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GAMING for skills

Practical approach to videogames in the classroom

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CHAPTER 1

WHAT TO CONSIDER WHEN YOU CREATE A PEDAGOGICAL SESSION INCLUDING VIDEO GAMES

1.1 The practicalities

1.1.1 Choosing video games based on students' profiles

Teaching through video games requires an integrative vision on the educational process, as the efficiency of the teaching is given by the ratio between results and how to engage with different video games, finding their best uses into the curriculum, clarifying objectives, organization, resources, strategies and evaluation. The successful integration of video games in the classroom requires tailoring the lesson to the individual requirements and capabilities of each student. Thus, in the creation process of a pedagogical session including video games, knowing the students is necessary for:

- Adapting and modelling methodologies and learning processes through the chosen video game(s), as well as content and evaluation methods, based on age, discipline, skills, interests, and personal characteristics;
- Creating and implementing successful teaching, learning and evaluation activities using video games;
- Creating a good learning atmosphere in which students can enjoy playing, while being aware of the educational value of the video game.

Here is a selection of aspects you should consider in the creation process of a pedagogical session that includes video games:

Personal characteristics (age, gender, specific learning disorders, disability). It is important to choose video games that are appropriate for your students' age. To help you choose age-appropriate video games for students, most game publishers will provide an age rating on their games. Regarding the relevance of gender, according to some academics, gender can influence the player's motivation to play particular types of digital games. For example, a research developed by Inal & Cagiltay found that that

male player might tend to choose games that contain difficulty, complexity, and competition such as sports and racing games, while female players would choose games that focus on narrative and storytelling (Y. Inal and K. Cagiltay, 2007). As a teacher, you need to collect information about your class and apply your findings in the creation of your lesson. Specific learning disorders and disabilities are important aspects you should consider when planning to integrate a video game in your discipline topics. Video games are generally designed to be easily accessible, and they allow for repetition. Students with learning difficulties can strengthen skills and information by repeating a learning activity through playing. However, you need to consider that video games might pose difficulties, such as physical manipulation of games, understanding the game rules, perform certain actions, or interacting with others, all of which could actually represent challenges to students with or without disabilities.

Practical questions you should ask yourself:

In what ways could the student's age and gender be influencing the using of video games in the classroom?
Are there any medical conditions that might impact the use of a specific videogame?
Does any student have some form of disability that could hinder their playing experience?

Learning preferences and social factors are important aspects you need to consider as they give you information about the students' profiles and the right video game to choose. Preferences and social factors can include: interests, learning styles, intelligence preferences, production styles, preferences for individual tasks or group tasks, engagements in after-school activities, interpersonal skills, etc. There is a substantial research that indicates a strong link between student interest and levels of motivation, achievement, production and perseverance. The same applies to the integration of video games in the classroom. While some students might be attracted

on games that provide strategic resource management (e.g., construction), others might be attracted by games that offers simulation of scenarios inspired by real life. In addition, some students may be individual players, while others are keener on collaborative or competitive games. Finding the balance is the key!

Practical questions you should ask yourself:

In what activities does the student engage in their leisure time and/or school breaks?
What is the learning style of the student? Is the student a visual, auditory, kinaesthetic, or tactual learner?
What is the intelligence preference of the student: analytical, practical or creative?
How would you characterize the student's social skills? Is the student more comfortable working alone or in groups?

Cultural and societal factors have a substantial impact on the student's motivation. They can include economic status, language, religion, norms and values. You might want to know if the economic status of the student allows them to have appropriate technology and financial resources, if they have access to computers or internet, therefore assessing if they are used to video games, and what their abilities are. Cultural identity has a comparable effect on students' expectations and values, as well as their way of thinking about video games. The way video game culture is perceived in your community and by your students might be a subject you might want to research previously. You can balance your lesson to be appropriate both for experienced and beginner students. Based on your analysis, you can classify students in three categories: are they proficient, casual or non-gamers? In addition, games, as any other cultural product, can carry cultural prejudices of some cultures. It is an important to analyze the myths about video games perpetuated over the years which can be more grounded in some cultures than in others. Our booklet 'When Video Games meet

Education' can help you debunk these myths.

Practical questions you should ask yourself:

What is the culture of the student, and how might it affect video-game use in the classroom?
What is the perceived opinion or attitude of the students about video games?
What are the students' prior experiences with video games?
How are video games perceived and adopted within a formal school context and/or in students' family context?
Have you identified any false assumptions or personal prejudices towards video games or gamers?

Academic success can allow you to identify the level of difficulty of the video games and thus balance the wide range of students' skill levels. Think about concrete and abstract thinking, proficiency in the discipline you teach, reading, writing, interpretation skills, ICT skills, what are the students' struggles and strengths.

Practical questions you should ask yourself:

What is the student's proficiency in the discipline you teach and how will this influence the creation process of a pedagogical session including video games?
What are the students' strengths and weaknesses?
What are your student's ICT skills?

1.1.2 Choosing video games based on the resources available

Once you have mastered your students' profile, the next step is to focus on the didactic content of your lesson while analyzing the time and resources you need to create a pedagogical session including video games. Choosing what to teach, how to integrate it in the discipline, the type of video game, or how you evaluate students based on this experience are aspects you need to clarify. Also, significant aspects such as internet access in your school, gaming devices and accessories or costs of popular games need to be taken into consideration. While other productions of project Gaming for Skills will help you to design your lesson, the next part will introduce you with some the most common resources.

Resources you need to play video games

Smartphones/tablets: Apple, Android, and Windows have good processors and app stores with games. While they have the advantage of being portable and most of the students have them, there are some limitations in their use for gaming such as: small screen affecting graphical intensity, the limits of the touchscreen, many games in the app stores have a poor quality as there is a lack of quality control, to run smoothly, good game need power and high-definition displays, which currently can't be demonstrated by mobile devices in comparison with PCs and consoles (Innovecs Games, 2018)

Computers: Offer an advanced gaming experience. While there are also tailored made gaming computers, a regular computer supports a variety of video games. If your computer can't handle video games, several companies have cloud gaming offers and some of them offer a free limited plan, such as Nvidia Geforce Now, that lets you play for free for an hour at a time (https://www.nvidia.com/en-eu/geforce-now/memberships/). If you have internet connection, cloud gaming allows you to run games that the computer might not handle.

Consoles: The most common consoles are: Sony's PlayStation; Microsoft's Xbox; Nintendo's Switch. You will need a monitor or a TV and HDMI port. Also, there are handheld consoles that you can take anywhere, such as Nintendo Switch. Their online stores allow you to download both big new titles and smaller independent titles of video games.

Where can you find online video games?

- **Steam** is one of the major platforms to buy computer video games https://store.steampowered.com/
- **Indie games** are independent video games created by individuals or smaller development teams without the financial and technical support of a large game publisher. Here you can browse for a variety of video games: https://itch.io/
- **The Internet Arcade** is a web-based collection of arcades (coin-operated) video games from the 1970s to the 1990s: https://archive.org/details/internetarcade?&sort=-week&page=2
- **Humble Bundle:** This website sells games at affordable prices and bundles: https://www.humblebundle.com/
- **Indie DB:** The website features a variety of independent video games https://www.indiedb.com/
- **Free-to-play games:** More and more well-known games are based on the free-to-play model, which means that the basic access is offered for

free, and only the more advanced features require payment. For instance:

- **Fortnite Battle Royale:** https://www.epicgames.com/fortnite/en-US/
- **PlanetSide 2:** https://www.planetside2.com/
- **League of Legends:** https://play.euw.leagueoflegends.com/en_GB
- **Warframe:** https://www.warframe.com/landing

- **Microsoft Xbox Game Pass -** More and more Xbox games are available on PC through a subscription. It allows you not to buy every single game you wish to play**.** https://www.microsoft.com/en-us/p/xbox-game-pass-for-pc/cfq7ttc0kgq8?activetab=pivot%3aoverviewtab

How can you create video games with your students?

- **Core games - https://www.coregames.com/**
  Features: free to you use; you can create 3D games in numerous genres; available for Windows; offers a learning resource centre to learn how to create games.

- **GameMaker - https://www.yoyogames.com/gamemaker**
  Features: free for 30 days, and then licenses start at €33/year; you can create 2D games; available for Windows and macOS; offers video tutorials.

- **Gdevelop - https://gdevelop-app.com/**

Features: free to use; you can create 2D games; available for Windows, macOS, Linux, and web; offers a learning resource centre to learn how to create games.

- **Godot - https://godotengine.org/**
  Features: free to use; you can create 2D and 3D games; available for Windows, macOS, and Linux; offers a learning resource centre to learn how to create games.

- **RPG Boss - https://rpgboss.com/**
  Features: free to use; you can create 2D role playing game: available for Windows, Mac, and Linux; offers free tutorials.

- **RPG Maker - https://www.rpgmakerweb.com/products/programs/rpg-maker-mv**
  Features: €67; you can create 2D role playing games; available for Windows and macOS; offers free tutorials and a community created that can support you.

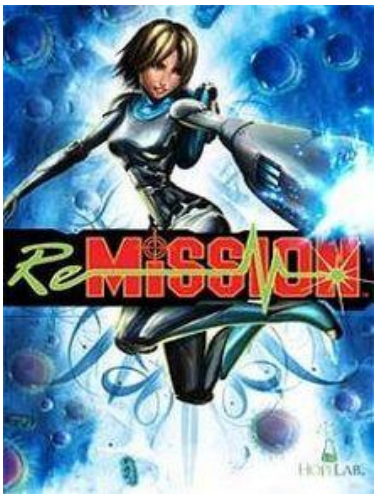
1.2 Why create lesson scenarios that include video games

Though there is a rise in the international video game market and it is expected to grow even more from 2020 to 2027 (Video Game Market Size, Share | Industry Report, 2020-2027, 2020), there is still some uncertainty and hesitation regarding video games in the classroom. Nevertheless, one can say it is encouraging to observe an increase throughout the years in the number of schools that use video games in several situations, such as using video games as a supplementary tool to the formal learning process within a variety of other resources and tools. Consequently, while expecting to see an abundance in the overall use of video games for teaching pertinent subject-based learning, it is rather disappointing to discover a general

absence of video games in the learning process (Kirriemuir, n.d.). Thus, why not create lesson scenarios that include video games? Why compete with technology rather than use the students' excitement for video games in the learning process? (Clark, 2018)

1.2.1 Pedagogical effect of video games

Video games engage many people - from preschool children, to students, to adults. The individual effect and the effect on society as a whole of this entertainment-based culture is being appealed through video games, as well as in the ways in which video games can precisely model the real world (Kirriemuir, n.d.). In fact, video games are all around us, and students love them! By creating a pedagogical session along with video games, educators can both motivate and educate their students in a fun and engaging way. Educators should consider that various educational video games teach students about math, ancient civilization, and further school subjects. It has been proved that by playing video games, students' moods and problem-solving skills can improve (Clark, 2018).



