Archaeology in video games:

A quest to involve a wider audience in archaeology by the use of video games

By Diantha Boerboom

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After http://freshwallpapers.net/games/bayek-sphinx-assassins-creed-origins.html

After https://www.*Battlefield*.com/nl-nl/news/*Battlefield*-1-wallpapers

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Archaeology in video games:

A quest to involve a wider audience in archaeology by the use of video games

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Contents

1. Introduction to the topic

This research aims to address the question of how and to what extent we can use video games to reach out to and involve a wider public in archaeology.

Video games are becoming an increasing part in everyone's life. They are played by all age groups and all genders and know a variety of types; from simple games on a phone or tablet to more complicated games on the PC and console. This thesis will maintain its focus on these more complicated games. A large number of these video games may deal with fictional narratives, like many people would assume, but not all games are. An increasing amount of video game developers are implementing historical and archaeological aspects in their video game series. An example is Ubisoft, who chose a historical theme for each of their *Assassin's Creed* games (Ubisoft Montreal, 2007-2018). One of the newest additions to this series is *Assassin's Creed: Origins*, which was released in 2017 (Ubisoft Montreal, 2017). In this game the focus is on Ancient Egypt at the time of the Ptolemaic empire around 332-30 BC. Other recent video games in which historic aspects were implemented are games from the *Battlefield* series, the Sid Meier's *Civilization* games, *The Witcher* series and many more (CD Projekt Red, 2007-2015; EA DICE *et al.*, 2002-2018; MicroProse and Firaxis Games, 1991-2016).

1.1 Public participation in archaeology

In heritage and in archaeology, it is desired to reach out to and involve as big an audience as possible. An involved public with an understanding of and interest in archaeological subjects is important because it can help promote the importance of archaeological research (Tops *et al.* 2008, 2). Secondly, archaeological involvement of the public will lead to more trust in the executor of a project (Berix 2012, 9). Lastly, the more people involved in archaeology, the broader the (financial) support for archaeological projects (Kleijntjens 2016, 36). Three aspects can be found that influence the participation of the public in archaeology. These will be elaborated in the next paragraph, based on examples from heritage projects. The first aspect that will be discussed is the way (public outreach) projects reach out to the public. The second is the amount of spare time people have available to spend on archaeology. The third and last aspect is the archaeological interest of the public.

An important organisation that has done research on public participation is the NEARCH project. The project has done European-wide research in 2015 about the changes in

public participation in archaeology (Mortelli-Banégas *et al.* 2015, 4). The NEARCH figures used in this section can be found in appendix 1. One of the questions asked in the (European) NEARCH study which is relevant to this research is number 8: "*How are you informed about archaeology and the archaeological heritage?*" (Mortelli-Banégas *et al.* 2015, 36-39; fig. 1.1 to 1.4). According to their research, the largest part of the public (56%) was informed about archaeology through documentary programs, and news reports on television and the radio (Mortelli-Banégas *et al.* 2015, 36-37; fig. 1.1 and 1.2). Interestingly, the age groups who chose this answer most were between 45 and 59 years (61%) and 60 years old or older (59%), while the people who least chose this answer were between 18 and 24 (44%) (Mortelli-Banégas *et al.* 2015, 39; fig. 1.4). The second way in which a lot of people (34%) were informed about archaeology was through visits to archaeological sites or exhibitions in the country in which the participant lived (Mortelli-Banégas *et al.* 2015, 36-37; fig. 1.1 and 1.2). In the UK, again the older age groups chose this answer most; 38% of the people between 45 and 59 and people between 60 years and older. The people who chose this answer the least were, again, between 18 and 24 years old (24%) and between 25 and 34 years old (27%) (Mortelli-Banégas *et al.* 2015, 39; fig. 1.4). Around 41% of the people between 18 and 44 years old chose the answer 'none' or did not choose any of the other answers, which could indicate them not getting information about archaeology and heritage. In comparison, about 11% of people aged 45 or more chose this answer (Mortelli-Banégas *et al.* 2015, 38-39; fig. 1.3 and 1.4).

In conclusion, people below the age of 45 are not informed about archaeology very well through the usual channels, like the radio, television, and newspapers. It should be noted, however, that no research has been done on whether or not people got information about archaeology by video games, which may be a way to reach out to this younger public of people below 45 years old. This option will be further researched in this thesis.

The previous paragraph showed how projects try to involve the public in archaeology. Sophie Lampe, who researched the way the Dutch public wishes to be involved in archaeology, states that archaeologists often do not know how to interact with the public (Lampe 2014, 49-52). To investigate this, she performed online questionnaires and in-depth interviews. In one of her five survey question categories she asked how the Dutch people wish to be involved in Dutch archaeology. She found that more than half of the respondents wanted to be involved in archaeology in a more enjoyable way

(Lampe 2014, 53). One of the archaeologists she interviewed stated that *active* participation of the public should receive more attention in Dutch archaeology, instead of a *passive* way of reaching out to the public. Two other archaeologists said to prefer the use of more multimedia, although they also stated that "*the use of multimedia is not that significant in itself*" (Lampe 2014, 53). When asked how the public wanted to be informed about archaeology, 55% would like to visit Archeon, a Dutch archaeological park showing the daily life of several archaeological periods, 42% would like to watch films about archaeology, 39% wanted to excavate themselves and 39% would like to hold archaeological objects. This differs from what archaeologists would organise; 95% would organise an open day, 91% would recommend creating exhibitions about excavations and 86% would create a local newspaper and/or make a film about an archaeological project (Lampe 2014, 54). These results show that the way in which archaeologists have tried to reach the public should change in the future.

A third important work is that by Suzie Thomas, who researched 'community archaeology' in Britain (Thomas 2014). Community archaeology is in this case used as a synonym for public participation in British archaeological heritage (Thomas 2014, 23-24). Thomas stated that many volunteering projects and local archaeology groups and societies are involved in archaeology (Thomas 2014, 24). Although many age groups are involved in these societies, the results from a questionnaire by the Council for British Archaeology (CBA) researching 504 voluntary groups showed an average age of around 55 years old among the group members. The fact that the average age of participants is relatively high is probably mainly due to the amount of spare time available to them to devote to a hobby like archaeology. The younger age groups are less well represented because they in turn lack spare time to devote to such hobbies (Thomas 2014, 24-25). A study by the European Commission yields these same results: they found that the main reason for people between 15 and 39 years old to not visit historical monuments or sites is because of a lack of time, but also because of a lack of interest (European Commission 2013, 36). The last aspect will be discussed into more detail further on in this section. According to the research done by Thomas (2014), "*research into the impact of heritage and archaeology presented on television suggests that heritage represents a 'significant niche programming strand', and also that many from less advantaged backgrounds rely primarily on television programmes for information about the past".* Other groups are more likely to visit heritage sites and museums (Thomas 2014, 25). This indicates that not only age influences the way in which people are

informed about archaeology, but one's position in society seems to have a significant impact on this as well.

Important archaeological research has been done about interest areas in archaeology to find out what archaeological activities people prefer to participate in. The results in a research by Lampe (2014) for example, show that often, a larger interest in general archaeology existed as opposed to local archaeology (Lampe 2014, 53). Of the Dutch respondents, a minimum of 74% of the general public said to have an overall interest in archaeology (Lampe 2014, 53). The results from a study by Bolt yielded a number close to this; she found that 78% of the general public was interested in archaeology (Bolt 2008 in Lampe 2014, 54). The European NEARCH survey shows slightly more specific results. According to their research, most people have a slight or certain interest in taking part in archaeological activities (Mortelli-Banégas *et al.* 2015, 66-68; fig 1.5 and 1.6). For example, about 85% of the participants would visit an archaeological site (Mortelli-Banégas *et al.* 2015, 66; fig. 1.5). When looking at the age categories, it can be seen that, depending on the activity, it is mostly younger to middle age groups that show an interest in participating in archaeological activities (Mortelli-Banégas *et al.* 2015, 68; fig. 1.6). It is remarkable that the same study shows that it was mostly older people (above 45 years old, but especially above the age of 60) who actually actively participated more in archaeology at the moment of the questionnaire. The younger people participated more often in national heritage weeks and archaeological investigations (Mortelli-Banégas *et al.* 2015, 32; fig. 1.7).

The research before shows that a difference can be found in the level of activity involved in participating in archaeological activities versus the experience that is offered. This can in my opinion be categorised into passive, relatively active, and active archaeological activities. Historical or archaeological films and documentaries could be characterised as passive activities that provide a medium experience (the person only observes but does not participate). Video games can be found in the middle: the person actively participates, but can stay at home, whilst having a richer experience of (virtual) archaeology and history. Visiting an archaeological site, or even better, participating in an excavation can be seen as an active archaeological activity with a rich archaeological experience. This could however also be the hardest to participate in for the average person, because it contains the most effort and time.

Every age group is already involved in archaeology to some extent, as seen in the research mentioned. However, the younger and middle age groups (up to the age of 44 years old) generally score lower on most aspects than the older age groups (45 years old and older) and are informed the least about archaeology, which explains why they are also less involved (Mortelli-Banégas *et al.* 2015, 35). According to the research by the European Commission, a variety of reasons exist to explain *why*, apart from personal interest, people of all ages were not as much involved in archaeology in some years compared to other years. Reasons include a lack of time, a lack of information, archaeological activities that are too expensive, and a limited choice or poor quality of archaeological activities in the place people live (European Commission 2013, 36).

Looking back at the way people are informed about archaeology, the amount of time they have available to them to spend on archaeology, and the archaeological interest they already have, one important aspect can be noticed. None of the studies mentioned pay attention to archaeology in video games, whether it be serious games or games with a focus on entertainment. Sophie Lampe fortunately describes that some museums are starting to create more interaction in their exhibitions, by implementing videos and the placement of computers (Lampe 2014, 49). This is a very good starting point in interacting with the public. Lampe stated that communities like to visualise and experience the past (Lampe 2014, 58). Video games can provide exactly this experience. They can provide information about archaeology towards the gaming public and they do not ask a lot of effort from this public; the people do not have to go anywhere and can play video games from the comfort of their own home whenever they have spare time. According to Lampe, people (the public) prefer to use their imagination and want to create their own interpretation of archaeology instead of learning about it in a systematic way like most archaeologists teach it (Lampe 2014, 54, 57). One of the ways in which the public would like to be involved in archaeology was through watching films about archaeology; 42% of the public said this would be how they would like to be involved. This way of involving the public would give them the opportunity to use their imagination which Lampe stated was an important aspect (Lampe 2014, 54, 57). Video games containing archaeological or historical elements could contribute to this the same way and help achieve involving a broader public in archaeology.

With this research, I would like to find to what extend video games could help in reaching out to the younger public in order to spike their interest in archaeology. This

could help involving them in archaeological activities, like visiting museums. To better understand the subject of video games, a short introduction on the subject will be provided in the next section. More in-depth information on video games as well as the three chosen video games for the thesis will be provided in chapter 2.

1.2 Introduction to video games

The fact that video games can contribute to archaeology can be seen in the research done on video games and archaeology (Champion, 2011; Copplestone, 2017; Morgan, 2009). Two examples are Andrew Reinhard (2018) and VALUE (2017). Andrew Reinhard is an archaeologist who is interested in the connection between video games and archaeology and termed the combination of the two '*archaeogaming*'. He created a blog dedicated to this subject and wrote a book which was published in 2018 (archaeogaming.com; Reinhard, 2018). VALUE consists of a group of five individuals researching the connection between video games and archaeology. They also wrote a collaborative book on the subject (interactivepasts.com; Mol *et al.* 2017).
Some of the research mentioned will be elaborated further on in this chapter and in chapter 2, but first some definitions of video games will be discussed and information on the age of gamers will be provided.

1.2.1 Video game definitions

The subject of video games keeps coming forward, but what exactly are 'video games' and what is their link with archaeology? Several definitions of video games exist and five of them will be discussed to give the reader several ideas of what video games are. After this, a definition applicable to this research will be formulated. For the sake of the research, puzzle games, word-games and board games are excluded from the thesis, as well as smaller (video) games that can be played on phones or video game-websites. Instead, the focus will be on digital (video) games played on a PC or a console.

A first definition of computer/video games is one by Erik Champion (2016). He defines a game as "*a challenge that offers up the possibility of temporary or permanent tactical resolution without harmful outcomes to the real-world situation of the participant*" (Champion 2016, 64).

A second definition is one by Jesper Juul: "*A game is a rule-based formal system with a variable and quantifiable outcome, where different outcomes are assigned different values, the player exerts effort in order to influence the outcome, the player feels attached to the outcome, and the consequences of the activity are optional and negotiable*" (Juul 2003, 35). Although this definition seems to be about games in general, the context in the article Juul wrote shows it is specifically about video games.

A third, but very general definition is provided by Esposito: "*a video game is a game which we play thanks to an audiovisual apparatus and which can be based on a story"* in which an emphasis is placed on the terms *game*, *play*, and *interactivity* (Esposito, 2005).

A fourth definition is a very specific one by Tavinor: "*x is a videogame if it is an artefact in a digital visual medium, is intended primarily as an object of entertainment, and is intended to provide such entertainment through the employment of one or both of the following modes of engagement: rulebound gameplay or interactive fiction*" (Tavinor, 2008).

A fifth and last definition of video games was provided by van den Berg (2007). He stated that "*a video game is a computer game that takes place in a virtual world that the player has control over and which, within the rules of the game, he can influence*" (van den Berg 2007 in Janssen and van der Meer 2007, 109).

The definition of Juul can also be found in the book "*Understanding video games: the essential introduction*" by Simon Egenfeldt-Nielsen, Jonas Heide Smith, and Susana Pajares Tosca, which also includes an in-depth discussion on several definitions (Egenfeldt-Nielsen *et al.* 2008).

The aspects from the stated definitions that are most important to remember for this thesis are that video games take place in a (pre-made) virtual world. The choices made in this virtual world have no direct harmful effect on the real world, although video games can have some effect, which will be discussed in chapter 2. Another important aspect is that the personal choices that the gamer makes affect the final outcome of the video game.

The definition I will be using in this thesis is "a video game is a game played on an electronic device, like a console or computer, which creates a virtual world in which the player can, in most cases, influence the outcome according to the rules of the game".

1.2.2 Basic information about genres

To get a little more background knowledge on video games, a short explanation is needed about video game genres. Granic, Lobeland, and Engels divided the main video game genres into categories which provides some background information (Granic et al. 2014, 70; fig. 1).

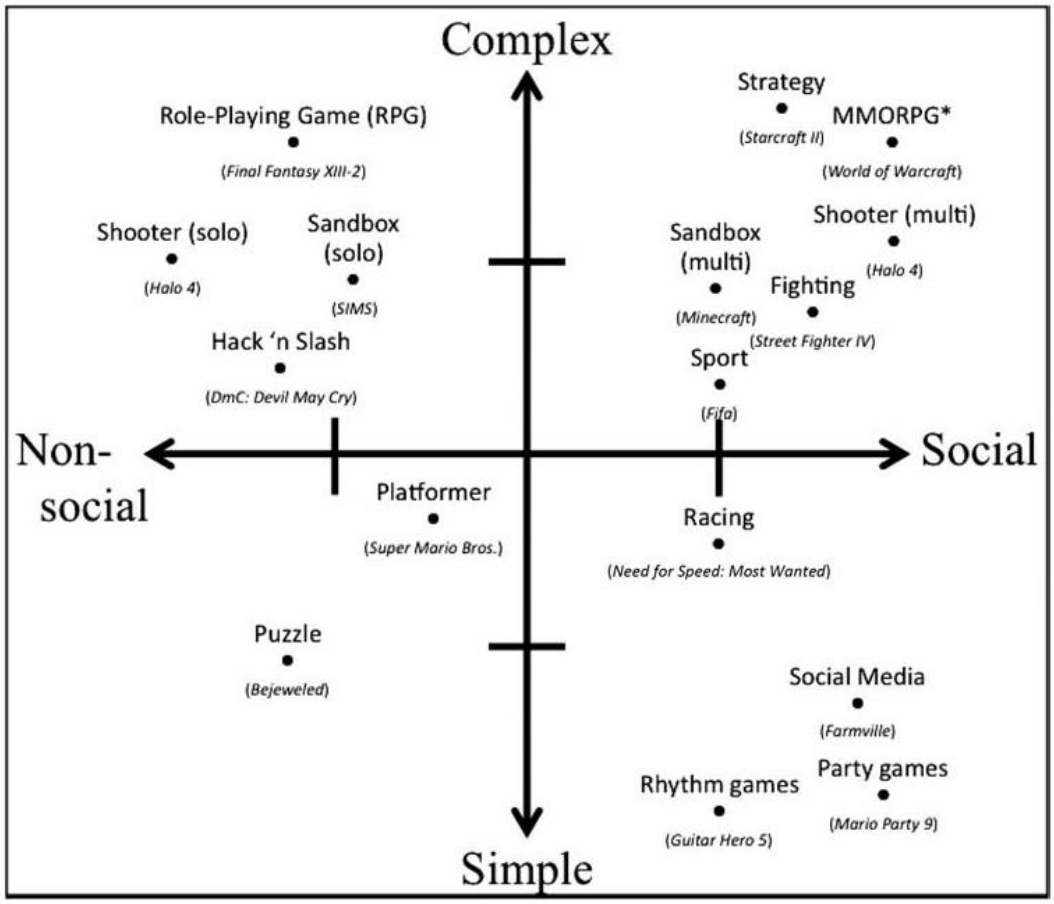

Figure 1: A division of video game genres according to complexity and level of social interaction (Granic et al. 2014, 70).

