

A game design plot: exploring the educational potentials of history-based video games

Baradaran Rahimi F., Kim B., Levy R.M., and Boyd J.E.

Abstract—The number of video games that are developed based on real historical events and evidence is increasing. These history-based video games provide players learning opportunities, but a certain type of such games – first and third person shooters - has not been carefully examined for their potentials. Knowing what players say about their game experience - even if the information and knowledge are inaccurate - helps researchers understand what type of learning could happen with such games. In this paper, we propose a systematic approach to assessing games as learning environments, using the method of comparing authenticity of popular history-based video games. Through a qualitative data analysis, we studied players' comments on the web-based communication services, such as game forums, digital distribution platforms, and discussion websites. Casual players' conversations on these websites showed that there exist several learning potentials in the games for players including building their understanding about history and historical forces of the time, through personally relating to the specific events, social artifacts, and places.

Index Terms— Communications technology, E-learning, History-based video games, Web-based communication services



1 INTRODUCTION

There exist controversies about historical video games, especially first and third-person shooter games, if they have potential to support learning. For example, according to McCall (2016, p.526), "the presence of choice and thus counterfactual outcomes raise some objections to historical games and their portrayal of the past." Some, however, assert that the video games of historical contexts might provide a useful and motivating method of learning about history and social history (Connolly et al., 2012; and McCall 2018). Social history concentrates upon the social, economic, and cultural institutions of a people and "emphasizes the forces that drive human behavior" (McCall, 2012, p. 20). While historical events such as revolutions and wars form a considerable part of the history, architecture and urban life of people are significant parts of the social history. History-based video games can provide players with a representation of social history. Yet, the educational values can get lost in the entertainment aspects of such games. Consequently, many historical details and values of these games remain as a background for players, if noticed at all.

We recognize the richness of the commercial games regardless of their success. While we point to the relative shortage of adopting their learning potentials, we also acknowledge the danger of reducing the multi-faceted human history to the history of militarism and violence. There exist methods of user-testing to understand how

players interact with new games (Desurvire & El-Nasr, 2013). However, there are not enough systematic ways to maximize different learning values of commercial history-based video games, especially first and third-person shooters, for casual players. These games provide historical environments rendered in 3D and navigated by a player agent. Yet, they include some violent interactions regarding their first and third-person shooter nature. Presumably these games can provide the players with historical sights, sounds, and spaces as well as animated characters capable of talking and interacting within the historical environment of the game. These games provide a different experience from the history-based strategy games, such as Civilization, which Chapman, Foka, and Westin (2017) categorizes as conceptual-approach games. Such history games as Civilization have been studied and proven to be useful for learning purposes (e.g. Squire & Barnett, 2004). However, most of these games are played from the "bird's eye view" as an invisible ruler, who does not experience the social history. In contrast and as a result of their view, first and third person-shooter games have the potential to provide players with sense of presence in the historical events of the game.

Conversations of casual players on web-based communication services such as game forums, digital distribution platforms, and discussion websites reveal the learning potentials in commercial video games (McCall 2018). Yet, each game's depiction of the history is value-laden, and there needs a systematic way to understand the values conveyed by these commercial games. How can the learning potentials for the players – to inquire into history in relation to the historical authenticity of different video games – be studied and compared? The goal of this paper is to investigate the learning opportunities that players may have with commercial history-based video games (i.e., historically oriented, situated, or themed video games). Based

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on this goal, we focused on assessing learning opportunities that players may have with commercial history-based video games instead of assessing games that are designed for learning about history or purely for entertainment. In this paper, we explored what kinds of conversations can happen around the historical contexts of video games and investigated how these conversations are already taking place online. Based on our findings we provide a game design plot for visualizing, listing, and comparing the learning outcomes of history-based video games. The plot and the systematic approach that we propose can help developers, designers, researchers, and educators make informed decisions about application of video games in different situations.

2 LITERATURE REVIEW

With the growing interest in video games over the past few decades, there has been a growing concern about the impact of gameplay on users. Some found negative impacts such as the increase in aggression and arousal (Anderson, 2004), difficulties in regulating the amount of time spent on playing games (Ogletree & Drake, 2007), and addiction (Griffiths & Davies, 2002). Yet, others reported on optimistic visions of video games, such as raising awareness of important social issues (Schreiner, 2008), developing gaming literacy in real life situations (Zimmerman, 2009), and learning through designing games in a participatory culture (Baradaran Rahimi, & Kim, 2018). Despite the skepticism, many scholars believe that video games provide useful and novel ways of learning. Modern theories of learning suggest that learning is most effective when it is active, experiential, situated, problem-based, and provides immediate feedback. Games offer activities that have these features and often involve players' emotions that help them make meaningful links to their prior knowledge and experience (Connolly et al., 2012; and Schreiner, 2008).

Metzger and Paxton (2016) argued, "[h]istory has much to offer video game developers, including ready-made settings that can activate players' prior mental schemas to provide a sensation of verisimilitude within a context that is nevertheless alternate and malleable" (p.533). Games can be seen as forms of public history. McCall (2018) appreciates how historical games can model some aspects of past systems and have the potential to be very powerful media for encouraging thoughts about history. In playing historical games, especially first and third person shooters, players are immersed into the historical settings which can be very powerful for understanding history. However, historical games usually create an experience that does not accurately match all the details in documented history. Therefore, authenticity and accuracy in the historical games require a reconsideration of terms (McCall, 2018).