Consider this: even games that are considered violent, such as shooter games, may have a positive effect on students by improving learning, social skills and health. Furthermore, one may argue that playing video games is an activity that does not stimulate the intellect, however, playing may in fact strengthen a number of cognitive skills. This includes spatial navigation, memory, reasoning and perception. According to a research in 2013, these skills are particularly reinforced by playing shooter video games, and a player's capacity to think about objects in three dimensional spaces can be improved in the same way academic courses boost these skills. Moreover, by playing strategic video games, for instance role-playing games, students may improve their grades and problem-solving skills and also enhance their creativity by playing any

kind of video game in general, including violent games (Video Games Play May Provide Learning, Health, Social Benefits, 2013).

1.2.2 Video Games as a European Educational Resource

According to ISFE (2020), Poland is the first government globally to include video games to an official school reading list as an educational resource. Simon Little, CEO of ISFE, says “Video games are an intrinsic part of 21st century society and bring enormous benefits especially when used appropriately in a school setting where they are proven to increase student engagement and learning outcomes, develop team-building, problem-solving and mental agility", (*ISFE - Poland*, 2020). Furthermore, a second European government, Belgium’s Flanders, has integrated video games into education. The Flemish department of Education and training has authorised a toolbox that acts as a practical guide with more than 30 ready-to-use activities, lesson sheets, and tools for educators to create their own game-based activities (*ISFE - Belgium*, 2020).

“Re-mission”

Let us have a look at an example of video game and how it is used in an educational way (Video Games Play May Provide Learning, Health, Social Benefits, 2013). “Re-Mission” – described as a collection of games designed to help young individuals with cancer take on the fight of their lives (Realtime Associated, Inc., 2006) –is a game in which cancer patients control a very small robot that shoots cancer cells, manages nausea, overcomes bacterial infections, and other barriers followed by the treatment. A former international study, in 2008, depicts that 34 medical centres found greater devotion to treatment in youngsters playing “Re-Mission”, and a general knowledge among them related to cancer (*Video Games Play May Provide Learning, Health, Social Benefits*, 2013).

Of course, spending countless hours staring at a rectangular box of glowing light and pressing buttons in response to electronic triggers can cause eyestrain, dry eye, pain

in your neck and shoulders. However, by spending a reasonable amount of time for educational purpose might be beneficial for both the students and the educator. Nowadays, the interaction between individuals and machines is natural and to respond to screen-based electronics is normal. Working in a modern world constantly includes some way of cooperation with digital platforms and therefore, video games should no longer trigger anxiety and terror from educators and parents. In a modern world, where students are required to develop strong meta-cognitive skills, to think critically, and to be inspired in making a difference in the world, technology is essential (Shapiro, 2014).

For example, when playing video games students comprehend that mastering one course does not necessarily mean that they are equally mastering the next course. This depicts that students understand that a new learning development begins at the end of the previous step. Video game players are rewarded for each task respectively, thus they learn to comprehend experimenting, learning and achieving together. Games used in the classroom can encourage the same motivational intelligence. Learning is all about applying content into context, therefore by applying this process of learning, students develop metacognitive skills (Shapiro, 2014). It can be defined as higher-order thinking, characterizing an individual's ability to think about their thinking, enabling analysis, understanding, and control of an individual's cognitive process (Definition of Metacognition | Dictionary.Com, n.d.). For students, strong metacognitive skills can be translated into study skills, and consequently strong metacognitive skills mean that students develop the ability to identify problems and search for the deliberate and required practice needed to solve them (Shapiro, 2014).
When creating a pedagogical session including video games, educators should consider the fact that video games, in general, can be used to develop social emotional learning skills (SEL). In other words, they may help students manage their emotions, display empathy, understand others and engage in positive relationships. Moreover, video games improve other aspects of positive psychology such as determination, civic duty, optimism and the capacity for insight. Apart from the fact that

these improvements in social emotional learning skills can be come from the gameplay itself, educators should also consider that the benefits can be found in the process of playing video games with others, using communication and collaboration skills, and learning from another individual's mistakes (Watkins, 2016).

Kerbal Space Program

Kerbal Space Program, is a space flight simulation video game, that allows players to build their own space ships and rockets to explore space. The characters – little green creatures – have access to a range of parts to assemble a fully-functional spacecraft based on accurate aerodynamic and orbital physics. The learners have to understand these principles to reach their space exploration goals (Kerbal Space Program, n.d.). One can therefore say that video games can help students reach their learning goals by engaging with them in the learning process (Raupp, 2018). Video games are considered an influential and powerful force in the lives of today's young people. Connecting these video games to STEM and further to the general world of learning, educators can confirm that video games are a force for good (Raupp, 2018).

Kerbal Space Program
Source: https://www.kerbalspaceprogram.com/product/kerbal-space-program/

1.2.3 A significant educational tool

Video games confirm that they are not only a significant part of the global culture, but also, a fundamental educational tool. They offer a safe and possibly low-cost way to approach learning and allow the mind of individuals to grow. Additional examples of educational applications of video games include Minecraft, SimCity, and Sid Meier's Civilization; each can be used as an experimentation tool for urban planning and architectural design even at the peak levels of education (Waas, 2017). The above examples of video games are things all educators want in a contemporary classroom;

to use them as a tool in improving the student's mental and physical skills by giving emphasis to students' cognitive development, in building aesthetically pleasing environments, in social connection, and collaboration (team-work), as well as creating a space with a fair and permissive attitude towards failure. When using video games and game-based learning, the educator's part is to apply a "semiotic mediation" – the adoption and use of signs as an aspect of psychological development, examples include language, mnemonic devices, regular signs, maps – to the learning practices. In other words, game-based learning educators develop lesson activities in and around the game (i.e., classroom conversations, playing, listening, etc.), and use signs of learning that depend upon teacher mediation for it to be valuable in summative and formative assessment (Richardson, 2014). Apart from the fact that video games are fun, they are designed in such way that they can also make learning fun.

Minecraft
Source: https://www.gameskinny.com/vp3qn/game-based-learning-how-teachers-use-video-games-in-education

Creating lesson scenarios that include video games is a significant way to help students reengage during distance learning. Distance learning, generates many challenges in motivating students and making them feel like they are still part of a learning environment. Well-designed engaging media tools such as video games offer students appropriate and interactive 'paths to content mastery' (Bidarra et al., 2011). Most importantly, students learning from home need to adopt approaches that guide them in remaining focused and self-motivated. Classcraft, for instance, is a game-based method of teaching, and it is used in encouraging students to participate in class and promotes good behaviour (Classcraft Team, 2020).

From a teacher's perspective:

To finish this part, here is a testimony from a teacher. Aviles, an ed-tech coach for Fair Haven School District in New Jersey and a former high school English teacher, recommends to work together with your students and help them achieve their goals by pushing his students towards their goals rather than being the kind of educator that stands in front of the students and think they know everything. He continues, discussing that video games teach students how to attack a problem – to identify and solve a problem – and it is okay if students fail because they did not get the correct answer the first time they tried. They will go back determined to try as many times possible to get the desired answer (Puno, 2016).

Aviles with his students
Source: https://www.upworthy.com/this-teacher-is-using-video-games-in-his-lesson-plan-and-kids-obviously-love-it

1.3 Approaches for cross-curricular teaching, developing learning to learn competences and soft skills

1.3.1 Introduction to cross-curricular teaching

Cross-curricular teaching should be used as a means to support students to better understand concepts and processes. An interdisciplinary approach provides multiple alternatives for problem solving and embraces differentiation in learning opportunities while exploring multiple modes of inquiry. Interdisciplinarity, as an integrator of different fields of study, from different degrees and multiple expertise areas, largely benefits from a cross-curricular teaching of specific pedagogical models. At the same time, it freely embraces students' preconceived imagination and stimulates their own creativity while allowing them to experiment with their own research and ideas (Sotiriou, M., et al 2021).

Several European and International policies have set arguments in order to support cross-curricular teaching:

- Schools are preparing students for the complexity of the real world. While using interdisciplinary approaches in education, teachers can bring lessons into the real world.
- It provides a framework to study notions, concepts, and events from different angles and can set up approaches that demonstrate their interconnections and relationships with each other.
- It is a tool that can provide solutions to answer students' difficulties.
- It facilitates the development of tomorrow's knowledge as well as the development of the 21st century skills.
- Interdisciplinarity can partly compensate the differences in social backgrounds according to Dominique Rojat. His argument is based on the fact that students

from disadvantaged backgrounds will make the connections between disciplines thanks to school, while students from privileged backgrounds will make them through their interactions with their environment.

The complete implementation of cross-curricular approaches is not easily achieved. In the long term, it will need restructuring schools and reform, in many cases, of the educational structures and systems. Changes should be made in the system, management, individual as well as classroom level. However, using video games in the classroom is an inherently cross-curricular activity which could help you as an educator set foot in this new territory.

1.3.2 Requirements for cross-curricular teaching

Going deeper into analysing the methods and the approaches to follow to implement cross-curricular teaching, we should consider the main requirements concerning the skills and training needed to implement it.
The use of video games could support and help teachers towards this direction as it is inherently cross-curricular. For example, Assassin's Creed could support cross-curricular teaching as this series of games includes many notions from history, languages and science history.

The 2 main categories of stakeholders that should be involved in these approaches are school leaders and teachers. The implementation of a cross-curricular teaching requires the acquisition of a set of skills from the school leaders and teachers.