Many video games, ranging from simple to complex, and non-social to social genres, already have historic and archaeological elements implemented. For the purposes of this study, three video games, *Assassin's Creed: Origins*, *Battlefield 1*, and Sid Meier's *Civilization V*, belonging to three different genres were chosen for the research (EA DICE, 2016; Firaxis Games *et al.*, 2010; Ubisoft Montreal, 2017). These genres are called 'Role-

Playing Game (RPG)', 'Shooter (multi)', and 'Strategy' (Granic *et al.* 2014, 70; fig. 9). These genres can be found in the 'complex' part of the figure, ranging from non-social to social (fig. 8). Why these games were chosen, what kind of games they are, and what genres they belong to will be explained further in chapter 2.4.

1.2.3 The gaming population

Video games have started to play a large role in society, especially in the last few years. Recent research by the Entertainment Software Association (ESA) in the United States for example, showed that around 64% of the US citizens own a device that they play video games on, which counts up to an average of circa 2 gamers per game-playing US household (ESA 2018, 4-5). This is not curious, seeing that about 97% of the US households own a PC and 48% owns a dedicated game console (ESA 2017, 6). In total, about 60% of the US citizens play video games daily. 41% of them *play* games on the PC and 36% on a dedicated game console (ESA 2018, 4-5).

Gender and age in general

Of the gaming population, ESA (2018) found out that 44% is female and 56% is male. Most gaming men are under 36 years old (33%) and 23% is above the age of 35. This means that the average gaming male is 32 years old (ESA 2018, 6). These numbers are slightly different for females. 24% of the gaming women are aged below 36 years old. The remaining 20% is 36 years old or older (ESA 2018, 6). The average gaming female is 36 years old, which puts the total average age of the US gamer at 34 years old (ESA 2018, 4, 6). More numbers from the ESA survey, like the most-played genres by US citizens, will be shown in chapter 2.

Several books like Janssen and van der Meer's "*De game-industrie*" (which translates to The Gaming Industry) show similar numbers. They found that the average age of gamers was 33 years old in the US in 2006. Back then, 38% of them were female and 62% were male (Janssen and van der Meer 2007, 96-97). Of the total population, 31% were under the age of 18, 44% were ages between 18 and 49 years old and 25% were 50 years or older (Janssen and van der Meer 2007, 97). In the Netherlands, the average age of the gamer in the beginning of 2006 was 30 years old (VPRO 2006 in Janssen and van der Meer, 96). 35% to 40% of this gaming population was female and the rest was male (Overmars 2007 in Janssen and van der Meer 2007, 97).

In short, according to the most recent study by the ESA, the gaming population consists of both females and males (ESA 2018, 4, 6). Females form about 44% of the total population, which is somewhat more than in 2007, when it was 35-40% (ESA 2018, 6; Janssen and van der Meer 2007, 96-97). The males represent the other 56%, which is a little less than in 2007, when it was 60-65% (ESA 2018, 6; Janssen and van der Meer 2007, 96-97). People of all ages play video games, but, according to the most recent research, the average age of the US gamer lies at 34 years old, which is a little higher than in 2006, when the average age was 30 years old (ESA 2018, 4, 6; Janssen and van der Meer 2007, 96).

In-depth research by VALUE on the gaming population

A recent survey performed by VALUE goes deeper into the opinion of students and staff members at the Faculty of Archaeology of Leiden University about video games including (virtual) archaeology and history. VALUE wanted to know how many students and staff members of the faculty played video games and to what extent they were interested in and appreciated games that included historical and archaeological themes (Mol *et al.* 2016, 11). The results of the survey, which was conducted in 2015, showed that about 69% of the respondents played videogames. This consisted of half of the staff members, and three-quarters of the students. About half of the gamers were male (48%) and the other half were female (52%) (Mol *et al.* 2016, 11-12).

The most popular video game genres among the researched public are strategy games and massive multiplayer online role-playing games (MMORPG's), in which the exploration aspect, the storyline and the in-game characters were found the most important (Mol *et al.* 2016, 12). Furthermore, they found that the public mostly answered with historical themed games and not as many archaeological themed games, which, according to VALUE, would open up the potential to incorporate more archaeological elements in video games (Mol *et al.* 2016, 12).

The research shows that even though many games could contain more archaeology, people did find present in-game archaeology enjoyable, even when they thought games did not *need* to have archaeological or historical elements to be enjoyable (Mol *et al.* 2016, 12-13). Whether or not video games with archaeological aspects included would be a good or a bad thing was debated in the research. According to some people it

would be a good thing, because it could create public awareness or could be useful to archaeology if done right. Others said it would be a bad thing, because in-game archaeology is more looting than actual archaeology, real-life archaeology would not be interesting enough for a video game and a lot of things would be popularised in video games instead of being correct (Mol *et al.* 2016, 13-14). VALUE thinks video games can actually offer a lot to the archaeological field, for example on the subjects of public outreach and research (Mol *et al.* 2016, 14). This could be done in many ways, for example by re-creating excavations in video games or by introducing the existence of archaeology in video games like it has been done in *World of Warcraft*, in which archaeology has become one of the many in-game professions (Blizzard Entertainment, 2004; Mol *et al.* 2016, 14).

The study by VALUE already shows that, considering this small group, a potential to incorporate more archaeology in video games exists (Mol *et al.* 2016, 11-15). I would like to add to this study and this research area starting with the problem statement and research questions stated in the next section.

1.3 Problem statement

In short, according to research, not every age group has been equally involved in archaeology (European Commission 2013, 36; Lampe 2014, 49-54; Mortelli-Banégas *et al.* 2015, 32, 36-39, 66-68; Thomas 2014, 24-25). Several studies suggest that, for different reasons, several younger age groups are harder to reach through the usual channels, like television and newspapers, than other, older, age groups. This is especially the case with adults between 18/20 and 40/45 years old (European Commission 2013, 36; Mortelli-Banégas *et al.* 2015, 32, 35). As stated before, a great opportunity exists that this age group can be reached out to and involved better in archaeology by the use of video games. This possibility should however be researched further than it already has. For the sake of this research, an age group of people between 20 and 45 will be researched. This is the age group around the average age of a gamer (34 years old) and includes the group of people who can be involved better in archaeology according to the studies performed by the European Commission (18 to 45 years old) and Mortelli-Banégas *et al.* (20 to 40 years old) (ESA 2018, 4, 6; European Commission 2013, 36; Mortelli-Banégas *et al.* 2015, 32, 35).

To solve the described problem, the main question for this research reads “How can videogames be used to involve a wider audience especially of people between 20 to 45 years old, in archaeology?”. Five sub-research questions were formulated to answer the main research question:

1. “What does the target audience generally find important in video games?” with which important aspects in video games can be illustrated.
2. “How does the target audience perceive archaeological aspects in video games?”.
3. “To what extent would the target audience be interested to play video games in which a bigger focus lies on archaeology, or that are ‘archaeologically/historically accurate’?” in which the interest in archaeological aspects in video games can be researched. Archaeologically correct video games can be defined here as video games that are accurate and true to real-life archaeology, which can generally be estimated by the general public.
4. “What selected video game genre(s) would be most suitable to use to involve a wider public in archaeology?” will be used to investigate what video game (genre) can be used to involve a wider audience in archaeology.
5. “To what extent can video games be used to involve a wider and particularly younger age group, of people between 20 and 45 years old, in archaeology?” will research the possibilities of video games to improve public participation in archaeology.

Before the questions can and will be answered, more information is needed in order to understand video games and the effect they have on people. Chapter 2 will focus on the explanation of video games. Why people play video games, a history of video games, video game genres, and why the three games have been chosen for the thesis will be discussed. In chapter 3, the methodology used in this research will be elaborated and discussed. In chapter 4, the results of the performed questionnaire will be presented. In chapter 5, some concluding words will be given and a few critical notes will be discussed. After this, the appendices can be found which include a number of figures and tables used in the thesis.

2. Video games: an overview

2.1 Video games

In the first chapter, the research- and gaming population have been discussed. This chapter will dive into the history of video games, the video game genres and games that were used for the thesis, why people play video games and what the connection is between video games and archaeology.

2.2 Why people play video games and how playing video games can affect them

When looking up video games on the internet, you will find many articles on the connection between video games and aggressive thoughts, feelings and behaviour. The media are known for labelling video games as being a negative influence for someone's behaviour, because they tend to make people aggressive, especially through FPS games.

Articles with opposite views on video games exist as well. An example is Katherine Isbister's article (Isbister, 2016). She shows a completely other view about the effect video games have on people. She states that video game developers use two qualities that activate emotions in the player of the video game and make the video game attractive (or unattractive) to play. These are *choice* and *flow* (Isbister 2016, 2). Video games offer the player the option to make *choices* that influence the outcome of the game (Isbister 2016, 2). Choices leading to a good outcome in the video game reward the brain, which makes the video game fun to play and vice versa (Isbister 2016, 2-3). Isbister uses the research by Csikszentmihalyi to describe flow as the state of mind that enables optimal performance (Csikszentmihalyi 2009). This means that too little skill for the game will result in frustration or anxiety whilst too much skill for the task at hand will result in boredom (Isbister 2016, 4-6). Furthermore, Isbister describes that video games have an "*additional palette of social emotions at their disposal because they depend on active player choice*", instead of films for example, in which other people make choices and the viewer is not participating (Isbister 2016, 8-9).

The last point that make video games emotionally attractive to play is that in a lot of video games, you play as an 'avatar', or in-game persona. This could turn out to be the hero of the game. The avatar could have their own personality, to the likes of the player,

and lives in a fantasy world in which the personal choices of the player matter the most (Isbister 2016, 11-20).

Different reasons why people play video games exist. According to Janssen and van der Meer, one of the main reasons why people play (online) video games is to obtain and maintain social connections (Janssen and van der Meer 2007, 99). I personally think a large part of why people play video games is to escape from reality into a fantasy world, in which they can *always* be a hero. This feeling of identifying with the hero is stronger in video games because they can actively participate in quests and influence the outcome, as opposed to movies and series, where they can only watch scenarios happen.

2.3 A brief history of video games on console and pc

The history of video games is a broad one. In this section, the highlights will be stated to show that archaeology and history have been part of video games since the beginning. I will give a general chronological summary of the biggest changes in the video game industry, loosely tied to the generations of the console and PC and video games released in those periods of time.

It all started in the period between 1972 and 1977; the beginning of video games. Many games could only be played on the arcade, mostly found in arcade halls. In this period, released games with a historic theme include *Tank,* which has a (world) war theme, and *Gun fight* with a 'wild west' theme, both for the arcade (Kee Games, 1974; Taito and Midway, 1975). *Pong* was introduced as one of the first games for one of the first home video consoles called "Atari" in 1975, after the video game had been a great success as an arcade game from 1972 onwards (Atari, 1972; Janssen and van der Meer 2007, 29). Later, between 1977 and 1981, specifically in 1977, the successful Atari 2600 was released (Janssen and van der Meer 2007, 30). One of the games that could be played on this console was *Combat* (1977), a wargame including smaller games like *Tank* (1974) and *Jet Fighter* (1975) (Atari, 1975; Atari, 1977).

In the period dating from 1981 to 1984, handheld computers like the Nintendo's Game & Watch started to become more popular than the earlier released home video consoles (Janssen and van der Meer 2007, 32). The Personal Computer (PC) and Home Computer

(HCE) started their existence whilst consoles were also thriving. An archaeologically themed game released in this period is *Raiders of the lost Ark*, a video game about the very adventurous archaeologist Indiana Jones, which could be played on the earlier released Atari 2600 (Atari, 1982). The period right after, between 1984 and 1989, can be characterised as the rise and fall of the HCE. The PC however slowly but steadily started to make a difference when the new graphic cards and the first graphic RPG's and Adventure games were released around 1987 (Janssen and van der Meer 2007, 37). The PC eventually evolved faster than the HCE, causing its fall. Two examples of games that were released for the computer in general including a historic theme are Sid Meier's *Pirates!* and 1985's *The Oregon Trail* (MECC, 1985; MicroProse, 1987). *Pirates!* could be played on multiple platforms, like the Atari ST, on a computer with PC Booter and on the Sega Genesis (MicroProse, 1987). *The Oregon Trail,* an educational video game about the 19th century pioneer life in what is now the United States, could be played on several computers and disk operating systems (MECC, 1985).

Between 1989 and 2001, the personal computer gained its real gaming status whilst several well-known consoles and hand-held consoles launched as well, like the Sega Genesis and the Nintendo Game Boy (Kent 2001, XV). The popular Sony PlayStation and Nintendo 64 released a few years later, in 1994 and 1995 (Kent 2001, XV-XVI). In 2000 the Playstation 2 released, which offered online possibilities from 2001 onwards (Kent 2001, XV-XVI). The Xbox (Microsoft) and GameCube (Nintendo) released in the same period. When considering games released in this time period, it can be seen that in 1991, the first game of the *Civilization* Series by Sid Meier was released, of which the goal was to create an empire that could stand the test of time (MicroProse and Firaxis Games, 1991-2016). A second game was *Indiana Jones and the Last Crusade*, which is based on the 1989 movie (Software Creations, 1991). In 1996, the popular first *Tomb Raider* game for the PlayStation was introduced in 1996 in which you played the daughter of an archaeologist. In 1997, *Age of Empires*, a strategic history game that could be played on PC's released. In *Age of Empires*, a civilization develops (with the help from the player) from the Stone Age to the Iron Age (Core Design, 1996; Ensemble Studios, 1997).

From 2002 to 2011, fewer consoles launched, because the technology now lasted longer. Important new consoles include the Xbox 360 (Microsoft) in 2005 the Wii (Nintendo) and the PlayStation 3 (Sony) in 2006. The PC world certainly did not stagnate

either. Thanks to the internet and improving computer hardware, games kept improving. The online medieval themed game *World of Warcraft* for example, became a worldwide success and a well-known MMORPG up until this day, including an archaeology profession that was introduced in 2010 (Blizzard Entertainment, 2004; Blizzard Entertainment, 2010). One of the games used in this thesis, Sid Meier's *Civilization V* and its expansions were released a few years later, between 2010 and 2013 (Firaxis Games *et al.*, 2010). A lot of games were now playable on the console (usually the PlayStation or the Xbox) as well as the PC.

Video games, as well as the technology behind consoles and PC's keep improving, causing new, improved, games, consoles and PC hardware (but also software) to release in short periods of time. The newest consoles can be dated between 2012 and 2018. These include the Wii U (Nintendo) in 2012, the PlayStation 4 (Sony) in 2013, the Xbox One (Microsoft) in 2013, and most recently the Nintendo Switch (Nintendo) in 2017. The most recent innovation in video games and the technology it uses, although not discussed in this thesis, is the phenomenon of Virtual Reality (VR). This way of playing video games makes use of special VR glasses, which can be used on consoles as well as computers to get the experience of being inside a video game. Video games on the platform of mobile phones, also not further discussed, have been improving as well.
A large number of video games were and are still released up until the present day, including two of the three games used in the thesis: *Battlefield 1* in 2016 and *Assassin's Creed: Origins* in 2017, both playable on the console as well as the PC (EA DICE, 2016; Ubisoft Montreal, 2017; www.statista.com, 2019).

