   d. While historical accuracy is important, it is also important (usually more than accuracy) to get the right balance between gameplay and historical accuracy (27 participants).

Question 7 Themes and Sub-themes

3. *EUIV*'s **Nation Management and Governance Accuracy**

   a. Some aspects of the game reflect and simulate nation governance and management accurately, while other aspects do not, or are lacking (15 participants)

   b. *EUIV* does reasonably well at reflecting and simulating nation governance and management (21 participants)

   c. Internal factions and powers are well represented in the game and the game was improving its depiction of internal nation management with each new version (19 participants)

d. *EUIV* does not perfectly reflect and simulate governance and nation management, but the game is currently the best history video game available (11 participants).

e. Governing is too easy as the player has a "god-like" control over government decisions. Managing a nation in this fashion does not compare to how a leader would have actually ruled in history (26 participants)

f. *EUIV* as a game is more focused on conquest and expansion than governance and nation management (18 participants)

g. Differences between governments of nations and their individual forms of nation management are not well reflected. There are only different game bonuses as opposed to different governance systems (8 participants)

h. *EUIV* does not reflect or simulate nation governance and management in many regards (22 participants)

i. The game mechanics and gameplay are simplified and do not reflect or simulate complex factors in nation governance and management (75 participants)

j. The game uses abstract mechanics and a points system to try and simulate governance (e.g. Monarch Power points or Power Projection points – "mana") (23 participants)

k. Dynasties, royal families and individuals are not reflected well (18 participants)

l. Internal factions, internal powers, societies and different populations within a nation are not well reflected (27 participants)

m. *EUIV* is not necessarily a game for reflecting and simulating governance within a nation state, but is rather better at reflecting and simulating international relations and diplomacy between nation states (9 participants)

4. ***EUIV*'s Gameplay and Nation Management and Governance Accuracy**

a. *EUIV* is not accurate; however, the issue is more about balancing historical accuracy and gameplay (33 participants)

b. *EUIV* is too exploitable in terms of governance (3 participants)

Appendix D: University Case Study Materials

D.1 Participation Information and Consent Form

The study is being carried out by the following researchers:		
Role	*Name*	*Organisation*
Chief Investigator	*Dr Thomas Apperley*	*UNSW*
Student Investigator/s	*Rhett Loban*	*UNSW*
Research Funder	This research is being funded by UNSW.	

What is the research study about?

You are invited to take part in this research study. You have been invited because you are a university student and have volunteered to participant in the research.

To participate in this project you need to meet the following inclusion criteria:

- be a university student

The research study is aiming to evaluate the use of Grand Strategy video games as a tool for formal adult learning in history. This study will help determine the viability of implementing video games as a tool for learning.

Do I have to take part in this research study?

Participation in this research study is voluntary. If you do not wish to take part, there is no obligation. Your decision will not affect your relationship with the University of New South Wales.

This Participant Information Statement and Consent Form tells you about the research study. It explains the research tasks involved. Knowing what is involved will help you decide if you want to take part in the research.

Please read this information carefully. Ask questions about anything that you do not understand or want to know more about. Before deciding whether or not to take part, you might want to talk about it with a relative or friend.

If you decide you want to take part in the research study, you will be asked to:

- Sign the consent form;

- Keep a copy of this Participant Information Statement;

What does participation in this research require, and are there any risks involved?

If you decide to take part in the research study, you will be asked to *play video games, participate in historical simulations and/or create content for a video game. You will be exposed to a video game with low-level violence and bad language.*

Aside from giving up your time, we do not expect that there will be any risks or costs associated with taking part in this study. You will be asked to complete a paper-based questionnaire, which will ask you questions about your previous experience with your study of history, technology and video games. We expect this activity to take up to 15 minutes.

You will be asked to complete a pre and post-knowledge test which will ask you questions relating to historical themes and events about the Renaissance/Early Modern era. We expect this activity to take up to 30 minutes for each test.

