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The Application of Video Games in Education: A Solution for the Lack of Motivation?

Abstract

There is a lack of motivation in high schools that is difficult to ignore. This is even worse in the case of history courses, which are perceived by students as "useless." Many would cite video games and mobile phones as some of the technological changes that explain how teenagers are less interested in such subjects. However, there is an enormous educational potential in video games that should not be ignored. This work is an explanation of how history can be translated not only through audio-visual language, but also in the form of a new type of word: ludic language. Moreover, an educational activity is proposed in order to find a solution to this lack of motivation. For this activity, the Early Modern period simulator *Europa Universalis IV* has been chosen as the video game to be implemented in a history class for 14-year-olds.

Keywords: video games, Europa Universalis IV, Early Modern period, history, education, audio-visual language, narrative, ludic language, ludology

Introduction

In recent years, we have been able to see a massive change in almost every single aspect of society. Of course, education is not an exception to this rule. New techniques and theories have arisen in order to improve educational systems across the world. If we had to enumerate all the changes in our lives, we could not avoid mentioning the internet and mobile phones. However, there is another element that explains a massive change in classrooms all across the world: the appearance of video games (Feixa, 2008, pp. 31–32).

At first glance, it could seem that video games have no impact on education. Since children do not play in class, it seems nonsense to worry about them. Nothing could be further from the truth, in fact. From the point of view of communication, video games are a massive change from the conventional storytelling paradigm. This is due to the fact that in video games, the consumer is simultaneously the main protagonist. If the player fails at saving the world, the world is not saved. Nevertheless, in both literature and cinema, this is quite different. The consumer is just a viewer, an observer, who watches the deeds of a hero. In other words, in conventional storytelling, kids read or see how somebody does something incredible. In video games, however, they do those incredible things. This is why this new interactive language is much more attractive and powerful than the one used in a conventional, 50-minute class (Moreno, 2008, pp. 73).

Therefore, the irruption of this new language is said to make students lose interest in school. While this may be true, it is also true that the way conventional classes work is not optimal. For instance, it is worth taking a look at the subject of history taught in high school. It very often consists of telling students about many events and the year in which they took place. Quite often, educational systems fail in explaining to children why history is a relevant subject. Many of them, unfortunately, believe this subject is just a set of arbitrary dates they have to memorize for an exam because the system says so. They cannot be blamed for this, because somehow it is partially true.

As a consequence, the lack of motivation in history classes across Western countries is a reality that cannot be ignored. A logical question arises: What can we do in order to tackle this issue? The Spanish scholar Francisco Mora says "you can only learn what you love," a quote which became the subtitle of one of his main books: *Neuroeducación: Solo se aprende aquello que se ama* (Mora, 2017). In it, he argues that human beings are wired to learn fairly quickly when they like something, whereas this process is quite slow when they get bored.

In this article, a new proposal is expounded: What if we can use video games as a tool in order to teach history to teenagers? What if we give teenagers a goal that motivates them? What if they enjoy competing with classmates when playing a game? In order to develop answers to these questions, this article first addresses the usefulness of history in our contemporary world. A case study of a specific game is presented. This game is the grand-strategy, Early Modern period simulator *Europa Universalis IV* (Paradox Interactive, 2013). The article then proposes an activity that applies this video game to a history class.

The Usefulness of History

One of the reasons that explain why teenage students see history as an uninteresting subject can be found in its practical use. History alone does not earn money for anyone, nor does it guarantee a proper position in such a competitive job market. If compared to other subjects, such as physics or economics, it seems clear that history is less practical. Nevertheless, the goal of having a decent knowledge of history is not just to embrace certain sociocultural elements from the world and culture that surround us. This may be one of the main purposes, but it is not the most relevant one.

