

How do Accessibility Options Influence Player Engagement and Usability in Video Games?

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Abstract

As the games industry continues to grow, the need for accessibility has evolved beyond an afterthought to a core component of player experience. This dissertation will explore the impact of game accessibility options on the player experience within the games industry with a focus on usability, engagement, and inclusive design. Using a thematic narrative review, this study examines theoretical and practical applications of accessibility in games. Three case studies —*The Last of Us Part II*, *Marvel Rivals*, and *Cuphead*, and an accessibility survey are analysed to assess how accessibility options are implemented and perceived within the context of the games' reception. Findings indicate that not only do accessibility options remove barriers for players with impairments, but also enhance the experience for all players, particularly when it comes to engagement and immersion. The study concludes that implementing inclusive game design practices positively correlates with improved player satisfaction and commercial viability. However, several key challenges are identified, including middleware limitations, a lack of a universal framework, and a failure to advocate for accessible game design. The study goes on to define actionable recommendations to assist developers with implementing accessibility in their games, as well as pose further research questions to explore.

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How do accessibility options influence player engagement and usability in video games?

Video games are one of the most popular forms of recreation, especially since the introduction of online multiplayer games that feature both competition and cooperation (Nuyens et al., 2016). They are often a source of entertainment that allows for an enjoyable way for players to relieve stress, socialise with friends, and spend free time (Grammenos et al., 2009; Stockdale & Coyne, 2018). Additionally, games can be used as a means for distraction, escapism, and self-care, often acting as a coping mechanism (Iacovides & Mekler, 2019). However, whilst gaming can often provide entertainment, escapism, and community, not all gamers can participate equally as a result of existing accessibility barriers.

Accessibility is defined as “the quality of being able to be entered or used by everyone, including people who have a disability” (Cambridge Dictionary, 2025). Accessibility barriers can hinder individuals with disabilities from fully engaging and enjoying gaming experiences (Sodhi et al., 2023). Gamers with disabilities may experience difficulty interacting with games, including mechanics, narratives, and interfaces, depending on the nature of their impairment (Kiecko, 2024). Yuan et al., 2011 classify players with impairments into four types:

- Visual impairments – Certain degrees of vision loss, including partial sight, legal blindness, complete blindness, and colour blindness.
- Hearing impairments – The partial or complete loss of hearing in one or both ears; this impairment has varying degrees from mild hearing loss to complete deafness.
- Motor impairments – Loss of muscle control that results in mobility issues. Many factors can cause this impairment, such as paralysis, arthritis, illnesses, or ailments that affect muscle control. This includes speech difficulties and the need for alternative input devices other than the traditional keyboard and controllers.

- Cognitive impairments – Refers to psychological conditions ranging from intellectual disabilities to senility in old age. These impairments may include those with Alzheimer's, autism, Down syndrome, dyslexia, and attention deficit disorder. These issues can lead to difficulties with social interactions, communication, limited interests, and repetitive behaviours.

These impairments can cause problems with perceiving messages (Visuals, Audio, and Text), responding to these messages (Controls), and understanding these messages (Cognitive and concentration); however, it is possible to introduce accessibility improvements for these problems (Kiecko, 2024). Moreover, many barriers to video game accessibility can usually be overcome or mitigated with little to no cost (Powers et al., 2015). This suggests that it is relatively easy to implement features or changes to lower accessibility barriers, raising questions about why mainstream game developers and major titles often lack basic accessibility options.

Player experience is a significant factor in the success rate of games. The concept is often interchangeable with concepts of fun, flow, fulfilment, engagement, satisfaction, pleasure, and playability (Chu et al., 2011). Player experience can be characterised by the playability of a game, which represents the degree to which a player can achieve specified goals with effectiveness, efficiency, satisfaction, and fun (Sánchez et al., 2009). The player experience can be influenced by numerous design elements, including:

- Visual and auditory information - particularly background characteristics, contextual information, representations of virtual worlds, music, sound, and quality of information displayed to a player (Caroux et al., 2015).
- Control Schemes – Responsiveness and adaptability of controls to fit any player's particular needs or preferences (Glinert, 2008).

- Feedback Systems – How effectively a game communicates objectives as well as success and failure to a player (Nesbitt & Hoskens, 2008).