You will be asked to participate in an interview that will take approximately 20 minutes. During the interview a member of the research team will ask you questions about your experience with the experiment and what you learnt. With your permission we would like

to digitially record the interview using a sound recorder. The interviews will take place at an agreed upon location.

You will be asked to participate in an allocated group activity each week for a month which can take around an hour to complete. These activites may be learning how to play a video game, gameplay, participating in a historical simulation or modding/creating content for a game. With your permission we would like to digitially record gameplay and take notes on any developments during the activities.

Will I be paid to participate in this project?

You will be given a $50 gift voucher for your participation and time.

What are the possible benefits to participation?

We hope to use information we obtain from this research study to benefit others who are enrolled at university to further enrich their understanding of history through the implementation of video games.

What will happen to information about me?

By signing the consent form, you consent to the research team collecting and using information about you for the research study. We will keep your data until the end of the project. We will store information about you on UNSW premises. Your identifying information will only be used for the purpose of this research study and will not be disclosed.

It is anticipated that the results of this research study will be published and/or presented in a variety of forums. In any publication and/or presentation, information will be published in such a way that you will not be individually identifiable.

You have the right to request access to the information about you that is collected and stored by the research team. You also have the right to request that any information with which you disagree be corrected. You can do this by contacting a member of the research team.

The audio and video-taped digital recordings are for the purposes of the research study. After the interview and gameplay we may transcribe and then delete your digital recordings. We will keep your digital recordings in the forms of sound recording and transcription until the end of the project. We will store information about you on the UNSW server. Your confidentiality will be ensured by UNSW IT security services.

How and when will I find out the results of the research study?

You have a right to receive feedback about the overall results of this study. You can tell us that you wish to receive feedback by emailing the student investigator. This feedback will be in the form of a one-page summary of the results. You will receive this feedback after the study is finished.

What if I want to withdraw from the research study?

If you do consent to continue your participation, you may withdraw at any time. If you do withdraw, you will be asked to complete and sign the Withdrawal of Consent Form, which is provided at the end of this document. Alternatively, you can ring the research team and tell them you no longer want to participate. If you decide to leave the research study, the researchers will not collect additional information from you.

You are free to stop the interview at any time. Unless you say that you want us to keep them, any recordings will be erased and the information you have provided will not be included in the study results. You may also refuse to answer any question during the interview.

If you take part in a Historical Simulation, you are free to stop participating at any stage or to refuse to answer any of the questions. However, it will not be possible to withdraw your individual comments from our records once the simulation has started, as it is a group discussion.

Please let us know at the time when you withdraw what you would like us to do with the information we have collected about you up until that point. If you wish for your information to be removed from our study records, your data will not be included in the study results, up to the point that we have analysed and published the results. Also, once your data has been de-identified it will no longer be possible to withdraw it as your individual data will not be identifiable.

What should I do if I have further questions about my involvement in the research study?

The person you may need to contact will depend on the nature of your query. If you want any further information concerning this project or if you have any problems that may be related to your involvement in the project, you can contact the following member/s of the research team:

Research Team Contact

Name	Rhett Loban
Position	Student Investigator
Telephone	N/A
Email	r.loban@student.unsw.edu.au

Name	Tom Apperley

Position	Chief Investigator
Telephone	N/A
Email	t.apperley@unsw.edu.au

What if I have a complaint or any concerns about the research study?

If you have any complaints about any aspect of the project, including the way it is being conducted, then you may contact:

Complaints Contact

Position	Human Research Ethics Coordinator
Telephone	+ 61 2 9385 6222
Email	humanethics@unsw.edu.au
HC Reference Number	HC16139

Consent Form – Participant Providing Own Consent

Declaration by the participant

☐ I have read the Participant Information Sheet or someone has read it to me in a language that I understand;

☐ I understand the purposes, study tasks and risks of the research described in the project;

☐ I have had an opportunity to ask questions and I am satisfied with the answers I have received;

☐ I freely agree to participate in this research study as described and understand that I am free to withdraw at any time during the project and withdrawal will not affect my relationship with any of the named organisations and/or research team members;

Rhett Loban

☐ I understand that I will be given a signed copy of this document to keep;

Participant's Contact Details

Name of Participant	
Participant's Phone Number	
Participant's Email	

Participant Signature

Name of Participant (please print)	
Signature of Research Participant	
Date	

Declaration by Researcher*

☐ I have given a verbal explanation of the research study, its study activities and risks and I believe that the participant has understood that explanation.