The improvements in video games (improved graphics, but also improved storylines) made the overall experience (and the specific in-game historical experience) of playing a video game a richer one. This creates great opportunities for the historical and (virtual) archaeological work fields, because they can now show history and virtual archaeology in video games to create a real-life-like experience of historical periods and events. This can have a great positive influence on both the archaeological and historical work fields as well as the video game industry.

2.4 Video game genres and subgenres

Video games, like films, series, and books, can be divided into genres. The genres work a little different and are not just informing the player about the feeling you get when playing the game, but more about the way the game will be played (also called the gameplay). The three genres important for this research will be elaborated further on in this section, but first, a little information on the popularity of genres will been provided.

Video games are usually connected to a 'super' genre or sub-genre. In the report of the 2018 ESA survey, a top 8 can be found including the 8 most bought video game 'super' genres in 1017 (ESA 2018, 12). These genres are, from most to least played, shooter (25.9%), action (21.9%), sports (11.6%), role playing (11.3%), adventure (9.1%), racing (6.4%), fighting (6.0%), and strategy (4.2%). All other video game genres (3.6%) were bought in smaller amounts (ESA 2018, 12). Many subgenres, like Action-Adventure games, and MOBA's (multiplayer online battle arena, a sub-genre of Strategy games) exist. Below, the (sub-)genres used in this thesis will be explained whilst also describing the chosen video games for the research. The three genres are the role-playing genre (also known as RPG: Role Playing Game), the shooter genre, and the strategy genre.

Role-playing in *Assassin's Creed: Origins*

A lot of controversy exists around the genre to which *Assassin's Creed* (AC): Origins belongs. Previous releases from the *Assassin's Creed* franchise were appointed to the Action Adventure genre, and were in their origin similar to video games like the *Tomb Raider* series (Core Design and Crystal Dynamics, 1996-2018). *Assassin's Creed: Origins* however contains, in my opinion, enough aspects to call it an RPG. The specific (sub-)genre Action RPG would fit the game the best. It contains, like the previous *Assassin's Creed* games, a few aspects of the action adventure (sub-) genre, like the story-driven nature, the encouragement of exploration, and the large amount of action, specifically in the form of combat (Arsenault 2016, 229; Fernández-Vara 2016, 233; Ubisoft Montreal, 2017). On top of that, it also contains many characteristic role-playing elements, like acquiring skills or a skillset connected to a certain class, the presence of life meters, and the presence of a crafting system (Burn 2016, 242; Ubisoft Montreal, 2017). In *Assassin's Creed: Origins*, these aspects are shown in the (for *Assassin's Creed*) new combat system in which weapon types, their upgrades and the character's skills matter significantly. Armour can be upgraded by using the crafting system and skills can

be obtained by the use of a skill graph which in its place improves the use of weapons. The skill-graph used in *Assassin's Creed: Origins* contains three major 'classes': the hunter, the seer and the warrior. The skills can be chosen in such a way that the player can create the playstyle he or she likes, whether it tends to one of these 'classes' or a personalised combination of the three (Ubisoft Montreal, 2017).

Other characteristic RPG elements are the levelling system (you cannot defeat all enemies at level 1), the questing structure (you do have a main questline, but there are also many present side quests in the open world you can or cannot accept), and a loot system (especially for weapons) that helps you progress throughout the game (Ubisoft Montreal, 2017). I will call this an Action RPG, comparable to the *Witcher 3: Wild Hunt*, because it is an RPG that contains the complex combat system found in the action genre (CD Projekt Red, 1015).

The historic/archaeological factor of the game is reflected by the historical architecture and the various 'real-life' (virtual) artefacts seen throughout the game. Ubisoft even created a special non-combat discovery mode in which the player can follow an 'archaeological tour' throughout the game. Here, the player can see the artefacts and architecture used in Assassin's Creed: Origins and gather more information about them (Ubisoft Montreal, 2017). In the discovery mode, the player is also informed about the locations, be it a museum or a library, in which the real artefacts and historical data can be found at the moment of the release of the game (Ubisoft Montreal, 2017).

Shooting enemies in *Battlefield 1*

Battlefield 1 (2016) can be categorised as a first-person shooter in the genre of shooters. A video game can, according to Salen and Zimmerman's definition, be considered a shooter when shooting is "*the essential nugget of game activity, the mechanism through which players make meaningful choices and arrive at meaningful play experience*" (Salen and Zimmerman 2004, 317). It is a first-person shooter; the game is played in a first-person view (as if you look through the eyes of your character), holding a weapon with which you shoot your enemies in the setting of the first World War (EA DICE, 2016). According to Voorhees, the definition by Salen and Zimmerman includes "*games where a player can decide some combination of what to shoot at, or when and where to shoot*" and excludes "*games in which shooting is the result of another action*", like the decision to go to war in strategy games like *Civilization V* (2010) (Voorhees 2016, 251).

Battlefield 1 contains a single-player and a multi-player mode (EA DICE, 2016). In the multiplayer mode, the goal is to exterminate the enemy to win the specific round, set in a map that reflects an area in which had been fought in the first world war. In the single-player mode, missions can be completed to learn more about specific events of the first world war, set in specific areas (EA DICE, 2016). An example is the battle in the Italian Alps between the Italian and Austro-Hungarian forces in which the player takes on the role of the Italian Luca Vincenzo Cocchiola who searches for his twin brother whilst taking part in this fight (EA DICE, 2016). Both game modes represent historic aspects, and virtual archaeological objects.

Making strategic choices in *Civilization V*

Civilization V, is considered a turn-based strategy game (Dor 2016, 275; Firaxis Games *et al.*, 2010). The game contains a single-player mode, in which the player competes against the computer, and a multi-player mode in which the player can compete live against other players (Firaxis Games, 2010). The strategy genre is reflected by the military theme of the game (Dor 2016, 275). The player needs to make strategic choices to develop a civilisation accompanied by a leader of their choice, and make it the biggest of them all. From a godlike view, lands are discovered, cities are built, resources gathered, and armies created to win from civilisations commanded by other players in the game (Firaxis Games, 2010).

The historic aspect is shown in the several leaders that represent a civilisation that can be chosen to play with and the timeline followed by each civilisation. Each civilisation represents a historic culture, like the Egyptian civilisation, led by Ramesses II and the German civilisation lead by Bismarck. Each civilisation represents its own historical time period, even though all civilisations begin in the 'Ancient Era' in the game, which is the starting period. This period represents the beginning of human civilisation including technologies like agriculture, mining and archery. Each civilisation slowly works towards the 'Future Era' through several other eras, like the 'Classical Era' and the 'Industrial Era', by researching all technologies of the current era. The 'Future Era' represents the latest period in which a focus lies on futuristic technologies like lasers, nanotechnology and robotics (Firaxis Games, 2010).

2.5 Why specifically these games?

By choosing three games from three different genres, a variety of opinions from different types of gamers can be gathered to create an opinion of a wider public as opposed to choosing just one video game (genre). The *Assassin's Creed* franchise (2007-2018) has been very popular since its beginning and *Assassin's Creed: Origins* (2017) is the latest one that released, including a lot of archaeology. *Battlefield 1* (2016) is one of the most popular shooters from the last few years. This one was chosen for its historical aspects in a more aggressive setting. All three games have been very popular amongst gamers, but *Battlefield 1* and *Assassin's Creed: Origins* could even be found in the top 20 of best-selling videogames (ESA 2017, 12; ESA 2018, 12). The third game, *Civilization V*, is a predecessor from the latest *Civilization* (*Civilization V*I). *Civilization V* was chosen over the newer *Civilization VI* (2016) because it was more popular than VI: in December 2017, Civilization V had about 48.964 active players on Steam whereas Civilization VI had 35.057 (www.steamcharts.com, 2019).

According to surveys conducted in 2016 and 2017 by the Entertainment Software Association (www.theesa.com), the genres can also be seen as some of the best-selling video game genres (ESA 2017, 12; ESA 2018, 7, 12). Because of this, it is expected that the video games belonging to these genres will have a considerable influence on this large community of gamers. This could provide us with a large opportunity to reach out to and involve a wider public in archaeology when containing archaeological or historical aspects.

3. Methodology

This chapter will describe the methods and techniques used in this study. Because the main research method used is a questionnaire, gathering information about the target group, the creation of the questionnaire(s) and the aspects validity, reliability, non-response and sample size will be discussed.

3.1 Research method used

The main research method is the use of a questionnaire, which was set out among a broad public (more on this can be found in chapters 3.2 and 3.3). The answers of the questionnaire were directly used for all research questions, but one. The first four research questions as seen in chapter 1.3 can be answered directly using the data that comes forth from the survey. The fifth research question, asking how video games can be used to involve a younger target audience of people between 20 and 45 in archaeology, will be answered using the answers on the first four research questions.

3.2 Setting out a questionnaire

3.2.1 Creating and distributing the questionnaire

Certain aspects of the age group investigated in this study had to be taken into account in order to formulate the questions used in the questionnaire. These include the use of language, and the way they could be approached. To reach the target group, the surveys were spread throughout three gaming forums (the *Assassin's Creed: Origins* forum (forums.ubi.com), the *Civilization V* forum (forums.civfanatics.com) and the *Battlefield* forum (forums.battlefield.com), Facebook (especially the Girlgamer NL group), through personal acquaintances, and in a few classes at the Dutch The Hague University of Applied Sciences. What was known about the target audience beforehand is that they consisted of people who play one of the video games used in the research, and that part of them were active on either the *Assassin's Creed: Origins*, the *Battlefield 1*, or the Sid Meier's *Civilization* forum. Because this group can contain large differences in education and wealth, the questions had to be formulated in a clear way in order to be understood by all participating parties (Jansen and Joostens 1998, 44-45). Furthermore, the questions were checked carefully to avoid suggestive ones. By doing so, the results will be more reliable. Reliability and validity will be discussed in more detail later on in this chapter.

3.2.2 The questions

All questionnaires were created using the online software named Qualtrics (www.qualtrics.com). Three surveys were constructed for the players of the three mentioned (types of) video games used in this research. All three surveys contain the same questions, apart from the names of the video games, and can be found in the appendix (appendix 3).

The survey questions (appendix 3) can be divided into factual questions and questions about opinions (Jansen and Joostens 1998, 45-47). The first section consists of three factual questions, to obtain basic information about the participants: their gender, age, and country of origin (question 1 to 3 in appendix 3). The next questions are asking about opinions. These seven questions gain insight in the participants' opinions about archaeology in video games and the way they look at archaeology after playing certain video games (appendix 3). A second distinction can be made between open and closed questions (Balch 2010, 60-65; Jansen and Joostens 1998, 46-48). The types of survey questions include open questions, (closed) multiple choice questions, and (closed) matrix questions. An overview of the question types can be found in table 1. By keeping most questions closed it is easier to compare and measure results. The third question type, the matrix questions, are those in which several questions can be asked instead of just one (survey questions 5 and 8). A Likert-scale is usually used to measure the participant's view on the subject (Balch 2010, 61-62; Jansen and Joostens 1998, 54).

Table 1: Overview of the survey questions, the type of question, and what the questions should measure.

Number of survey question	Question type	What does it measure?
1	Multiple choice	Basic information: gender
2	Multiple choice	Basic information: age category
3	Open question	Basic information: country of origin
4	Multiple choice	Preference of video game genre
5	Matrix question, Likert-scale	Importance of video game aspects
6	Multiple choice, Likert-scale	Likeliness to play a certain video game based on its historical context or concept
7	Multiple choice	Interest in the games' archaeology/history before playing a certain video game
8	Matrix question, Likert-scale	Interest in archaeological activities after playing a certain video game
9	Multiple choice	Likeliness to play video games containing accurate archaeological aspects
10	Multiple choice	Preference of video game genre in which real-life archaeology should appear

3.2.3 Questionnaire design

In order to fill out the survey in a pleasant way, it needs to have a well-thought-out design. This design can be reviewed when all questions are formulated. The design includes an introduction, a clear layout and if necessary extra explanation for difficult questions (Balch 2010, 27, 38-39, 45-47, 58-59; Jansen and Joostens 1998, 67-82). The questionnaire's introduction includes some basic information about the survey, like the amount of questions asked (10) and its anonymity. At the time the questionnaires were posted on the forums, a second, short introduction including the background of this research was given, as well as information about the goal of the survey. Furthermore, it stated that the results will only be used for this research and will thus not be shared with third parties.

It is important that survey questions are asked in a logical order presented in a structured layout (Balch 2010, 21, 27, 44; Jansen and Joostens 1998, 69-70). This is not

only important for the participants understanding of the survey, but it also influences the reliability and validity of the research (Balch 2010, 21, 43-44) (see also paragraph 3.3). The general questions were asked first, followed by the more specific questions, so that the answers will not be influenced by a previous question. All questions were presented separately, on separate pages, to keep it clear for the participant. A few questions needed further explanation for the participant to understand them. This was the case for questions 6 and 9. The descriptions were enclosed in the questions and are of a short and clear order. By adding a short description, confusion about the question and its answer possibilities can be avoided and reliable results will follow (Balch 2010, 38, 44-47; Jansen and Joostens 1998, 73-74).

3.3 Reliability and validity in questionnaires

Two aspects are important to consider when creating a questionnaire in order to perform a good research: reliability and validity (Saunders *et al.* 2010, 140-145; Saunders et al. 2012, 428-429). Figure 2 shows when, according to Foddy (1994), a question is both valid and reliable. He explains this according to four steps (Foddy 1994 in Saunders *et al.* 2012, 429). The first step is that the researcher needs is clear about the data required and so designs a question. The second step is that the respondent decodes the question in the way the researcher intended. The third step is the respondent answering the question. The fourth and last step is that the researcher decodes the answer in the way the respondent intended (fig. 2). Foddy discusses reliability and validity as a means to find out whether the questions and answers make sense (Foddy 1994 in Saunders *et al.* 2012, 429).

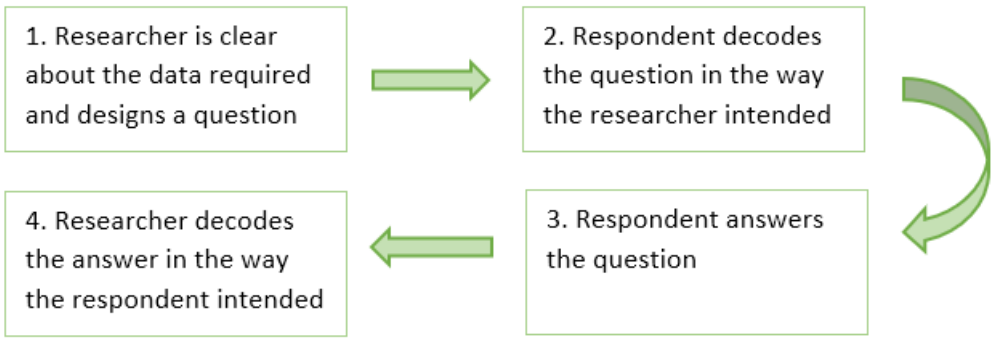

Figure 2: Four stages that need to occur in order for a question to be valid and reliable (after Saunders et al. 2012, 429).

According to other literature, research is reliable when the measuring procedure, in this case the survey, is accurate and precise (Saunders *et al.* 2010, 140; van der Velde *et al.* 2007, 50). Furthermore, all data need to be collected consistently to be reliable

(Saunders *et al.* 2012, 428-429). A reliable research can be redone in a comparable setting, yielding similar observations when done by any other researcher. When researching the results in the end, it is important to interpret the data in a transparent manner (Saunders *et al.* 2010, 140).

Research shows that two types of validity related to questionnaires exist: internal and external validity (Saunders *et al.*, 2010, 2012). Internal validity is the ability of the survey to measure what is intended to be measured (Saunders et al. 2012, 429). External validity is the extent to which the results of the research can be generalised to the broader public (Saunders *et al.* 2010, 142). If, for example, the respondents are only from Europe, the survey may yield very different results when set out in Asia of Africa, meaning that the research would not be externally valid for this region.

Certain aspects can influence the validity and reliability of the collected survey data. An example is choosing features like complex text formatting and animated graphics (Balch 2010, 21, 43-44). These types of features may spike up the layout, but can also distract the participants from the essential content and which can change the responses of the participant (Balch 2010, 21, 43-44). Furthermore, it is of great importance to only reach just the needed target group and not also people outside of this group in order to gain reliable results for the research conducted (Balch 2010, 71).