Inaccessible game design can negatively impact the player experience by reducing engagement, immersion, and usability. Simultaneously, enhancing accessibility options can significantly improve the overall player experience, even for players who do not have a disability, by reducing frustration from how certain game elements are communicated. This concept aligns with the theoretical framework laid out in *The Design of Everyday Things* (Norman, 2013), which contains principles of human-centered design, effective feedback, constraints, and affordances.

The video game industry has made significant strides in recent years in including accessibility options. According to the 2024 state of the gaming industry report, 48% of game developers include accessibility measures in their games, up from 38% in 2023. Conversely, only 27% of developers said they had not implemented any accessibility measures, down from 32% in 2023 (Game Developers Conference & Game Developer, 2024). Naughty Dog, the developer behind *The Last of Us: Part II*, a subsidiary of Sony Interactive Entertainment (Naughty Dog, 2025), released *The Last of Us: Part II* in 2020 (PlayStation, n.d.). The game has over 60 accessibility options and is rated very highly for its accessibility; it is seen as a standard of accessibility that other games should aspire to (Kiecko, 2024). These efforts demonstrate a growing recognition of the importance of inclusive game design from developers, large gaming companies such as Sony, and the gaming industry as a whole. Although many barriers continue to persist in the industry, especially in games developed by smaller studios that lack the resources and knowledge to better implement accessibility practices.

For this dissertation, I will adopt Yuan, Folmer, and Harris's (2011, p. 81) definition of video game inaccessibility as "(1) not being able to receive feedback; (2) not being able to determine in-game responses; and (3) not being able to provide input using conventional input devices". Using a literature-based approach, this dissertation will:

- Identify and analyse common accessibility barriers in video games.
- Evaluate how these barriers impact player experience, particularly in terms of immersion, usability, and engagement.
- Examine industry best practices and explore three case studies of games that have implemented accessibility successfully or unsuccessfully.
- Propose actionable recommendations for game developers to enhance accessibility.

A thematic narrative review will be conducted to analyse existing research and industry reports. This review ensures a comprehensive, methodologically robust, and structured literature review. Thematic analysis allows for the highlighting of recurring themes, including accessibility related challenges and solutions. The findings of this dissertation will aim to contribute to the body of knowledge on game accessibility and contribute to the framework for inclusive game design practices, assisting game developers in making accessibility options standard, as opposed to an afterthought. Despite increasing adoption of accessibility practices, there is a lack of consensus on how these affect player experiences. This dissertation will aim to bridge this research gap.

Background and Context

According to the World Health Organization (2023), an estimated 1.3 billion people, 16% of the population, have a significant disability. In part due to the ageing population and the increasing prevalence of noncommunicable diseases. Individuals with a disability have an increased risk of developing comorbid conditions such as depression, asthma, diabetes,

stroke, and poor oral health. This is partly due to the challenges that disabled individuals may face, such as stigma, discrimination, poverty, exclusion from education and employment, and barriers in health systems. Disability can affect anyone regardless of gender, race, sex, or nationality (World Health Organization, 2023).

Gamers that suffer from disabilities can face some key challenges within video games, including demanding motor and sensory skills due to special-purpose input devices, complex interactions, and an emphasis on visual control and attention (Grammenos et al., 2009). Regarding accessibility in video games, there are two types: the accessibility of disabled individuals and the accessibility of novice or inexperienced players; however, I will not explore the latter in this research. Although, there may be some overlap, as many of the accessibility needs for those with impairments can also cover the accessibility issues faced by those who are new or inexperienced with games, such as, but not limited to, pause menus and difficulty options (Kiecko, 2024).

Early video games were unintentionally accessible due to technical limitations in controls and hardware. For example, the first commercially successful game, *Pong*, as well as early text-based games, were inherently accessible as a result of their simplicity (Kiecko, 2024). Kiecko (2024) further discusses the accessibility effort including early attempts such as Nintendo's NES hands free controller released in 1985 that could be controlled by breathing, Atari's introduction of a "child" mode for games developed for the 2600 console and the introduction of audio games such as audio space invaders and audio quake. These early innovations laid the groundwork for accessibility, proving even rudimentary adaptations could allow for broader audiences to enjoy certain video games.

