Literature Review

Video games, “a game in which the player controls moving pictures on a screen by pressing buttons” (Cambridge Dictionary, (2020). VIDEO GAME), have become an everyday presence in today’s modern society. Being around since the 1950s, they have gone from military machines to arcade systems, to home consoles, to handheld consoles and mobile devices (History.com Editors, 2019), a brief timeline of video game history can be found in Mark J. P. Wolf’s book The Video Game Explosion: A history from PONG to PlayStation and Beyond (Wolf, M.J.P. (2008), pg. 17-21).

With the evolution of video games has also come the evolution of technology itself, with great improvement on new hardware, graphics, and performance. The number of people playing video games has also risen massively over the years, according to (Clement, J. 2021), the number of video game users in the UK is 44.32 million people, over 50% of the whole UK population. The game industry in the UK itself is the biggest in Europe and the sixth worldwide, with a market value of £5.3 billion, this makes it one the highest market in the entertainment industry, compared to music and film. And with more players come more different types of players and player styles. According to AbleGamers, a charity that aims to improve accessibility in video games, around 46million video game players in the United States have a disability (Valentine, R. 2020). Which is around 1 in 5 of video game players in the United States, and according to (Clarysse, 2021) 1.75 billion people are dealing with disabilities in their everyday life, which is not including their friends and family, however, as Pascal says “the representation ratio in media is abysmally low, and worse, it’s almost condescending and tear-based content“. Which is why there is a need to have awareness and for action. Many of these players are unable to play popular games due to the complexity and lack of accessibility options for them, and do not hold any disability representation or if they do, can be negative and inaccurate.

Accessibility is the level that a product is available according to the number of people. It's about treating everyone with respect and enabling them access to all possible cultural manifestations. It can be thought of as a system's or entity's "ability to access" and benefit from it. It's frequently linked to people with special needs and their rights to such organisations. (Carrera, S. (2016), pg. 23). Therefore, Adapting a game's hardware and software (such as game controllers, difficulty level, or feedback type) to individual needs, whether they have a disability, is what game accessibility is all about. (Westin et al, 2011)

Over the years, accessibility in gaming has grown in accordance with the new technological advances being made. (AbleGamers, n.d.) shows the history of adaptive tech, and how far it has come, starting from 1986 where Nintendo created first accessible technology with the hands-free controller for the NES, September 2009 the PlayStation 3 adding button mapping to their OS system, becoming the first console to add accessibility features at OS level. 2011 saw AbleGamers themselves creating the Adroit controller with Evil Controllers, a controller with switch inputs for the first time, 2014 had Borderlands 2 add a colourblind mode in their game. Finally, in 2018 the Microsoft Adaptive Controller (XAC) is released.

Silvio Carrera with their book, *Accessibility in Games: Including people with disabilities*, explains that with the evolution of technology, “there was an increase on the amount of attention and control input necessary in order to play” (Carrera, S. (2016), pg. intro). They also describe that one of the issues that disabled gamers come across within video games “They might not be able to use the default controller the platform suggests, which means they won’t be able to do input in the game.” (Carrera, S. (2016), pg. 13), which is a sharp reason for the purpose of this project, to allow players to use their own controllers and map their buttons to the game prototype games and allow them to be saved. Carrera also mentions how the lack of flexibility in the control options, such as the ability to reconfigure buttons, makes it more difficult and unlikely for someone with special needs to tailor the game to their demands. As (NLS, 2015) explains, playing video games can help you be more creative, increase your problem-solving abilities, and foster teamwork. People with disabilities, such as those with movement impairments may not be able to utilise a normal game controller and therefore have fewer options for enjoying video games.

This is a project to create a control mapping program for game accessibility, there are currently programs such as this out there, for example, Rewired (guavaman.com, n.d.) is a comprehensive input system for Unity that contains a configurable and saveable controller map as well as a control mapper system that uses the Unity GUI to allow players to rebind controllers in real time. Another example is, reWASD (rewasd, 2017), which can remap controller buttons on PC which can be used on different games just by loading and setting the mappings on the program, including saving profiles for different games. Other examples are gaming console themselves, such as Xbox and PlayStation that include their own controller configurations and mappings, as can be navigated by (Hesse, B. 2021). This information can be considered when designing the control mapping program.

