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Guide to Creating Video Games with Students

This guide is the result of the fourth Intellectual Output of the #gaming4skills project, along with the pedagogical sequences for creators.

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INTRODUCTION TO THE GUIDE

As you likely already know if you are reading this guide, video games can be an extremely valuable pedagogical tool for teachers, as they offer students the chance to explore curricular material in a context that is engaging, enjoyable, interactive, and informative. Since some students are already familiar with video games (as many already play them at home in their spare time), it is often quite easy for them to take part in activities when teachers incorporate games in the classroom. This is true not only of video games that are created specifically for educational purposes, but also of all video games, in general.

As the Gaming for Skills project is currently proving through varied materials, popular non-educational games also can be incorporated in the classroom in a variety of ways that support formal learning. This approach shows students that their studies can relate to real-world situations and their interests outside of the classroom, thus introducing them to new ways of thinking and allowing them to make connections between formal and informal learning. These benefits exist even for students who do not have prior experience with video games, as they learn these skills while also developing new competences particularly related to video games.

The same may be said for teachers. Educators with prior experience or personal interest in video games may be able to integrate games into their curricular activities with a bit more ease, though you should not worry if you are a teacher with little to no experience with video games— you can still use this pedagogical tool to great effect!

This guide is meant to help facilitate the use of video games in the classroom for all teachers, regardless of your level of experience or expertise with gaming. Concretely, the guide provides an explanation of the diverse categories and steps involved in the process of creating a video game from scratch with your students, as well as offering some important points for ensuring your video game creation process is inclusive for all learners.

This guide is also made to be used specifically with the set of **pedagogical sequences for creators (IO4)** that have been produced by the Gaming for Skills project partners. Thus, each step of the guide will offer a brief explanation of the

related category of video game creation and indicate the appropriate pedagogical sequences you can use to implement each stage of creation.

Further pedagogical materials and information about the Gaming for Skills project are available on the project website: www.gaming4skills.eu.

We encourage you to take a look at our booklet on video games in education and its accompanying fact sheets, the guide providing a practical approach to video games in the classroom, and this current guide on video game creation before getting started with the implementation of the pedagogical sequences.

For more information and help with planning the implementation of this creation process, please see our guide to Coordinating Video Game Creation with Your Students.

We hope this guide is useful and leads to an enjoyable experience for both you and your students.

CHAPTER 1:
GUIDE TO VIDEO GAME CREATION: EXPLAINING THE CATEGORIES AND STEPS IN THE PEDAGOGICAL SEQUENCES

2.1 Technical requirements for creating a video game

Before starting to create a video game, there are some important things to take into account. What you will be able to do and how you do it depends on the technical infrastructure you have. In that sense, a series of details will have to be taken into account regarding what you have or what you want to achieve, especially in case you are buying equipment.

In general, here are the items and minimum configuration you will need to create games:

- A recent operating system (Windows, iOS, Linux)
- Good processors (Intel-Core i3 or more, AMD Ryzen 5 or more)
- Enough working memory, or RAM (4 Go minimum recommended)
- Graphics cards (on a local computer the minimum required by the software; for video games intended to be played in a browser, the best choice is Chrome, as it comes with OpenGL, an application programming interface for rendering graphics)
- Sufficient GPU Storage (minimum available space needed)

Each developing program or platform has its own technical requirements. Please refer to each website to learn about the latest requirements needed in each platform.

Here in this section, you will find different options of platforms and software to develop video games. They have different features, and their results vary in graphic development, the kind of video games you can create, the level of programming skills required and the possibilities to export the results into different resulting formats.

Please check the following table to decide which platform you would like to use. We have organized it according to the degree of difficulty of use and whether it is more or less intuitive. Then, verify the technical requirements and check if you can fulfil them.

Scratch	
What is it?	Free software created by MIT. It allows you to create animations and video games. It can also be paired with Lego robots. Create by programming with blocks, a visual system that doesn't require coding skills, especially useful for young students.
Link	https://scratch.mit.edu/
What can you do?	The creation interface with blocks is very good to develop skills and competences related to computational thinking. The interaction possibilities include the keyboard, mouse, microphone and also Lego robots, which are all applicable to any video game and other creations.
Is it free?	Yes, and it's open source.
Other considerations	This software includes some graphic resources, but users can create or import their own.