Supporting that history-based video games can help understanding history (McCall, 2018; Metzger and Paxton, 2016), we believe that defining factors of historical context in games would facilitate the productive use of them. We take the Tschumi (2012), Gerosa (2005), and Pallasma's

(2001) views on discussions relevant to factors of historical context as the environment and architecture are important parts of the action in the video games. Later, these provided the grounds for identifying the "learning potentials" in Table 2. To explore the educational potential of such video games, we looked at the most relevant literature in game studies to identify three groups of the history-based video games in terms of authenticity and accuracy. Using the literature in media and architecture five factors are identified to describe the historical context in such games. A plot was then created based on these factors for those three groups of video games (Fig. 1).

2.1 Learning through history-based video games

The ways in which players learn and think about history and social history can be influenced by popular culture and media technologies (Wineburg, 2001; and Schreiner, 2008). Video games, that are historically oriented, situated, or themed (Metzger and Paxton, 2016), offer players an opportunity to alter historical events, such as winning a battle based on their choices. Experiencing these alternatives can also help understanding how a single decision has the potential to change the history or result in better solutions in the context of history:

Video games can provide a unique mode of engagement for thinking about the world and its past—allowing the young learner not just to observe historical accounts but to actively engage in simulations of history, easily repeating events or sequences, or even controlling and modifying alternate visions of what could have happened in the past (Metzger and Paxton, 2016, p.533).

As Walsh (2013) noted, some game developers tend to move their games from the realm of pure fantasy to the realm of reality in the minds of players. Gee (2008, p.254), recognized such games as "action- and goal-directed simulations of embodied experience." Video games offer an opportunity for learning history in such an immersive, interactive, and engaging way that is almost impossible using traditional media like movies and books.

Metzger and Paxton (2016) suggested a framework that can help identify the video games that facilitate learning history. Their framework offers "deployments"¹ of historical understanding while considering authenticity versus fantasy in video games. Metzger and Paxton (2016) suggested that disciplinary practices, elements, and perceptions of validity are important factors to make a video game a legitimate historical representation. Behind the group of legitimate games lays considerable archival or scholarly research by historians and professionals. This archival and scholarly research can range from a deep investigation of a historical event, atmosphere, fashion, and manner of socialization to a detailed recreation of historic buildings, landscapes, sites, and cities (Metzger and Paxton, 2016). The second group of video games valorizes historic momentums and important events, but not necessarily based on extensive research (Metzger and Paxton,

¹ Deployment is the term that Metzger and Paxton (2016, 533) used for "a designed representation of the past utilized by game creators to reflect a perspective, interest, or purpose."
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2016). A third group focuses on reconstructing objects, artifacts, or communications with authentic details, such as historical buildings, furniture, battlefields, and weaponry in a certain period (Metzger and Paxton, 2016). There exist many deployments of history in video games, but the history often collides with fantasy. The more a game goes into fantasy, the more it may depart from the authenticity.

2.2 Factors of historical context in games

In conceptualizing varying adoptions of historical contexts in video games, we considered how architecture and cinema have coexisted in games from the early days of the game industry. DOOM, one of the most significant and influential titles in video game history, pioneered the use of architecture and cinema in a first-person shooter game (Arsenault, 2009). Later, the cinematic exploration of video games was pursued by players on Machinima¹, as creating game movies became “an outlet for creative expression” (Lowood, 2006, p.326). Such movies can be considered as a “part of the player culture to engage with more challenging stories and themes” (Lowood, 2006, p.380). The architectural and cinematic representations engage players as protagonists of video games:

A central concept for the architecture of video games is that they are part of the action. They live together with the characters. They are often theatrical architecture, with traps, moving walls, pitfalls, etc. They respond to every move of the player: in that way, they are living, organic creatures. But they also live because they are visited, admired and interacted with by people (Gerosa, 2008, p.53).

Bernard Tschumi (2012, p.176) argued that “there is no architecture without event, no architecture without action, without activities.” Citing Foucault, Tschumi (2012) said that an event is “the moment of erosion, collapse, questioning, or problematizing the very assumption of the setting within which a drama may take place – occasioning the chance or possibility of another, different setting” (p.176). History-based games unfold in a spatial context, such as an ancient city in the Roman Empire (e.g., *Ryse: Son of Rome*), Paris during the French Revolution (e.g., *Assassin’s Creed Unity*), or Los Angeles in the 1940s (e.g., *La Noire*). Players engage in activities to complete a mission (e.g., investigating a crime scene, destroying the enemies’ structures, or helping a certain group). Events in a game can occur through unexpected encounters in the games (e.g., a player meeting a street hawker selling something from that period) within the social-historical contexts by roaming the open-world of the game. This can resonate with Foucault’s explanation; players may begin questioning or problematizing the very assumption of the game (i.e., gaming as accomplishing pre-determined missions) and find their own missions (e.g., free roaming in the game world to explore its architecture).

Jean Nouvel, similarly, said that “[a]rchitecture exists, like cinema, in the dimension of time and movement. One conceives and reads a building in terms of sequences².” As

Nouvel explained, movement (activity) of people help them conceive building (space) through time in sequences. Players experience time in different scales within history-based games. In addition to the real-time that players spend with the video games, players engage with the time that unfolds in the virtual world of the game. In this time scale, a couple of days or weeks or months in the virtual world of the game may pass just in half an hour. The players also engage with the historical time that the game narrative belongs to. It is indicative of its culture and customs. People, as historical societies or individuals are inseparable parts of video games considering their roles in historical events.