Today, accessibility is becoming increasingly recognised as an important part of game development; however, modern development practices face new challenges with the ever-

growing industry. For example, on Steam, a leading marketplace of PC games advertised as the “ultimate destination for playing, discussing, and creating games” (Valve Corporation, n.d), dozens of games are released every day, with 15,422 released in 2024, a rise from 9,204 in 2020. This number continues to rise, with the total number of games released on Steam increasing yearly, and this likely contributes to why Steam is synonymous with PC gaming (Clement, 2025). This growth is in part due to the availability of free game engines such as Unity and Unreal that enable inexperienced developers and indie studios with limited budgets and expertise to produce games (Unity Technologies, n.d.; Epic Games, n.d.). While these advancements lower the barrier for individuals and indie developers to enter the game design space, it may also mean they are less informed and therefore may struggle with implementing accessibility industry standards and agile methodologies. As a result, the testing phases for refinement may be overlooked, even those who implement this phase may focus on their target audience, unintentionally excluding those who suffer from accessibility issues. For example, with *Uncharted 2*, there was a lack of awareness about the difficulty quick time events could have, preventing players with motor impairments from completing the game, as highlighted by Kiecko (2024).

Table 1

Table of video game industry statistics

| Global Revenue | |
|-----------------------|--------|
| 2024 | \$475B |
| 2023 | \$428B |
| 2022 | \$389B |
| 2021 | \$393B |

Note. This Table shows the estimated global video game revenue from 2021 -2024 (Statista 2024).

Table 1 shows that the video game industry has seen a steady increase in revenue year over year; it is estimated to exceed \$600 billion by 2029 (Statista, 2024). The economic context will support the benefits of accessibility. The video game industry is one of the most rapidly growing industries, surpassing the film and music industries combined (Kiecko, 2024). This rapid growth of the industry in conjunction with the fact that an estimated 4.4 billion people, roughly 54% of the population, own a smartphone (Total Telecom, n.d.), has made mobile gaming, the biggest revenue generating sector of the market, more accessible than other platforms that require more expensive hardware, such as consoles or personal computers. This shows how much of an effect accessibility already has on the video game market. Consequently, it is reasonable to assume increased accessibility will not only allow developers to help disabled individuals access their game but also increase other positive traits associated with a game's success, such as higher revenue, increased player counts, and improved player retention rates. Furthermore, this would also add to the appeal of a game, considering the process many disabled gamers follow to select a game: identifying a game they want to play, researching its accessibility features, and then deciding. This aligns with the three-phase model of game adoption by Martinez, Froehlich, & Fogarty (2024) derived from Lee et al. (2016), in which players go through a discovery phase (finding a game of interest), an evaluation phase (assessing accessibility features), and an adaptation phase (learning to play and managing access challenges).

Accessible game design is not only beneficial for improving revenue but also has a wider societal impact. By following the principles of universal design (Imrie, 2014), developers can foster social inclusion and equity. Additionally, universally accessible game design may contribute towards raising public acceptance of video games, and redefining the typical gamer stereotype, as concluded by Grammenos et al (2009).

Table 2

Comparison of State of the Games Industry survey question by year

Have you implemented any accessibility measures (i.e. closed captioning, colorblind mode, content warnings) into your current game?

| | Yes | No | Don't Know/NA |
|------|------------|-----------|----------------------|
| 2024 | 48% | 27% | 25% |
| 2023 | 38% | 32% | 29% |
| 2022 | 39% | 36% | 25% |
| 2021 | 31% | 42% | 27% |

Note. State of the Game Industry Reports 2021-2024 (Game Developers Conference, 2021, 2022; Game Developers Conference & Game Developer, 2023, 2024).

Table 2 presents data from the State of the Games Industry survey conducted for 2021-2024, indicating an increased awareness for implementing accessibility features in games. Recently, in only the past several years, the percentage of developers implementing these measures has increased by 17% (from 31% to 47%), with an average increase of 5.5% year over year. Furthermore, the number of developers not implementing these measures has decreased significantly by 15% (from 42% to 27%), with an average decrease of 5% year over year. Some accessibility options developers are introducing include colour blind modes, closed captions, content warnings, key remapping, various game speeds, adjustable difficulties, Quick Time event toggles, and many more.