3.4 Non-response

For this research, a written (digital) questionnaire was chosen and shared across several platforms using a hyperlink. The use of an online software programme that uses a specific link for the created survey makes it easier to distribute. If distributed in the right place, for example a forum sharing the same subject, a large number of people can be reached at once, and a large number of responses can be gathered (Balch 2010, 14, 22; Jansen and Joostens 1998, 85). Another aspect that influences the response rate for a web page survey in a positive way is the universal accessibility of the web page among all people, no matter the browser they use (Balch 2010, 14). A third important aspect is called non-response, which means that not everyone who sees the survey will respond to it. Reasons for non-response include a lack of interest in the subject, a lack of time to fill out the survey, a survey that is too complicated, a survey that is too long and one that has too little answer possibilities (Balch 2010, 48-53; Jansen and Joostens 1998, 94-

95). A number of things have been paid attention to when creating the survey in order to avoid non-response as much as possible. These are the presence of a short introduction, a clear layout including a progress bar, a maximum of ten questions, and a clear formulation of answer possibilities. Furthermore, the target group could be interested in the subject of the research, which will have a positive influence on completing the survey. A few reminders were put on the forums to stimulate reactions. Lastly, research shows that participants are less likely to finish a survey when they have to provide a lot of personal information (Balch 2010, 50, 58-59). Because of this, the survey data have been collected anonymously, and only the age, gender and country of origin were asked for.

It has to be taken into account that many people who play one of the three games are not active on the forums and can therefore not be reached. Because of this, a large proportion of the gamers will not be able to respond, because they may not be aware of the existence of the survey. Non-response may therefore not always be caused by unwillingness of the participant.

3.5 Sample size

When researching a target group, a specific minimal number of participants is needed to achieve reliable results. With a target group of over 20.000 people, at least 377 participants are needed in order to achieve a confidence level of 95% and a margin of error of 5% (surveymonkey.com). This number was calculated for the research using an online sample size calculator (www.surveymonkey.com). SurveyMonkey uses a specific equation for their calculator in order to determine the required number of responses for a survey. The equation they use is shown in figure 3. N is the total population size. *e* is the margin of error, in this case 5%. The smaller this percentage, the higher the accuracy and the needed sample size (www.surveymonkey.com). *p* is the sample fraction, for example the fraction of heads or tails when flipping a coin several times (Moore and McCabe 2001). By choosing p=0.5, $p(1-p)$ is at its maximum, which positively influences the accuracy and reliability. *z* is the z-score used to calculate the interval of reliability (for a reliability of 95% the z-score will be 1.96) (Moore and McCabe 2001, 63; fig. 3).

The upper half of the equation shows the equation for an endless population. The second part of the equation corrects this (adding “1+” to the equation), which turns it

into the equation for an ending population of size N. For more information on how to use the calculator and the equation, see www.surveymonkey.com (2019).

$$\text{Sample size} = \frac{\frac{z^2 \times p\,(1-p)}{e^2}}{1 + \left(\frac{z^2 \times p\,(1-p)}{e^2 N}\right)}$$

Figure 3: Equation used to calculate the sample size needed for research with N= population size, e= margin of error, z= the z-score used, and p= the sample fraction (www.surveymonkey.com, 2019).

4. Data analysis

This chapter will give an overview of the data collected by performing three questionnaires among a group of people who have played *Assassin's Creed: Origins*, *Battlefield 1*, or *Civilization V* (EA DICE 2016; MicroProse and Firaxis Games, 2010; Ubisoft Montreal 2017). First, some general information about the survey and its participants will be provided, after which the research questions will be discussed using the survey data.

4.1 General information

4.1.1 The survey

The surveys contained 10 questions each. All three surveys were live from the 25th of December 2017 until the 31st of march 2018. In total, 163 people started filling in the survey and 141 finished it (tab. 2). Unfortunately, this number is lower than necessary for a good reliability, as was discussed in chapter 3. It is however a good enough result to say something about the responses.

Table 2: General information about the three questionnaires. For the mean duration, all responses that took more than 500 seconds were filtered out to get a convenient mean.

Survey	Live from	Live until	Amount of people who started it	Amount of people who finished it	Mean duration (in seconds)
Assassin's Creed: Origins	25-12-2017	31-03-2018	70	61	172,3
Battlefield 1	15-12-2017	31-03-2018	43	36	195,1
Civilization V	25-12-2017	31-03-2018	50	44	206,0
Total	15-12-2017	31-03-2018	163	141	191.1

The surveys took the participants an average of 191.1 seconds (3 minutes and 11.1 seconds) to fill out (tab. 2). For more convenient results, the responses that took more than 500 seconds were excluded from the average time it took them to complete it. The amount of time it took the participants to complete the survey is more than expected, for Qualtrics estimated the time needed for completion at 2 minutes.

The largest part of the participants responded to the *Assassin's Creed: Origins* survey (70 in total). 43 people filled out the *Battlefield 1* survey and 50 people filled out the *Civilization V* survey (fig. 4). This could mean two things: either, compared to the other

two games, a bigger percentage of the people who play Assassin's Creed are active on the forum, or, more people actively play Assassin's Creed and therefore more people are active on the forum. The number of responses also differs per survey question. The percentages shown in the data analysis will thus be based on different amounts of responses per question. Table 2.1 in Appendix 2 shows an overview of the amount of responses per survey question.

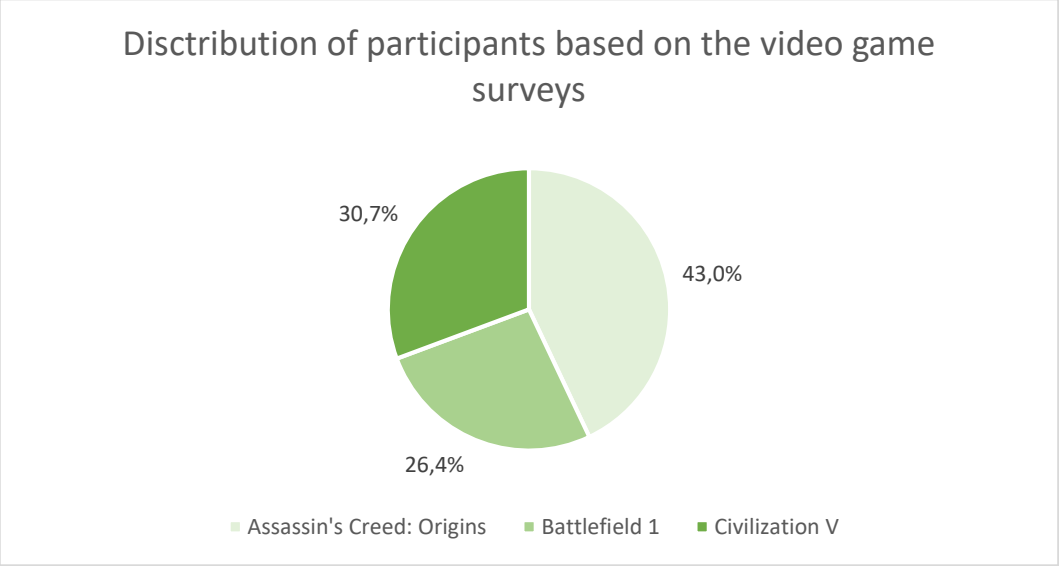

Figure 4: The distribution of participants between the three video game surveys (N= 163).

4.1.2 The participants

The first three questions asked the participants about their gender, age, and country of origin. Both genders are represented in all surveys. Most participants were of the male gender: 121 out of 159. 36 participants were of the female gender and two participants answered that they belonged to another gender (fig. 5). When comparing the three

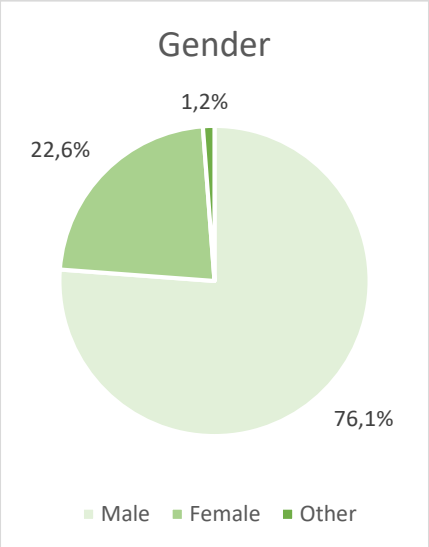

Figure 5: The distribution in gender among all participants (N=159).

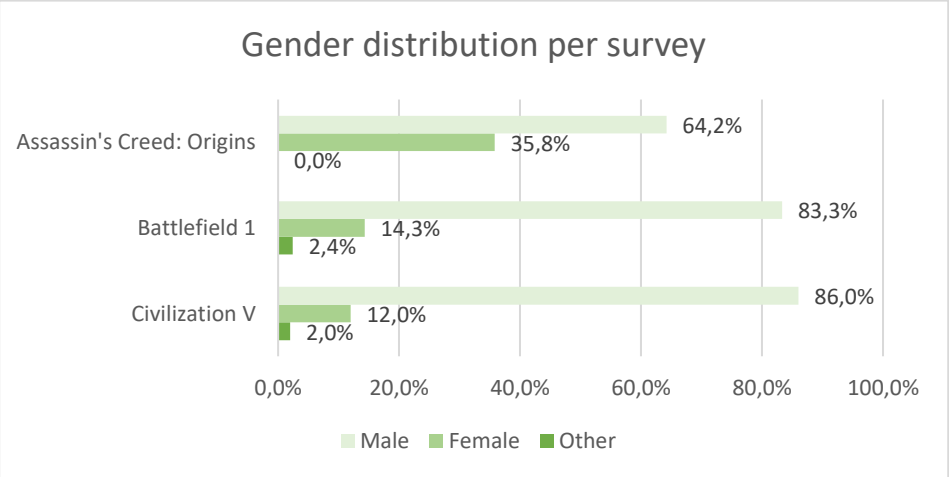

Figure 6: Distribution of gender based on the video game survey (N= 159; male N=121, female N= 36, other N=2).

surveys, it can be seen that the *Assassin's Creed: Origins* survey yielded the largest percentage of female participants (35.8%/ 24 women). The largest percentage of male respondents can be found in the C*ivilization V* survey, closely followed by the *Battlefield 1* survey (83.3% and 86% respectively/ both 43 men) (fig. 6). This could mean that women are more interested in video games like Assassin's Creed than games like Battlefield 1 and Civilization V. It could also mean that they are less active on forums than men.

When looking at the age of the participants, it is noticeable that in two out of three surveys all age categories are represented. Only in the *Assassin's Creed: Origins* survey no one of 15 years old or younger responded (fig. 7). About a third of the participants were in the age category of 21-25 years old (fig. 7). This figure shows that a fair number of gamers can be found in the age category of 46 years old or older (fig. 7), and that few people can be found in the age category of 15 years old or younger. The reason for this could be that they have no access to, or are not interested in gaming forums. Also noticeable is that there are less respondents between 31-45 years old than between 16 to 30 years old (fig. 7). This will be discussed in more detail and compared to other research in chapter 5.

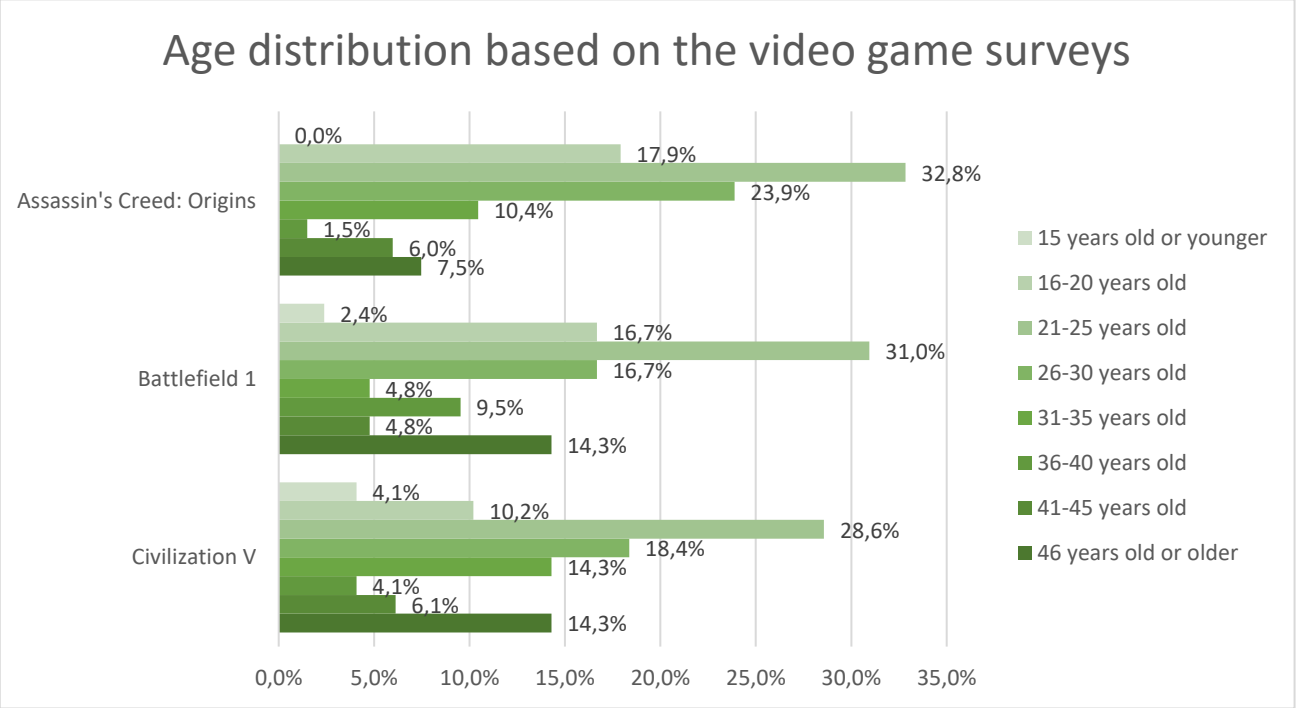

Figure 7: Age distribution based on the video game surveys (N= 158; Assassin's Creed: Origins N=67, Battlefield 1 N=42, Civilization V N=49).

Figure 8 shows the age distribution based on gender. In general, the male gender is distributed more evenly across the age spectrum. Females are mostly grouped around 16 to 35 years old. Some are found to be in the category of 41-45 years old or 46 years and older. Women however are not represented in the age categories of 15 years or younger and 36-40 years old. Both women (52,8%/ 19 women) as well as men (25%/ 30 men) are best represented in the age category of 21-25 years old (fig. 8). The two participants who answered 'other' have an age of 46 years old or older. The fact that most participants can be found in the age category of 21-25 years old could have something to do with the stage of life they are in; playing video games and/or searching the forums may fit better in their lifestyle in this age category than other age categories. It could also mean that people in the other age categories are less interested in visiting forums.