We consider people, time, space, event, and activity as five factors that represent life in games. These factors can guide game creators to provide players with educational experiences within the historical contexts of the games. These factors are critical in identifying or designing structural attributes of the history-based video games. Thus, these factors can play an important role in transforming a history-based video game into an educational medium. Based on Squire’s study (2011), considerable historical content of such games helps players make decisions leading to alternative ideas of the historical consequences.

2.3 History-based video games plot

To visualize the information from the literature, we created a plot in which a continuum of historical authenticity and five factors of historical context represent two axes. The plot can be used as a basis for defining different factors in relation to the historical authenticity.

The horizontal axis does not represent fixed ends of the authenticity continuum. Instead, it represents both the subjective and relative positions of more authentic and less authentic factors of a video game. For each game, the higher the frequency of appearing a factor in players’ comments (subjective) the further the factor goes towards right side of the authenticity continuum (relative) in Fig 2. The vertical axis with the factors can play a critical role in identifying or designing structural attributes of the history-based video games. Depending on the nature of a game, specific variables can be used to describe the response to specific occasions in the game. A plot of authenticity against these factors can be used to compare multiple video games to understand the educational values they offer. This plot will be used in this paper for comparing sample video games and their educational values.

3 METHOD

To understand the learning potentials of commercial video games and provide a tool for others to examine similar games, authors selected five history-based video games for discussion in this paper. Commercial games are still more affordable, already available, and far less obtrusive than sophisticated serious games for a variety of learning purposes. Five selected games are serving as examples of a very specific type of commercial games, namely, first

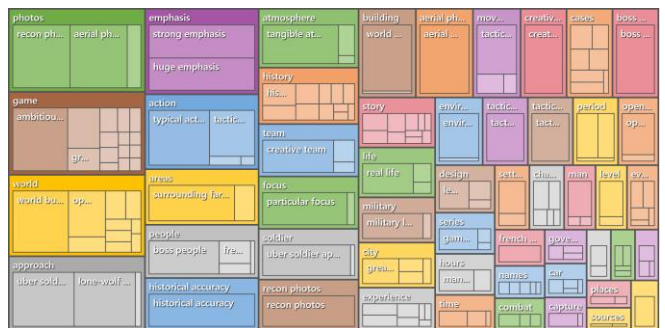
¹ A global multimedia network focusing on animations made from games.
² <http://www.pritzkerprize.com/2008/bio>
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To investigate how game players, engage in online conversations about historical aspects of the games, we analyzed the comments and discussions of players retrieved from online communities and venues including Steam, NeoGAF, YouTube, and GameFAQs. Investigating opinions of actual players through forum posts is a very new methodology in game studies (McCall, 2018). According to McCall (2018, p.405), “in the forum dialogues spurred by the game, players are empowered to interact with the past and, as they do so, analyze and critique the game designers’ visions of the past”. Table 1 summarizes the themes, publishers, and genres of the selected games for this study.

TITLE (RELEASE YEAR)	DESCRIPTION
ASSASSIN'S CREED UNITY (2014)	Action-adventure game set in Paris during the French Revolution. The player must fight for peace and free will, against the enemies to expose the true powers behind the Revolution. (Ubisoft Montreal)
LA NOIRE (2011)	Neo-noir detective action-adventure video game set in Los Angeles during the 1940s. The player assumes the role of a detective investigating several real LAPD cases based on a specific type of crime. (Rockstar Games)
THE SABOTEUR (2009)	Neo-noir open-world third-person action-adventure game set during World War II (WWII) in German-occupied France. The player is a rival who joins the French Resistance to take revenge of his best friend killed by a Nazi commander. (Electronic Arts)
CALL OF DUTY: WORLD AT WAR (2008)	First-person shooter game set in the period of WWII. It is open-ended, giving the player multiple ways to complete several missions and objectives. (Activision)
BROTHERS IN ARMS: ROAD TO HILL 30 (2005)	First-person shooter game set around the true story of the 502nd Parachute Infantry Regiment of the famed 101st Airborne Division who were dropped behind German lines on D-Day. It is based on the historical Mission Albany, in which the player must complete tasks based on real actions of the 101st in Normandy. (Ubisoft)

The games we chose may have more potential to provide holistic experience for educational purposes rather than the latest games that have online services. In recent years,

Players had commented on several aspects of the games, such as narrative, the backstory of characters, historical values and veracity, game environment, atmosphere, etc. Using Nvivo 11⁴ to analyze every sentence of the online discourses, we could organize the codes and themes based on their similarity (Fig 1).



Overall, 1072 were coded. The frequency of the codes and themes were then extracted from NVivo 11. To exemplify, the frequency of direct and aggregated references to “authenticity” was 239. This number was 170 for “space”, 150

⁴ NVivo is a computer software package designed for researchers working with very rich text-based and/or multimedia information, where deep levels of analysis on small or large volumes of data are required. permission. See http://www.elsevier.com/publications_standards/publications/rights/index.html for more information.

for “people”, 100 for “activity”, 95 for “time, and 78 for “event”. The frequency of the references that we later categorized under “learning the history and social history through the game” was 429. This number was 266 for “visiting the historical time and space”, and 248 for “learning history by discussion and decision-making”. This number was 183 for “finding new ways of doing”, and 117 for “sympathy for soldiers and citizens”. These themes represent most of the keywords repeated in the online discourses that we studied.