Knowing history lets students understand two facts: that history is cyclic and that history is logical. This means that whatever happened in the past is likely to happen in the near future if the same logical chain occurs. For instance, the financial crises of both 1929 and 2008 left similar
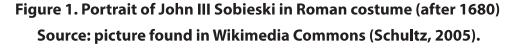
consequences: discredit of the establishment, political polarization, justification of economic interventionism, and – in some cases – the rise of extremist ideologies. Therefore, we can perfectly state that those citizens who had a deeper understanding of the Great Depression starting in 1929 were able to react better to the Great Recession from 2008, as it has recently been named (Zuckerman, 2010).

History is not the result of arbitrary decisions by evil rulers or the consequence of outlandish coincidences. On the contrary, historical evolution is linked to technological factors (ships, the compass, the steam machine, etc.), economic phenomena (feudalism, mercantilism, capitalism, etc.), and social iterations (culture, religion, the estate system). In other words, imagine that a country suddenly turned into a dictatorship. It is very likely that subjects like mathematics or chemistry would remain unchanged. Some changes would probably be made to language classes. Nevertheless, history would not be changed, so much as re-written from top to bottom. This is due to the consequence of the usefulness of history. That is, knowing history makes individuals independent from the political power and the sociocultural trends. This is why properly teaching history happens to be key in order to guarantee a good future for our civilization. Otherwise, our successors will not be able to understand their present, and thus, will fail when trying to adapt to the future.

History and Word

Throughout the millennia, history has been transmitted from generation to generation using different types of communication. Of course, literature is one of the main sources, but the visual arts approach is equally relevant. It is worth taking a look at this famous painting of John III Sobieski by Daniel Schultz.

It is very easy to point out that this Polish–Lithuanian monarch is depicted as a Roman Emperor although he was not. In fact, his reign started 1,200 years after the last Western Roman Emperor had been overthrown. However, it is very likely that the painter wanted to express through visual

Figure 1. Portrait of John III Sobieski in Roman costume (after 1680)
Source: picture found in Wikimedia Commons (Schultz, 2005).

words that John III was such a magnificent king for the Polish–Lithuanian Commonwealth – and that he deserved to be compared to the old emperors of Rome. Therefore, the word – understood as the smallest unity with meaning within a code – is not literal, but visual. This is utterly important in order to understand the purpose of this work.

Without any doubt, the 19th century was a revolution from very different points of view. Communication was not an exception. Two new forms of visual art appeared, namely, photography and cinema. The former represents reality as is, whereas the latter is usually a narrative construction. We can see that almost every single history book published after these inventions features photographs in order to better explain what was happening at that time. We cannot even imagine a book on World War II or the

Cold War without some iconic pictures. Cinema, on the other hand, features both things. In documentaries, for instance, the cameras simply capture what reality is showing at that very moment in that place. However, cinema has often offered historical recreations of what a certain period would have been – which also includes actors, makeup, lights, scripts, and so on.

As for the late 20th century, another quite relevant breakthrough took place: interactive media. Video games are probably the most iconic iteration of this phenomenon.

Introduction to Ludology

Before going deeper into analyzing *Europa Universalis IV* and its alleged suitability for history class, it is more appropriate to properly introduce some concepts first. The term *ludology* is a neologism that comes from the Latin *lūdus, lūdī* [game] and the Greek *λογία* [study or science]. It is therefore a discipline that studies games – whether these are electronic, table-based, or even sports – through their rules and communicative elements.

Dutch historian Johan Huizinga defines a *game* as a "free action or activity which developed among certain limits in terms of time and space according to a set of mandatory – yet freely accepted – rules" (Huizinga, 2012, pp. 54–55). Huizinga also states that games have an ultimate goal which consists in pretending it is not taking place in real life, but in a commonly agreed, imaginary setting. Of course, video games can fall under the umbrella of this definition, yet they add some relevant elements. A common definition that can be found in a dictionary under the entry for *video game* would be "an electronic game that is displayed using a screen" (Real Academia Española, n.d.).

Two elements are added here, which have tremendous implications. Firstly, it is electronic, so it works through automatized computer software. This means that the rules are not "freely accepted," as in Huizinga's definition. The rules are automatic. Video games do not need players to agree to the conditions, nor do they need a referee, as in most sports, in

order to ensure the observance of such rules. On the contrary, there is an omniscient referee, who watches all the time and sets the score automatically. Shouting to this referee or calling for a revision is useless.