Researcher Signature*

Rhett Loban

Name of Researcher (please print)	
Signature of Researcher	
Date	

+An appropriately qualified member of the research team must provide the explanation of and information concerning the research study.

Note: All parties signing the consent section must date their own signature.

D.2 Case Study Participant Demographic Form

Name: [text answer]

Gender: [text answer]

Age: [numerical answer]

Enrolled Degree: [text answer]

Nationality: [text answer]

What is your previous experience and skill with information technology? (e.g. navigate internet or specific software, beginner programming)

[text answer]

What is your previous experience and skill with video games? (e.g. play console games often, play only mobile games occasional)

 [text answer]

Do you play a particular video game or video game genre? If so, please list game/s, genre/s and explain preferences.

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[text answer]

What is your previous experience interest in and knowledge of history? (e.g. a history student at university, watch documentaries sometimes)

[text answer]

Do you have an interest in a specific history or country? If so, please explain.

[text answer]

Appendix E: Pre and Post-Tests

E.1 Written and Visual Pre and Post-Tests

Written Pre-Test Questions

1. In which geographic region was the Aztec Empire located? [text answer]

2. Who were the main nations involved in the conflict between the Spanish and the Aztecs? [text answer]

3. What was the commodity (or commodities) that was highly valued in Europe, but in abundance in Aztec Society? [text answer]

4. What were the major religions followed by the Aztecs and the Spanish? [text answer]

5. What did the Aztecs practice to delay the apocalypse in their religion? [text answer]

6. Who was the Aztec leader when the Spanish arrived in Mexico? [text answer]

7. Who were the Tlaxcalans? [text answer]

8. When did the Spanish land in Mexico? [text answer]

Written Post-Test Questions

1. In which modern day nation was the Aztec Empire located? [text answer]

2. In the Spanish conquest of the Aztecs, who were the major nations involved in the conflict? [text answer]

3. What was the commodity (or commodities) that was valued by the Spanish, but was in great surplus and used for everyday items in the Aztec Empire? [text answer]