As a **school leader** you should develop:

- Strong pedagogical competences
- Solid subject knowledge
- Willingness to collaborate
- Openness to changes and development

As a **teacher** you should develop:

- Individual motivation for cross-curricular teaching
- Insight into other disciplines
- Curiosity and broad intellectual interests
- Management skills and project competences
- Good relations among colleagues
- Broad life experience

In practice, here are 4 levels that should be considered when thinking about implementing a cross-curricular approach in a school thanks to the use of video games:

- **School level**: understand the school culture and infrastructure as well as the local community environment, its strengths and opportunities, existing obstacles and threats;
- **Classroom level:** particularize findings to each grade level, taking into consideration the specific needs of each age group of students;
- **Teacher's level:** teachers from the different disciplines involved in each level should have the opportunity to participate in other teachers' activities to identify possible common areas of study, and teachers should introduce new lessons video games to their colleagues to inspire them and offer them to cooperate on specific lessons or topics;
- **Student's level:** provide multiple opportunities for self-development of each student by enabling the autonomous creation of their own journey, be it by playing or creating video games.

Here are steps to follow in order to design specific curriculum activities encompassing these aspects:

a) Start by focusing on the integration of several subjects into a cross-curricular approach by using already existing good practices (e.g., to integrate science subjects someone could use Harlen's (2015) "Working with Big Ideas of Science Education");
b) Encourage horizontal, vertical and diagonal collaboration between teachers (from different subjects and grade levels, including opportunities for collaboration in the same subject domain and throughout different subject domains, such as mixing humanities and sciences);
c) Contextualize students' learning experiences and localize them by integrating examples from within the school community that can be addressed, studied, explored in the framework of projects;
d) Create the context for students' creativity to emerge by offering opportunities to further develop their ideas providing enough freedom for them to explore their vision on certain topics, learn by trying to materialize their own theories and foreseen solutions.

The whole process needs to be facilitated and accompanied by teachers who must assume the role of travel companions. The use of the cross-curricular teaching approach can not only ensure the acquisition of the specific skills but also increase the understanding of all the relevant content knowledge and a much more effective practice at school. The methodology does not impose an increase in classroom time, on the contrary. If teachers work as a team and operate in a coherent way, they can actually save a lot of time, especially in researching video games. Such experiences can facilitate a deeper learning for students involved and a much more meaningful teaching experience for the teachers as well.

1.3.3 Development of learning to learn competences and soft skills through the use of video games in cross-curricular teaching.

As we have already presented in the booklet “When video games meet education” and specifically in Chapter 3, video games can contribute to the development of all aspects of learning to learn competence by developing collaboration, communication, social and/or cultural skills, ICT skills, time and task management, creativity, critical thinking, and problem solving.

In the previous sections, we presented that teachers can benefit from the implementation of cross-curricular teaching in many ways.

Not only does this teaching approach provide benefits for teachers, but it does for students as well. Positive social interactions can lead to deeper conversations and the acquisition of new knowledge. Teamwork creates opportunities for new discoveries and ideas. Students can learn to be flexible. As students discover that learning is an ongoing process, they may begin to use what they have already learned to manage new difficulties of what they are currently learning. This can allow students to realise that everything is connected. Cross-curricular teaching can foster teamwork, new discoveries, more motivation and more knowledge of the learning process, thus supporting students into becoming life-long learners.

Over the years there have been several attempts and examples on how to use video games in order to achieve a cross-curricular teaching approach. These contribute to the development of the learning to learn competence by using a cross-curricular teaching approach. Here a few examples:

- Developing problem solving and collaboration skills among students by introducing project-based learning through the use of Classcraft;
- Learning programming basics with Scratch that can easily be integrated into STEM curriculum;
- Learning how to build a virtual society in Civilization Revolution for both social studies and history classes;

- Space is a topic that can provide numerous activities in different disciplines and it is rather interesting to students as it opens a new world for them. For younger students, NASA Kids' Club provides numerous games in which where students can play while learning about space and applying logic and mathematics.

1.4 A creation roadmap to include video games in existing or new lessons

This section will show you how to create a pedagogical sequence, a lesson, a learning environment or any other educational action that includes video games as a resource. It is intended to work for both existing and new lessons. After working on the previous considerations we included in this guide, you will need to combine all the knowledge to create the activities. We have seen which practicalities to take into account (such as student's profiles, resources besides video games), how to communicate with the educational community about the use of video games, as well as how to choose the games in accordance with the student's needs. There will be different examples, each of them following the structure below.

Practical guide

The aim of this table is to serve as a framework to create any kind of activity that uses video games as a pedagogical resource. It has two parts:

First, you should take into account all the preparatory steps before planning the activity. It is important to be able to answer most of the questions, especially those which you consider to be closely connected to the goals of the activity. It will help you to determine the more specific aspects of the activity.

The second part is meant to work as a straightforward description of the activity, its goals, dynamics, duration, etc. You should use this as a reference of the progression of the activity.

Preparatory steps	
Student's profile	Age range. School level. Any learning disorders or other specificities to be considered within the group.
Learning space	Is it a formal, informal or non-formal educational activity? Is it an activity to be done only in the classroom or will it extend to other places or times (homework, time with family or friends…)? Physical space available (classroom, outdoor space, the school, a community centre…) . Do you have a wifi connection? Do you have equipment (computers, tablets, other), if needed? Do you need a common screen for all the participants to watch at the same time?
Communication	How are you going to communicate to students when using video games in a teaching environment? Will you communicate the idea to parents? How? Is your institution familiar with the use of video games in teaching? Do you have to convince anyone inside your institution?
Contents	What educational content will the activity have: curricular or extra-curricular content, skill development, inspiration for future activities...

Characteristics of the video game	Is it a single-player or a multi-player video game?
Video game	What video game will the students watch or play? Will it be a game created specifically for this pedagogical sequence or an existing game? Will there be only one video game?

Creating the activity	
Aim	What will be the outcome of the activity: what will the students learn, what skills will they develop, does it have a motivational goal for future activities, etc.?
Activity dynamics	What is the planning of the activity (tasks, exercises...), what is the role of the educator, what actions will the students perform?
Time	Duration of the activity.
Further practice	Will there be homework? Will this activity be connected to other activities? Will there be other times for students to practice what they have learned?
References	Educational references related to the type of video game. Resources to discuss, or reference to topics that appear in the video game.

Example 1

Teaching History to secondary students with a specially-created video game

Sometimes educators may consider creating a video game themselves. This is a way of ensuring that certain content, or requirements that induce the development of a certain skill, will appear in the game the students will play. Again, this could apply to a number of different pedagogical spaces, formal, informal and non-formal, but in this example we consider a secondary school classroom.

Teachers will first have to decide what platform they will use to create the game. Will it be a web application that lets you create small action or platform games? Will it be a computer program specially designed to create video games for non-creators? Or will a game engine and coding scripts to be used directly? This will depend on the knowledge of the teacher, but this decision should also be made taking into account the specific needs of the class, as there are different possibilities for each of these levels of technical complexity. In this example, since the content to be taught is History, we thought it would be very useful to create a short RPG (Role-Playing Game) that allows students to play in the role of a character living in the era they are studying.

Preparatory steps	
Student's profile	Secondary school students, 12 to 16 years old.
Learning space	Formal space: classroom in school. Equipment needed: one computer for each student.
Communication	Students will be told what the game is about, what era it is based on and some clues about what they will discover in relation to the historical content (how the characters interact, what historical events will be reflected in the game, what is the context…).

Contents	Curricular content on History.
Video game	RPG (Role-Playing Game) created by educators using a program such as RPG Maker (not free) or rpgboss (open source, beta).
Creating the activity	
Aim	The goal of the game should not only be to transmit the curricular contents, but also to motivate the students to engage with the subject. In the video game there should be contextual references (what people and their life was like at the time, what the environment was like, how they talked, etc). Before the activity, the teacher will create the game (only once, and then it can be used as many times as wanted), which will include the desired historical contents, its context, a story, characters, game mechanics, etc.
Activity dynamics	1. Explanation of the curricular contents (this step can be moved after the game has been played, at the teacher's discretion). 2. General explanation of the video game if needed (controls, mechanics, etc.) and, briefly, about what students can expect in terms of historical content. 3. Students play the game. 4. Practice on the contents, after playing the game: students will reflect on what they have learned in a class exercise chosen by the teacher in which students will have to refer to what they have discovered in the video game.
Time	Duration is variable and it should be adapted to the extension of the contents. It is recommended to spend between 30 to 60 minutes.

Further practice	Students may have to replay the game to pay attention to all of its key information. This may require homework, new class exercises, etc.
References	There are many graphic and sound resources on the internet for creating RPG games. There are also accessible games that can serve as inspiration for this exercise. Take a look at these games created by students and educators: www.cogame.eu/play-games

Example 2

Conducting a multiplayer video game activity for teenagers in a community centre

In non-formal educational contexts, the learning outputs of the activities are not necessarily their main objective, although they are usually inseparable from other objectives such as motivation, working on community values, having fun, etc. For instance, in a community centre many activities have relational purposes, that is to say the idea of strengthening bonds, engaging people in the community life of their territory, enriching the cultural life of a neighbourhood, etc.

In this example we are going to describe an activity for teenagers whose main aim is to make them interact with each other, discover common interests, share their time together, etc. All this will be achieved by playing a multiplayer video game through which they will acquire or develop certain soft skills and knowledge.

Preparatory steps	
Student's profile	The users of the community centre are aged between 12 and 17.
Learning space	Informal space. It can be a classroom in a community centre but if played on mobile devices, it can be outdoors.
Communication	Besides teenagers, the whole community can be informed of the activity and its values, especially parents. This can be done through different channels: in direct conversation during other activities, on social media and other digital channels, on written communication (flyers, posters…), etc. In addition, communication can be used to expand the activity to other or new activities.
Contents	The participants of the activity (users) will practice several soft skills: social engagement, emotional communication, etc.
Video game	There are many possible multiplayer video games that can be used. For this particular activity, it is recommended to choose a game with short levels so that it can be repeated in a tournament-like dynamic.
Creating the activity	
Aim	To facilitate a fun activity for the users where they have the opportunity to develop social skills, sense of community, communication skills, etc. Also to open doors to other activities in the community. The dynamics described here work for one session, but should have continuity and be open to change and be merged with other activities.
Activity dynamics	Prior to the activity, educators will establish certain actions in the game that should be rewarded by a "badge" representing an

	achievement (having played a certain level, having earned a certain number of points, etc). 1. The educators will explain how the activity works (order of the players, is there a reward for participation?). 2. In teams, users will play one level (5-10 min each). Each team will earn the achievements as a group. For this to work, if the game cannot be played by the whole team at the same time, each member must play in turns (one level each) and think of strategies together between levels. 3. With the results of the levels, the educators will create a panel showing each "achievement" in the form of a badge or other representation and which group has been awarded. 4. As a way of continuity, the panel will be maintained and displayed on the social channels that participants normally use and will encourage them to continue earning new badges and also encourage new participants to take part of the game.
Time	60 - 90 min each session.
Further practice	In addition to the continuity of the activity itself, in a community centre any action can lead to others, depending on the interests of the users. If the centre plans to work on a range of activities, this could form part of it.