In the Game Developers Conference & Game Developer (2024) survey, 32% of respondents reported working for indie studios. While 75% of larger AAA studios' developers had over 250 employees, the same number of indie developers work with 20 people or fewer. This suggests that indie studios could be lacking in expertise and have fewer resources to implement accessibility options. Moreover, in 2024, PC remained the dominant

platform, meaning that many of the games released that year on PC would lack the rigorous quality control standard of other platforms. Whilst the industry was greatly impacted by layoffs in 2024, with around a third of developers being affected, and continued layoffs in 2025, it is likely that many studios will continue to unintentionally exclude disabled gamers in their developmental phases due to the industry's current priorities.

Aims and Objectives

The primary research objective of this dissertation is to investigate how accessibility options influence player engagement, usability, and the overall player experience within video games. This central research question will explore whether the presence of accessibility options impacts how players experience, engage, enjoy, or use video games from an accessibility perspective. With a growing number of disabled gamers, this research will find answers on how inclusive design practices can enhance user satisfaction, widen the target audience, and improve the industry itself.

The primary research aim of this dissertation is to evaluate the relation between accessibility options and player experience, particularly on usability and engagement with these video games. This will involve research into game accessibility and various player experience frameworks, drawing connections between the subject areas to finalise conclusions about this research question.

There are also several secondary scientific objectives: 1. Identifying key barriers to game accessibility that prevent gamers with visual, auditory, motor, or cognitive impairments from accessing games. This dissertation will examine how these barriers influence player experience, especially in relation to input, navigation, perception, and comprehension within the game context. It will also assess the best way to mitigate these barriers from existing. 2.

Asses the current state of accessibility in commercial video games through analysis of various case studies, survey responses and critical reviews. This objective will explore the types of features implemented, their effectiveness, the overall success of the game, and its accessibility features, focusing on their impact on player experiences. 3. To explore player and developer perceptions surrounding accessibility, drawing from original survey data, academic papers, and contact with experts to better understand how accessibility is implemented and experienced in practice. 4. Developing actionable recommendations for practice to allow developers and studios to understand better how they can remove barriers to accessibility in their games. Informed by existing guidelines such as accessible player experiences, the International Game Developers Association Game Accessibility Special Interest Group, and player expectations, these recommendations will consider technical and cultural aspects of inclusive design to propose good accessibility practice. 5. Analysing the role of accessible game design in shaping positive traits associated with games, particularly player retention and satisfaction rates. While many studies focus on barriers alone, this objective will involve the benefits that come with introducing accessibility features into a game. 6. Differentiating how different accessibility features impact varied types of engagement, such as immersion, challenge, and socialising, in the context of Flow Theory. This objective is an acknowledgment of the fact that accessibility is not a one-size-fits-all and will aim to determine impact depending on genre, platform, and the goals of the players.

This dissertation will explore the advantages of accessibility features in games and contribute to growing perceptions of inclusive game design practices. The findings will offer guidance for designers and studios looking for knowledge on improving game accessibility while also bringing attention to the concerns and needs of disabled players. It will also highlight how accessibility can be used as a tool for better game design practice rather than just being an afterthought.

Methodology and Research Strategy

The study will primarily consist of qualitative data from papers, theories, books, and other academic sources. These qualitative perceptions and perspectives will be used for knowledge gathering and using existing ideas to formulate unique conclusions. Quantitative data, including industry reports and survey results, will be sourced and added where relevant and available to provide contextual information as well as to support various claims. Various theoretical frameworks, such as Flow Theory, will be examined for their measurement of player engagement and APX for a practical design-based viewpoint. The aim is to explore the primary research objective of how accessibility features influence player engagement and usability in video games by reviewing academic, theoretical, and industry perspectives. Furthermore, the research will be supported with data and informed sourced from reliable accessibility organisations.

The research will begin with a literature review that examines existing accessibility barriers, a proposed framework to address those barriers, theories surrounding player experience, and various studies that link to these topics. This review will be subject to thematic analysis to gain insight into the existing literature by identifying recurring concepts, patterns, or gaps in the knowledge base. This will form a basis for answering the core research question. This literature review will examine the existing body of academic literature on game accessibility, in conjunction with industry research, to analyse its influence on player experiences. Its purpose is to highlight the following major thematic topics:

- Identification of the major accessibility barriers in video games.
- How these barriers affect the player experience in terms of engagement, immersion, and usability.