4 FINDINGS

The findings are categorized and discussed below with a variety of textual materials cited from the players in relation to each game. We used pseudonyms (derived from mythology and written in italics) to cite players.

4.1 “A huge labour of love” – Learning the history and social history through the game

Players noticed the effort to include accurate representations in the games. Martin and Turcot (2015) clarified that professors and historians from France helped to develop the world of the Assassin’s Creed Unity (ACU) and the everyday life of Parisians during the French Revolution⁵. Players seemed to know about such effort when *Hera* delineated “[w]hen the French re-create France you can assume you’ll have a fairly accurate depiction.” Many players such as *Thetis* and *Aphrodite* acknowledged the “real-life events you’ll see in Assassin’s Creed Unity”. They might be pointing at the people’s lives on the streets during the French Revolution. The information about people’s real-life events shapes a considerable part of the social history. Players also found the architecture in the game realistic and accurate. For *Scamander*, “[t]he depth in details to architecture was outstanding” whereas for *Athena*, “[t]he story was just there to keep me going but I really played just for the architecture and visuals.”

Rockstar Games⁶ confirmed that the events in LA Noire were recreated based on real evidence, documents, and film recordings. The players also acknowledged this in their comments. *Merlin* mentioned that “[l]ast I heard, 90% of the cases were based on genuine crimes.” *Iseult* stated that “[a]parently the main dude behind LA Noire read through about 1500 newspapers to get his facts accurate, so I would say a lot of them are very close to being accurate.” The players appreciated authenticity and accuracy of LA Noire’s representation of Los Angeles beyond the story. Poseidon who lives in LA mentioned that “[l]iving in Hollywood makes it pretty cool to just drive the LA Noire neighborhoods, there was A LOT of work put into the city.” His comment reveals the possibility of understanding the urban development of this city over time. *Dido* expressed that “[o]ver time, L.A. Noire has proven to be a masterpiece of recreation, as one thing that the game certainly did well was honoring its source material.”

The Saboteur represents Paris during the World War II (WWII) occupation and recreates the atmosphere of the

time. Although the story of the game is not fully accurate, the activities of the French Resistance, everyday life of Parisians at the time, and the look of the city during the occupation are true to history. *Polydorus* mentioned that the game is “based on many of the real events” and shared knowledge about the main character: “Sean Devlin is based off an S.O.E.⁷ operative named William Grover-Williams, a race car driver who help organize the resistance movements and plot sabotage cells.”

As a first-person shooter game, Call of Duty: World at War (COD), pays attention to a variety of real events and important battles of the WWII such as the battles of Stalingrad and Okinawa. The game allows playing alongside historical groups involved in the WWII such as Russian and American troops. *Gaheris* acknowledged that “[t]he campaign is really cool, and it proves the struggle that the Russians had during the Germans’ rise to power.” Several players, such as *Epaphus* and *Galeshin*, explained that this game taught them more about WWII than their history class at school.

The players of Brothers in Arms: Road to Hill 30 (BIA) compared the game character with an actual historical figure and acknowledged its legitimacy. *Diomedes* claimed that the main characters of the game represent, “a paratrooper part of the 101st Airborne, 502 Regiment, 2nd Battalion.” Sharing his inquiries about the game, *Calchas* explained that “[m]any man-hours were spent pouring over old aerial reconnaissance photographs, in order to recreate the landscape as accurately as possible.” According to *Nestor*, “they replicated major battlefields down to the closest details of its time”, whereas *Teucer* pointed out that “[t]he producers of this game put a huge labour of love into producing this way back in 2004/05 with numerous trips to Normandy, researching, visiting battle sites, testing weaponry etc. and all these add to the realism.” In response to *Teucer*, *Agenor* wrote that “[e]ach battle scene in the game was actually a carbon copy of the real battle site. So, the producers did definitely put a lot of effort into it.”

Players put their energy into exploration as well as evaluation of the game events against the historical events, which may involve various learning outcomes, such as content understanding and problem-solving. Their evaluations about the historical events behind these games often resulted in acknowledging the effort by the game developers to create accurate representations.

4.2 “This game made me care about its citizens” – Sympathy for soldiers and citizens

BIA seemed to engage players emotionally and intellectually in the life story of the soldiers. For example, *Belus* mentioned that “[t]he game is remarkable not just for the authenticity, but the true to life story of the soldiers.” Other players, such as *Theano*, responded in agreement: “it is probably due to the recreated locations and the stellar voice acting.” It seems that some players engage deeply with space and the people depicted in the game. Some players, such as *Sarpedon*, delineated that “when you realize that you care more about your men than yourself is a

⁵ <https://www.ubisoft.com/fr-ca/>

⁶ <https://www.rockstargames.com/>

⁷ The Special Operations Executive (SOE) was a British World War II organization.

signal that you got the spirit of the game.” Similarly, a player of *The Saboteur*, *Caradoc*, expressed that “the best part of this game and why I keep playing it is that this game made me care about its citizens.” According to Kim & Kim (2010, p.14), “having emotions would mean having certain evaluative appraisals of, for example, a person, which indicate having knowledge about the person’s characteristics.” The feeling and understanding that *Sarpedon* pointed to as well as the sympathy that *Sarpedon* and *Caradoc* described can be considered as the effective learning outcomes of such video games.