CHAPTER 2

4 DIFFERENT WAYS TO USE VIDEO GAMES IN YOUR CLASSROOM

2.1 As a spectator

It is already known that video games can contribute to the learning process, by engaging students in learning activities. Usually, video games engage a person when they play the game. But could it be the same when watching others play?
In the video game industry, there is already a discussion about targeting people who want to be spectators rather than players, and from their point of view keeping their interest in the game and maybe convincing them to go further and start playing the game through the full version (Severin 2021). Though, this fact gives us the perspective of how the video game industry is planning to involve even more spectators.

Figure 1: Visitors watch international teams playing during the tournament of the computer game "League of Legends" on May 8, 2014 in Paris. Lionel Bonaventure—AFP/Getty Images

The same perspective could be further developed within a classroom. Instead of using a video game in the classroom and engaging students to play the game, a teacher could use video games and involve students as spectators of existing video game content. But how could this be done? And before that, what exactly does it mean to use video games as a spectator in the classroom?

One of the aims of the Gaming for Skills project is to propose ways on how a teacher could take advantage of video games and involve the students as spectators. There are already several approaches that a teacher could use. Many games are recorded by players and are available on several platforms such as YouTube, Twitch or Facebook Gaming. Teachers could use these platforms in their classroom to embrace the use of video games as a complementary approach in covering a specific part of the curriculum. Teachers can use video games in several ways:

- Walkthroughs
- Video game trailer or demos
- Video game tutorials
- Watch others playing a video game
- The teacher plays or demonstrates the video game according to students' decisions

To use video games as a spectator for educational purpose is not as easy as it sounds. It needs preparation in order to create a specific lesson plan and to know from the beginning the specific educational aims. Teachers could use most of the video games categories (adventure games, puzzle, life simulation, role playing, strategy, racing, etc.) in these processes according to what they would like to achieve and to the skills that they would like their students to develop. It is important to clearly define the educational goals according to the different game titles and content that will be used.

For example, when using educational video games (Math Blaster, Pajama Sam and Castle of Dr. Brain to quote games for younger players), teachers should focus on teaching certain specific skills such as, algebra, spelling, problem-solving, and other basic skills.
If teachers decide to use commercial entertainment video games (SimCity, Civilization), then the aim should be to involve students in more than one subject, and

students can further develop transversal skills (teamwork, communication, critical thinking).

Another case could be when teachers use research-based educational video games (Oregon Trail, Logical Journey of the Zoombinis, Phoenix Quest). Even if such games might not always have the technical quality of modern commercial games, they could offer teachers the opportunity to present new approaches and introduce students to research issues.

Teachers can use video games in several occasions during a lesson or a period of the school year. Below are presented the recommended ways:

Situation	Level of importance	Explanation
Homework	**	The teacher could indicate a specific link in one of the platforms referred above and ask students to watch a game or a specific part of the game related to the curriculum they want to cover. Then, they could ask the students to analyse and report their findings or to complete a specific exercise.
In class	***	The same as above but this could be a part of the class hours
As a tool to introduce a topic	**	The teacher could use a game in order to introduce a specific topic related to the subject that they would like to teach in the following class. This could gain the interest of the students as they will realise that the specific topic can be related it with a game.

As a tool to go further into a topic, or as the main tool in the lesson	***	The teacher could use a game in order to go deeper into the explanation of a specific topic.
As a tool to integrate students' formal learning into less formal examples	**	The teacher could use a game in order to explain several informal activities (activities of everyday life) that can be connected with the topic that is teaching at the time. This will give students the ability to connect formal learning with everyday activities (informal).
As a regular tool for a subject or soft skill	***	The teacher could split students into teams in order to work together while they are watching a specific video game, such as a strategy game, aiming to collaborate and to develop communication and teamwork skills through this process
For distance learning	***	It is difficult for a teacher to have the attention and engagement of students while they is teaching from distance. The use of a game in these occasions could support the teacher in catching students' interest and by providing more engaging activities.

2.2 As a creator

The creation of a video game as an educational activity can be carried out in different ways. It consists of involving students in a creative process. What provides them with something new are the prerequisites for learners to create the game: a lesson, the development of a soft skill, the acquisition of a competence, etc. On the one hand, the learning goals can be related to the content of the game (its storyline, mechanics, visuals, etc.). For instance, if students are assigned to create a short game that makes the player solve a maths problem, students will need to understand how to solve that problem during the creation process. On the other hand, the learning outcomes can come from the creation process itself. For example, if the game has to be created in a team, students will develop their ability to work in a team, as well as their social and emotional learning skills when organising and distributing tasks which, in turn, will provide them the knowledge of the video game creation process. Note that this process can be also transferred to other types of projects, as its structure has points in common with other types of creative processes.

The game creation process can be modelled according to the educational needs of the activity. However, we are going to give you a general outline that you can adapt. It should be taken into account that this kind of activity can vary considerably in length and depth: from a short level building exercise that can be completed in a single-session, to a team project to work on for a whole term. In any case, an ordered process should be followed.

1. **Preliminary phase**: collecting the information that will be necessary to create the contents of the game. This information can be a historical context, elements of a fictional or literary universe, a theme or a curricular knowledge to be transmitted, etc.
2. **Design phase**: preparing the necessary information and organization before making the game. This means creating a script, a storyline, a storyboard or any other document that reflects what the game will be about. What is the story if

any, what kind of graphics will the game include, what are the game mechanics (obstacles, difficulties and rewards), how will the information of the preliminary phase appear, etc.

3. **Production phase**: you use any kind of software to make and program the game. This is the moment to implement the design work and turn it into the actual game. Normally, the program used to create the game should be chosen at the beginning, as its technical possibilities usually determine what kind of games can be created. Also, there are more complex programs that require higher technical knowledge but are much more versatile.
4. **Post-production and communication phase:** these are the actions that bring the game to the players. Mainly, these are: testing, communication and distribution. It is important to test the game to avoid errors (make sure that the game can be beaten!). Create a cover or any other kind of material to share with the community, upload the game to a digital platform or share it in any way you choose so that others can play it, etc.

As mentioned above, **this process can be adapted** to any kind of school project or in-class exercise. Sometimes teachers just need their students to spend a lesson or two developing something by creating a single-game level, or maybe a part of a larger game. For this purpose, there are simple online tools that allow for the quick creation of short and simple games such as sploder.com. In this case, some of the phases of the process will not be necessary or will be simplified (usually the 1st and the 4th phases are the shortest here). On the other hand, a more extensive project can be made in which students have to work for several sessions on each of the phases, thus working in an interdisciplinary activity. Then, they will spend more time looking for information, organizing the team of creators, creating visual materials, a storyline, etc. The potential of this kind of project is enormous as it allows teachers to work on different competences and skills, curricular content of different subjects, etc.

There are **examples of projects** that have been developed on the creation of video games in education. For instance, the European project CoGame (www.cogame.eu), in which this creative process was applied in different educational environments. On the project's website there are examples of actions from each of the phases, information about video games from an educational point of view, technical documents that may be useful if you want to implement the creation of a game in the classroom, etc. Also, there are several video games created by students in educational activities that took place during the life of the CoGame project in different formal and non-formal educational spaces. Another example is the project "Let's research and invent to be more sustainable" (City Council El Prat de Llobregat, 2019), which took place in the city of El Prat de Llobregat (next to Barcelona, Catalonia), as part of the municipal program IntersECCions that involved schools and cultural community centres working together as a network. During one academic year, secondary and upper primary school students from different schools worked on technological projects, mostly using the Scratch (https://scratch.mit.edu/) program to create video games or interactive animations. They created them in class, led by their teachers with the support of community centre workers. They worked on sustainability content which they then put into practice by designing and producing the games and interactive creations. At the end, they finished with a joint demonstration session in two community centres which we see as a way of developing the last phase of the creation process.

The creation of video games has many **educational benefits**. Besides being a very versatile tool, as we have explained before, there are several points to take into account. Video games, like any other technological tool or device, are something very widely used by children and teenagers but they don't necessarily know how they work, why we have them and whether it is possible to make one themselves. Learning how something so familiar is made, that is, knowing the "behind the scenes", is very valuable for them to understand how the world works and where all these technological realities come from. This is even more important as an increasing number of games are free-to-play, which means that the basic game comes for free

but it prompts the player to make in-game purchases, to which younger players can be particularly vulnerable. At this point, the teacher's work becomes very important for students to acquire a certain awareness of video games as a technological, and also social-cultural, reality.

In particular, the educational values of game creation are based on the contents that the teacher decides to work on. Teacher's role is important in the preliminary phase as the choice of the content is crucial. In this phase is where themes, topics and curricular content will define the aims and scope of the learning activity. Part of the challenge for the students will be to find ways for the players to use this knowledge to reach the end of the game.
This requires, but also encourages, a better understanding of the curricular content during the creation process. In addition, another benefit is the development of skills and competences. Each part of the process may require different sets of skills. Teachers can strengthen one of them by focusing students' actions on specific parts, such as having students create a storyboard to work on their drawing skills, or requiring the game to have a specific narrative structure to develop their storytelling and writing skills.

Situation	Level of importance	Explanation
Homework	**	Large projects are usually worked on exclusively in the classroom, but it is also possible to continue working on a video game at home, especially if it is a small one that can be worked on with a program with low system requirements.
In class	***	
As a tool to introduce a	**	Creating a short game could be an attractive way for the students to discover a new topic.

topic		
As a tool to go further into a topic, or as the main tool in the lesson	***	Normally, creating a game requires a minimum knowledge of a certain topic. So, by creating the game, students will develop their understanding and make connections to other topics. In addition, they are likely to easily remember the learning outcomes, as it is a project they did themselves.
As a tool to integrate students' formal learning into less formal examples	*	Normally this should be done by playing a game. However, the game played could be created by other students.
As a regular tool for a subject or soft skill	***	Although the range of possible subjects or skills and competences is very broad, some of them are very common in all processes. For instance, digital skills, teamwork, social and emotional skills, creative thinking, etc. If an educational centre wants to teach some of these skills on a regular basis with an adapted video game creation process, it is perfectly possible and highly recommended to do so.
For distance learning	*	At least the first time they create a video game, students need some support and examples to get to know the process and how to use the creation tools.