RPG Maker (series)	
What is it?	Create RPGs (Role Playing-Game) without coding. It is a series of programs: there are several versions of them with cosmetic improvements and some special features and plugins included on the latest versions.
Link	https://www.rpgmakerweb.com/

What can you do?	You can create and edit most of the basic elements of RPGs: draw 2D scenes, create characters, items, monsters, events, dialogues and cutscenes, etc. Also, you can import graphic and audio resources, as well as plugins to change features of the games. Some of them are produced by the creators of RPG Maker and are not free, but there are large communities of creators that share resources with free licenses.
Is it free?	No. Do keep an eye out for Steam sales!
Other considerations	With the basic options (without plugins) the type of game you can create is limited to RPGs, even though with plugins —or the programming knowledge to create plugins— it is possible to create other types of games. Some games in the market have been created with RPG Maker.

RPG Boss	
What is it?	Create RPGs (Role Playing-Game) without coding in a very similar way as RPG Maker.
Link	https://rpgboss.com/
What can you do?	Just like RPG Maker, you can create and edit elements of RPGs, import graphic and audio resources, etc. Community-shared resources can also be imported to RPG Boss. There are no plugins, but it is possible to add pieces of code.

Is it free?	Yes, and it's open source.
Other considerations	This is a beta version, so some features will not work as easily as with RPG Maker and the usage is a little more complicated, but it is a viable option to create at least a short and nice game.

Sploder!	
What is it?	A web platform where kids and teens can create different kinds of video games: platforms, action, puzzles, space shooters, etc.
Link	https://www.sploder.com/
What can you do?	You can create games, save them on your user account and share them. You can also play games made by other users and earn points to unlock new resources for your creations.
Is it free?	Yes. It requires registration.
Other considerations	Since it is a web-based platform, all games must be played, created and saved on the site. It is not possible to download the games.

Twine	
What is it?	A web platform and downloadable software to create hypertexts.
Link	https://twinery.org/
What can you do?	You can create interactive stories and narrative video games. It is possible to make them in the web browser but also by downloading the software on a computer.
Is it free?	Yes, and it's open source.
Other considerations	The genres of games you can create with this tool is limited to text games.

Core	
What is it?	Game creation interface based on Unreal Engine 4 and focused on multiplayer and online characteristics. Create video games of different genres and for different platforms, mobile devices included.
Link	https://www.coregames.com/create
What can you do?	It is an easier and simpler way to use coding, as well as to create more dynamic games. It is not possible to use external resources although you can alter and combine the almost infinite graphic elements that come with the program. It is a tool with many

	possibilities for creation. It includes tutorials and sample games to work on. You can download this software for Windows, Mac and Linux systems.
Is it free?	Yes, it is available to download on Epic Games.
Other considerations	It uses the Lua programming language, which is one of the easiest to understand; its multiplayer approach helps to involve a larger number of people, allows for many game genres and aesthetically resembles modern MMO titles such as Fortnite or Overwatch. It is a program with guided options, tools to learn its usage and lots of helpful documents on its website (video tutorials, manuals, community forums, etc.). However, coding knowledge is required to create the games.

2.2 Step 1: Definition of the genre of the game

Before the development of a game, the game developer has to decide what type of game they want to develop for their targeted audience. The atmosphere of the game can be defined by various categories, which can also be called the genre of game. For instance, adventure, role-playing, simulation, strategy, sports game, etc. While video game genres are constantly evolving, game developers try to keep up with the rising trends (Beattie, 2021).