4.3 “It’s like time travel” – Visiting the historical time and space

Some players took their freedom to explore the open world of the games rather than doing the mission. In discussing ACU, *Iris* mentioned, “as a Parisian, this game gives me the possibility to see some missing places in Paris, such as the Tuileries castle or the court of miracles.” Another player, *Pandarus*, explained that “[t]his is why I play Assassin’s Creed. To visit places in the past that don’t exist anymore. Just walking around Paris during the French Revolution is incredible. Reading the newspaper, listening to people talking in a café, listening to someone making a speech about the politics of the day. It’s like time travel.” The activity and space (i.e., free roaming in Paris), as well as the time and event (i.e., during the French Revolution), provide the ground for an immersive play.

The case for BIA was different. As the game narrates stories about historical battles, revisiting the history was limited to the atmosphere of the battlefield. *Lycaon* said, “after being in the military for a few years, I found myself coming back to BIA”.

Similar impressions were also reported about LA Noire. *Lancelot* played this game with his father who was born in the 1940s in Los Angeles (LA). *Lancelot* explained that he got to learn about his grandfather while playing and having conversations with his father. His grandfather was a police officer in the 1940s and shot a person in LA. He mentioned, “[i]t was the only time my grandfather ever used his gun - and that’s just one of the things I learned playing L.A. Noire with my dad a few weeks back.” *Lancelot* continued, “[I]like any son with a father in his late 60s, I assumed his sudden silence meant he was having a minor cardiac event. He wasn’t, however: he was simply back in the presence of a building he hadn’t seen in half a century.” Two players even went further and played the game alongside their grandmothers who lived in LA in the 1940s. *Abas* explained that “one of many reasons I very much enjoyed L.A. Noire, despite its occasional faults, is that I was able to do this too with my grandmother who was a teenager when the game is set.” Another player, *Ocalea*, delineated, “I played and drove around, for my grandmother who grew up in LA in the 1940s, and she said it was spot on and loved seeing so much of her world recreated like that.” Such activities by players (i.e., playing a game with a person belonging to an earlier generation) echo the affective aspect of learning, which becomes personally more meaningful (Schreiner, 2008). As per Baradaran Rahimi, Levy,

and Boyd (2018), such meaningful activities have the power to be applied to museums both during museum visit event and before/after the visit.

4.4 “Getting back to the feel of problem-solving” – Finding new ways of doing

Some games provide players with an open-world to explore (e.g., LA Noire and ACU) and others offer players multiple ways to accomplish a mission (e.g., *The Saboteur* and BIA). Regarding *The Saboteur*, *Gareth* explained that “[t]he sandbox quality of this game gives you lots of ‘play’ time, thinking of different ways you can take out an installation.” Other players, such as *Pelleas* and *Zeus*, shared a very similar view. For *Pellimore*, finding different ways of accomplishing *The Saboteur* missions was an attempt to solve a problem: “I’m finally getting back to the feel of the problem-solving.”

Similarly, LA Noire’s game mission is for the players to solve criminal cases. As *Apollo* explained, “[e]verything revolves around your own willingness to get to the truth: your ability to find every clue, check every nook and cranny, and get answers from your witnesses and suspects.” Players could also develop their own method to solve the cases. According to *Ares*, “[a]fter investigating the scene I would always take a few minutes to put together what I thought happened so if any of the witnesses said something contrary to my version of events I would know to grill them. It usually worked out well.” Seemingly, players are in a position to make (good or bad) decisions and deal with the consequences of their decisions in LA Noire.

COD has a potential for players to come up with different ways of playing the game. The players may twist historical content available in the game by creating modifications (mods). This could provide players with an opportunity to reflect on historical events or groups involved in the WWII. One of the most popular mods is to make the invaders in COD as zombies. For example, *Brastius* mentioned that “[t]his is all where it started. Zombie mode!” Such a representation may show how those who created this mod twisted the dark impression of the invaders into non-player characters.

4.5 “It’s like being back at school!” – Learning history by discussion and decision-making

Sometimes, the online discussions by the players went into details about the history and consequent sharing of information. In discussing ACU, *Diomedes* delineated that “[t]he layout of Paris was a pretty big mess before Haussmann’s renovation.”⁸ This is true as the plan and distinctive appearance of the center of Paris today is largely the result of Haussmann’s renovation (Giedion, 2009). In exchanging historical information, players talked about the similarities of a character in *Assassin’s Creed Unity* (ACU) to Napoleon Bonaparte and referred to the history. *Ornytus* clarified in the ongoing discussion that “the rise of Napoleon was from 1802. I believe when he becomes consul then an emperor in 1804 till 1815 where he loses the Waterloo battle.” *Cydon*, another player participating in this ongoing discussion acknowledged *Ornytus*’s sharing of information

⁸ Haussmann’s renovation of Paris was a vast public program directed by Baron Haussmann, between 1853 and 1870. 2475-1502 (c) 2019 IEEE. Personal use is permitted, but republication/redistribution requires IEEE permission. See http://www.ieee.org/publications_standards/publications/rights/index.html for more information.

by writing “[g]ood history recap.” Another player, *Pallene*, expressed his amazement about the ongoing discussion by saying “[m]an, it’s like being back at school!” Such ongoing discussions raised in a game forum is promising and shows that players not only play the game but also pay attention to the historical content, collect information from sources, and examine the information through the discussions. Similarly, the historical context of BIA was also a source of learning for some players. *Laodice* commented, “I learned more about D-Day from the extras menu than I have ever learned from high school history class.” *Iphis* explained, “honestly, this game is a sublime gem for a history nut like me.”