2.3 As a single-player

Students can be a part of a video game as a single-player. This means that students play a video game that is designed to be played by a single player, or a video game that is designed to have different modes, one of them being a single-player. Even though this means that a video game would only have one exclusive player, the capacity of play may consist of multiple players (IGI Global, n.d.). Therefore, in a single-player video game, while there is usually a leader board at the end of the game, each student plays as an individual and not against each other or with other players inside the game. Video games played by single-users may be easier to play and to use in an educational context (Davis, 2014).

An example of a single-player video game is 'The Legend of Zelda', a Japanese designed series of games first released in 1986, best known for its single-player experience. This game can be described as an avatar-based game that relies on combined information and interacting symbols, in a typical action-adventure environment (Klevjer, 2006). The Legend of Zelda series feature a combination of puzzles, adventure, action gameplay and analysis. In addition, The Legend of Zelda: Breath of the Wild is the first open-world game of the Zelda series and offers the player freedom to do and go as they please (The Legend of Zelda, n.d.). Breath of the Wild emphasizes a number of gameplay and learning features in the game, and these features can prompt and support educational experiences (Bros, 2020).

Source: https://www.zelda.com/breath-of-the-wild/

Different ways to play single player games

A more formal definition for single-playing is playing a video game where input from only one player is expected throughout the course of the gaming session. Moreover, the number of people connected in the actual game can be distinct from the originally set player mode, and players may participate and communicate in an activity with each other in a number of ways other than the game design. There are two cases in which players can be involved; either by playing a video game in the same physical environment or scattered space. For instance, players sitting together and playing a video game on a single computer or console to solve the puzzles in a game, or players in an online video game communicating in a real-time chat to suggest and give tips and hints to each other respectively. Single-player video games do not have the need for collaboration, yet, there are various possible and common forms of collaborative interaction. Furthermore, players can play in turns or together, solve problems on their own or work together and support one another in the same physical space or even online. These are all interesting forms of playing single player games that you can think about to apply in the classroom.

Source: https://www.edutopia.org/blog/guide-to-game-based-learning-vicki-davis

Through concurrent communication, the online communities of a video game usually make tips, hints, and other important support available to players. It can be acknowledged that the single-player interacts with the game, and its characters as well, and video games can be described as “inherently social” – as per Gee (2003) –

even if other “players” are real people or fantasy creatures, and computer-created characters (Eskelinen, 2019).

The future of single-player video games

A debate has been generated regarding the destiny of a single-player video game in a world of multiplayer video games. It could be said that all single-player video games are played with some form of connection to others. For example, in Xbox Live and PlayStation Network all single-player games have online profiles, individual badges called “achievements” or “trophies”, players are aware that other players are playing in parallel. Some even argue that all single-player video games will be developed within a multiplayer background of connectivity, continuing and publicly visible profiles, and having a consciousness of other users (Koster, 2018).

Perhaps, single-player video games are indeed changing, however, they are certainly not disappearing. A lot of players go for the single-player mode as they enjoy getting lost in the world of gaming and feel connected to the characters as well as the plot (Khasru, 2018). Single players games allow to follow one’s own pace, and they are generally considered to offer more opportunity for character development, character identification and narrative focus. Not all players, such as veteran developer Warren Spector, find virtual socializing to be as interesting and appealing as interactive storytelling. He argues that one of the most significant elements when playing video games is to build a connection with the game; the games are a discussion between the player and the developers and do not require 16 players out there in the world (Martens, 2018).

Situation	Level of Importance	Explanation
Homework	***	Usually, homework is done individually, therefore, the single-player mode is relevant for this situation.
In class	**	In class, usually, students work either individually or in a group. The single-player mode is not the most important activity for this use.
As a tool to introduce a topic	*	Educators deliver a topic to the classroom as a whole, so the single-player mode is not the most relevant in this case, except if used as preparatory homework.
As a tool to go further into a topic, or as the main tool in the lesson	*	The situation is similar to introducing a topic.
As a tool to integrate students' formal learning into less formal examples	**	Both single and multiplayers games are relevant for this use.
As a regular tool for a subject or soft skill	*	Social skills might not be the most developed by single player activities. However, they can be useful to develop problem solving at one's own pace, for instance.
For distance learning	**	Both single and multiplayers games are relevant for this use.

2.4 For multiple players

A multiplayer video game is defined as a video game that allows collaboration and interaction opportunities between more than one person. These take place in the same game environment and can be supported either locally (e.g. Nintendo games: Mario Kart, Super Smash Bros) or online (e.g., World of Warcraft, Eve Online).

In multiplayer video games, individuals work cooperatively to achieve a common goal or compete against each other, providing social communication and interaction opportunities in real time. In the case of online games, players can use text chat, voice to talk and collaborate with team members while playing.

In a lesson using multiplayer video games, whether it's competing or collaboration, there are different ways to make the most of about being together in a learning environment either virtually (distance learning, homework) or physically (in the class).

Some of the most important learning and personal development benefits of multiplayer video games are:

Social interaction: students interact with one another in the school settings/virtual environment where they chat, collaborate, organize and elaborate game strategies according to their goal, they practice talking and listening, thus the multiplayer-mode represents a good tool in developing literacy skills among students.

Creativity and imagination: the concept of role-playing is found in many of these games, students take on the part of a character with special abilities and follow a story line, advancing along they play; video games immerse the players in new world, where they need to challenge themselves and find creative ways and expand their imagination to escape, fight or complete various tasks.

Adaptability, problem solving and decision making: in multiplayer video games, students will deal with various situations, and they will need to find solutions, learn how to ask for help and practice leadership skills.

Self-regulation: multiplayer video games and their competitive mode, will help students find ways to manage their emotions of anger (of not winning), fear (of losing) as well as coping effectively with stress, pressure, relating to others, and sustaining focus while playing the game.

Knowledge: video games can be used in a variety of teaching and learning situations (e.g. Mario Kart can be used in mathematics to convert between units of measurement, to calculate km/mile per hour in teams; Minecraft can be used for reading comprehension, in history classes, to teach various mathematical competences; Civilization allows the exploration of history notions, strategy, resources management).

Situation	Level of Importance	Explanation
Homework	*	Multiplayer-mode provides a more engaging experience while students experience playing in the classroom.
In class	***	There are various ways for the teacher to integrate multiplayer video games such as: students negotiate a goal for the gaming session and play the game together to complete the goal, they can take turns in trying different roles, or they can have a competitive gaming session.
As a tool to introduce a topic	**	Depending on the video game you choose, multiplayer-mode allows for the exploration of various topics suitable for the discipline you teach.

As a tool to go further into a topic or as the main tool in the lesson	***	Same as above.
As a tool to integrate students' formal learning into less formal examples	**	Same as above.
As a regular tool for a subject or soft skill	***	Multiplayer-mode is relevant for the development of soft skills among students: collaboration, communication, leadership, persuasion, problem solving and many more.
For distance learning	***	Multiplayer-mode is suitable for distant learning as it allows to create a sense of community or group work.

CHAPTER 3

INSPIRATION FOR TOPICS YOU COULD EXPLORE

3.1 Inspiration for topics you could explore

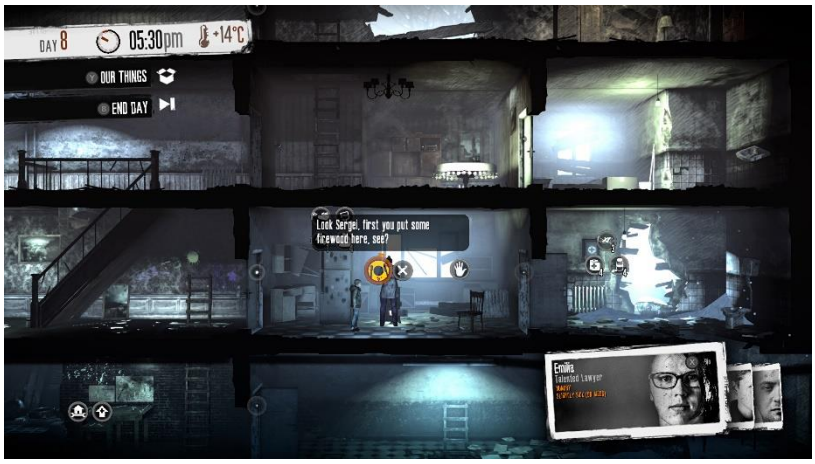
3.1.1 Games to teach about war

When talking about war in the classroom, it often remains a rather abstract notion for students in Western Europe. As video games are the immersive media par excellence, we could ask ourselves if they could not become a powerful tool for learning about war and pacifism (Annart, 2018). So as teachers are already using literature and films to illustrate what war really means, we propose to take it a step further and consider using one of the following video games in class. It is important to note, however, that age-appropriateness needs to be considered and a common reflection of the games is a must.

1. This war of mine, by 11 bit studios

17+ / 19€ / Single player / Desktop/Smartphone/Tablet

This war of mine tells the story of the **Siege of Sarajevo** (1992-1996) from the **perspective of Bosnian civilians** living in the fictional city of Pogoren, Graznavia. The player controls a certain number of characters in a makeshift shelter and has to take difficult decisions for them during the game. While the destiny of the characters depends on the players' choices, the goal of the game is to **make the characters survive** by maintaining their health, hunger and mood levels. You could compare the gameplay to what The Sims offers - but in wartime. The game proposes another perspective on war than many big-budget titles and makes the player understand what war does to people (Annart et al., 2018), sending a strong message for peace. This war of mine has been



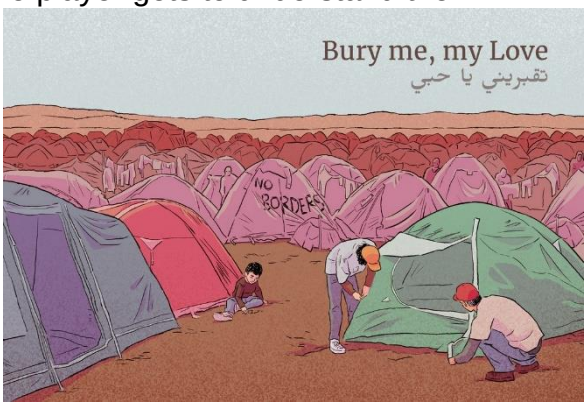
Source: https://www.thiswarofmine.com/

added to Poland's school reading list (Handrahan, 2020). You can use the game in single player mode in class - either playing yourself and projecting the game for everyone to be able to watch and discuss the in-game decisions with your students or make them play themselves in small groups followed by a group discussion.
This game makes the player think and reflect by making them go through uneasy ethical decision.