The second new element is that video games are displayed using a screen. As a consequence, visual and auditory elements come into consideration. Thus, many of the communication developments found in other media – the use of color, music, voices, text, lighting, and so on – can be applied here. Of course, game mechanics – i.e., rules – are a quite relevant element as well. Furthermore, video games can express ideas and emotions through conventional audio-visual language. Nevertheless, they have another new type of communication: ludic narrative, or communicating through its automatized mechanics.

One example, for instance, would be the survival horror adventure *Resident Evil* (Capcom, 2002). While it is fair to say that this game has plenty of audio-visual resources that help to create a gloomy environment, some ludic elements help to do this as well. For instance, the limited possibilities of movement combined with a fixed-camera system make the player quite vulnerable to any threat.

Figure 2. Resident Evil (Capcom, 2002)

Source: picture found in Wikimedia Commons.

Also, as zombies hit the player, the health bar drops lower. This has no real implication in other games, but in *Resident Evil* it certainly does. The worse the health bar is, the slower the player will walk. In other words, this game's rules are automatized in a way that creates a lot of tension and a feeling of vulnerability, of being alone in front of an imminent, deathly danger.

To make this feeling even more disturbing, the save system is a bit peculiar. In order to save, players have to use typewriters. However, there are limited spots on the map with typewriters. In other words, players cannot save progress whenever they want. Furthermore, in order to save, players need to spend ink ribbons each time they want to use these typewriters. Therefore, the number of times the player can save is actually quite limited. This forces the player to manage resources wisely and to be very careful with potential dangers. If the player dies, they will have to come back to the last time they saved, and hours of progress may be lost. The risk is expanded tremendously through rules and ludic narrative, rather than through conventional audio-visual elements.

Management Simulators and Systemic Gameplay

First of all, the term *video game* covers many different products of different kinds. The above-mentioned *Resident Evil* is a third-person action-adventure title based on both exploration and puzzle-solving. It is therefore quite different from other genres, such as the Japanese role-playing game series *Final Fantasy* or common sports recreations like *FIFA*. Keeping that in mind, there is a video game genre that turns out to be quite an interesting one for educators: management simulators. These games have systemic gameplay, that is to say, all of those mechanics and rules present in the game are just different gears within a big clock. This means that if the player carries out a small change in just one area of the game, the rest of it will be affected.

For example, *Caesar III* (Impressions Games, 1998) is an easy-to-understand example. This is a management simulator that consists of building

cities in the ancient Roman Empire. Every single aspect the player changes in the game – building a home, destroying a palace, or betting on exporting wheat – results in a change in the remaining aspects. For instance, spending too much will result in a deficit, which will mean the player will have to ask the Emperor for funds and lose credibility as a Roman civil servant. However, if the player wisely builds houses far from industry while placing markets near the city gates, a large revenue stream will be generated and wealthier citizens will move to the city.

The remarkable thing is that through such a clockwork set of ludic rules, *Caesar III* recreated the two main achievements of the Roman Empire: Romanization and trade-node cities. A person that has played this game to the point of understanding its depth and has succeeded in building such cities will very likely understand what the Roman Empire was. That person would not need to memorize dozens of Latin names and dates, but will comprehend the factors and processes that ended up creating one of the greatest empires in world history.

How *Europa Universalis IV* Translated History Language into Ludic Language

Europa Universalis IV is the culmination of historical recreation combined with systemic gameplay. Therefore, it is the perfect example of how the words used in history can be translated not only into visual art, music, or cinema, but into ludic language as well. And precisely because of that, it is quite a good title for being implemented in history classes in high schools. The functioning of ludic words has been already explained. Nevertheless, in order to understand how this translation took place, it is also necessary to explain what the game is and how it works. *Europa Universalis IV* is a management simulator in which, instead of building cities, the player takes control of a specific country in 1444. The player sees a map of the world and they have a user interface they use in order to rule their dominions.