Discussions about LA Noire was mostly on the LA Police Department cases incorporated in the game, often verifying their authenticity. *Deneter* mentioned, “Mickey Cohen and the Black Dahlia killer are real people.” *Dionysus* responded, “[f]rom what I’ve read, most of the cases were based on real cases but not all were taken from 1947.” *Hades* joined this conversation and delineated, “[t]hink of this game like a huge connected series of Dragnet episodes, the cases are real, the names have been changed to protect the innocent.” Later, players talked about other cases in a follow up to the ongoing discussion by creating new threads, such as “Red Lipstick Murder” (by *Hestia*) and “Silk-Stocking Murder” (by *Eros*). *Eros* went into factual details of the Silk-Stocking Murder: “[i]n 1947, Rosenda Mondragon was found dead after being strangled by a stocking near the City Hall in Los Angeles.” Moreover, online discussions revealed that several players found ways to play the game together, although LA Noire is a single player game. *Juno* explained, “I played until dawn with the family and that was great. I’d pause at key moments and let everyone discuss what we should do.” *Artemis* responded, “I agree and have had similar experiences with friends and family who aren’t gamers. The discussions that come out of it are great.”

5 DISCUSSIONS

The historical references of each game have different potentials for learning. We compare and summarize the findings on how the players might inquire into history through these video games (Table 2). Knowing what players say they have learned from games - even if the information and knowledge are not completely accurate - helps researchers know the type of content that can be learned from such games. For example, when players learned about a historical figure like Napoleon Bonaparte in their forum discussions - even if they learned untrue things about the figure - it means that history-based video games are potentially useful for teaching about historical figures (McCall, 2018; 2016; 2012). This can be extended to other aspects of history (e.g., sights, sounds, spaces, and interactions) that may exist in a first and third-person shooter game that unfold in the context of history.

Based on the comments and the discussions raised by the players, it seems that players pay attention to and learn from the representations of the historical contexts in the video games. Comments indicate that the authenticity of

representations in the historical contexts of the games could be used for several purposes including building understanding about history and historical forces of a time.

TABLE 2
History-based video games learning potentials

TITLE	LEARNING POTENTIALS	HISTORICAL REFERENCE
ASSASSIN’S CREED UNITY	<ul style="list-style-type: none"> Learning about the history and social history during the French Revolution Experiencing Paris scenes from this historical period Learning the historical details through online discussions 	Objects (e.g., outfits), atmosphere (e.g., life during the French Revolution), buildings (e.g., Notre-Dame Cathedral), and communications (e.g., trade)
LA NOIRE	<ul style="list-style-type: none"> Learning the history and social history during the 1940s in LA. Experiencing LA from the 1940s. Finding ways to solve problems and accomplish the missions Making in-room group decisions Learning criminological information through the game and online discussions 	Events (e.g., famous crimes), atmosphere (e.g., life in the 1940s), lifestyle (e.g., sociocultural interactions), buildings (e.g., City Hall), and police activities (e.g., investigation methods).
THE SABOTEUR	<ul style="list-style-type: none"> Learning the history and social history during the German occupation of France Sympathizing with situation and people through immersion Understanding the ways of being French Resistance and doing stealth missions 	Landscapes (e.g., Eiffel Tower), buildings (Sacré-Cœur Basilica), events (e.g., the occupation of France during WWII), and people (e.g., French Resistance).
CALL OF DUTY: WORLD AT WAR	<ul style="list-style-type: none"> Learning about certain World War II battles Sympathizing with soldiers through immersion Finding ways of being and doing the missions of the game 	Battlefields (e.g., Stalingrad), groups and troops (e.g., USSR troops), battle style (e.g., Urban warfare), and weaponry (e.g., SVT-40 rifle)
BROTHERS IN ARMS: ROAD TO HILL 30	<ul style="list-style-type: none"> Learning about World War II, Mission Albany Experiencing the battlefield and events Sympathizing with the soldiers at war Learning about the historic battle through the game and online discussions 	Battlefields (e.g., Normandy), events (e.g., Mission Albany), groups and troops (e.g., the 502nd Parachute Infantry Regiment (PIR) of the 101st Airborne Division), weaponry (e.g., M1911 pistol), and atmosphere (e.g., representing D-Day).

We plot the data (Fig. 2) to visualize the historical reference and authenticity of each game. In Fig. 2, each game is represented on the plot with a certain shape (i.e. indicators). Concentrating on two games (ACU and LA Noire), we show the specific use of the plot for investigating the potentials of these games. For each factor, namely, people, time, space, event, and activity, an assigned shape is located on the plot that can move on the continuum (i.e., the horizontal axis of Fig. 2) towards more, or less, authentic. This continuum is based on the discussions by Metzger and Paxton (2016). Those video games that focus on fantasy shift towards the less authentic end of the continuum on the plot. For example, some versions of the COD like the Zombie modification, take place in a dystopian representation of spaces and events in the past. So, the indicators related to time, space, and event are close to the left side of the continuum. Points enlisted in the callouts may be different from game to game. However, based on the findings of this research and the comments from the players, they play a significant role in making a video game pertinent for particular use as an educational medium. For instance, a video game like The Saboteur may authentically represent the historical occurrences - i.e., event in Tschumi’s work (2012) - or buildings, and landscapes - i.e., space in Tschumi’s work (2012) - but include fictional characters - i.e., people in Tschumi’s work (2012). If the purpose of learning revolves around the historical event or space and buildings, then the game may be a good choice as Pallasmaa (2001) stated that “buildings and cities create and preserve images of culture and a particular way of life”. However, if the purpose is to learn about historical figures the game may not be a good choice.