2. Enterre-moi, mon amour, by The Pixel Hunt, ARTE France and Figs

10+ / 3,50€ / Single player / Smartphone/Tablet/Desktop

Enterre moi, mon amour can be described more like an interactive novel than a game (Vincent, 2019), but that does not take away any of its legitimacy to be used to make people understand what it is like to **flee from war**, which is exactly what the game was created for (Maurin, 2019). The game is based on the true story of Dana, a **Syrian refugee**, who helped in the development of the game. Its title "Bury me, my love", means "Take care of yourself", "Don't you dare die before me". Enterre moi, mon amour tells the story of a fictional Syrian woman, Nour, making her way to Germany in a quite unusual way: the player incarnates her husband Majd and gets **text messages from Nour in real time** over several days. While the game removes the boundary between fiction and daily-life (Annart et al., 2018), the player gets to understand the struggles a refugee has to face. Due to its rather special gameplay, you could make your students play at home, write about the experience and discuss it in class. Again, be mindful that this game can have a big emotional impact on students: discussion can help deal with this by allowing students to share all the aspects of their experience.



Source: https://burymemylove.arte.tv/

3. Peacemaker, by Impact games

17+ / Free / Single Player / Smartphone/Tablet/Desktop

Peacemaker is a government simulation game during which the player does not only learn about the **Israeli-Palestinian conflict**, but actively engages in **peace making**. The game represents the conflict accurately, featuring actual footage of events that happened. The player can choose to play either the President of the Palestinian Federation or the Prime Minister of Israel and has to try to lead the two sides towards peace, war being considered a failure (Annart et al., 2018). Decisions have to be taken on a social, political and military level. The goal of the game is to arrive at the two-state solution. You can use the game in single player mode in class - either playing yourself and projecting the game for everyone to be able to watch and discuss the in-game decisions with your students or make them play themselves in small groups followed by a group discussion.

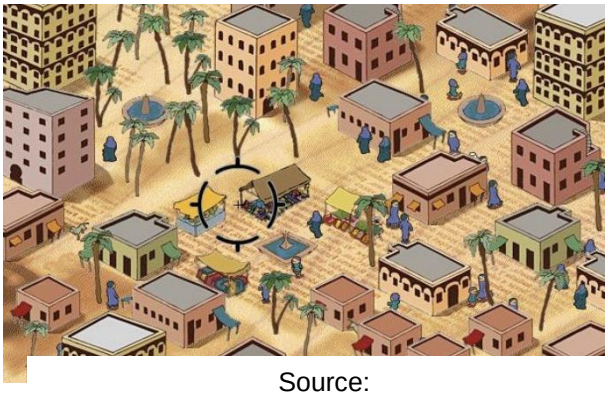
Source: http://peacemakergame.com/about.php

4. September 12th: A Toy World, by Newsgaming

No age rating / Free / Single Player / Online

September 12th: A Toy World “is not a game. You can’t win and you can’t lose.” according to its instructions. The game indeed is not a typical game: it is designed to be more frustrating than fun to play. The player can launch missiles at terrorists, but they always kill civilians as well. Civilians mourning the innocent dead then turn into terrorists themselves. Thus, trying to kill terrorists only leads to more and more

terrorists in the game (Games for change). The game is effective in making the player think about the **war on terror** and if violence can be the only answer to **terrorism**. (Annart et al., 2018) You can use this game as a starting point to discuss terrorism, by letting the students play in small groups for a few minutes followed by a group discussion.



Source: https://www.gamesforchange.org/game/september-12th-a-toy-world/

5. Valiant Hearts: The Great War, by Ubisoft

12+ / 15€ / Single Player / Desktop/Game consoles/Smartphone

Valiant Hearts: The Great War is a puzzle adventure game about the **First World War** inspired by letters from the wartime. The player learns more about the war from the perspective of four different characters: a German soldier, a French prisoner of war, a Belgian nurse and an American volunteer. The game also features historical information on numerous topics in the form of collectible items. The cartoon-like graphics and simplicity of the puzzles make it an accessible yet emotionally engaging pacifist game (Annart et al., 2018). You can use the game in single player mode in class - either playing yourself and projecting the game for everyone to be able to watch or make your students play themselves in small groups followed by a group discussion.

Source: https://www.ubisoft.com/en-us/game/valiant-hearts

3.1.2 Games to teach about empathy

The immersive nature of video games allows their players to see the world from another perspective. The player incorporates the character they are playing in almost any game, but the message of some games is especially powerful. Here is our selection of a few games to teach your students about empathy.

1. Journey, by Thatgamecompany and Santa Monica Studio

7+ / 12,50€ / Single Player / Desktop/Game consoles

Journey is an adventure game, featuring beautiful images and music. The player wanders through ruins in a desert in the direction of a mountain on the horizon, collecting pieces of cloth that light up when touched. It is possible to collaborate with other players during the journey, but this happens without any direct communication. **Playing with a stranger** creates a sense of companionship, providing Journey's players with an **emotional experience**. You could play parts of the game in front of your students or let them play in small groups and have them write about what kind of emotions the game provoked in them to reflect on emotions and their causes.

Source: https://thatgamecompany.com/journey/

2. Papers, Please, by 3909 LLC

16+ / 9€ / Single Player / Desktop/Tablet

Papers, Please can be described as an administration simulator. The game places the player in the role of a **customs officer at the border post of a totalitarian state**, confronting them with dramatic moral dilemmas and involving the player emotionally.

The player has to make **difficult choices** considering aspects like efficiency, humanity, family and democracy and is later confronted by the consequences of their choices (Annart et al., 2019). You could use this game to introduce Hannah Arendt's concept of the banality of evil, ethics and the consequences of personal choices in general, either by playing in front of your students or making them play themselves.

Source: https://papersplea.se/

3. Life is strange, by Dontnod Entertainment

16+ / 20€ (Episode 1 free) / Single Player / Desktop/Game

Life is strange is a narrative game set in a high school environment in which the player incorporates a **teenager** who discovers she can slightly go back in time. By making different decisions, the player influences how the story unfolds. The game addresses teenagers' problems including depression, bullying, suicide, domestic violence, mental illness and the loss of loved ones. It is made clear to the player that personal **decisions** and social interactions have immediate and long-term **consequences**. You can use the game to discuss any of the subjects it addresses or the illustrate how small decisions can have a big impact on our lives.

Source: https://dont-nod.com/en/projects/

4. Gris, by Nomada Studio and Blitworks

7+ / 17€ / Single Player / Desktop/Game consoles/Smartphone

Gris is an adventure game that deals with the **process of grieving** and features beautiful images and music. The player passes through the different steps of grief, which is illustrated with colours, solving small puzzles along the way.

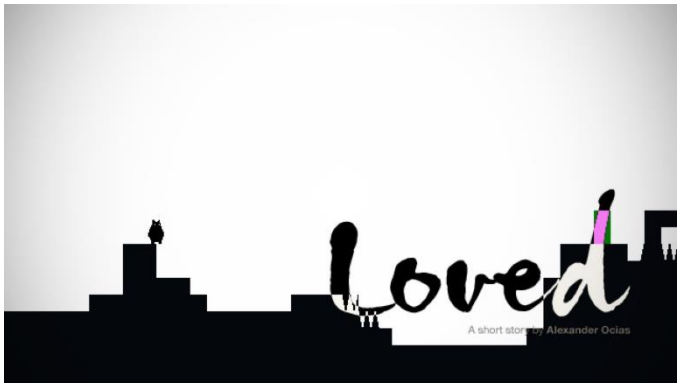
Source: https://nomada.studio/

At the beginning, the game environment is grey and gradually, as the character gains skills, more and more colours emerge (Eros Madelung). As death and mourning are complex subjects to deal with as they are surrounded by taboos (Annart, 2019), you can use this game to address them in a playful way. You could, for example, make your students play and have them write about their interpretation of the game's symbolism afterwards.

5. Loved, by Alexander Ocias

16+ / Free / Single Player / Desktop

Loved is a rather unusual and **thought provoking** game that illustrates what being in an **abusive relationship** feels like. The narrator instructs the player during the game, sometimes helping them and sometimes instructing them to kill their character. When obeying, the player is sometimes praised. When disobeying the instructions, an insulting message appears



Source: https://ocias.com/works/loved/

and a colourful motive emerges in the otherwise black environment that expands as the player advances. You can use Loved for example to discuss the right to privacy, (dis-)obedience and how these aspects play out in relationships. As the gameplay lasts only for a few minutes, you can make your students play the whole game.

3.1.3 Cooperation and communication

The traditional classroom is not the place where students have the opportunity to talk to each other, to discuss ideas or to learn to work together. Group work can be difficult for students to dive into: they might have to work with students who are not their friends, or they might not like that all the members of the group work at a different pace. In some cases, pre-existing tensions from outside the classroom come and parasite the group work dynamic. One way to foster cooperation and communication can be to start by playing video games together, especially those that force to cooperate and communicate. It is always essential to debrief with your students after such activities: not all players will play games in the same way nor adapt quickly to a new game. This can create frustration and conflict if left not handled. If you take time to debrief with each group after an introductory playing session though, you can set your students towards a more cooperative path by encouraging them to discuss their frustrations and misunderstandings, and possibly make them more eager to overcome them together in a future playing session or during their school work.

Here is a list of games that push players to cooperate and communicate under different levels of pressure.

1. Among Us by Innersloth

9+ / Free on mobile devices / Multiplayer / Desktop, console, mobile

Source: https://www.innersloth.com/

Among Us was published at the end of 2018, but it became very popular since summer 2020. It is a game for 4 to 10 players, either local or online (i.e.., either player that knows one another or mixed with external players). The graphics and mechanics of this game are rather simple as the focus is put on cooperation. Each player plays a member of a spaceship crew, except for one who is an impostor and whose mission is to kill the other players. As soon as the game launches, each player has tasks to complete on the spaceship and sees the others completing their tasks, and the impostor has to fake tasks well enough. Players remain silent until a first body is found, and then they have to vote on who the impostor is to eject them from the ship. This debate phase can get quite animated as the impostor is likely to deny any accusations but to accuse another player.