Figure 3. 1444 map in Europa Universalis IV
Source: Screenshot by this article author.

As the game progresses, players and AI-controlled countries interact in order to fulfill the historical goal of those countries during the Early Modern period: to maintain their dominions and defend from both foreign and domestic aggressions (Maquiavelo, 2016). Diplomacy, trade, public spending, the army, the navy, and so on are just the tip of quite a deep ludic iceberg. The game evolves slowly and ends in 1821. During this evolution, some rules are history-driven. For instance, there is a value in the game called "reform desire". This will increase as Catholic countries abuse some ecclesiastical prerogatives. When it reaches 100 points, an algorithm will be triggered and – in most scenarios – a German-speaking province will be the center of the Reformation, where a monk will write his 95 theses. Another history-driven element is the mission system. Each country will have a mission tree. Completing these missions will give that country some improvements and bonifications. For instance, if Poland is selected, the player will gain certain advantages if Mazovia is reincorporated into the Kingdom of Poland, and even greater ones if the Polish–Lithuanian Commonwealth is eventually formed.

Figure 4. Polish mission tree

Source: Paradox Wikis ("Polish Missions", n.d.)

Nevertheless, the game borders are only historically accurate at the beginning of the game (1444 AD). After that moment, everything is fiction. Despite those history-driven events, nations will compete. For instance, the Partitions of Poland ended up erasing the country from the map during the late 18th century, but if the player plays well as Poland–Lithuania, and properly manages trade, the army, and diplomacy, they will not only survive, but probably devour part of Prussia, Russia, or Austria as well.

One of the most important factors in a *Europa Universalis IV* game is stability. This is a value from -3 to +3 that represents the level of people's satisfaction with policies, and thus with the level of peace within the realm ("Stability", n.d.). Generally speaking, the higher stability, the better conditions and vice versa. For each positive point of stability, the country gains +1% in trade power, +5% in foreign spy detection, -1 to national unrest, +5% in national taxes, +0.5% in missionary strength, and +5% in institution spread. In other words, the higher stability, the better the trade, the less vulnerability to spies and revolts, the more public income, and the faster conversion to a different faith and spread of ideas. However, for each negative point of stability, the country will suffer some penalties, namely, -1% in trade power, -5% in foreign spy detection, +2 in national unrest, -1 legitimacy point per year, and +1% in interest. Therefore, the player must keep stability as high as possible. Otherwise, chaos will devour the country, and it will be vulnerable to the surrounding nations, who most likely will be interested in conquering new provinces.

This way, *Europa Universalis IV* translates the historical duty of rulers to work for their subjects' benefit. If rulers do not, problems will arise and rebellions will be around the corner. Thus, a new question emerges: How can players gain or lose stability points? This game manages a stability cost system. The base cost is 100 points of administrative power, which are obtained on a yearly basis depending on the ruler's administrative ability. This cost may vary depending on several factors ("Prestige", n.d.), such as having a ruler with a calm personality (-10%), being an Eastern Orthodox country (-10%), or being a Catholic country which controls the Vatican Curia (-10%). Like stability, prestige is a value, ranging from -100 to +100, that measures the glory, honor, and international respect that a country deserves. There are no consequences if prestige equals 0, but as it increases, so does the range of advantages. For instance, at -100 prestige, trade power will decrease (-15%). At +100, it will increase (+15%). This progression is linear: at 0 prestige points, there is no variation, but at +50 trade power increases by +7.5%. Naturally, prestige does not affect trade alone, but army morale (±10%), spy detection (±10%), legitimacy (±1 per year), aggressive expansion (±10%), and many other factors as well.

Prestige is obtained through certain international deeds, such as being the defender of a Christian or Muslim faith, hiring a philosopher as counsellor, controlling the Vatican Curia, receiving a papal blessing, taking part in a Crusade, or being the Holy Roman Emperor. Of course, some deeds will decrease prestige. Not helping an ally at war and committing apostasy will cost -25 and -100 points of prestige, respectively. If the crown prince becomes a bad ruler, the player can disinherit him, which would most likely ensure a better heir, though it will mean -50 points of prestige. Finally, losing wars or acceding to rebels' requests will of course make prestige fall quite easily.