- The frameworks and guidelines that have been proposed to address these challenges.

By structuring the literature review into these sections, the analysis will highlight the current state of existing research in game accessibility, and identify any gaps in the knowledge where further investigation is required.

The selection of literature for this research was set with the following criteria: priority given to peer-reviewed work, seminal works, and authoritative industry reports published within the last 15 years to include the most recent advancements and ideas. Foundational studies that provide further context were also included. Key academic databases were used for the selection of literature, including Google Scholar and Scopus, with targeted keywords such as “game accessibility” and “inclusive game design”. Sources were selected based on these criteria, as well as their methodological robustness, relevance to thematic topics, and clarity of findings. The analysis of this research under these topics will aim to develop an understanding of the impact game accessibility has on the player experience. Importantly, a narrative review, in particular a thematic one, was chosen over a structured review, such as a systematic literature review, due to the very nature of the research question being experience-based. This allows the dissertation to explore the research questions from less of a clinical perspective but rather by aggregating design philosophies, player experiences, and game design practices. This reduced reliance on empirical data will be replaced with an emphasis on theory and insight from differing perspectives. Furthermore, structured reviews focus primarily on collating data from existing research, which in many areas is found to be consistently lacking, especially when it comes to data and figures, with many papers often opting for methodologies focused on direct interviews with players and developers. A thematic narrative review enables a flexible synthesis of existing literature, grouping the research by existing concepts and themes. This allows for comparisons between academic

theory, industry practices, and valuable player insights. It is also reflective of many of the ideas surrounding accessibility, namely being experience and individually focused.

Additionally, the literature will be further supported by case studies aiming to contextualise the literature and evaluate how accessibility features are implemented in practice. These case studies, chosen by varied approaches and differing backgrounds, will aim to analyse how accessibility was implemented and how it affected the player experience. This approach will connect theoretical concepts to real-world applications to discover the impact of accessibility options and propose actionable recommendations on how developers could implement them in their games. These case studies will give insight into the effectiveness of accessibility options and offer real industry practices that can be linked back to academic theory, in terms of user-centred design and meeting the requirements of disabled gamers.

Real-world primary data will support the research, including gaining insights from real-world developers and conducting surveys that will allow for a descriptive and statistical analysis of survey responses. Recurring patterns and themes will be drawn from this primary data to formulate conclusions from the player's perspective, such as feature usage, impact, and the current state of accessibility in the games industry. The process of gathering this data will be completed ethically with anonymous answers unless participants opt otherwise. Analysis of this data will involve thematically coding the gathered data to identify key themes and draw comparisons on differing perspectives. The data will gain insight into the current perception of a small, focused group of gamers on accessibility, as well as evaluating how well they support existing ideas and research brought up in the course of the literature review.

Finally, the research obtained throughout this methodology will be translated into recommendations from practices, which the findings will inform of this paper. These will be based upon recurring themes and place value upon the most important takeaways from the dissertation. They will aim to address accessibility concerns raised throughout the literature review.

In conclusion, this dissertation will adopt qualitative and quantitative techniques with a balance of primary and secondary sources to answer the core research question. Ultimately, the methodology is grounded in a theoretical narrative review supported by case studies, survey analysis, and relevant accessibility theories. It will take into account player-oriented experience and developer frameworks to accurately make evidence-based conclusions and propose reasonable recommendations for developers. By integrating a wide range of sources and data, this dissertation will aim to have a well-rounded analysis and review of the core research question: how do accessibility options influence player engagement and usability in video games?

Literature Review

Major Accessibility Barriers in Video Games

Physical Accessibility

There exist key significant barriers for physical accessibility considerations; many mainstream games are designed around conventional input devices such as keyboards and controllers (Glinert, 2008), making it difficult or impossible for players who cannot use these standard controllers due to limited mobility (Yuan et al., 2011). Furthermore, there is often an absence of remappable control features, with default control schemes lacking this important functionality, preventing players from adjusting control schemes to suit their needs and preferences (Martinez et al., 2024). A lack of functionality is not the only barrier as many

games incorporate reliance on players being able to complete quick-time events, however, these timed mechanics can be inaccessible for players with slow reaction times or limited dexterity and research suggest these events cause frustration for all players, not just among those with accessibility needs (Johnson, 2015). Games may often be reliant on fine motor skills, assuming the player will be capable of precision-based mechanics such as accurate aiming, button-holding, or fast-paced directional movement, which can be a challenge for players who struggle with hand-eye coordination or grip strength (Yuan et al., 2011).