The game is not too difficult to handle but it could be good to present the ship's map before playing as seasoned players will know more about where to go. There is also a short tutorial.

2. Keep Talking and Nobody Explodes by Steel Crate Games

12+ / +/- 15-20€ / Multiplayer / Desktop, console, mobile

The goal of this coop game is for a group to defuse a bomb. However, only one side has the bomb (in game) and the other one has only the bomb defusing manual (in print or in PDF) and neither side sees what the other see. Therefore, communication is key for each side to understand what to do based on what the other side can tell them. This game aims to be fun thanks to all the possible confusion during either sides' explanations or understanding.

Source: https://keeptalkinggame.com/

3. The Trine series by Frozenbyte

10+ / +/- 15-20€ / Multiplayer / Desktop, console

Trine is a series of platform games in which players can either play a knight, a thief or a wizard, and combine their abilities to solve platform puzzles, i.e. to figure out how to overcome obstacles or to progress through a level. For instance, one character would need to jump on the knight's shield to jump over a fallen tree, etc. There are several ways of solving the obstacles, therefore while the game requires players to think and cooperate, people with different playing styles can enjoy the game. Games by Frozenbyte tend to have an "enchanted" immersive atmosphere with beautiful graphics and music.

Source: https://www.trinegame.com/

4. Factorio by Wube Software

13+ / 25€ / Multiplayer / Desktop

Source: https://cdn.factorio.com/assets/img/screenshots/screenshot-5.jpg

Factorio is a game that revolves around creating and maintaining factories. In terms of story, the player lands on a new planet and starts using its resources to create their factory and obtain sufficient technology and infrastructure to build a spaceship and go back home. The local species regularly come to attack the factory and mining sites, which prompts the players to create defence systems and to optimise their factory structure to make it easy to defend. There are several coop scenarios, one of which revolves around ultimately developing enough to build a spaceship and leave the planet. This game is a relatively easy to apprehend management game that allows for a wide range of possibilities for the more experienced players as well.

3.1.4 Learning to fail, learning to learn

Learning how to play a video game follows a similar path to any other learning process: in a given situation, the player tries different ways to overcome an obstacle. Upon success, they will repeat the procedure when facing a similar obstacle. If the efforts are unsuccessful, the player has to try and repeat different strategies until the obstacle is overcome. It is similar to anybody learning how to walk or to ride a bicycle:

you will likely fall, but less and less over time, until you are able to walk or ride without thinking about it anymore.

While all video games will push to player to devise different strategies to solve puzzles and overcome challenges, some games revolve around “learning by failing” process. They can be single and multiplayer games, and require good cooperation and communication efforts when they are multiplayer.

1. Untitled Goose Game by House House

All ages / 15-20€ / 1 to 2 players / Desktop, console

1.

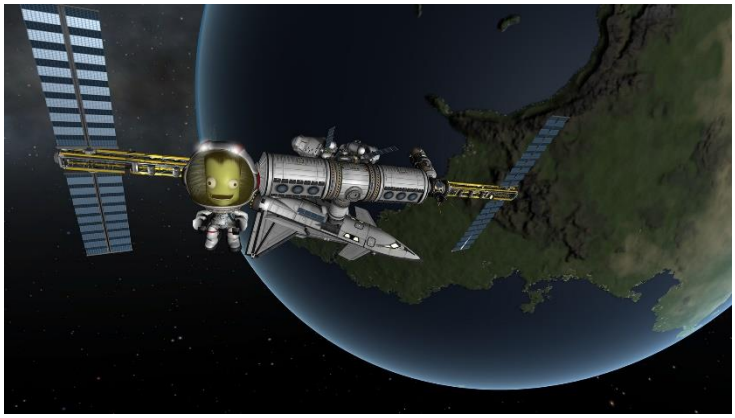
Source: https://goose.game/#&gid=1&pid=12

The slogan of the game reads: “It’s a lovely morning in the village, and you are a horrible goose”. In this game, you (and possibly another player) play a goose, and can do only what geese can do: walk, glide over water, flap your wings, catch things with your beak, and honk. The goose has a list of tasks to complete, such as setting up a picnic, and completing them will annoy the resident villagers (such as stealing the farmer’s sandwich, apple and radio for the picnic). However, you are but a goose, and humans can easily shoo you away, which can make the game challenging. The game graphics are simple and clean and the whole soundtrack is written as a series of variations of Debussy’s Preludes, which gives a humoristic mute movie atmosphere to the game. Overall, the game pushes players to do funny tricks and to have fun by just annoying virtual people for the sake of it.

2. Kerbal Space Program by Squad

8+ / 40€ / Single player / Desktop

In this game, the player has to create their own spacecraft from scratch and launch it into space (into orbit, to create a Moon base, to go to Mars, etc.). The characters are represented by cartoonish green characters that dedramatize their inevitable disappearance into space, as the game finely simulates physics and takes into account advanced engineering principles. The first levels are accessible to most players, but more elaborate missions require a fine understanding of the game mechanics, possibly of engineering, and advanced planning. Even in the first levels, the player is pushed to learn through trial and error, and the spectacular explosions of failed rocket launches are more likely to make the player laugh rather than getting mad at the game.



Source: https://www.kerbalspaceprogram.com/wp-content/uploads/2019/01/ss_de8762796859f062d1871084f4448bc45dbb4445.jpg

3. The Legend of Zelda: Link's Awakening by Nintendo

All ages / 60€ / Single player / Nintendo Switch

The Legend of Zelda series are probably one of the most iconic of this action-adventure game based on solving enigmas and puzzles. This is a 2019 remaster of a 1993 action-adventure game for the GameBoy. As such, it retains the 2D map effect and simple game mechanics.

It is therefore accessible to players of any level but comes with graphics more adapted to a modern audience, while the childish appearance of the game balances a somewhat dark scenario.

Source: https://www.nintendo.com/games/detail/the-legend-of-zelda-links-awakening-switch/

4. SimCity by Maxis/Electronic Arts

SimCity: All ages / 30€ / Single and multiplayer / Desktop
SimCity BuildIt: 10+ / in game purchases / Single and multiplayer / Mobile

Another video game classic that requires the player to fail first to learn to play better is the Sim City series. The player is the mayor of the city they build from scratch and has to manage its resources, crime level, and launch catastrophes onto their citizens to see how to resist or break. Apart from the game features, which do not transform the player into an experienced mayor but instil an idea of the parameters to take into account in urbanism and city management, this game can be interesting to illustrate practical examples from geography examples. For example, a teacher could prompt their students to build a tsunami or earthquake resilient city in a certain amount of time, then launch the

Source: https://www.ea.com/fr-fr/games/simcity/simcity

catastrophe in the game, and see how the cities created resisted and why to explore themes such as natural catastrophes and climate change resilience, for instance.

3.2 Conclusion

This chapter aimed to provide a few examples of how different games, from big commercial franchises to independent games, can help develop knowledge and soft skills among your students. By showing how a wide range of games could be used in the classroom, we aimed to show that video games can offer more than just being an entertaining break for your students but a real part of your programs in different subjects. Either by allowing them to practically experience concepts studied, by putting them in the shoes of characters, by confronting them to ethical dilemmas, or by encouraging your students to communicate and cooperate better, to name a few, video games can enrich your teaching practice and students' learning journey in ways that you might have not imagined yet. We hope these examples will encourage you to integrate video games into your lessons, either by bringing games you or your students know or by using our pedagogical sequences.

REFERENCES

11 bit Studio (2014) This war of mine [video game]. Warsaw, Poland: 11 bit studio.

3909 LLC. (2013) Papers, please [video game]. 3909 LLC.

AIDLET Model. In Computer Games As Educational and Management Tools: Uses and Approaches (p. 19). https://doi.org/10.4018/978-1-60960-569-8.ch005

Alexander Ocias (2010) Loved [video game]. Australia: Alexander Ocias.

Annart, Julien. (2018). Guerre et paix (et jeu vidéo). https://www.agirparlaculture.be/guerre-et-paix-et-jeu-video/

Annart, Julien, Gilson, Gaël, Cornut, Anne, Michnik, Grégory, Fenaert, Mélanie, Marquet, Virginie, Plumel, David, Guquet, Thierry, Bonvoisin, Daniel, Culot, Martin, Ponsard, Jonathan. (2019). Jeux vidéo et éducation, Ateliers de Pédagogie vidéoludique. FOr'J. https://www.quai10.be/projets-pedagogiques/gaming/

Ashinoff, B.K. (2014). The potential of video games as a pedagogical tool. Frontiers in Psychology, September 2014, Volume 5, Article 1109. https://doi.org/10.3389/fpsyg.2014.01109

Bavelier, D., Green, C. S., Pouget, A., & Schrater, P. (2012). « Brain plasticity through the life span: Learning to learn and action video games ». Annual Review of Neuroscience 35(1):391-416.

Blizzard Entertainment (2021) World Of Warcraft [video game]. Irvine, USA: Blizzard Entertainment.

CCP Games (2003) EVE Online [video game]. Reykjavik, Iceland: CCP Games.

Chiang, S. (2017). Integrating Video Games into the Elementary School Classroom. https://tspace.library.utoronto.ca/bitstream/1807/77307/1/Chiang_Simon_201706_MT_MTRP.pdf

City Council El Prat de Llobregat. June 2019. “Let’s research and invent to be more sustainable”, Available at: https://www.elprat.cat/actualitat/noticies/alumnes-del-prat-creen-videojocs-videos-tutorials-i-circuits-electronics-sobre?lan=en#googtrans(ca%7Cen).

City Council El Prat de Llobregat, June 2019. “Fes-t @ Lab, final action of the project: Let’s research, invent to be more sustainable”. Available at: https://www.elprat.cat/actualitat/noticies/fes-t-lab-accio-final-del-projecte-investiguem-inventem-ser-mes-sostenibles?lan=en#googtrans(ca%7Cen)

Clark, A. (2018). 7 Ways to Integrate Video Games into Your Classroom. Classcraft Blog. https://www.classcraft.com/blog/features/video-games-in-the-classroom/

Classcraft Team. (2020). Classcraft’s Guide to Remote Education—Classcraft Blog. Resource Hub for Schools and Districts. https://www.classcraft.com/resources/blog/classcrafts-guide-to-remote-education/

Davis, V. (2014). A Guide to Game-Based Learning. Edutopia. https://www.edutopia.org/blog/guide-to-game-based-learning-vicki-davis

Definition of metacognition | Dictionary.com. (n.d.). Www.Dictionary.Com. Retrieved January 7, 2021, from https://www.dictionary.com/browse/metacognition

de Freitas, S., Ott, M., Popescu, M. M., & Stanescu, I. (2013). New pedagogical approaches in game enhanced learning: curriculum integration. IGI Global. https://doi.org/10.4018/978-1-4666-3950-8

Dontnod Entertainment (2015) Life is strange [video game]. Tokyo, Japan: Square Enix.