4. What were the major religions of a) the Aztecs and b) the Spanish? [text answer]

5. What did the Aztecs practice that caused the Spanish great disdain? [text answer]

6. Who was the Aztec Emperor at the time of the Spanish conquest? [text answer]

7. Who were the Tlaxcalans and what role did they play in the conflict between the Spanish and the Aztecs? [text answer]

8. In what year did Cortes arrive in Mexico? [text answer]

Rhett Loban

Visual Pre and Post-Test Map

Figure A.11 shows the test map that was used in the Visual Pre and Post-Tests.
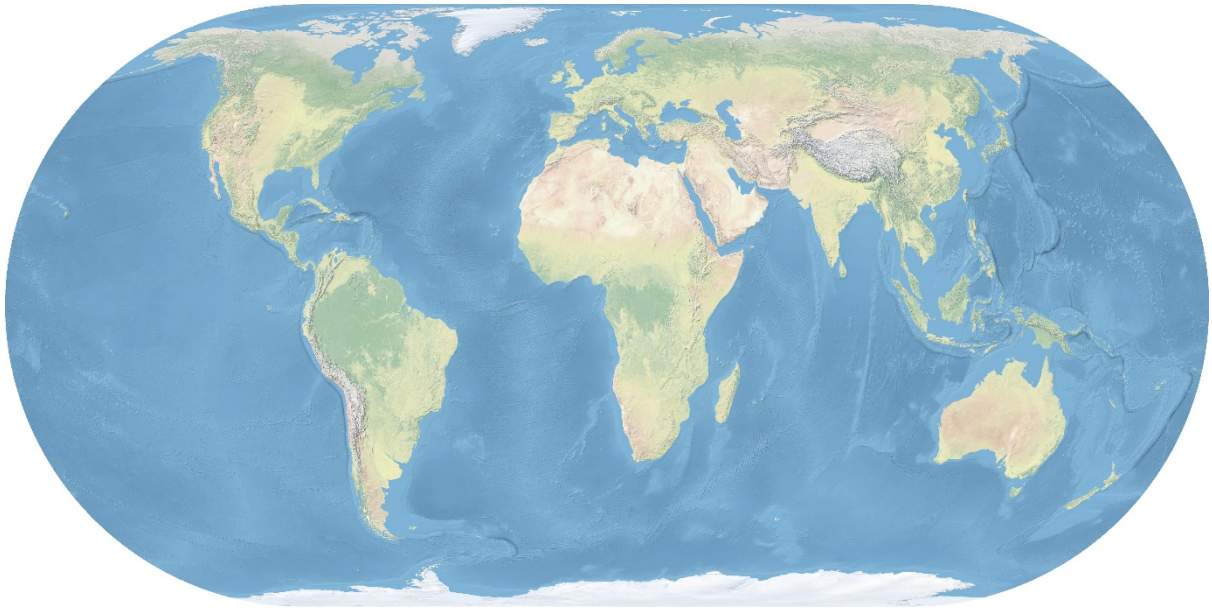
Figure A.18. World Map used in Visual Pre and Post-Tests.

Appendix F: Modding and Historical Simulation Documents

F.1 Modding Brief

Task: You need to create an event that describes and imitates (in terms of in-game triggers and commands) the contact between the Spanish and Aztecs. For example, you may wish to create an event that triggers once the Aztecs are discovered and gives prestige to the player, or an event that causes Spain to annex the Aztecs and gives the player a lump sum of gold. This will require research and evaluation of different information sources about the Aztecs and Spanish to understand the history of their contact. The primary purpose of the exercise is that you understand the historical contexts and themes enough to insert well-researched content/information into the game and try to implement the event with appropriate triggers and conditions.

Books and academic articles are by far the best sources of information; however, in the interest of time you should use the internet and websites to source your information. You may use any internet sources to find your information. The following websites may be useful:

- http://www.ushistory.org/civ/11d.asp

- http://www.ancient.eu/Aztec_Civilization/

- http://www.spanishwars.net/16th-century-conquest-of-the-aztec-empire-partIII.html

- http://www.aztec-history.com/fall-of-the-aztec-empire.html

- http://www.pbs.org/conquistadors/cortes/cortes_flat.html

- http://www.history.com/topics/aztecs/videos/hernan-cortes-fast-facts?m=528e394da93ae&s=undefined&f=1&free=false

- http://www.aztec-history.com/aztec-empire.html

F.2 Historical Simulation Briefs

The purpose of this simulation is to learn about history through a solo or collaborative roleplay scenario. You will be assigned one nation and a leader within that nation with their own responsibilities and objectives. Learning about history from this exercise can come in many forms: mouse hover information boxes (when you hover your mouse over certain icons), National Ideas, religious information, missions, the in-game map and provinces, and so on.

Aztec Nation Brief

Nation: Aztec Empire

Role and Responsibilities: Govern the Aztec Empire and defend against the invaders.

Overview: Our ruler Moctezuma II has been informed about strange men that have appeared on our shore. Their arrival coincides with the coming of Quetzalcoatl. Our ruler believes the leader of these strangers to be a living god. The men of this god carry metallic weapons and sticks that can kill people from a distance. It appears they have taken our leader Moctezuma II hostage and constantly demand gold. They have even demanded we remove our idols and stop our traditional sacrifices. They have even formed an alliance with our enemies, the Tlaxcalan. We must stop these invaders as they threaten our existence.