Adaptive controllers such as Microsoft's Xbox Adaptive Controller and other assistive devices have provided new avenues for accessibility (Martinez et al., 2024). Whilst many games still lack comprehensive input controls, developers are increasingly trending to implement control remapping (Game Developers Conference and Game Developer, 2024). One participant in Martinez et al.'s (2024) study noted that this trend appears truer in US and Europe-based studios, though further research is required to confirm this regional distinction. The reliance on dual-stick movement and multiple button presses remains a significant barrier in popular genres; Research highlights that certain players require single-button alternatives or assistive input solutions (Grammenos et al., 2009).

Best practices for physical accessibility include the following:

- Allowing for fully customisable button remapping and alternative control schemes allows players to remap to suit their needs (Martinez et al., 2024; Yuan et al., 2011).
- Supporting multiple control inputs, such as voice commands, motion controls, single-handed play, and external assistive devices, gives players flexibility in interacting with a game (Yuan et al., 2011).
- Customisable input sensitivity and game speed adjustments, allowing players to customise sensitivity of controls, and slow down gameplay or increase response

windows to accommodate varying levels of motor ability (Martinez et al., 2024; Yuan et al., 2011).

Visual Accessibility

When it comes to visual accessibility, many games fail to accommodate those with colour blindness or visual impairments. The over-reliance on visual feedback in games often results in using only visual cues to communicate interfaces, objectives, and mechanics to the player (Palmquist et al., 2024). In the particular context of colour usage in games, colour blindness can have a profound negative impact on the game experience. This can be attributed to reduced performance for players and games being ineffective at conveying game mechanics or emotional context through colour (Pinheiro et al., 2023). For example, colour-blind players may have trouble differentiating between team colours, a core mechanic in many games, compromising the underlying experience (Pinheiro et al., 2023). Another issue stems from poor contrast and text readability, as games may use low-contrast UI elements, making it difficult for certain players to identify certain game elements (Fedorenko, 2024). Furthermore, cluttered interfaces that are too densely packed or contain UI elements that are too small can be confusing and difficult to navigate for those with visual impairments. Martinez (2024) highlights how visual motion and cluttered UI can present a challenge to gamers with sensory sensitivities, causing difficulty in processing on-screen information. Additionally, participants in the study noted difficulties in finding accessibility options, and navigating game menus due to poor labelling and a lack of simplicity. This suggests a strong need for customisable user interface (UI) elements, and adherence to universal design principles to prevent these issues from arising.

Best practices for visual accessibility include the following:

- The addition of colourblind accessibility options, such as implementing different colourblind modes for deuteranopia, protanopia, and tritanopia, and contrast filters to enhance accessibility further (Pinheiro et al., 2023).
- Adjustable user interface settings, including scalable text and adjustable contrast settings for user interfaces. This allows for resizing user interface elements, and different text options, such as font and size, would improve readability (Fedorenko, 2024).
- Customisable HUD elements allow the player to toggle certain elements on/off to prevent screen clutter and enhance simplistic, readable UI elements (Martinez, 2024).
- Navigation aids such as narrated menus, spatial audio cues, and haptic feedback to assist in the navigation of menus and game spaces (Palmquist et al., 2024).

Auditory Accessibility

Auditory accessibility pertains to how auditory information is communicated to the player and whether alternative feedback options are included for players with hearing impairments. Sound plays a vital role in games, contributing to player immersion and game mechanics (Grimshaw, 2011). However, many modern video games fail to provide other communication methods for those with auditory disabilities (Porter & Kientz, 2013), leading to usability issues. Many games lack subtitles and closed captioning that allow for dialogue to be communicated to the player, as the game industry has not fully adopted this standard for TV, DVD, and cinema (Mangiron, 2016). When they are included, they may also face various issues such as poor readability, lack of clarity, or incorrect synchronization. Games may also fail to provide an accurate alternative for critical non-verbal sound cues (Maloney et al.,

2020), such as background noises or enemy movements. The same issue may also be found in multiplayer games that rely on voice chat functionality, without providing a text chat alternative, preventing intended communication for those with hearing impairments.