EC (2019). Key competences for lifelong learning. European Commission, Brussels. doi:10.2766/291008.

Forbes. https://www.forbes.com/sites/forbestechcouncil/2018/10/09/how-video-games-help-students-level-up-stem-learning/

Frozenbyte (2009) Trine [video game]. Limonest, France: Nobilis.

Games for Change. September 12th: A Toy World. https://www.gamesforchange.org/game/september-12th-a-toy-world/

Handrahan, M. (2020). 'This War of Mine will be added to school reading list in Poland', available at: https://www.gamesindustry.biz/articles/2020-06-18-this-war-of-mine-will-be-added-to-polish-schools-reading-list

Hanghøj, T. (2013). Game-based teaching: Practices, roles, and pedagogies. In New Pedagogical Approaches in Game-enhanced Learning: Curriculum integration (pp. 81-101). IGI Global.

Home | Re-Mission 2: Fight cancer and WIN! Games for cancer support based on scientific research. (n.d.). Retrieved January 5, 2021, from https://www.re-mission2.org/

House House (2019) Untitled Goose Game [video game]. Portland, USA: Panic Inc.

Humongous Entertainment (1996) Pajama Sam [video game series]. Bothel, USA: Humongous Entertainment

Impact games (2007) Peacemaker [video game]. Pennsylvania, USA: Impact games.

Inal, Y. and Cagiltay, K. (2007). Flow experiences of children in an interactive social game environment. Br. J. Educ. Technol., vol. 38, no. 3.

Innersloth (2018). Among Us [video game]. Redmond, USA: Innersloth.

Innovecs Games. (2018, 10/10). Mobile Gaming vs PC Gaming: Latest Tendencies in Game Industry Development. https://www.innovecsgames.com/blog/mobile-gaming-vs-pc-gaming-tendencies-in-game-industry-development/

ISFE - Belgium. (n.d.). ISFE. Retrieved June 22, 2021, from https://www.isfe.eu/news/belgiums-flanders-is-second-european-government-to-integrate-video-games-into-mainstream-education/

ISFE - Poland. (n.d.). ISFE. Retrieved June 22, 2021, from https://www.isfe.eu/news/poland-is-first-government-worldwide-to-add-video-games-to-official-school-reading-list-as-educational-resource/

JumpStart Games (2021) Math Blaster [video game]. Gardena, USA: JumpStart games.

Khasru, A. (2018, June 21). Are single-player games dying? Dhaka Tribune. https://www.dhakatribune.com/magazine/2018/06/21/are-single-player-games-dying

Kampylis, P., Punie, Y. & Devine, J. (2015). Promoting Effective Digital-Age Learning - A European Framework for Digitally-Competent Educational Organisations. Joint Research Centre, Brussels. doi:10.2791/54070

Kerbal Space Program – Kerbal Space Program. (n.d.). Retrieved June 23, 2021, from https://www.kerbalspaceprogram.com/game/kerbal-space-program/

Kirriemuir, J. (n.d.). Use of Computer and Video Games in the Classroom. 12.

Klevjer, R. (2006). What is the Avatar? Available at: https://bora.uib.no/bora-xmlui/bitstream/handle/1956/2234/Dr._Avh_Rune_Klevje.pdf?sequence=1

Koster, R. (2018, January 4). Are single-player games really doomed? The Daily Dot. https://www.dailydot.com/parsec/single-player-games-doomed/

LeMonde (no date) ‘Le voyage d’une migrante syrienne à travers son fil WhatsApp’. Available at: https://www.lemonde.fr/international/visuel/2015/12/18/dans-le-telephone-d-une-migrante-syrienne_4834834_3210.html

Maurin, F., Vincent , R., Macq, M. (2019) ‘JVH - Jeux Vidéo et Histoire. Play-Conférence : Enterre-moi mon amour’. Available at: https://www.youtube.com/watch?v=sPScK4IoF3E

Martens, T. (2018, June 20). Surviving as a single-player in video game's multiplayer world. Los Angeles Times. https://www.latimes.com/entertainment/herocomplex/la-et-hc-single-player-game-survival-e3-20180620-story.html

Martinez, M. & McGrath, D. (2014). Deeper Learning: How Eight Innovative Public Schools Are Transforming Education in the Twenty-First Century. New York: The New Press. pp. 1–21.

Maxis (1989) SimCity [video game]. Redwood, USA: Electronic Arts.

MECC, Gameloft (1971) The Oregon Trail [video game]. Novato, USA: Broderbund Software.

Nintendo (2017) Mario Kart™ 8 Deluxe [video game]. Kyoto, Japan: Nintendo.

Nintendo (2018) Super Smash Bros. Ultimate [video game]. Kyoto, Japan: Nintendo.

Nomada Studios (2019) Gris [video game]. Austin, USA: Devolver Digital.

OECD (2020). Back to the Future of Education: Four OECD Scenarios for Schooling, Educational Research and Innovation, OECD Publishing, Paris, https://doi.org/10.1787/178ef527-en.

One Earth Rising. (2018). PC vs Console vs Mobile Games: What market is the best bet? https://oneearthrising.com/news/pc-vs-console-vs-mobile-games-part-1

Panic Bros (2020). 'Breath of the Wild: The Educational Game'. Available at: https://panicbros.medium.com/breath-of-the-wild-the-educational-game-9f53549bf3c6

Puno, R. (2016, December 12). This teacher is using video games in his lesson plan. And kids (obviously) love it. Upworthy. https://www.upworthy.com/this-teacher-is-using-video-games-in-his-lesson-plan-and-kids-obviously-love-it

Raupp, A. B. (2018). Council Post: How Video Games Help Students Level Up STEM Learning.

Richardson, W. (2014, July 16). How Video Games Will Save School. Modern Learners. https://modernlearners.com/how-video-games-will-save-school/

Rojat D. (2017). Key ideas about cross-curricular teaching. Presentation in the conference of CROSSCUT project, "Cross-curricular teaching: How does it work?", 7th November 2017.

Senge P., Cambron-McCabe N., Lucas T., Smith B. & Dutton J. (2012). Schools that Learn: A Fifth Discipline Field book for Educators, Parents, and Everyone who Cares about Education. Nicholas Brealey Publishing, London.

Severin, K. (2021). The next generation of spectator modes. GamesIndustry.biz. https://www.gamesindustry.biz/articles/2021-04-29-the-case-for-next-generation-spectator-modes-opinion

Sierra On-Line, Inc. (1991) The Castle of Dr. Brain [video game]. Simi Valley, USA: Sierra On-Line, Inc.

Simon Egenfeldt-Nielsen (2006). Overview of research on the educational use of video games. Digital Kompetanse, 3-2006, vol. 1, side 184–213

Shapiro, J. (2014). Social And Emotional Benefits Of Video Games: Metacognition and Relationships. KQED. https://www.kqed.org/mindshift/35734/social-and-emotional-benefits-of-video-games-metacognition-and-relationships

Sjöblom, M., Hamari, J. (2017). Why do people watch others play video games? An empirical study on the motivations of Twitch users. Computers in Human Behavior. Volume 75, October 2017, Pages 985-996. https://doi.org/10.1016/j.chb.2016.10.019

Sotiriou, S., Cherouvis, S., Zygouritsas, N., Bogner, F.X. (2020). Open Schooling Roadmap. A Guide for School Leaders and Innovative Teachers. Published by Ellinogermaniki Agogi, ISBN: 978-960-636-106-7

Sotiriou, M., Robberstad, J., Ben-Horin, O., Stergiopoulos, P.. The GSO4SCHOOL Framework and Master Plan. Deliverable D1.1. Retrived from http://gso4school.eu/wp-

content/uploads/2021/O1_D1_1/D1_1_GSO4SCHOOL%20Framework%20and%20Master%20Plan_FINAL.pdf

Squad (2015) Kerbal Space Program [video game]. New York, USA: Take-Two Interactive.

Steel Crate Games (2015). Keep Talking And Nobody Explodes [video game]. Ottawa, Canada: Steel Crate Games.

TeachThought Staff (2013). Exactly How To Teach With Video Games In The Classroom. https://www.teachthought.com/technology/exactly-how-to-teach-with-video-games-in-the-classroom/

TERC (2015) Zombinis [video games]. New York, USA: Viva Media.

Thatgamecompany (2012) Journey [video game]. Tokyo, Japan: Sony Interactive Entertainment.

The Legend of Zelda: Breath of the Wild. (n.d.). The Legend of Zelda: Breath of the Wild for the Nintendo Switch™ Home Gaming System and Wii U™ Console. Retrieved June 23, 2021, from https://www.zelda.com/breath-of-the-wild/

The Pixel Hunt, ARTE France and Figs. 'Enterre-moi, mon amour'. Available at : https://enterremoimonamour.arte.tv/

TrackTwenty (2014). SimCity: BuildIt app [video game]. Redwood, USA: Electronic Arts.

Wube Software (2020) Factorio [video game]. Prague, Czech Republic: Wube Software.

Ubisoft (2014) Valiant Hearts: the Great War [video game]. Montpellier, France: Ubisoft.

Video Game Market Size, Share | Industry Report, 2020-2027. (2020). https://www.grandviewresearch.com/industry-analysis/video-game-market

Video games play may provide learning, health, social benefits. (2013). Https://Www.Apa.Org. https://www.apa.org/news/press/releases/2013/11/video-games

Waas, M. (2017, October 24). Video Games as a Learning Tool? Medium. https://medium.com/mind-at-play/video-games-as-a-learning-tool-108b95895234

Watkins C. (2005). Classrooms as Learning Communities: What's In It For Schools? London: Routledge.

Watkins, L. (2016, January 28). Can Video Games Improve Social and Emotional Learning Skills? LearningWorks for Kids. https://learningworksforkids.com/2016/01/can-video-games-improve-social-and-emotional-learning-skills/

What is Single-Player Game | IGI Global. (n.d.). Retrieved January 11, 2021, from https://www.igi-global.com/dictionary/single-player-game/27018

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