Below you can find the 11 most significant categories:

1. **Action and Adventure games**, such as Star Wars Jedi: Fallen Order, Sekiro: Shadows Die Twice, Assassin's Creed

2. **Multiplayer online battle arena (MOBA):** These share many features with real-time strategy games and consist of games in which players fight for survival against other players in a closed map. E.g., Dota 2, League of Legends, Smite

3. **Platformers,** which consist of games in which the players make the character progress on the screen. E.g., Cuphead, Crash Bandicoot, Ori & The Blind Forest

4. **Puzzle games** that focus on resolving enigmas, such as The Talos Principle (puzzler), Portal 2 (puzzler)

5. **Puzzlers and Party games,** intended to be played with a group of friends. E.g., Jackbox Party Pack (party game), Mario Party, Super Smash Bros

6. **Role-playing games.** E.g., Skyrim, The Witcher 3, Fallout 4

7. **Sandbox:** An open-ended mode available within certain games. It's often associated with player choice, open environments, and non-linear gameplay. E.g., Minecraft, Grand Theft Auto, The Sims

8. **Shooter games,** which can be first-person shooter (FPS) or third-person shooter (TPS) depending on whether the player sees as they would if they were the character or see the character from a camera view. E.g., Halo (FPS), Gears of War (TPS), DOOM. (FPS)

9. **Simulation and sports:** These simulate real life sports or activities (flying a plane, managing a restaurant, etc.). E.g., Forza Motorsport, Madden NFL, NBA2K, Farming Simulator

10. **Strategy, or Real-time strategy (RTS),** such as Warcraft, Age of Empires, Command & Conquer

11. **Survival and horror.** E.g., The Long Dark, Don't Starve, Resident Evil (survival-horror)

(Study Tonight, 2021)

Related pedagogical sequence:
Sequence 1: Genre/ typology of the video game.

Links to video games mentioned:

- Age of Empires (1997): https://www.ageofempires.com/games/aoe/
- Assassin's Creed (2007): https://www.ubisoft.com/en-gb/game/assassins-creed/valhalla
- Command & Conquer (1995): https://www.ea.com/games/command-and-conquer
- Crash Bandicoot (1996): https://www.crashbandicoot.com/crash4/home
- Cuphead (2017): https://www.nintendo.com/games/detail/cuphead-switch/
- Don't Starve (2013): https://store.steampowered.com/app/219740/Dont_Starve/
- DOOM (1993): https://bethesda.net/en/game/doom
- Dota 2 (2013): https://www.dota2.com/home
- Fallout 4 (2015): https://store.steampowered.com/agecheck/app/377160/
- Farming Simulator (2008): https://www.farming-simulator.com/
- Forza Motorsport (2018): https://forzamotorsport.net/en-US
- Gear of War (2006): https://gearsofwar.com/
- Grand Theft Auto (1997): https://store.steampowered.com/app/12170/Grand_Theft_Auto/
- Halo: Combat Evolved (2001): https://halo.fandom.com/wiki/Halo:_Combat_Evolved
- League of Legends (2009): https://eune.leagueoflegends.com/en-pl/
- Madden NFL 21 (2021): https://www.ea.com/games/madden-nfl/madden-nfl-21
- Mario Party (1998): https://www.nintendo.com/games/detail/super-mario-party-switch/
- Minecraft (2011): https://www.minecraft.net/en-us
- NBA2K (1999): https://www.nba2k.com/
- Ori and the Blind Forest (2015): https://store.steampowered.com/app/261570/Ori_and_the_Blind_Forest/
- Portal 2 (2011): https://store.steampowered.com/app/620/Portal_2/

- Resident Evil (2015):
  https://store.steampowered.com/app/304240/Resident_Evil/
- Sekiro: Shadows Die Twice (2019):
  https://store.steampowered.com/agecheck/app/814380/
- Skyrim (2011): https://www.nintendo.com/games/detail/the-elder-scrolls-v-skyrim-switch/
- Smite (2014): https://www.smitegame.com/
- Star Wars Jedi: Fallen Order (2019): https://www.ea.com/games/starwars/jedi-fallen-order
- Super Smash Bros. (1999): https://www.smashbros.com/en_GB/index.html
- The Jackbox Games (2014): https://www.jackboxgames.com/games/
- The Long Dark (2017):
  https://store.steampowered.com/app/305620/The_Long_Dark/
- The Sims (2000): https://www.ea.com/games/the-sims
- The Talos (2014):
  https://store.steampowered.com/app/257510/The_Talos_Principle/
- The Witcher 3 (2015): https://thewitcher.com/en/witcher3
- World of Warcraft (2004): https://worldofwarcraft.com/en-us/