Spanish Nation Brief

Nation: Kingdom of Spain

Role and Responsibilities: Manage your nation and lead an expedition into Mexico to obtain riches, expand the empire and spread the Christian faith.

Overview: After hearing about new lands from the Cordoba expedition, a new expedition set sail from Cuba under Hernan Cortes. We have arrived in Vera Cruz, Mexico with the prospect of establishing a new colonial town. We have met a group of Tlaxcalan natives who seem willing to form an alliance with us, especially given their hostility with the Aztecs, the

dominant native empire. Our contact with the Aztec Empire has shown that they engage in sacrificial rituals that go against all our Christian beliefs. However, they have an abundance of gold and wealth that could be exploited. This presents an opportunity for us to take their wealth, spreading the word of God and expanding the Spanish Empire.

Tlaxcalan Nation Brief

Nation: Tlaxcalan Republic

Role and Responsibilities: Govern your nation and protect yourself against the Aztec oppressors.

Overview: The life of our people has been harsh and full of torment. The dominant neighbouring empire, the Aztecs, have engaged in constant hostilities against us, known as the Flower Wars. They capture our people only to sacrifice them to their gods. However, strange men have arrived on the shores of Mexico bearing metallic weapons and sticks that can kill people from a distance. They also seem to detest the sacrificial practices of the Aztecs. We should seek an alliance with them against our tormentors and put an end to their oppression.

Appendix G: Case Study Interview Script

1. How did you find the entire experience?

2. What was the most important thing you learnt in this experience?

3. How does learning about history through a video game compare to learning through other sources, say a book, documentary, etc?

4. Did playing encourage you to look into history outside of the experiment session? If yes, what other sources?

5. What was most difficult concept or feature about the exercise?

6. How did you go about playing and strategising in the game?

7. Did your previous experience in video games, history or technology change or inform how you played the game? If yes, how so?

Appendix H: Case Study Participants' Mods

Peter's mod

<u>Trigger:</u>

Player is Castile or Spain, the year is not before 1500 and has discovered the Mexico city province.

<u>Options:</u>

Defeat Tlaxcala

War declared between Tlaxcalans and the Spanish

<u>Description:</u>

Cortés marched to the territory of the Tlaxcalans. They were resolute enemies of Mexico and Cortés thought they might join him in a military alliance against the Aztecs. After a long debate, the Tlaxcalans decided to fight Cortés instead.

James's mod

Trigger:

October 1519, Hernán Cortés suspects that the people of Cholula are plotting against him.

Options:

Cortés had the leaders of Cholula killed. Thousands of the city's residents are murdered by Spanish troops and parts of Cholula are burned. 'Declares War Between Two Nations'.

Description:

The Massacre of Cholula

In October 1519 while at Cholula Hernán Cortés suspects that the city's leaders and warriors are plotting to attack his Spanish Forces. Cholula was the second largest city in the region, behind Tenochtitlan – the capital of the Aztec Empire. Cortés confronted the city's leaders at the main temple. The leaders claimed that while King Moctezuma of the Aztecs had ordered them to fight the Spanish, they had no intention of resisting. Nonetheless, Cortés had the leaders killed; thousands of people murdered; and, parts of the city burned.

Anna's mod

Trigger:

Death of Aztec king Moctezuma II

Options:

Retreat to Tlaxcala!

Description:

On the night of June 30th 1520, the Spanish conquistadors decided to escape from Technotitlan following the death of the Aztec king Moctezuma II, whom they had been holding hostage. But before they could reach the exit of the Aztec city they were spotted by angered locals, who rallied their warriors to attack. A violent battle ensued and the Spaniards, being outnumbered by the Mexica army, lost a great number of their own soldiers (more than 500 men - made up of both Spanish and Aztec allies). A lot of their resources were also lost such as food, gunpowder and treasure. The Spaniards referred to this night as "la noche triste", which translated to 'the night of sorrows'.