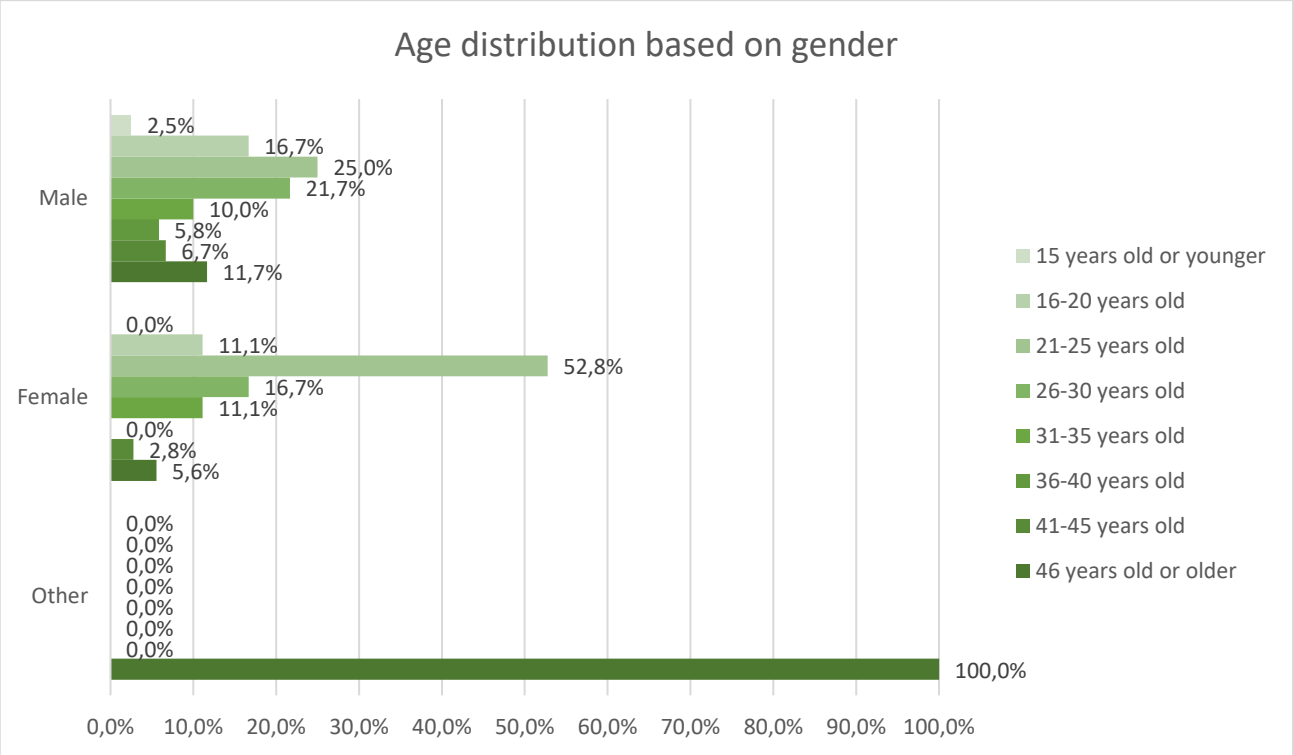

Figure 8: Age distribution based on gender (N=158, male N=120, female N= 36, other N=2).

With respect to the country of origin, it can be seen that most participants (70 (45%)) are from the Netherlands, which makes sense, because apart from the forums, the surveys were distributed among Dutch students as well as people from the Dutch Facebook group "Girlgamer NL". The USA and the UK are also well represented with 24 and 13 participants each (24% in total). Other countries (the remaining 31%) are less

represented (tab. 2.2 in Appendix 2). Nothing reliable can be said about the difference in opinion between participants from specific countries, because too little data is available.

To summarise this section, just over three quarters of the participants were of the male gender (fig. 5). These results show that either males are more active on forums than females, or that there is a larger number of males that play video games compared to females. Of all people, male as well as female and 'other', most could be placed within the age category of 21 to 25 years old, but a lot of people were older than that as well (fig. 7).

The participants mostly originated from the Netherlands, the USA and the UK (tab 2.2). The number of Dutch participants can be explained by the way the surveys were distributed. The results will be discussed and compared to other research in chapter 5.

4.2 Data per research question

Now that a clear image of the people who filled out the surveys is created, the more specific survey questions (question four to ten, found in appendix 3) can be discussed based on the five research questions discussed in the first chapter. An overview of the research questions and the survey questions used to answer them can be found below (tab. 3).

Table 3: An overview of the survey questions (found in appendix 3) used to answer the research questions.

Research Question	**Number of used survey question**
1. What does the target audience generally find important in video games?	5
2. How does the target audience perceive archaeological aspects in video games?	5 and 9
3. To what extent would the target audience be interested to play video games in which a bigger focus lies on archaeology, or that are 'archaeologically/historically accurate'?	6, 7, and 9
4. What genres would be most suitable to use to involve a wider public in archaeology?	4 and 10
5. To what extent can video games be used to involve a wider and particularly younger age group, of people between 20 and 45 years old, in archaeology?	All, but especially 8

4.2.1 What does the target audience generally find important in video games?

To answer this question, the answers from survey question number five will be used, asking the participant what aspects they find important in video games (appendix 3). The results show that a good storyline as well as well-written or executed characters and a realistic environment were found most important in a video game; these are found to be 'very important' to 'extremely important' (tab. 4). Good graphics were found moderately important. When looking at the importance of archaeological aspects, the results show that real historical and archaeological aspects seem to be found less important, with the highest percentage lying at 'moderately important'. Historical accuracy, however, is found to be 'moderately important', leaning towards 'very important' (tab. 4).

Table 4: Results of survey question 5: the importance of video game aspects to the participant. The red/bold numbers point out the lowest percentages, the green/italic numbers point out the highest percentages (N=149).

Video game aspect	**Importance to the participant**					
	Not at all important	Slightly important	Moderately important	Very important	Extremely important	Total N
Good graphics	**1,3% (2)**	13,4%	*39,6% (59)*	34,2%	11,4%	100% (149)
A good storyline	5,4%	**2,0% (3)**	15,4%	*42,3% (63)*	34,9%	100% (149)
Real historical or archaeological aspects	10,1%	21,5%	*34,9% (52)*	25,5%	**8,1% (12)**	100% (149)
Historical accuracy	12,1%	14,8%	*36,2% (54)*	31,5%	**5,4% (8)**	100% (149)
Well written of executed characters	4,0%	**2,0% (3)**	14,1%	*44,3% (66)*	35,6%	100% (149)
A realistic environment (physically possible)	**5,4% (8)**	10,7%	27,5%	*40,3% (60)*	16,1%	100% (149)

The results from the three separate surveys show the same general pattern in the archaeological/historical aspects, although with slight differences (tab. 2.3 in appendix 2). Real historical or archaeological aspects are found less important by those who play *Civilization* than by those playing *Assassin's Creed: Origins* (2017) or *Battlefield 1* (2016). Historical accuracy is generally found to be of more importance, especially by those playing *Assassin's Creed: Origins* (tab 2.3 in appendix 2).

To answer the first sub-research question in short, it can be stated that the target audience mostly finds the popular gaming aspects of a realistic environment, well-written or executed characters and a good storyline quite important. Real historical or archaeological aspects are found to be less important, especially by those playing *Civilization V*. Historical accuracy is however found to be slightly more important, especially by those playing *Assassin's Creed: Origins* and *Civilization V* (tab. 4 and 2.3 in appendix 2). History and archaeology in video games seem to be most important to those playing *Assassin's Creed: Origins*. The results show that opportunities to make people interested in archaeology by implementing archaeological and historical accuracy in video games exist, even though this might not yet be among a broad public.

4.2.2 How does the target audience perceive archaeological aspects in video games?

To answer the second research question, data from survey questions five and nine are used. The results from the fifth survey question already showed that archaeological aspects in video games were appreciated in video games. They however turned out to be less important than aspects like the level of the storyline and in-game characters (paragraph 4.2.1).

The results yielding from the ninth survey question show that 67.6% of the participants would like a video game with accurate archaeological aspects. 17.6% said they did not know if they would like it and 14.8% said it would not matter to them (fig. 9).
The questionnaires for the three games yield about the same results and show the same division in answers. These answers show that the participants would like video games with accurate archaeological aspects (fig. 9).

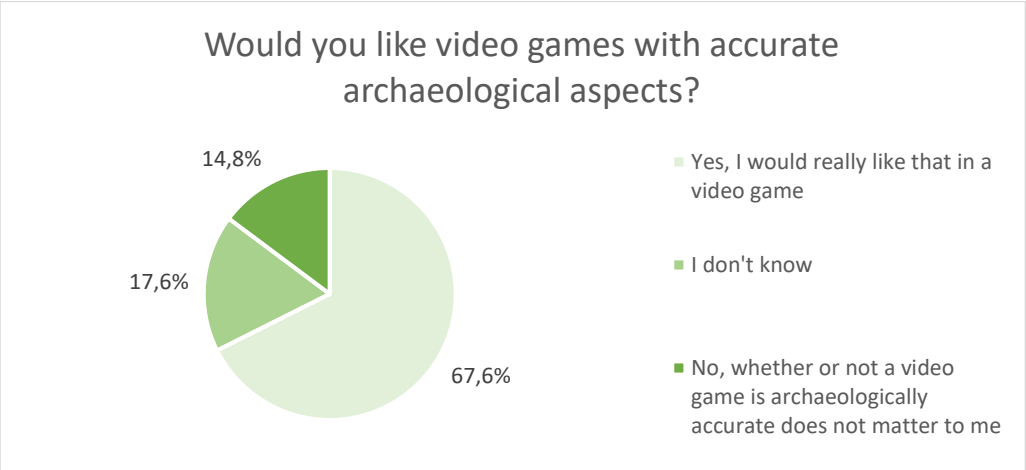

Figure 9: Results of survey question 9: the distribution of the total amount of participants who would or would not like video games with accurate archaeological aspects (N=142).

Based on the results, it can be stated that the participants perceive archaeology in video games as moderately to very important. Especially participants playing *Assassin's Creed: Origins* rate archaeological aspects as very important (paragraph 4.2.1). Most participants would like accurate archaeological aspects in video games. In conclusion, it can be stated that archaeological (and historical) aspects would be appreciated, but are not the most important aspects in video games.

4.2.3 To what extent would the target audience be interested to play video games in which a bigger focus lies on archaeology, or that are 'archaeologically/historically accurate'?

The sixth, seventh and ninth survey questions are used to understand to what extent the target audience would be interested in playing video games that contain a bigger focus on archaeology, or games that are archaeologically or historically accurate.

The results from the sixth survey question, asking about the likability to play a video game mainly because of its historical context or concept, show high scores for likeability (fig. 10). Most people rated their likability a 7 out of 10 (fig. 10). The largest group of participants rated their likeliness between a six and a nine out of ten (fig. 10). The results differ slightly between the three surveys, showing the highest scores in the *Assassin's Creed: Origins* results (fig. 2.1 in appendix 2). Overall, the results show that there is a large interest to play video games mainly because of the incorporated history or archaeology.

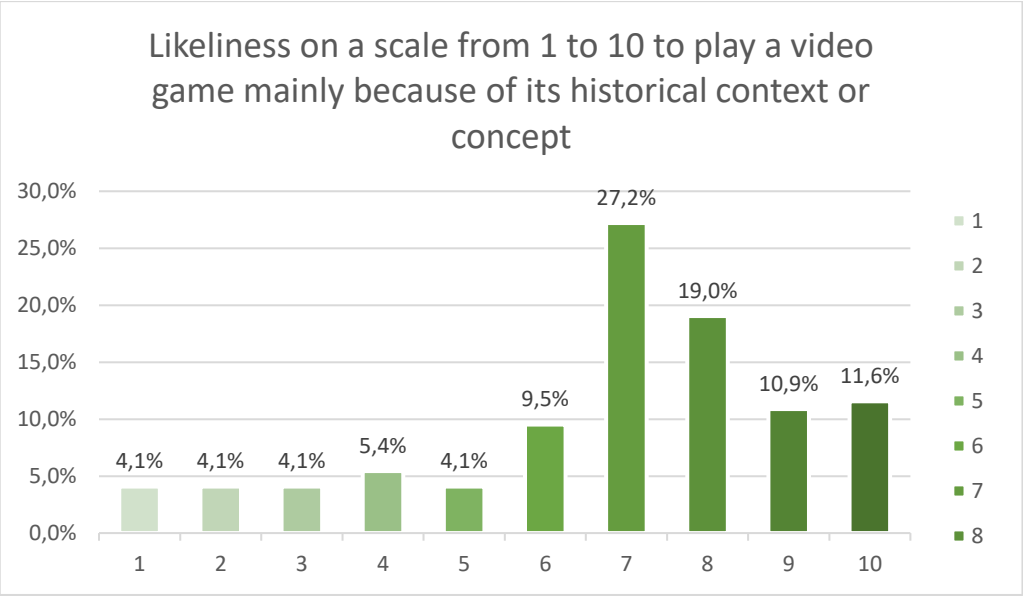

Figure 10: Results of survey question 6: likeliness on a scale from 1 to 10 to play a video game mainly because of its historical context or concept (N=147).

Survey question seven asked the participants about their interest in the video game's archaeology or history (or history or archaeology in general) *before* playing the game.

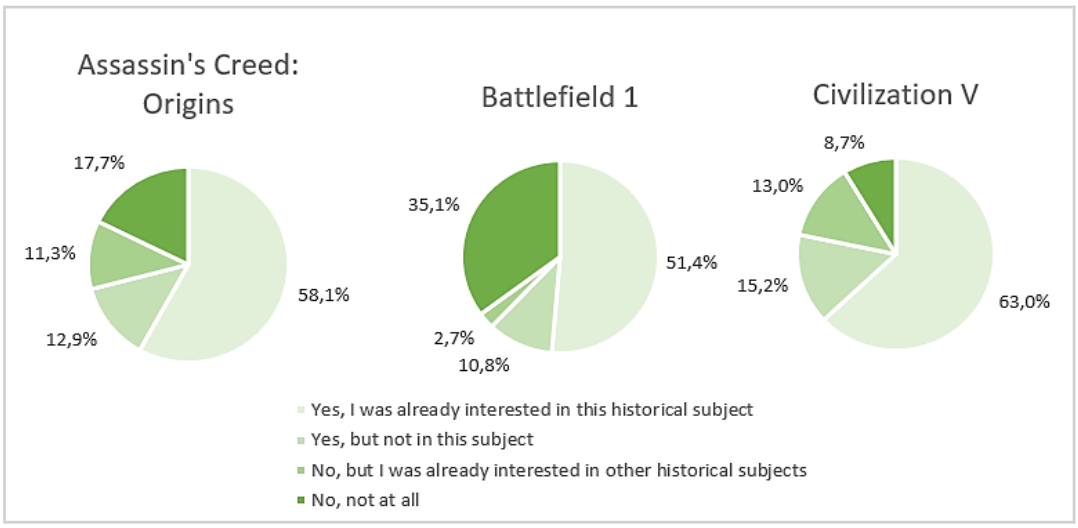

Figure 11: Results of survey question 7: the interest in historical subject before playing the video game (N=145; Assassin's Creed: Origins N=62, Battlefield 1 N=37, Civilization N=46).

The results from this question, presented in figure 11, show that 51.4% to 63% of the people were already interested in the game's history or archaeology before they started playing it (fig. 11). This could mean that they have started playing the game mainly because of the history or archaeology it contains. It could also mean, however, that they liked the game as such, and that it happened to contain historical or archaeological aspects they liked. In any case, over half of the participants, especially those playing

Assassin's Creed: Origins and *Civilization V*, would be interested in playing a game with an archaeological or historical focus.

The ninth question of the surveys asked whether or not the participant would like video games with accurate archaeological aspects. As seen in 4.2.2, about two third of the total public answered that they would really like accurate archaeological aspects in a video game. 17.6% answered they did not know and 14.8% answered that archaeological accuracy did not matter to them in video games (fig. 9). The distribution in opinion between the three answers does not differ much between surveys. In all three surveys, most people said they would be interested in in-game archaeological accuracy (fig. 9).

Looking at the results from survey questions 6, 7, and 9 together, it can be seen that a large interest in archaeology in video games, or video games that are archaeologically or historical accurate is present. About 66% to 75% of the people were interested in playing games that contain (accurate) archaeology. These results show that there definitely is potential to use video games for the sake of widening the target audience in archaeology.

4.2.4 What genres would be most suitable to use to involve a wider public in archaeology?

To investigate what video game genres would be most suitable to use in order to (reach out to and) involve a wider public in archaeology, the fourth and tenth questions from the survey were researched.

The fourth question asked the participants which of the three genres researched in this thesis (RPG's, first person shooters, or strategy) they prefer most. The results show that most participants prefer the RPG genre, or like all three genres equally (fig. 12). The highest score is however biased, because every participant chose the genre of the game they played (fig. 13). The second highest answer is that they like all three genres equally.