2.3 Step 2: Definition of the game atmosphere

Defining the genre of a game is one thing, but it is not enough just to identify a game: you also need to know about its atmosphere. The atmosphere of a video game can be defined as "the hidden layer between the artwork, audio, narrative and level design, and can elevate the experience above and beyond the moment-to-moment pleasures of the gameplay" (GDC, n.d.). The definition of the atmosphere has to be the second element to be defined in the creation process, since the atmosphere you want to give your game will have repercussions on everything you include and create in it, in order to make the player feel immersed throughout the game. For instance, if you create a

historically accurate game, you might not choose colourful cupcakes for your cover picture or loading screen, which will surely look inconsistent with the rest of the game.

Any atmosphere can be used with any game genre. For instance, a platform game can differ from classics such as Nintendo's Mario Bros or The Legend of Zelda (the first in the series) thanks to their atmosphere: Playdead's Limbo has a particularly dark atmosphere; Dodge Roll's Enter the Gungeon is a difficult game that makes fun of the player's failures, Nomada's Gris offers a contemplative atmosphere in an emotional growth journey, and Lovers In A Dangerous Spacetime by Asteroidbase is a colourful game with cute characters that is not as easy as it may look, which creates an effect of surprise.

If you create a game about a historical topic with your students, the characters' costumes and way of speaking will better contribute to the immersion of the player if they are more accurate, but the atmosphere could range from humorous to more serious tones.

While in class you might not have time to develop a deep atmosphere, it is an interesting concept to introduce to your students for them to create a coherent and consistent game.

Related pedagogical sequence:
Sequence 2: Definition of the game atmosphere

2.4 Step 3: Content research and content definition

The process for video game creation needs to follow a bottom-up approach to document the different aspects of the video game content. Once you have established the game genre and its atmosphere, before going further in developing the video game you must define its exact content.

For this, it is necessary to go through a research process. For example, if the video game atmosphere is historical and the idea of the game is situated in the World War II, students will need to research different aspects related to the main elements of that historical period (territory, topography, how people dressed, which kind of transportation they used, etc). After researching these elements, they will need to decide how they will integrate them in the game mechanics.

Related pedagogical sequences:
Sequence 3: Content research and content definition 1
Sequence 4: Content research and content definition 2

2.5 Step 4: Integration of curricular elements in the game

The integration of curricular elements represents an important step in video game creation, and an integrative view of the whole educational process is required.

Whether you are a math, history or language teacher, the objective of the video game, its use in the curriculum and its expected results must be clearly established. At the same time, the goals must be known by the creators of the video game in order to ensure the students' awareness of the educational value of the activity.

After deciding to involve students in creating a video game as an educational tool, you will need to consider the pedagogical purpose of the activity. For example: will it be

used to address a specific topic within the discipline, to exercise a skill/competence or to assess students' progress?

While your students create their video game, it is also important to make connections with the curriculum and to link game concepts to real life situations through various means such as reflection, observation, and summarisation. These processes will ensure successful integration of curricular elements into the newly created video game and the development of subject-specific knowledge and skills.

Related pedagogical sequences:
Sequence 5: Integration of curricular elements in the game 1
Sequence 6: Integration of curricular elements in the game 2

2.6 Step 5: Creation of the story: Storyboard

The objective of all storytelling is to 'absorb' the listener/viewer/reader in a story, in other words, to involve the player to become an active participant in the story or action of the game (the setting, the scene, the objectives or challenges that the player may face) (Carys, 2017). Generating such synergy requires a lot of technical know-how, as well as a sense of design and art.

Some basic steps to classify game design are as follows:
● Produce an idea for a game.
● Develop descriptions for your game world, the main characters, and the action.
● List the details of your game and take into consideration all the previous steps. An example of game details could be— a simulation game taking place in Athens with three characters: one young boy, his sister and their grandmother. Then you can add some more details about the characters, their background, and their actions in the game etc.