Henry's mod

Trigger:

Spanish discovering Tenochtitlan and after May 4 1519

Options:

- Let the practice continue - Become friendly with Aztecs (vassal), receive gold, penalty with Catholic nations (--piety)

- Stop the practice - Declare war on Aztecs (casus belli colonialism), friendly with Catholic nations (++piety)

Description:

A Clash of Cultures

When the Spanish met the Aztecs in 1519, they were confronted by the Aztec practice of human sacrifice. In Aztec religion, the gods had sacrificed themselves in order to give life to humanity. Nanauatl gave himself to become the sun, while the other gods sacrificed themselves to form the wind that moved the sun in the sky. In turn, humans gave their blood to repay and sustain the gods as they kept the sun moving. The sacrifice to the gods was an important part of Aztec culture - the temple called Hueyi Teocalli, dedicated to two gods, Huitzilopochtli, god of war, and Tlaloc, god of rain and agriculture, occupied a large part of the Sacred Precinct in the capital Tenochtitlan.

Hernan Cortes, leader of the Spanish expedition to what was termed the New World, was appalled at the custom, and saw the practice of human sacrifice as abhorrent. Arguably, this was one of the factors that led to the conflict between the Spanish and the Aztecs, and formed a powerful justification for the Spanish Conquest. Further, surrounding Mesoamerican city-states, like Tlaxcala, whom had a number of its people sacrificed in the aftermath of wars with Tenochtitlan, allied with the Spanish against the Aztecs.

<u>Ethan's mod</u>

<u>Trigger:</u>

Discovering new nation after colonising Cuba in Mexico/south America

<u>Options:</u>

Mission

Score 60-74: Gain Trade, Establish new Trade Node, regular tribute

Score 75-100: Solidify alliance (no decay) increased trade/tribute (+20%) regional stability+ political stability + Diplomatic resource. Conversion does not impact public stability. Tolerance does not impact public stability

Mission Failure

50-59: Nation takes hostile stance against you, and is more likely to join alliances opposing you.

0-49: Nation declares war on you.

<u>Description:</u>

Winning Hearts and Minds

In an unfamiliar and hostile land, who better to guide your expedition than the locals? The lay of the land is hidden in dark yet beautiful forests that conceal bountiful treasures of wealth, resources and intangible value if you know where to look. Developing a relationship with the locals might just help you to uncover these secrets, least of all, the fabled land of gold.

Paul's mod

Trigger:

Spanish forces annex Tenochtitlan (Aztec Empire)

Options:

Doomed by fate

Description:

Smallpox strikes the Aztecs

After the massacre at Tenochtitlan, the Aztecs cleaned the temple courtyards and again celebrated their fiestas in the traditional way. But by the end of September 1520, people started to die of a mysterious and alien illness that had horrifying symptoms of "racking coughs and painful burning sores." The pestilence, smallpox, spread soon crossed the causeways into Tenochtitlán. It lasted 70 days, until late November, and killed a vast number of people.

Doomed by fate

Nathan's mod

Trigger:

Player is Castile or Spain and he/she has discovered the Aztec nation.

Options:

Take their gold and infect them with small pox!

-3000 manpower from the Aztecs, add 10 prestige, Spain receives 10000 in Ducats, the Aztec leader dies.

Description:

You Have Discovered The Aztecs

Hernan Cortez has discovered the Aztecs, who probably originated as a nomadic tribe in northern Mexico, arrived in Mesoamerica around the beginning of the 13th century. From their magnificent capital city, Tenochtitlan, the Aztecs emerged as the dominant force in central Mexico. Their lands are plentiful of gold and their people have not been exposed to any European diseases like small pox, measels[sic] or mumps. Biological warfare would surely destroy them, leaving their gold all to us.

Beth's mod

Trigger:

Player is Castile or Spain and the year is not before 1519.