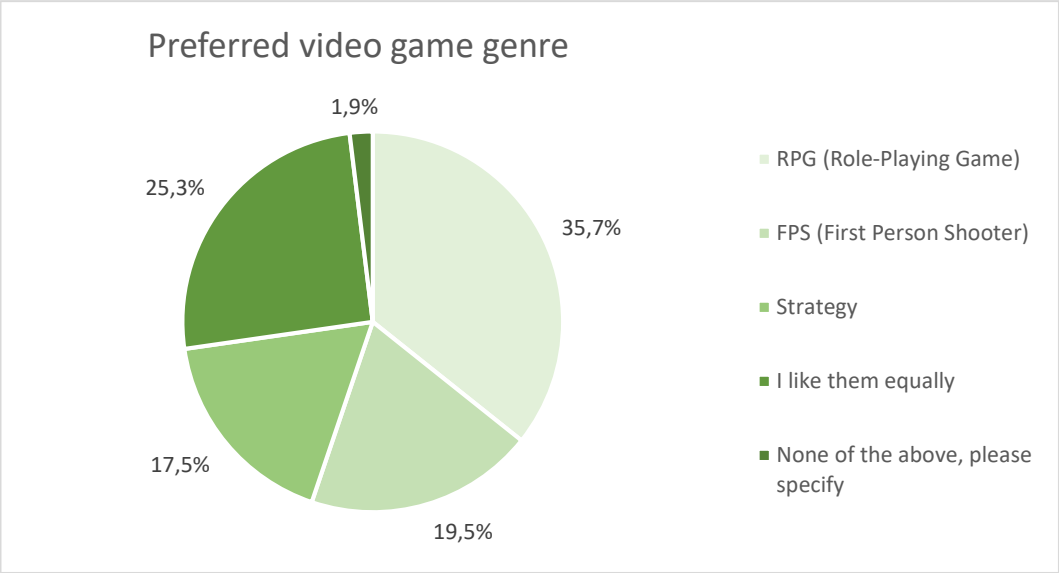

Figure 12: Results of survey question 4: general distribution of answers given on question 4: What type of video game genre from the three options below would you prefer to play? (N=154).

The participants who play Battlefield 1 and Civilization V generally put the RPG genre at the second place of the most preferred genres. The ones that answered 'none of the above', said they preferred the Action Adventure genre, or two of the genres, instead of one or all three.

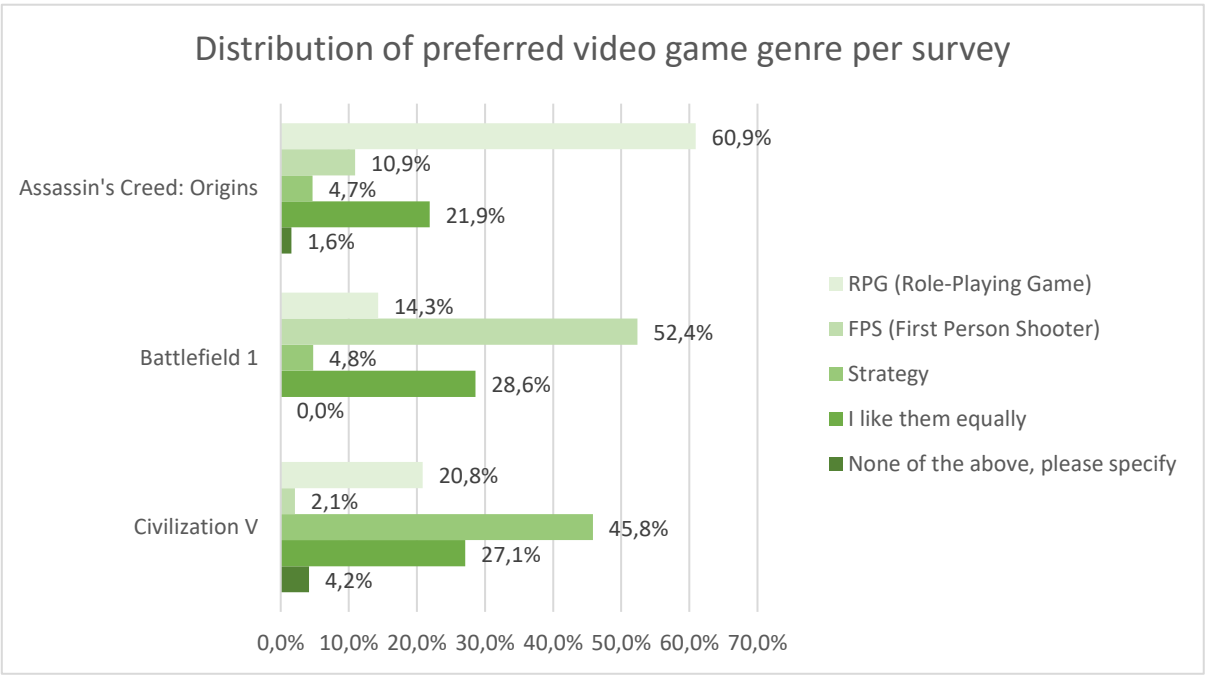

Figure 13: Results of survey question 4: distribution of preferred video game genre among the survey participants (N=154; Assassin's Creed: Origins N= 64, Battlefield 1 N=42, Civilization V N=48).

The tenth question asked the participants in which genre they prefer to see archaeology implemented in. Most (61%) participants said they would prefer to see archaeology implemented in the RPG genre (fig. 14). 6.4% answered with 'other'. They either preferred to see real-life archaeology appear in the action-adventure genre, or in the RPG and strategy genre, but not in the FPS genre (fig. 14).

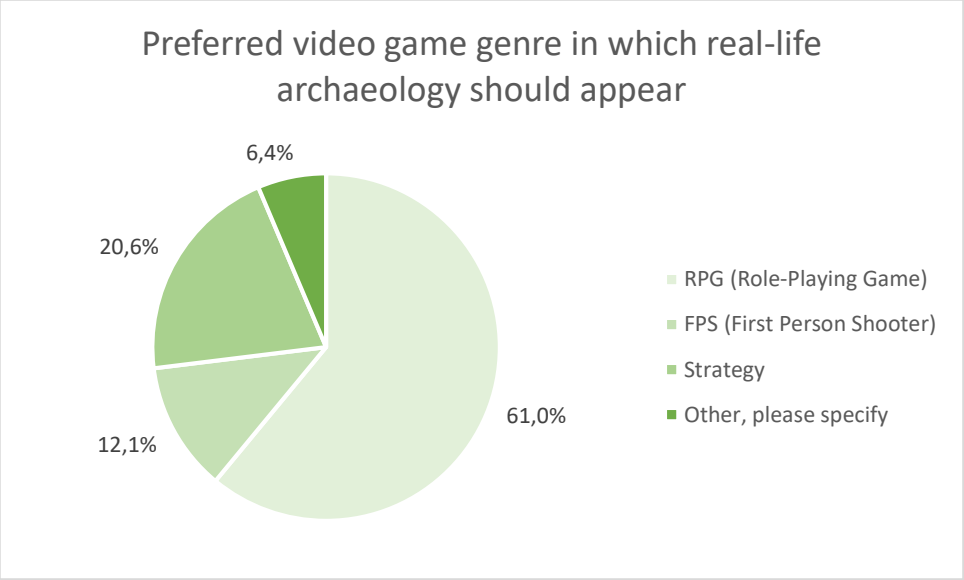

Figure 14: Results of survey question 10: the preferred video game genre in which real-life archaeology should appear according to the participants, N=141.

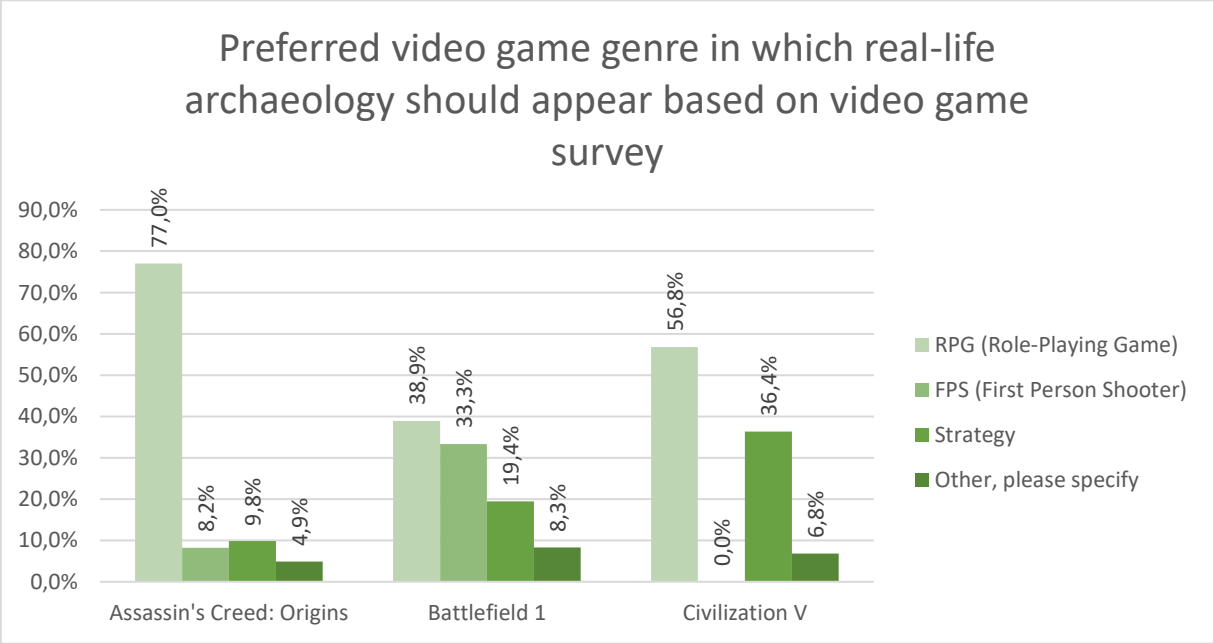

Figure 15: Results of survey question 10: preferred video game genre in which real-life archaeology should appear based on the separate video game surveys (Assassin's Creed: Origins N= 61, Battlefield 1 N=36, Civilization V N=44).

When looking at the results specifically per survey, the RPG genre scores highest still, even when excluding the participants who filled in the *Assassin's Creed: Origins survey* (fig. 15). According to the results, the most suitable genre to use in order to reach out to and involve a wider public in archaeology, is the RPG genre. It was chosen as the most preferred genre by the participants in all three survey questions.

4.2.5 To what extent can video games be used to involve a wider and particularly younger age group, of people between 20 and 45 years old, in archaeology?

To answer this research question, the eighth question will be discussed first, after which the results from the other survey questions (specifically the fourth to tenth questions) are used as background information.

The results from the eighth survey question show the interest in real-life archaeology, which increased for some participants after playing a video game that includes (virtual) archaeological or historical aspects (tab. 5). The results show that circa 37% would probably look up more information on the internet about the subject of the game. 27.5% said that they would read more about the subject, visit a museum, or even visit an archaeological site (tab. 5). These results show that people are more motivated to participate in archaeological activities after playing a certain video game than before playing.

As seen in the results from the research, about two third of the respondents to the surveys are interested in in-game (virtual) archaeology and history. The archaeological aspects in video games seem to be not as important as other aspects, like good graphics or a good storyline, but the participants generally appreciate the idea of archaeology in video games. They are however found historical accuracy very important.

In short: an opportunity to use games in order to reach out to and then involve a wider target audience in archaeology is certainly present. The archaeological interest in video games already exists, but has to be strengthened.

Table 5: Results from survey question 8: the interest in archaeological activities of the participants after playing a certain video game (Assassin's Creed: Origins N= 62, Battlefield 1 N=36, Civilization V N=44).

Archaeological activity		Assassin's Creed: Origins	Battlefield 1	Civilization V	Total
Look up background information about the in-game archaeological aspects					
	Definitely not	3,2%	8,3%	4,5%	**4,9%**
	Definitely yes	25,8%	19,4%	27,3%	**24,6%**
	Might or might not	16,1%	11,1%	13,6%	**14,1%**
	Probably not	16,1%	22,2%	20,5%	**19,0%**
	Probably yes	38,7%	38,9%	34,1%	**37,3%**
	Total	**100,0%**	**100,0%**	**100,0%**	**100,0%**
Read more about archaeology in general					
	Definitely not	9,7%	13,9%	9,1%	**10,6%**
	Definitely yes	11,3%	8,3%	13,6%	**11,3%**
	Might or might not	24,2%	25,0%	29,5%	**26,1%**
	Probably not	22,6%	27,8%	25,0%	**24,6%**
	Probably yes	32,3%	25,0%	22,7%	**27,5%**
	Total	**100,0%**	**100,0%**	**100,0%**	**100,0%**
Visit a museum					
	Definitely not	12,9%	22,2%	11,4%	**14,8%**
	Definitely yes	17,7%	16,7%	15,9%	**16,9%**
	Might or might not	25,8%	25,0%	18,2%	**23,2%**
	Probably not	16,1%	11,1%	25,0%	**17,6%**
	Probably yes	27,4%	25,0%	29,5%	**27,5%**
	Total	**100,0%**	**100,0%**	**100,0%**	**100,0%**
Visit an archaeological site					
	Definitely not	9,7%	13,9%	9,1%	**10,6%**
	Definitely yes	11,3%	8,3%	13,6%	**11,3%**
	Might or might not	24,2%	25,0%	29,5%	**26,1%**
	Probably not	22,6%	27,8%	25,0%	**24,6%**
	Probably yes	32,3%	25,0%	22,7%	**27,5%**
	Total	**100,0%**	**100,0%**	**100,0%**	**100,0%**

5. Discussion and conclusion

This chapter will give a short summary of the research, bring forward some discussion points, and then conclude the research by answering the sub-questions resulting in the answer of the main research question.

5.1 The research

Previous research made clear that younger age categories were participating less in archaeology than older age categories. The methods by which the archaeological sector have tried to reach out to and involve the general public in archaeology are not always what people prefer: the public prefers to use their imagination and they would like to experience the past, not receive information about archaeology in a passive way (Lampe 2014, 53-58). Furthermore, video games may be method of involving the public in the archaeological sector that has not yet been researched to its full potential. Hence came forth this thesis, which researched if and how video games could be used to involve a wider and particularly younger public using the games *Assassin's Creed: Origins, Battlefield 1, and Civilization V* (EA DICE, 2016; Firaxis Games *et al*. 2010; Ubisoft Montreal, 2017). The main research question was "How can videogames be used to involve a wider audience especially of people between 20 to 45 years old, in archaeology?".

5.2 Discussion

In this section, the results will be evaluated and compared to previous research on the subject in 5.2.1. In chapter 5.2.2, a number of discussion points on the research itself will be discussed.

5.2.1 Results and previous research

In this section, first the general data will be examined. Then, the answers to the sub-research questions will be given one by one. Furthermore, both aspects will be discussed using previously mentioned research.

Gender

This research showed an unbalanced division in gender: circa 76% of the participants was of the male gender and only circa 22% of the female gender (fig. 5). These results are striking, because other recent researches showed a more balanced gender division

(ESA 2018, 4-5; Mol *et al.* 2016, 11-12). This could mean that men are generally more active on forums than women, or that men are more interested in the selected games than women.

Age

The research shows that most participants (31%) can be found in the age category of 21-25 years old. In total, 76% of the participants are younger than 36 years old, which is a large number compared to the most recent research by ESA (ESA 2018, 6; fig. 7). This could mean that playing video games and/or searching forums may well be part of the participant's lifestyle nowadays, but not anymore for older players. However, whereas in this research, an obvious spike can be seen at 21-25 years old, in the research by ESA and Janssen and van der Meer, the participants are well balanced among the age categories (ESA 2018, 6; Janssen and van der Meer 2007, 96-97). This shows that it may not be caused by the participants lifestyles after all. Instead, the cause for the spike in the 21- to 25-year olds may be explained by the way the surveys were distributed: the survey has been sent to many students and other people of this age category. The results may have been quite different from the current ones if the surveys were only distributed on the forums. More research on a larger scale is however needed in order to investigate whether or not the distribution of the survey may be the cause.

Country of Origin

Most participants originate from the Netherlands (45%). This means that the other countries are not represented at a high enough level to make statements about differences based on the country of origin of the participant. Because the representation of Dutch people consists of 70 participants, unfortunately, nothing of great value can be said about them either, because this number is, in fact, insufficient.

"What does the target audience generally find important in video games?"

The analysis shows that the archaeological and historical aspects, like the historical accuracy and real historical or archaeological aspects, in a video game are found to be less important (moderately to very important) than aspects like a good storyline. The results from the former research by VALUE showed similar results: archaeological aspects and historical accuracy in games are fun, but not extremely important (Mol *et al.* 2016, 12-13). Opportunities to increase people's interest in archaeology by

implementing archaeological aspects, and especially historical accuracy in video games definitely exist.

The results are based on a survey question that was formulated in general terms. By making the archaeological component of the survey questions more specific, deeper insight might be obtained. One could for instance refer to architecture or the use of utensils within a certain time frame.

"How does the target audience perceive archaeological aspects in video games?"