- Finally, put these concepts all together into a design document that you will use as a reference during the creation process.

The development of a storyboard is one of the best ways to generate a series of drawings that show progression through each of the levels of the game and its distinct scenes and goals. It is recommended that each panel in a storyboard includes a paragraph describing what is taking place (Amit, 2015).

You can find many options of storyboard templates online. A good example is to use Canva (https://www.canva.com/), which offers many storyboard templates as well as templates related to video games.

Here is an example from Canva to get you started:
https://www.canva.com/templates/EAEnnk8s_TM-pink-vibrant-art-storyboard/.

Related pedagogical sequences:
Sequence 7: Creation of the story: Storyboard 1
Sequence 8: Creation of the story: Storyboard 2

2.7 Step 6: Creation of the story: Description of characters

Creating a character for any medium can be challenging, and it might be even more intimidating to create a character for a video game. The principles for character creation are similar for all media, so a literature teacher could give sound advice on this process. In order to produce a feeling of engagement with the character in the targeted audience, the character should come from a legitimate environment.

Therefore, the game creator should certainly dive into the character and understand what the character does. For instance, people do not act without reason, and neither should your character. It is important and a significant step to establish your

character's decision-making and action-taking in reality. Thus researching and comprehending how and why people react the way they do in different situations is considered a powerful character development tool. It is easier to create a strong character when it is based in the real world, as it stems from a shared environment between you and the players.

Below you can find more detailed tutorials on character development:

- [60+ Outstanding Character Design Tutorials](#) (Snell, 2016).
- [How to Design a Video Game Character](#) (MasterClass, 2020).

You can also consult the tutorial by EM Welsh (2017), '[How to Write a Good Video Game Story](#)'. This tutorial uses language that is simple and easy to follow.

Then, create a visual representation of the character: this can be a sketch, a drawing, or you can take existing pictures or illustrations as working documents. This will help you create the characters in the game creation software you choose.

In her tutorial on "[How to write video games characters](#)", E.M. Welsh (2017) suggests 5 important steps to follow to ensure your characters are complete.

Related pedagogical sequences:
Sequence 9: Creating characters for video games 1
Sequence 10: Creating characters for video games 2
Sequence 11: Creation of the story: Description of characters

2.8 Step 7: Creation of the story: Creation of dialogues

Perhaps one of the most important aspects of writing for interactive narratives in video games is creating a dialogue (Jones, 2019). According to Bridgett (2009), dialogue is often mentioned by players as an important element of the audio component of games. Therefore, badly created dialogue can ruin an entire game. Dialogue allows players to find out more about different characters and how they interact with each other and with the player. In short, dialogue is about creating a relationship between the player and the characters.

In one form or another, dialogue has been a component of video games since the early history of video games' development (Domsch, 2017), and it can be represented as written or spoken language, most commonly in the forms of quests, choices, to give explanations about the world, to give a tutorial, or for small talk.

Related pedagogical sequences:
Sequence 12: Creating the dialogue 1
Sequence 13: Creating the dialogue 2

2.9 Step 8: Creation of graphic design

The development of a video game necessarily involves making a decision regarding the graphic design. The options go from very a basic 8-bit design to hyper realistic environments, and the decision will involve using different skills to achieve a good result.

As in this context we are focused on creating video games with students and we are not trying to get commercial results that may require professional graphic designers,

we have to make decisions about the graphic design by taking into account the following ideas:

a) **The platform/software used,** because each platform uses different options for graphic design. Some platforms allow you to import your own graphics, while others just have some graphics at your disposal for you to use.

b) **The students' skills**, both in arts and in programming.

c) **The subject you are linking the video game with**, because if you are working on this step in Arts class, you may develop your own graphic materials and use a platform that allows you to import them.

Related pedagogical sequence:
Sequence 14: Creation of the graphic design

2.10 Step 9: Creation of the animation

During the development of a video game, some forms of animations should be created. This is a decision that should be made from the beginning of the game planning, while the structure of the game is still being defined.