A similar, yet not identical, mechanic is legitimacy. While prestige is a national value, legitimacy is a personal one. It measures the respect of the population toward their ruler. In fact, this value resets whenever the ruler dies and a new monarch arrives. Legitimacy is a value from 0 to +100 and has some positive effects if this level is high enough. As with prestige, the effects from legitimacy follow a linear progression. Legitimacy affects national unrest ($\pm 2\%$), religious tolerance ($\pm 1\%$), diplomatic reputation (± 1), and income from vassals ($\pm 5\%$), among several other factors ("Monarchy", n.d.).

The goal of this article is not to develop every single aspect of the game's algorithms. Instead, the goal of this brief analysis is to help readers understand how this game makes players behave exactly as if they were kings back in the Early Modern period. Players will manage royal marriages with powerful dynasties in order to guarantee peace and good relations with the main powers; they will convert to a Protestant faith if it facilitates them getting a *casus belli* – that is, a justification for war – against their rivals; and they will wait until their neighbors are vulnerable in order to take some rich provinces after a quick but fruitful war.

Previous Examples in Video Games

Before thinking of an application of any video game in high schools, it is quite relevant that previous examples are taken into account. Prof. Moreno states that using educational video games would be a mistake, since those

are extremely uninteresting for students (Moreno, 2008, pp. 73–74). The main goal of such an activity would vanish. This is why Prof. Moreno proposed *Zoo Tycoon* (Blue Fang Games, 2001), a simulator in which players manage a zoo, including staff, salaries, ticket prices, rooms, shows, areas, cages, animals, and so on. The objective in this game is to create an efficient zoo, one whose customers are satisfied, which is solvent, and which fulfills some of the public's demands.

Moreno's research consisted of watching what students would do, but Moreno decided not to intervene throughout this activity. After his research, he wrote that

> Regarding *Zoo Tycoon* … we made teenagers play it without imposing any constriction, so most of them focused on watching what would happen if rules were broken; for instance, some set lions free, so they started to eat customers. Such an example shows the relevance of constrictions for an educational application. [translated by the author] (Moreno, 2008, p. 87)

In other words, leaving teenagers to play video games with no control would be a mistake. Teachers should not allow this, as it could lead to difficult problems or – as in the above-mentioned example – would mean the activity was a failure.

On the other hand, some games, despite having no educational intention, have achieved some success in the teaching community. This is the case with *Minecraft* by Mojang Studios, one of the most successful titles in video game history. There is even a website called *Education.Minecraft*, where teachers can find documentation on how to apply this game to different areas of education. Another interesting case is the one reported by Antònia Bernat Cuello. He was part of a research team on the use of the Medieval strategy game *Age of Empires II: The Conquerors* in a history class for 11-year-olds. Bernat Cuello stated in an article that

> video games reduce the description of very complex realities to essential mechanisms. They provide conflict simulation using fun

gameplay rules … which lead players through a path we could call a "suspension of insecurity," that is, confidence in finding a solution. It is an absolute success, even though the way may be long and complicated. Moreover, they will enjoy and learn more if there are a lot of hard challenges. [translated by the author] (Bernat Cuello, 2008, p. 95)

Application of *Europa Universalis IV* in High Schools

There are five speed levels in *Europa Universalis IV*. Level 5 is so fast that is not realistic for students to understand anything, yet level 1 is too slow. For this project, level 2 is proposed for the whole activity, where each passing minute is equivalent to 58 virtual days. Considering classes last around 55 minutes, it would mean 3,190 days per class, or eight years and nine months per class. This activity is proposed to be divided into six sessions.

It is recommended that students form groups of three, since it is a complex game and collaborative learning is a key goal during the activity. The game will start in the year 1500 and only a predetermined set of countries will be available for these teams. In order to reduce the number of options, it is proposed that each team selects a medium-sized country within the Holy Roman Empire. This way, they will be able to understand what that political organization was and why Ottoman Turkey and the Reformation were its main threats during the 16th century.