As discussed previously, the participants perceive archaeological aspects in a positive way; most people like archaeological aspects in video games. People who play *Assassin's Creed: Origins* perceive archaeological aspects in video games as more important than those who play *Battlefield 1* or *Civilization V*, which shows a slight genre preference for implementing archaeology in games (see paragraph 4.2.1).

"To what extent would the target audience be interested to play video games in which a bigger focus lies on archaeology, or that are 'archaeologically/historically accurate'?"

The analysis shows that about 66% to 75% of the participants are interested in playing games that contain (accurate) archaeology, which is a majority. This definitely provides possibilities in generating an archaeological interest using video games. However, a larger research will be needed to find out which archaeological aspects gamers really prefer in video games.

"What selected video game genre(s) would be most suitable to use to involve a wider public in archaeology?"

Out of the three researched games, the RPG genre (in this case connected to the *Assassin's Creed: Origins* game*)* seems to be the best one for involving a wider audience in archaeology. this conclusion can be drawn because the participants in the *Assassin's Creed: Origins* survey showed the most positive opinions towards archaeological aspects and historical accuracy in video games. When asked to choose a genre in which archaeology could be implemented best, participants from the *Battlefield 1* and *Civilization V* surveys showed a preference towards archaeology in the role-playing genre (after the genre of the game they played). This also shows that, apart from the Assassin's Creed: Origins survey participants' opinion towards virtual archaeology, the role-playing genre would be the best genre to implement archaeological aspects and historical accuracy in.

“To what extent can video games be used to involve a wider and particularly younger age group, of people between 20 and 45 years old, in archaeology?”

The results from the research show that a great interest already exists in archaeological and historical aspects in video games. At least two thirds of the participants would be interested in video games containing archaeology. Furthermore, a small part of the participants indicated that their interest in archaeological activities, like visiting a museum or even an archaeological site, has improved by playing video games that contained virtual archaeological or historical aspects. However, the research population is too small to make a reasoned statement about the extent to which video games can be used to involve a wider and younger public in archaeology.

5.2.2 Discussion points of the research

Several aspects of the methodology mentioned in this research could be improved in following research. Firstly, it should be researched thoroughly how people from many countries can be reached through the internet surveys as they were set out. Now, mostly people from the Netherlands, the US and the UK reacted to the call to fill out the survey. For this reason, nothing of great value could be said about the difference in opinion when looking at the nationality of the participants. A proposition would be to ask video game developers for help: in a larger research set-up, video game developers may be able to help reach many more people from different countries and different backgrounds.

A second point of interest is that this research only focuses on the differences in opinion based on age groups. This could be refined by separating ages in order to gain more detailed results of the participants’ opinion based on age. A second broadening of the research could be one with a bigger focus on other aspects, like the difference in opinion based on gender.

A third shortcoming is that of not being able to perform a broad pilot survey among a smaller group of people to test the questionnaire. The survey was tested among a small group of four people, but more opinions about the survey would be preferable in order to filter out all confusing aspects referring to questions or answer possibilities.

A last point of improvement is to create a questionnaire on a larger scale. Although this research provides a great foundation, a much larger research would be preferred to gain better insight in this subject and its possibilities for the archaeological field. In a larger research, more specific research questions could be included, like what specific kind of archaeology in video games would spark the interest of the participants in real-life archaeology.

5.3 Conclusion

The research shows that a certain interest in archaeology exists, but that this should be increased in order to have a bigger effect on people and to activate the participants in actively participating in archaeological activities. The majority of the participants state that they would like to play games mainly because of its historical or archaeological context or concept. Furthermore, about a third of the participants proved to be more interested in archaeological activities after playing a video game that contained archaeological or historical subjects than they were before playing it. This research showed that video games can thus indeed be used to reach out to and involve a wider, and especially younger public of people between 20-45 years old in archaeology. The research shows that people can especially be reached out to by using role-playing games like Assassin's Creed: Origins, rather than shooters and strategy games.

Suggestions for further research and applying current results

Suggestions for further research firstly include research on what specific aspects of archaeological and historical aspects the target audience appreciates. This could be performed by using the same or other video games, preferably on a larger scale including more participants. This could shine light upon new results and new insights. Furthermore, an extended research in order to collect a larger amount of more specific data on the same subject is useful. A suggestion would be a more in-depth research considering age, the difference between country of origin and differences in gender.

The increased interest in certain subjects gained from playing a video game, can be used by the archaeological sector to attract more visitors and a broader audience, specifically between the age of 20 to 45. For example, museums could adjust their exhibitions to current video games and upcoming releases. They could promote these exhibitions in the media, but they can also use the names of related games in their exhibition adverts.

Earlier, in chapter 1, Lampe stated that people like to be involved in exhibitions in an interactive way, and want to visualise and experience the past, which could be partly achieved by films and interactive displays (Lampe 2014, 58). An even better experience would be in playing an archaeologically accurate video game with an avatar one can choose themselves and so identify themselves with the main character of the game (Isbister, 2016, 11-20). In conclusion, a link should be made between branches of the archaeological, heritage, and the historical sector, and video games.

Abstract

This research focuses on if and how video games could be used to reach out to and involve a wider and particularly younger audience of people between 20-45 years old in archaeology. By setting out a questionnaire among the players of three video games belonging to three major gaming genres, namely *Assassin's Creed: Origins* (RPG), *Battlefield 1* (FPS), and Sid Meier's *Civilization V* (strategy), this research searches to investigate how the target audience perceives archaeological and historical aspects in video games (EA DICE, 2016; Firaxis Games *et al.*, 2010; Ubisoft Montreal, 2017). The research looks to find out what gamers find important in video games and what genres are preferred to use in order to implement more real-life (virtual) archaeology. Furthermore, it researches how the target audience perceives archaeological aspects in video games and to what extent they would be interested to play video games in which a bigger focus lies on archaeology, or that are 'archaeologically/historically accurate. Lastly, it was researched which of the selected video game genre(s) would be most suitable to use to involve a wider public in archaeology. The three set out surveys resulted in a total of 163 responses from men and women, concerning several ages and countries, including the Netherlands, the UK and the US. The results show that the participants are interested in archaeological aspects and historical accuracy in video games. A number of participants were more interested in archaeological activities than they were before playing the video game, which means that video games can indeed be used in order to reach out to and involve a wider audience in archaeology. The research shows that the participants preferred the role-playing genre to have more archaeological and historical aspects implemented in. The participants who played Assassin's Creed: Origins were most interested in archaeology and history in video games, and also most open to archaeological activities in the real world, like visiting museums after playing the video game. In conclusion: The most preferred video game genre to use in order to reach out to a wider public is shown to be the role-playing genre.

Ludography

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Lists of figures, tables, and appendices

Figures

Tables

Appendices

Appendix 1: NEARCH Figures

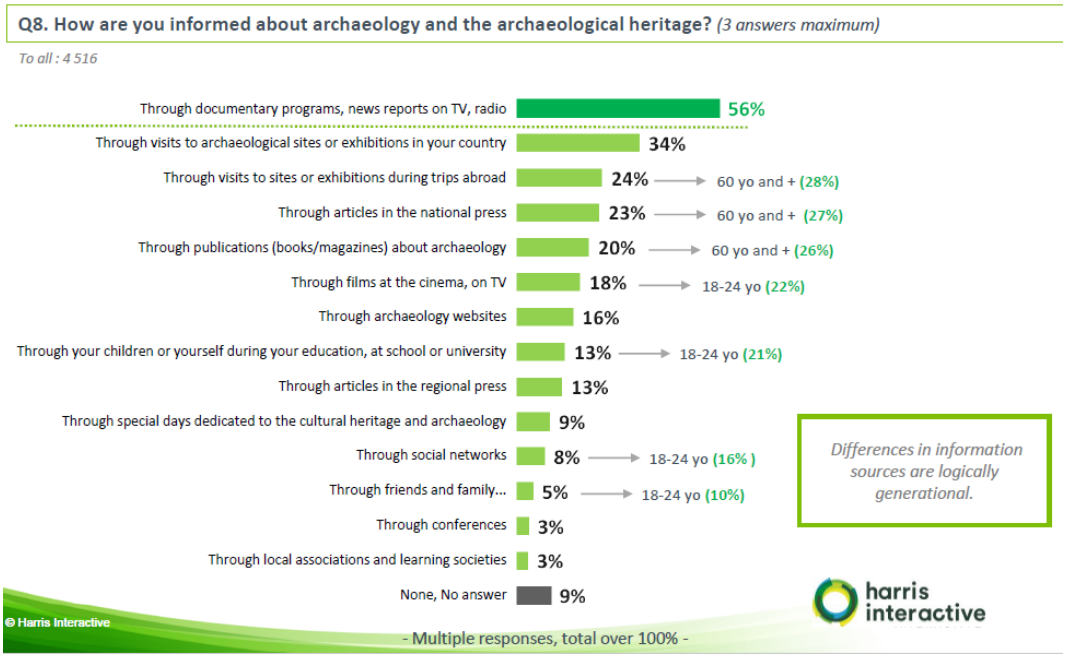

Figure 1.1: Question 8 from the 2015 NEARCH survey including the results (after Mortelli-Banégas et al. 2015, 36).

Q8. How are you informed about archaeology and the archaeological heritage? *(3 answers maximum)*

To all : 4 516

1/2

	EUROPE	UK	FRA	GER	GRE	ITA	NED	POL	SPA	SWE
Through documentary programs, news reports on TV, radio	56%	59%	60%	58%	60%	57%	46%	54%	55%	55%
Through visits to archaeological sites or exhibitions in your country	34%	33%	38%	30%	53%	47%	23%	14%	38%	29%
Through visits to sites or exhibitions during trips abroad	24%	22%	31%	31%	24%	37%	12%	10%	22%	23%
Through articles in the national press	23%	26%	22%	19%	24%	16%	32%	23%	22%	21%
Through publications (books/magazines) about archaeology	20%	12%	15%	22%	21%	18%	19%	28%	21%	23%
Through films at the cinema, on TV	18%	20%	17%	20%	12%	12%	10%	34%	15%	18%
Through archaeology websites	16%	11%	10%	7%	31%	12%	13%	26%	14%	17%

- Multiple responses, total over 100% -

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Figure 1.2: Question 8 from the 2015 NEARCH survey including the results per country, part 1 of 2 (after Mortelli-Banégas et al. 2015, 37).

Q8. How are you informed about archaeology and the archaeological heritage? *(3 answers maximum)*

To all : 4 516

2/2

	EUROPE	UK	FRA	GER	GRE	ITA	NED	POL	SPA	SWE
Through your children or yourself during your education, at school or university	13%	12%	11%	5%	8%	21%	7%	24%	19%	13%
Through articles in the regional press	13%	9%	13%	17%	6%	6%	29%	10%	10%	13%
Through special days dedicated to the cultural heritage and archaeology	9%	6%	19%	2%	7%	17%	8%	8%	9%	7%
Through social networks	8%	4%	1%	6%	20%	5%	6%	6%	10%	11%
Through friends and family...	5%	7%	4%	7%	5%	2%	6%	4%	4%	3%
Through conferences	3%	2%	7%	2%	5%	5%	1%	2%	6%	1%
Through local associations and learning societies	3%	4%	3%	2%	1%	5%	4%	5%	3%	3%
None, No answer	9%	13%	10%	14%	2%	7%	16%	5%	8%	11%

- Multiple responses, total over 100% -

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Figure 1.3: Question 8 from the 2015 NEARCH survey including the results per country, part 2 of 2 (after Mortelli-Banégas et al. 2015, 38).

Q8. How are you informed about archaeology and the archaeological heritage? *(3 answers maximum)*

To all : 4 516

	TOTAL Europe	Gender		Age					SPC		
		Male	Female	18-24 yo	25-34 yo	35-44 yo	45-59 yo	60 yo and more	SPC+	SPC-	Inactive people
Through documentary programmes, news reports on TV, radio	56%	56%	56%	44%	53%	54%	61%	59%	57%	55%	56%
Through visits to archaeological sites or exhibitions in the United Kingdom	34%	33%	35%	24%	27%	34%	38%	38%	40%	27%	33%
Through visits to sites or exhibitions during trips abroad	24%	23%	25%	17%	20%	23%	24%	28%	27%	19%	24%
Through articles in the national press	23%	25%	21%	18%	19%	23%	22%	27%	24%	22%	23%
Through publications (books/magazines) about archaeology	20%	22%	18%	14%	15%	15%	22%	26%	20%	16%	22%
Through films at the cinema, on TV	18%	18%	17%	22%	19%	16%	17%	16%	16%	19%	18%
Through archaeology websites	16%	17%	14%	13%	14%	13%	18%	18%	15%	15%	17%
Through your children or yourself during your education, at school or university	13%	12%	15%	21%	15%	15%	13%	9%	15%	12%	13%
Through articles in the regional press	13%	14%	11%	8%	10%	13%	13%	15%	13%	14%	11%
Through special days dedicated to the cultural heritage and archaeology	9%	8%	10%	7%	8%	8%	10%	11%	9%	8%	10%
Through social networks	8%	8%		16%	11%	9%	6%	4%	7%	9%	8%
Through friends and family...	5%	4%	5%	10%	8%	4%	3%	3%	4%	6%	4%
Through conferences	3%	4%	3%	3%	4%	2%	3%	4%	4%	3%	3%
Through local associations and learning societies	3%	3%	3%	2%	4%	3%	3%	4%	3%	3%	3%
None, No answers	9%	9%	10%	15%	14%	12%	7%	6%	7%	13%	9%

- Multiple responses, total over 100% -

harris interactive

Figure 1.4: Question 8 from the 2015 NEARCH survey including the results per age group (after Mortelli-Banégas et al. 2015, 39).

Figure 1.5: Question 16 from the 2015 NEARCH survey including the results (after Mortelli-Banégas et al. 2015, 66).

Differences according to socio-demographic profile

Q16. Would you be interested in taking part in each of the following actions?

To all : 4 516

TOTAL YES	TOTAL Europe	Gender		Age					SPC		
		Male	Female	18-24 yo	25-34 yo	35-44 yo	45-59 yo	60 yo and more	SPC+	SPC-	Inactive people
Visiting an archaeological site	85%	84%	84%	**78%**	84%	85%	**88%**	**82%**	**87%**	83%	**83%**
Meeting archaeologists so as to better understand archaeology's usefulness for my local community	62%	63%	63%	**58%**	65%	63%	**66%**	61%	**65%**	62%	62%
Meeting archaeologists so as to better understand their profession	61%	60%	61%	62%	63%	61%	**63%**	**57%**	**64%**	59%	59%
Taking part in an archaeological excavation	61%	**57%**	**64%**	**69%**	**71%**	**67%**	61%	**47%**	**63%**	**65%**	**55%**
Attending an archaeology conference to find out more	52%	54%	52%	51%	55%	52%	55%	51%	55%	51%	52%
Be involved in the decision taking process of a nearby archaeological project	51%	**52%**	**48%**	51%	**55%**	53%	51%	**45%**	**53%**	50%	**48%**
Contributing to the funding of archaeological excavations	30%	31%	30%	**37%**	**35%**	**35%**	29%	**24%**	**33%**	32%	**27%**

Figure 1.6: Question 16 from the 2015 NEARCH survey including the results per age group (after Mortelli-Banégas et al. 2015, 68).