There are several types of animations that one could choose. This depends on the complexity, as well as the targets that have been set from the beginning of structuring your idea to develop a video game. Some types of animation may include: Traditional or 2D Animation; 3D Animation; Stop Motion Animation; Motion Capture; or Typography Animation.

As we are targeting school students as the creators of the video games, standard 2D, 3D, and motion graphics animation are ideal for their creations. Depending on the purposes and the aim of the game and on your specific project requirements, you may prefer one of the other styles included above.

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At this stage, it is also crucial to decide on the following aspects in order to develop the animations for your video game:

a) **The platform or software used,** because each platform uses different options of animation design. There are several opportunities depending on the platform or software that you are going to use, varying from already existing animation styles and characters to the creation of your own characters and animations.

b) **The skills of the students**, especially regarding their experience using software and tools for animation design.

c) **The availability of resources**. There are many free applications and platforms, but they provide limited aspects and there are some restrictions on using them. Full (and paid) versions are not all expensive and they can greatly broaden the scope of possibilities to create animations. Naturally, there are a lot of options available, and it is up to teachers to select the best one according to their needs and capabilities.

For video game animation, there are a lot of tips and hints— and many, many principles. One very interesting book, called "The Illusion of Life: Disney Animation", was written in 1981 by Disney animators Ollie Johnston and Frank Thomas; this book contains key information about the "twelve basic principles of animation" that can be applied in video games.

Related pedagogical sequence:
Sequence 15: Creating the game animation

2.11 Step 10: Creation of Sound

Sound is one of the most important aspects to keep in mind while developing a video game. Every sound of the game that we are hearing when we are playing a video game is called: "game audio". There are three kind of game audio, that is: background music, ambience sounds and sound effects (Andersen et al., 2021).

Every aspect of game audio must be implemented properly to fit with the graphics, animations, and the whole atmosphere of the game. As Léo (2020) notes: "music as a meaningful emotional and narrative conveyor has become a central element in contemporary video games", and sound effects make a video game more engaging. Think about the following counterexample: if in a game a rock gets smashed or there is an explosion but there is no sound, it will not fit the scene and will disengage the players.

Another important aspect when you are creating sound is to include it in the game in the right order and to synchronise it with the specific event that is happening. It is also right to say that a good choice and quality of sound in a video game is a key element for creating a much more immersive atmosphere.

The goal of the students' team or the student that will act as the sound designer is to work together with the design and animation team to create rich audio that fits the experience of the video game being developed. This means that the sound designer must create several layers of audio that matches the player's choices and movement, so that each sound effect and music track is appropriate to what is taking place on-screen.

There are many applications that provide the opportunity to create sounds or use already existing sounds that might fit your video game. There is no need for students to have music skills, though a student with music knowledge is included in the team, this will surely be a benefit for the creation of the video game's sounds.

School students should choose the right application that fits their needs. Applications such as Garageband, Bandlab – Cakewalk, and Tracktion Waveform may provide easy-to-use sounds, as well as allowing students to create new sounds. However, many animation applications have already existing sound libraries that can be used. You could also consider using classical music, as there are many readily available pieces online that can be used for free!

Related pedagogical sequences:
Sequence 16: Creating sound effects and dialogues in video games
Sequence 17: Adding music themes in video games

2.12 Step 11: Playability/mechanics: Identification of game roles, challenges, and rewards

It is a given that most video games will present challenges to the player: without any form of challenge, there is no game. However, challenges can take a myriad of forms. They can range from walking or jumping with the appropriate timing and place in platform games, to mastering army formations and military strategies, or to interacting with non-player characters in a way that will provide the best possible outcome according to what the player is looking for. Not all games will offer the same challenges.

When overcoming a challenge, the player obtains some form of reward. It can be a fictional world or in-game currency, it can be specific items, a higher ranking, or just a specific reaction from a character in the game.

The other side of the coin is that failing a challenge or completing it in a way that is not favoured in the game design will have negative consequences. The player might have to redo a challenge until they complete it, they might lose health points, they might not

obtain an important piece of information or a bonus reward, or, if they have done something morally reprehensible in front of other characters, they might have a harder time interacting with them.