As Fig. 2 shows, ACU integrates fictional protagonist/antagonist into the game although the outfitting style

of ordinary people and their social interactions remain loyal to the historical evidence as Ubisoft and players mentioned. The number of players' references to the authenticity of game characters was two. Therefore, on the plot, game characters (first factor: people) appear less authentic on the continuum (Metzger and Paxton 2016). However, the historical time and space (i.e., Paris during the French Revolution) are considerably based on extensive research according to Martin and Turcot (2015). Moreover, for each player, the game could represent the atmosphere of the time, buildings and environment (space) of the game authentically. This recalls Pallasma's (2001) idea of creating and preserving the images of history. Players of the ACU referred to the authenticity of "time" 15 times and to the authenticity of "space" 29 times. The event of the revolution is again fictionalized to some extents and involves fictional characters (protagonist and antagonist groups). The number of references by players to the authenticity of the "event" was three. Therefore, the "event" is located in the mid-low part of the authenticity continuum on the plot. The rebellious activity of the main character in the game has some real and fictional sides as well. Although the character belongs to a fictional society, the nature of rebellious activities of this character, such as guerrilla-warfare and fire/ambush strategy, in the game has similarities in many aspects with the activities that took place during the French Revolution⁹. Moreover, players referred to the authenticity of such "activities" 12 times. This means that ACU could be appropriate for the learning social history, existing architecture of the time, and the general atmosphere of French Revolution.

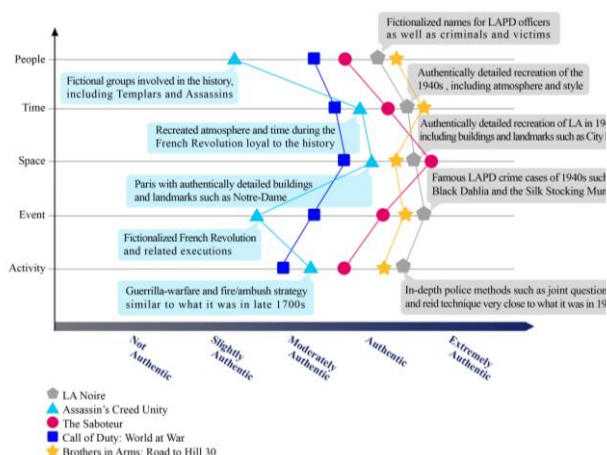


Fig. 2. Completed plot for history-based video games. For each factor, an assigned shape is located on the plot that can shift towards right or left side of the plot. Points enlisted in the callouts may be different from game to game.

According to the findings, LA Noire represents a game with almost every factor close to the right end of authenticity continuum. The number of players' reference to the authenticity of "time" was 23, "space" was 39, "people" was 38, "event" was 23, and "activity" was 31. As the findings pointed out, the atmosphere of the 1940s (time), the city of Los Angeles (space), and the criminal events that happened in that era are authentically recreated in the game based on

the evidence and documents. The activity of investigating the crimes are also representative of the methods used by LAPD in the 1940s such as joint questioning and the Reid technique. The outfits of people and their social interactions, as well as the vehicles that people used in the 1940s, are also a good representation of the period (time). However, the main character of the game may not be an exact member of LAPD in the 1940s. This does not dramatically change the authenticity of the game and therefore "people" is placed to the left of – but still close to – the right end of the authenticity continuum on the horizontal axis of the plot. Resonating with Pallasma's (2001) idea about creating and preserving the images of history, LA Noire can be used for learning about the modern history of Los Angeles having depicted with a high degree of accuracy, the atmosphere, architecture, and criminology as well as clothing and vehicles of the 1940s.

Based on the findings from the analysis of the online comments, the Saboteur represents the atmosphere (space and time) of the occupation of France during the World War II (WWII) representative of the reality. The players acknowledged the authenticity of the atmosphere frequently (i.e., "time" 20 and "space" 36 times) in their comments. Moreover, space in this game is quite close to the Paris during WWII. Everyday life of people in occupied Paris, as well as the activities of French Résistance at the time of occupation, are also partially representative of the reality in that era. Players of this game referred to the authenticity of "people" 32, "event" 18, and "activity" 20 times in their comments. Therefore, all factors of this game are located from the middle to the more authentic side of the continuum on the plot (Fig. 2). The Saboteur seems to be useful for learning about general atmosphere and urban landscape as well as the history of France and related events during the German occupation, regarding Pallasma's (2001) idea about the images of history.

Given the findings about the COD, the time and events of the selected battles during the WWII are relatively authentic regarding Metzger and Paxton's (2016) deployments. The number of references to each of these two factors was 13. The ruined buildings and cities in the game (space) are also considerable as they help a lot to reinforce the authentic atmosphere and events of the time. However, disciplinary practices are mixed with fictionalized facts. For example, the activity of fighting with the enemy and the soldiers in the game are partly fictionalized. Players acknowledged the authenticity of "space" 25 times in their discussions. Since the characters change from time to time in the game and there are few links between the narrative of the game and the characters (people), these two factors, people and activity, represent the lower level of authenticity. Yet, the uniforms of the soldiers and their weaponry are authentically represented in the game. The number of players' references to "people" was 24 and to "activity" was nine. Therefore, Call of Duty: World at War (COD) can serve some educational purposes that are focused on selected battles of the WWII, such as the battle of Stalingrad, as well as the general atmosphere of WWII in the battlefields, including weaponry,

related events, and characteristics of regiments belonging to different countries, such as Germany, Russia, Japan, and the United States.