Options:

500 Admin points, 50 prestige and option to hire Malintzin as an advisor.

Description:

Malintzin

Malintzin, a woman of intelligence and grace, would prove to be invaluable in Cortés' mission to colonize Mexico. Abandoned by her family in the Maya, and given away to people in Xicalango, she is well versed in the languages of both Mayan and Nahuatl. She was able to communicate with the Spaniards via a priest by the name of Geronimo de Aguilar. Aguilar picked up Mayan from when he was in captivity for a period of time in the area. In modern Mexican Spanish, Malinchista (from La Malinche, another name for Malintzin) is used as an insult for people who prefer foreign goods, alluding to how she betrayed her own people for the benefit of the Spaniards.

Rhett Loban

Appendix I: Case Study Themes and Sub-Themes

Table A.2. *Case Study Themes, sub-themes and numbers of participants commenting on each theme/sub-theme.*

Themes	Sub-themes	Number of participants commenting on the topic	Researcher comments
Theme 1: Difficulty playing the game	Complex interface	4	
	A lot of functions and variables	5	
	Hard to manage everything or unsure of parts of the game	8	
	Huge map	2	
	Difficulty following historical simulation	4	
	Tutorial hard, buggy or not streamlined	3	
	Learning the game was the hardest thing	2	One participant noted the learning curve
	Implementing code (modding) hardest part	3	
Theme 2: Learning benefits of game or game-based activities	Gaming is an interactive medium (more than books or documentaries)	8	
	Feels like you have to memorise with books, not the case for games	2	
	Learnt about history, geography, locations or nations I did not know about	6	
	Learnt about nations that were initially larger than I thought.	2	

	Found lots of details of history in gaming sessions (gaming or modding)	8	One participant discovered how dark history could be
	Researching for the mod about history was the most or an interesting part	3	One participant noted *EUIV* put history into practice, and reinforced their knowledge and learning
	Modding made learning more efficient or effective	2	
	Game is a good catalyst for interest in history	4	One participant noted *EUIV* is a good way to motivate people not otherwise interested in history to become interested
	Found out about technology differences between nations and their importance	1	
Theme 3: Participant game strategies	Tried to better manage and improve the economy, income or finances of nation	7	Most business students seemed to comment on this idea
	Aztecs easier to manage because of smaller land mass	1	
	Tried to conquer other nation and form alliance with more powerful nations	2	
Theme 4: Participants' understanding of historical	Game quite an abstracted version of history	2	One participant said there were lots of in-game variables and numbers, but he/she did not feel the impact (e.g. people lost in battle)

representations in *EUIV*	New perspective on history as a historical actor rather than a learning the history from an outside perspective	1	
	Time spent learning the game impeded the learning of history in the game	2	
	History is there, but focused on gameplay	1	
	Found the depictions of historical and strategy game themes such as overextension interesting	1	
	Aimed to recreate historical borders	1	
	Allows counterfactuals	2	
	Found it interesting the Aztecs had no money, despite being most populous nation in the Americas	1	
	Not sure what is true and what is not true	2	
	Realised limitations of Native American nations	1	
Theme 5: History in video games compared to other mediums or video games	Games more informative than other resources like movies	1	
	Other forms of learning history such as videos, documentaries, articles fed into modding	1	
	Details better in books (game does not explain everything or can miss some things)	3	
	Normally satisfied with the interpretation of the video game (only if very interested does the participant seek out other sources)	1	

	Strategy games such as *Age of Empires* have greater focus, but not larger scope	1	
	More complex than other strategy games	2	
	The game covers more historical scope than a book/documentary	1	
	Books or documentaries best sources of information (most accurate)	2	
	Enjoys strategy games because of the achievement at the end	1	
	Understood different aspects of governance (political, economic, diplomacy) like in other games	1	
Theme 6: Previous experience and game activities	Previous experience with strategy games may have helped (familiar with strategy concepts)	6	
	Previous knowledge of history may have helped me play	2	
Theme 7: General impression of game or gaming session	Need more time or to understand everything to be good at the game	1	
	Enjoyed the gaming session or thought *EUIV* was fun	2	
	The game layout was good and could see a lot of historical elements	1	

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