As a general rule, some sense of variety is key in video games for 2 reasons: monotony and difficulty. A game that presents the exact same challenges and the same rewards to a player might not make them feel engaged with the game, as there is no surprise. Puzzle games might look monotonous, but they do come with differentiation between the games they offer, or their homogeneity is more easily tolerated because the levels are short.

The most important point, however, is for challenges to be coherent with the atmosphere of the game: for instance, it would be strange for a medieval knight in war times to suddenly start reviewing his calculus and spelling out of nowhere, except if, maybe, he does so to refine his strategy. A study by Vahlo and Karhulahti (2020) identifies 38 different types of challenges in video games. This illustrates not only the importance of having challenges, but also the wide range of types of challenges that currently exist in video games!

Related pedagogical sequences:
Sequence 18: Designing game rewards using experimental psychology
Sequence 19: Analysis of the games-as-a-service business model through the lens of behavioural economics

2.13 Step 12: Playability/mechanics: Definition of the different levels and difficulty curve

Most video games offer a choice of difficulty level between easy, medium and hard. It is more and more common to have a fourth higher level, such as 'critical' or 'professional'. As a teacher creating games for or with your students, to ensure the games can be played by most students, the safest option is not to go higher than medium, but offering games that are too easy might actually make your students feel bored.

The difficulty curve in video games refers to the game design principle that players must not start with too difficult challenges to help them dive into the game, though in order to keep their motivation and interest, the challenges should become more and more difficult. It is important that games should always keep a balance between making challenges difficult enough for learners to keep being entertained, though they should not be too difficult, to make sure players can actually continue or finish the game.

The difficulty curve is not linear, as the final challenges are generally designed to be more difficult and require patience from the player. In addition, game designers are using more and more the concept of the 'difficulty saw', which means that at each new chapter difficulty decreases a little before increasing again until the end of the chapter (Stratchan, n.d.).

Related pedagogical sequences:
Sequence 20: Creating a new level at Crayon Physics Deluxe
Sequence 21: Game balancing theory
Sequence 22: Game balancing practice

CHAPTER 2:
POINTS OF ATTENTION FOR INCLUSION

3.1 Some points to keep in mind for inclusive teaching and gaming

As video games have educational value and are not only used for entertainment, it is important to make them inclusive and accessible to all learners. Inclusion and accessibility are characteristics that the video game industry has only been facing in recent years (Jaramillo-Alcázar et al., 2021). Many players with specific learning disorders cannot enjoy the full experience of video games because of the lack of inclusion features.

Some of the most common difficulties are complexity of commands and controls; difficulty understanding texts (due to their font, size or colour); complicated gameplay which is hard to follow; inability to change the game speed; and non-modifiable controls.

Here are some suggestions to create more inclusive video games for students with learning disorders:

- Use simple language and writing style, with short and clear sentences
- Use captions and subtitles
- Use an easy to difficult progression
- Remind the player of the objectives during gameplay
- Offer the possibility for repetition
- Offer the possibility to pause while reading
- Use off-white or pastel background colour whenever possible
- Font size should be 12 or larger
- The text should not be justified - align to the left
- Use a clear sans serif font such as Arial, Open Sans, Century Gothic or OpenDys
- Use line spacing of 1.5
- Avoid *italics*, underlining and CAPITALS – put the text in bold to highlight important information

- Use clear visual elements without overloading them
- Avoid distractions and unnecessary information
- If possible, add an audio reader with different speeds and possibility to pause or replay
- Focus on logic rather than memory

REFERENCES

Amit, S. (2015, August 20). 3 Tips for Rapid Storyboard Development. *Amit G. Soni Blog.* Retrieved from: http://amitksoni.com/3-tips-for-rapid-storyboard-development/#.Yao71NDMLIU

Andersen, F., King, C. L., & Gunawan, A. A. (2021). Audio Influence on Game Atmosphere during Various Game Events. *Procedia Computer Science*, 179, 222-231.

Asteroidbase. (2015). Lovers in a Dangerous Spacetime [video game]. Toronto, Canada: Asteroidbase.