However, a key component of this activity that must be defined is the teacher's role. Those who want to implement an activity like this in their classroom must have a deep understanding of the game. As it has been shown above, it is quite a complex game; thus, teachers must be knowledgeable not only about the age the game is recreating, but also about the game's rules and mechanics. It is highly recommended that the teachers give a small dossier to every team the first day so that students may have some knowledge on the basic rules, tips, and so on.

As a matter of fact, teachers have a triple role. First, they have a ludic role, since they will play the game as a country. It is very likely that students

will compete among each other quite aggressively – do not forget that they are still teenagers. Therefore, if the teacher is playing Austria, which is the most powerful country within the Holy Roman Empire and the seat of its Emperor at the beginning of the game, he or she can somehow set some level of peace and stability among the different powers in the game. This is, by the way, how the Holy Roman Empire worked during the Early Modern period. Secondly, there is an academic role. The teacher has to guide this activity so the students can adopt critical thinking and apply to their knowledge of history the logical elements the game offers. Going from table to table, watching what the students are doing and checking that they understand what they are doing are key in order to have a successful activity. Thirdly, the teacher should help with troubleshooting, not only for hardware and software issues, which will certainly occur. Moreover, teachers should maintain a good atmosphere in class. Once again, it cannot be forgotten that they are teenagers who are both competing and collaborating. There will be treasons among teams, who will switch from allies to enemies in a second. Therefore, teachers might encounter moments of tension.

The first session of this activity will consist of a first contact. This means that teachers will inform students about the rules and both the ludic and academic objectives. Additionally, students will form teams, choose a country to play, and will spend the rest of the class in an unofficial game, so they can become familiar with the interface. In the next four sessions the students will play the game. Each day, they will resume their progress from the last class. They will not play during the sixth session; instead they will discuss the activity and will exchange ideas on what they have learned.

Ludic objectives are in-game deeds the students can achieve which will have positive academic results. For instance, they may receive an extra point in their grades if they manage to become elected the new Holy Roman Emperor. Seemingly, academic objectives are some homework they must do. It is recommended that the first day they receive a set of questions they have to answer in a four-page composition. These questions will ask about historical events, and so the students will not

just play a game, but will be required to demonstrate what they have learned.

A cost study was made on August 2020 in order to ensure that it is affordable for many schools in Europe. According to the prices in the online video game store Instant Gaming, a full copy of the game costs €66.66, whereas a basic license would cost €3.49 (Instant Gaming, n.d.). Since only one full copy is needed, and assuming there would be about five teams, the cost would be approximately €84.11 for the whole activity. Of course, if the teachers wanted to repeat the activity, the cost would be €0.

Conclusion

A lack of motivation is one of the most relevant issues concerning high schools. It particularly affects subjects like history, since these are not directly linked to a well-paid position in the job market. Nevertheless, history is still one of the most important subjects in modern-day education systems. Historical knowledge makes citizens independent of cultural trends and the political regime. Therefore, there is a conundrum to be solved: How can this situation be reverted? As discussed in this article, video games may be an interesting solution. They are a powerful way of modifying our way of communicating, of changing the words we use in education.

Europa Universalis IV is just one example of this. However, many other games have been used for educational purposes. Some of them, like *Kerbal Space Program*, instead of being applied to 15-year-olds, have been implemented by the NASA training program (NASA, 2016). However, these cannot be taken as some kind of panacea that would solve our problems. It is just a tool that can be used in certain specific situations. It will not replace either conventional classes or the role of teachers. In fact, both aspects of a traditional education are quite present in the activity that is proposed in this article.

The key to understanding why this may mean a change in motivation can be found in the very nature of video games. While words in cinema

and literature are passive, that is, we as users can only hear or read, words in video games can be also spoken and written. In other words, students will not see how the hero is saving the world – they will be the ones saving it. Therefore, motivation has its source in such an intellectual challenge that produces a powerful feeling of reward as well.

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