Based on the findings, *Brothers in Arms: Road to Hill 30* (BIA), paid considerable attention to the authenticity. The number of players references to the authenticity of “time” was 24. This number was 41 for “space”, 37 for “people”, 21 for “event”, and 28 for “activity”. This resonates with Metzger and Paxton’s (2016) deployments. The players acknowledged lots of research and assessment of historical evidence and documents to support the game development. People represented in the game are the 502nd Parachute Infantry Regiment of the famed 101st Airborne Division who were dropped behind German lines (place) on D-Day (time). The game is based on the historical Mission Albany (event) and the player must accomplish the mission (activity). The people, place, event, activity, and time are all historically accurate. Although the game revolves around a limited chunk of the WWII events, spaces, people, and time, it delivers certain values, such as sympathy and caring about soldiers, to the players. Many details, such as the uniforms of the soldiers and their weaponry are authentically represented in the game. Resonating with Pallasma’s (2001) idea, the factors of BIA are located towards the more authentic side of the continuum on the plot. This game can be used for educational purposes that concentrate on the study of a particular mission during the WWII. It can serve as a medium to learn about the general atmosphere of the D-Day in the battlefield, weaponry, and characteristics of the 502nd Parachute Infantry Regiment of the 101st Airborne Division.

The outcomes for players include building understanding about history and historical forces of the time, through personally relating to the specific events, social artifacts, and places. Revisiting history in games and post-play discussions could help understanding of historical details. Through their discussions, the exchange of information and knowledge took place. Teamwork to go through a historical event, mission, or mystery was another considerable part of the outcome. Sometimes teamwork was focused on multi-player mode and sometimes it was focused on playing a single player game with a friend, parent, or a grandparent who was familiar with the specific part of the history represented in the game. Such a teamwork could help them to learn about the history by doing it along with a person familiar with certain historical events. Sympathizing through their immersive game experiences were also part of the outcomes for some players. These outcomes involved caring about others and feeling better about one-self. Moreover, finding new ways of being, such as being a game modifier, could help some players to develop new identities. More explicitly, this process let players see themselves as co-designers implementing a modification of a game to share with others and get feedback from them. In addition, finding new ways of doing the game mission was obvious in the creative ways that players could implement to play a game beyond its intended purposes. It also helps to find their own ways to engage in deeper learning, drawing on their desire. For example, several players refused to play the mission of a game and instead explore the open world of the game to visit the architectural structures and historic monuments.

6 CONCLUSIONS

A considerable amount of online conversations in game forums can be helpful in evaluating players’ responses to specific occurrences in the game. These conversations – even if they are not completely accurate – contain valuable points that can help researchers, educators, game developers, and designers understand how casual players play and learn from a commercial game.

This paper explored a certain type of history-based video games (i.e., first and third-person shooters) to understand the learning potentials for the casual players in relation to the historical authenticity and factors of the historical context in such games (i.e., people, time, space, event, activity). Players revealed they inquire into history using different resources such as online archives, documentaries, history books, and verifications from those who lived a certain era. A sample of five commercial games was considered for this study (Table 1). A plot was then created to visualize the learning potentials of each game and to compare them together. Using NVivo 11 data linked to each game was analyzed (Fig. 1) and the relative position of factors towards the ends of the authenticity continuum (i.e., the horizontal axis of the plot) was determined (Fig. 2). As a tool, the suggested plot can provide an overview of learning potentials to facilitate comparison and selection between the history-based video games for the use as an educational platform (Table 2). Future studies may add to the factors or go beyond the authenticity of the games.

Undoubtedly, there are other aspects of learning through video games that are not depicted in this paper. These aspects include a range of skills such as problem-solving and strategic decision making. For future studies, researchers may want to investigate the role of historical authenticity and factors of historical context in developing such skills. Sociocultural differences and preferences in the learning outcomes, which was informally witnessed during the investigations of this study, may have impacts on how players look at learning values of the games. For instance, when players made modifications to the COD, the number of zombie modifications surpassed the other modifications, which could have been influenced by popular media and gender.

In terms of using video games for learning purposes, the outcomes of this research suggest that they have the potential for particular proposes such as learning about certain people, spaces, events, details in the history, social history, and alternative histories. Some games we discussed in this paper, such as *LA Noire*, may have potentials to be used as a platform in museums for learning and enjoyment. One may continue this work with testing this in an exhibition. Moreover, this paper may be considered as an attempt to motivate game developers to more deeply look at how their games may influence players and learners beyond the entertainment purposes. Developers and game designers may want to provide educational versions or special editions of their games to be used in educational or cultural institutes such as universities and museums. Commercial games have a great potential for in-depth learning, as they incorporate the vast knowledge of experts, such as historians, archivists, and librarians, as well as university professors in the fields of history, social history, and digital media. Maximizing this

vast knowledge of experts may help players learn about history. We hope that our work contributes to the scholarly discussion on design and application of games among multiple disciplines and stimulates further exploration on the synergistic work between industry and academia.

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