Beattie, A. (2021). How the Video Game Industry is Changing. *Investopedia.* Retrieved from: https://www.investopedia.com/articles/investing/053115/how-video-game-industry-changing.asp

Bleja, D. (2016, October 18). 5 tips to make your game animations better. *Game Developer.* Retrieved from: https://www.gamedeveloper.com/design/5-tips-to-make-your-game-animations-better

Bridgett, R. (2009, October 29). A Holistic Approach to Game Dialogue Production. *Game Developer.* Retrieved from: https://www.gamasutra.com/view/feature/132566/a_holistic_approach_to_game_.php?print=1

Carys, S. (2017). Why Storytelling is Important. *International Housing Journal of Education and Development,* 43. Retrieved from: https://ihjournal.com/why-storytelling-is-important-by-carys-shannon

Dodge Roll. (2016). Enter the Gungeon [video game]. Austin, Texas: Devolver Digital.

Domsch, S. (2017). Dialogue in video games. *Dialogue across media*, 251-70.

GDC. (No date). 'Creating Atmosphere in Games', www.gdcvault.com. Available at: https://www.gdcvault.com/play/1015556/Creating-Atmosphere-in [accessed 23/06/2021].

Jaramillo-Alcázar, A., Venegas, E., Criollo-C, S., & Luján-Mora, S. (2021). An Approach to Accessible Serious Games for People with Dyslexia. *Sustainability*, 13(5), 2507.

Jones, N. (2019, May 14). Speak Up! Creating Meaningful Characters Through Dialogue. Retrieved from: https://www.thepunkwriter.com/article/speak-up-creating-meaningful-characters-through-dialogue.

Lasseter, J. (1987). "Principles of Traditional Animation applied to 3D Computer Animation". *ACM Computer Graphics*, 21 (4): 35–44. doi:10.1145/37402.37407

Léo, S. (2020). The Effect of Dynamic Music in Video Games: An Overview of Current Research. Bachelor's Thesis in Game Design, University of Uppsala. Retrieved from: https://docplayer.net/197832043-The-effect-of-dynamic-music-in-video-games-an-overview-of-current-research.html

MasterClass. (2020, November 8). How to Design a Video Game Character. *MasterClass Blog, Design & Style Section.* Retrieved from: https://www.masterclass.com/articles/how-to-design-a-video-game-character

Nintendo. (1983). Mario Bros. [video game]. Kyoto, Japan: Nintendo R&D1

Nintendo. (1986). The Legend of Zelda [video game]. Kyoto, Japan: Nintendo R&D4

Nomada. (2018). Gris [video game]. Austin, Texas: Devolver Digital

Playdead. (2010). Limbo [video game]. Copenhagen, Denmark: Playdead

Snell, S. (2016). 60+ Outstanding Character Design Tutorials. *Vandelay Design*. Retrieved from: https://www.vandelaydesign.com/outstanding-character-design-tutorials/

Stratchan, D. (no date) 'The idea of a difficulty curve is all wrong'. Available at: http://www.davetech.co.uk/difficultycurves [accessed 23/06/2021]

Study Tonight. (2021). Different Genres of Game. *StudyTonight.com.* Retrieved from: https://www.studytonight.com/3d-game-engineering-with-unity/genres-of-game

Twelve basic principles of animation. (2021, November 15). *In Wikipedia.* *https://en.wikipedia.org/wiki/Twelve_basic_principles_of_animation*

Vahlo, J. and Karhulahti, V-M. (2020). 'Challenge types in gaming validation of video game challenge inventory (CHA)', *International Journal of Human-Computer Studies*, vol. 143, November 2020, 102473. Available at: https://www.sciencedirect.com/science/article/pii/S1071581920300756

Welsh, E.M. (2017, November 22). How to Write a Good Video Game Story. *E.M. Welsh Blog.* Retrieved from:

Welsh, E.M. (2017, December 20). How to Write Video Game Characters. *E.M. Welsh Blog.* Retrieved from: https://www.emwelsh.com/blog/video-game-characters

https://www.gaming4skills.eu/

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