For the project, there will need for a couple of prototype games to test the program on, whilst I could create any simple prototype game, I thought it would be best to create a couple of game prototypes that would include some disability representation within them. For example, my first game prototype is a simple 2D basketball shooter, where the main character is in a wheelchair. This idea came about as I read through (Brody, 2020)’s article for the AbleGamers Charity called *The Need for More Disabilities in the Games We Play*. Where they discuss how there is little physical disability representation in games in our current society, and a good way to overcome this is to have a game such as Wheelchair Basketball, which could be like any other sport games out there. Another approach is to include disabled people in a wheelchair for basketball video games, which is the approach that was taken in this prototype game. Inspiration was taken from the android game Doodle Basketball, (Byril OOO, 2013) for gameplay and style. It is important to include physical disability representation even within a prototype game such as this to help convey how it is possible to include appropriate representation in the media, especially when in most mainstream video games, as (Ready Player, 2016)’s article explains, “a game protagonist is physically disabled in some manner, it’s usually immediately fixed through the use of cybernetics, prosthetics, or even cybernetic prosthetics.” This idea is shared with (TechTalk, n.d.) as disabled characters are the most likely to get “fixed”. "Fixed" is being deliberately utilised to emphasise the fact that these are game constructions, and not easy to come by in real life, a catch-all fix is frequently thrown into the mix in video games. Ian Hamilton, an accessibility expert, agrees as he explains that there is still a notion in video games that people with disabilities are broken and need to be fixed, with tropes of these fixes being superpowers or superhuman prosthetics. And “Moreover, games are often guilty of furthering the myth that a disability is rare, with all the impact that has on broader prejudice and discrimination.”

For the second game prototype that is being created for this project, the main premise is on mental health and representing that within a simple 3D shooter game. Where the main character will have a mental health issue such as depression or anxiety, and the aim of the game is to shoot away the negative thought bubbles. The reason why the second prototype game is about mental health instead of another physical disability is because it is not portrayed near enough in video games compared to physical disabilities. (TechTalk, n.d.) shows two diagrams that represent how mental health has been tackled in recent years, in figure 1, in video games and the distribution of different types of disabilities portrayed in games most often, in figure 2. Even then, the way that mental health is portrayed can be stereotyped and inaccurate. Or, as (Dunlap and Kowert, 2021, pg. 122) explored in their Mental Health in 3D article, mental illness is shown in video games in both traditional and novel ways, such as in-game mechanisms (e.g., sanity meters) and player-driven decision making. One example of this in a popular video game is (Grand Theft Auto, 2013) where the playable character has a mental state that can rise if the player causes too much violence. Few games truly look at mental health, which is the purpose of the representation in this second prototype.

The other important things in the prototype games are the design of them, including the representation of disabilities in the characters and making sure they are as accessibly designed as possible for prototypes. The Game Accessibility guidelines website, (Anon, n.d.) includes a wide range of guidelines and accessibility design ideas for developers to include in their games, ranging from basic guidelines to advanced. This also includes guidelines on 5 different types of disabilities such as Motor, Cognitive, Vision, Hearing and Speech.

Overall, positive representation of disabilities in video games is very important as it can bring awareness to more disabilities (Valentine, R. 2020), especially with accurate representation of disabilities such as Symmetra and Ana from Overwatch with Autism and with the loss of an eye, which are seen as disabilities in the context “that is, impairments that diminish their ability in the context of Western Society” (Cullen, Ringland, & Wolf, 2018). As well as Joker from the Mass Effect series, who was born with Vrolik syndrome which causes extreme bone brittleness, using crutches and leg braces to get around. (Blockfort, n.d.) this has been seen as great representation, as the best thing is that his disability does not define him, he is still fiercely independent despite the challenges he might face, (TechTalk, n.d.). Within the same article, Ian Hamilton says; “Representation of characters with disabilities is still rare. It is often simply not on people's radars. And when it is, fear of handling it badly can put people off.” And that game accessibility is a more prevalent topic in today’s media.

Figure 1

Chart

Description automatically generated

Figure 2

Graphical user interface, text, application

Description automatically generated