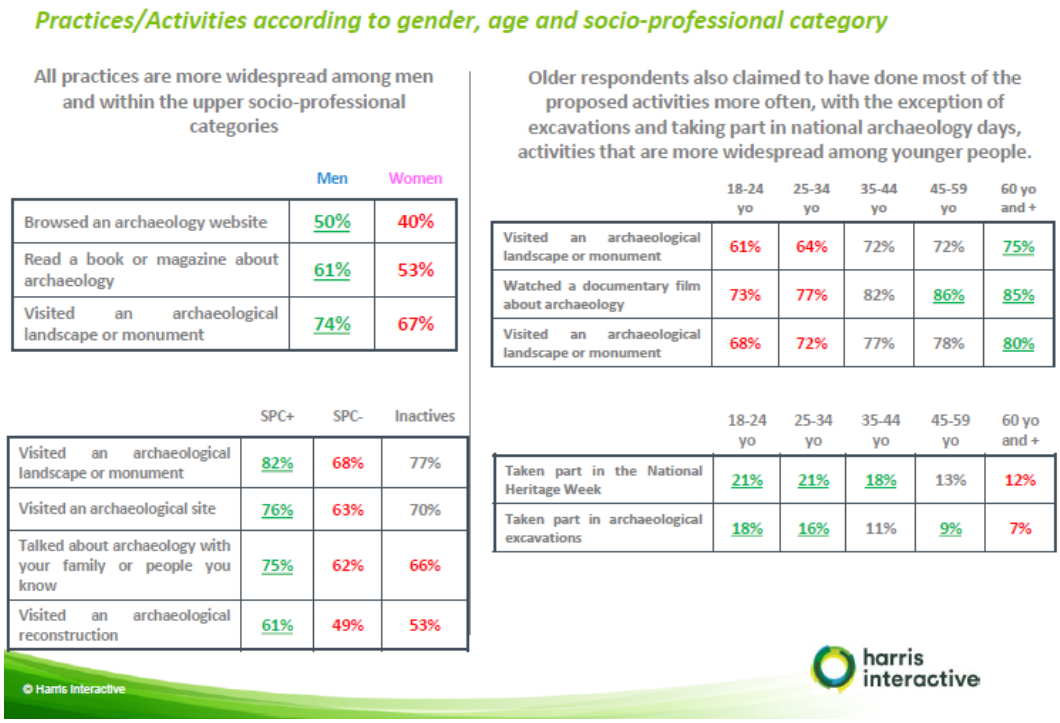

Figure 1.7: A summarised overview from the results of question 7 from the 2015 NEARCH survey (after Mortelli-Banégas et al. 2015, 32).

Appendix 2: Figures and Tables with research data

Appendix 2.1: Figures with research data

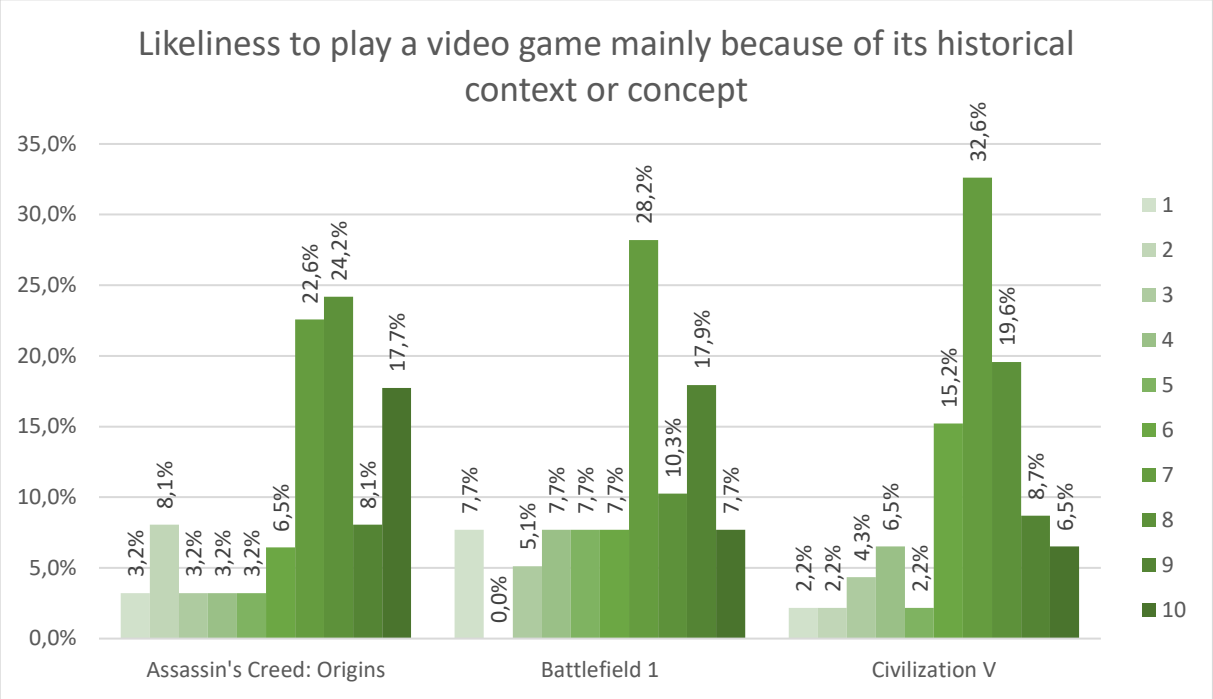

Figure 2.1: Results from survey question 6: likeliness on a scale from 1 to 10 to play a video game mainly because of its historical context or concept (N=147; Assassin's Creed: Origins N= 62, Battlefield 1 N=39, Civilization V N=46).

Appendix 2.2: Tables and research data

Table 2.1: The number of responses per survey question. The names of the specific video games in question 7 and 8 were replaced by "this video game". AC:O= Assassin's Creed: Origins; BF1= Battlefield 1; Civ V= Civilization V.

Number of responses per question per video game Survey question	AC: O	BF1	Civ V	Total amount of responses per question
1: What is your gender?	67	42	50	159
2: What is your age?	67	42	49	158
3: What country are you from?	64	42	48	154
4: What type of video game genre from the three options below would you prefer to play?	64	42	48	154
5: How important are the options below for you in a video game?	63	40	46	149
6: On a scale of 1 to 10, how likely are you to play a video game mainly because of its historical context or concept?	62	39	46	147
7: Were you already interested in the archaeology/history used in this video game or in general before you started playing the video game?	62	37	46	145
8: After playing this game, would you be more interested than playing before to…	62	36	44	142
9: Would you like video games with accurate archaeological aspects?	62	36	44	142
10: In what video game genre would you like to see real-life archaeology appear?	61	36	45	141

Table 2.2: Results from survey question 3: distribution of country of origin based on the video game surveys (N=154).

Country of origin	*Assassin's Creed: Origins*	*Battlefield 1*	*Civilization V*	Total
Australia	1	1	1	**3**
Belgium	1		1	**2**
Botswana		1		**1**
Brazil	1			**1**
Canada	2	1		**3**
CE (EC-Equador?)	1			**1**
Denmark	3	1	1	**5**
England			2	**2**
Germany	4		1	**5**
Greece	1	2		**3**
Ireland	1			**1**
Italy	1	1		**2**
Norway			1	**1**
Poland	3		1	**4**
Romania	1		1	**2**
Sint Maarten	1			**1**
Slovenia	1			**1**
Suriname	1	1		**2**
Sweden			3	**3**
The Netherlands	27	20	23	**70**
Turkey	2	1		**3**
UK	2	8	3	**13**
USA	9	5	10	**24**
Wales	1			**1**
Total	**64**	**42**	**48**	**154**

Table 2.3: Results from survey question 5: importance of certain video game aspects to the participants, shown for each video game. Light grey: Assassin's Creed: Origins (N=63), medium grey: Battlefield 1 (N=40), dark green: Civilization V (N=46). The lowest percentages are shown in bold, the highest percentages are shown in italic and are underlined.

Video game aspect	Importance to the participant, per game				
	Not at all important	Slightly important	Moderately important	Very important	Extremely important
Good graphics	**0,0%** **0,0%** 4,4%	11,1% 7,5% 21,7%	30,2% 32,5% *58,7%*	*41,3%* *45,0%* 15,2%	17,5% 15,0% **0,0%**
A good storyline	**1,6%** 15,0% **2,2%**	**1,6%** **0,0%** 4,4%	7,9% 17,5% 23,9%	41,3% *40,0%* *45,7%*	*47,6%* 27,5% 23,9%
Real historical or archaeological aspects	**4,8%** 17,5% 10,9%	20,6% **10,0%** *32,6%*	*36,6%* *37,5%* 30,4%	28,6% 22,5% 23,9%	9,5% 12,5% **2,2%**
Historical accuracy	9,5% 17,5% **10,9%**	15,9% 7,5% 19,6%	*36,5%* *42,5%* *30,4%*	*36,5%* 27,5% 28,3%	**1,6%** **5,0%** **10,9%**
Well written of executed characters	3,2% 10,0% **0,0%**	**1,6%** **5,0%** **0,0%**	6,3% 20,0% 19,6%	*49,2%* *40,0%* *41,3%*	39,7% 25,0% 39,1%
A realistic environment (physically possible)	4,8% **2,5%** **8,7%**	**1,6%** 10,0% 23,9%	28,8% 25,0% *28,3%*	*44,4%* *47,5%* *28,3%*	20,6% 15,0% 10,9%

Appendix 3: Questionnaires

Appendix 3.1: Archaeology and video games: *Assassin's Creed: Origins*

Archaeology and video games:

Assassin's Creed: Origins

Hey!

Thank you so much for wanting to participate in this short (completely anonymous) survey for my bachelor thesis! I would like to ask you just 10 questions. That's very doable, right? ;)

Thanks in advance for helping me!

---

1 What is your gender?

- ○ Male
- ○ Female
- ○ Other

---

2 What is your age?

- ○ 15 years old or younger
- ○ 16-20 years old
- ○ 21-25 years old
- ○ 26-30 years old
- ○ 31-35 years old
- ○ 36-40 years old
- ○ 41-45 years old
- ○ 46 years old or older

3 What country are you from?

_____

4 What type of video game genre from the three options below would you prefer to play?

- ○ RPG (Role-Playing Game)
- ○ FPS (First Person Shooter)
- ○ Strategy
- ○ I like them equally
- ○ None of the above, please specify

_____

5 How important are the options below for you in a video game?

	Not at all important	Slightly important	Moderately important	Very important	Extremely important
Good graphics	○	○	○	○	○
A good storyline	○	○	○	○	○
Real historical or archaeological aspects	○	○	○	○	○
Historical accuracy	○	○	○	○	○
Well written or excecuted characters	○	○	○	○	○
A realistic environment (physically possible)	○	○	○	○	○

6 On a scale of 1 (very unlikely) to 10 (very likely), how likely are you to play a video game mainly because of its historical context or concept (e.g. a video game based on the Medieval Period or a World War)?

	1	2	3	4	5	6	7	8	9	10
Likeliness to play a video game because of historical/archaeological context or concept	(	(	(	(	(	(	(	(	(	(

7 Were you already interested in the archaeology/history used in *Assassin's Creed: Origins* or in general before you started playing the video game?

- ○ Yes, I was already interested in this historical subject
- ○ Yes, but not in this subject
- ○ No, but I was already interested in other historical subjects
- ○ No, not at all

8 After playing *Assassin's Creed: Origins*, would you be more interested than before playing to...

	Definitely not	Probably not	Might or might not	Probably yes	Definitely yes
Look up background information about the in-game archaeological aspects	○	○	○	○	○
Read more about archaeology in general	○	○	○	○	○
Visit a museum	○	○	○	○	○
Visit an archaeological site	○	○	○	○	○

9 Would you like video games with accurate archaeological aspects (For example, Ubisoft is creating a playing mode in *Assassin's Creed: Origins* in which you can get more

information about the different real archaeological artefacts that can be seen throughout the game)?

- ○ Yes, I would really like that in a video game
- ○ I don't know
- ○ No, whether or not a video game is archaeologically accurate does not matter to me

---

10 In what video game genre would you like to see real-life archaeology appear?

- ○ FPS (First Person Shooter)
- ○ RPG (Role-Playing Game)
- ○ Strategy
- ○ Other, please specify _____

Archaeology and video games:

Battlefield 1

Hey!

Thank you so much for wanting to participate in this short (completely anonymous) survey for my bachelor thesis! I would like to ask you just 10 questions. That's very doable, right? ;)

Thanks in advance for helping me!

1 What is your gender?

- ○ Male
- ○ Female
- ○ Other

2 What is your age?

- ○ 15 years old or younger
- ○ 16-20 years old
- ○ 21-25 years old
- ○ 26-30 years old
- ○ 31-35 years old
- ○ 36-40 years old
- ○ 41-45 years old
- ○ 46 years old or older

---

3 What country are you from?

_____

---

4 What type of video game genre from the three options below would you prefer to play?

- ○ RPG (Role-Playing Game)
- ○ FPS (First Person Shooter)
- ○ Strategy
- ○ I like them equally
- ○ None of the above, please specify

_____

---

5 How important are the options below for you in a video game?

	Not at all important	Slightly important	Moderately important	Very important	Extremely important
Good graphics	○	○	○	○	○
A good storyline	○	○	○	○	○
Real historical or archaeological aspects	○	○	○	○	○
Historical accuracy	○	○	○	○	○
Well written or excecuted characters	○	○	○	○	○
A realistic environment (physically possible)	○	○	○	○	○

6 On a scale of 1 (very unlikely) to 10 (very likely), how likely are you to play a video game mainly because of its historical context or concept (e.g. a video game based on the Medieval Period or a World War)?

	1	2	3	4	5	6	7	8	9	10
Likeliness to play a video game because of historical/archaeological context or concept	(	(	(	(	(	(	(	(	(	(

7 Were you already interested in the archaeology/history used in *Battlefield 1* or in general before you started playing the video game?

- ○ Yes, I was already interested in this historical subject
- ○ Yes, but not in this subject
- ○ No, but I was already interested in other historical subjects
- ○ No, not at all

8 After playing *Battlefield 1*, would you be more interested than before playing to...

	Definitely not	Probably not	Might or might not	Probably yes	Definitely yes
Look up background information about the in-game archaeological aspects	○	○	○	○	○
Read more about archaeology in general	○	○	○	○	○
Visit a museum	○	○	○	○	○
Visit an archaeological site	○	○	○	○	○

9 Would you like video games with accurate archaeological aspects (For example, Ubisoft is creating a playing mode in *Assassin's Creed: Origins* in which you can get more

information about the different real archaeological artefacts that can be seen throughout the game)?

- ○ Yes, I would really like that in a video game
- ○ I don't know
- ○ No, whether or not a video game is archaeologically accurate does not matter to me

---

10 In what video game genre would you like to see real-life archaeology appear?

- ○ FPS (First Person Shooter)
- ○ RPG (Role-Playing Game)
- ○ Strategy
- ○ Other, please specify _____

Archaeology and video games: Sid Meier's *Civilization V*

Hey!

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Thanks in advance for helping me!

1 What is your gender?

- ○ Male
- ○ Female
- ○ Other

2 What is your age?

- ○ 15 years old or younger
- ○ 16-20 years old
- ○ 21-25 years old
- ○ 26-30 years old
- ○ 31-35 years old
- ○ 36-40 years old
- ○ 41-45 years old
- ○ 46 years old or older

3 What country are you from?

_____

4 What type of video game genre from the three options below would you prefer to play?

- ○ RPG (Role-Playing Game)
- ○ FPS (First Person Shooter)
- ○ Strategy
- ○ I like them equally
- ○ None of the above, please specify

_____

5 How important are the options below for you in a video game?

	Not at all important	Slightly important	Moderately important	Very important	Extremely important
Good graphics	○	○	○	○	○
A good storyline	○	○	○	○	○
Real historical or archaeological aspects	○	○	○	○	○
Historical accuracy	○	○	○	○	○
Well written or excecuted characters	○	○	○	○	○
A realistic environment (physically possible)	○	○	○	○	○

6 On a scale of 1 (very unlikely) to 10 (very likely), how likely are you to play a video game mainly because of its historical context or concept (e.g. a video game based on the Medieval Period or a World War)?

	1	2	3	4	5	6	7	8	9	10
Likeliness to play a video game because of historical/archaeological context or concept	(	(	(	(	(	(	(	(	(	(

7 Were you already interested in the archaeology/history used in Sid Meier's *Civilization V* or in general before you started playing the video game?

- ○ Yes, I was already interested in this historical subject
- ○ Yes, but not in this subject
- ○ No, but I was already interested in other historical subjects
- ○ No, not at all

8 After playing Sid Meier's *Civilization V*, would you be more interested than before playing to...

	Definitely not	Probably not	Might or might not	Probably yes	Definitely yes
Look up background information about the in-game archaeological aspects	○	○	○	○	○
Read more about archaeology in general	○	○	○	○	○
Visit a museum	○	○	○	○	○
Visit an archaeological site	○	○	○	○	○

9 Would you like video games with accurate archaeological aspects (For example, Ubisoft is creating a playing mode in *Assassin's Creed: Origins* in which you can get more information about the different real archaeological artefacts that can be seen throughout the game)?

- ○ Yes, I would really like that in a video game
- ○ I don't know
- ○ No, whether or not a video game is archaeologically accurate does not matter to me

---

10 In what video game genre would you like to see real-life archaeology appear?

- ○ FPS (First Person Shooter)
- ○ RPG (Role-Playing Game)
- ○ Strategy
- ○ Other, please specify _____