Best practices for auditory accessibility include the following:

- Providing clear, synchronised, adjustable captions and subtitles to understand dialogue (Mangiron, 2016).
- Alternative sound indicators, such as on-screen visualisations or haptic feedback, such as vibrations, can be added to communicate game mechanics or help identify sound-based events, such as enemy positions.
- Text-based chat communication in multiplayer games includes voice chat, text-to-speech menus, spatial audio cues, and haptic feedback to assist in navigation menus and game spaces (Nees & Walker, 2009).

Cognitive Accessibility

Cognitive accessibility primarily focuses on elements that affect a player's ability to learn, process information, and comprehend. Players with Attention Deficit Hyperactivity Disorder (ADHD), Autism Spectrum Disorder (ASD), dyslexia, or other cognitive impairments could struggle with games that provide excessive information, fast-paced gameplay, or complex mechanics (Fedorenko, 2024). Guilherm (2025) discusses three main barriers to inclusive design practice insights. Firstly, difficult to navigate complex content hierarchies with demand users follow submenus where information is often contained within multiple layers of subdivisions. Secondly, overly complex language, such as vague or generic phrasing, causes the content to become unclear. This lack of clarity can result in confusion. Thirdly, access is impaired due to bewilderingly excessive information, which is known as

information overload. In games, information overload can result from substantial amounts of text, icons, and menus simultaneously, which players with cognitive impairment may struggle to keep up with. Poorly structured menus can amplify this; complex Heads-Up Displays (HUDs) and small text sizes contribute to the information load. Game mechanics often fail to consider this impairment; time-limited mechanics, which require fast decision-making or multitasking, can overwhelm some players. This leads to the issue that many games lack difficulty scaling options that allow for adjusting the difficulty of mechanics, especially in games that view difficulty as their core game loop. Cognitive barriers may go unaddressed in game design due to them often being an invisible disability, unlike other types of impairment. Following inclusive design practices and including those with intellectual disability in the iterative playtest process and collecting data using a mixed methods approach is a good way to mitigate these barriers (Sousa et al., 2022b).

Best practices for cognitive accessibility include the following:

- UI simplification options such as clarity settings and dyslexia friendly fonts.
- Flexible, difficulty modes such as adaptive difficulty scaling, adjustable game speed, and assistance mechanics to accommodate varying levels of cognitive processing speeds.
- Clear and concise information presentation, avoiding UI clutter and information overloads.
- Tutorials and guidance features such as hints, step-by-step tutorials, and learning curves that will allow players to retain information without instantly being overwhelmed.

Industry Barriers to Game Accessibility

One of the biggest challenges to game accessibility is the development of games themselves, as by nature, game development is incredibly competitive, whereas the amount of profitable games is relatively low. This is only furthered by an increase in development times and costs. Game accessibility could be one way to sell more games; however, a lack of understanding of the effort to implement features may cause hesitation for developers (Shimabukuro et al., 2024; Yuan et al., 2011). Developers may also hold misconceptions that accessibility features negatively affect the gameplay experience for non-disabled players (Shimabukuro et al., 2024).

While the majority of the literature agrees on the key accessibility barriers that affect physical, visual, auditory, and cognitive accessibility, as well as industry challenges, it is important to consider the broader accessibility barriers from different perspectives. This section will analyse three key papers, Sodhi, Girouard, & Thue (2023), Mangiron (2021), and Porter & Kientz (2013), each of which offers differing but complementary views on accessibility within the games industry. This dissertation will compare the findings of these papers to establish points of agreement and the conflicting viewpoints on how best to improve game accessibility.

Porter and Kientz (2013) surveyed 55 disabled gamers and conducted semi-structured interviews with game professionals to identify issues with the adoption of accessibility in mainstream game development. They found several issues:

- ‘Low-hanging fruit’ of accessibility comes first, with multiple participants citing simplicity as a factor in deciding which features to implement.
- The value of in-house expertise and accessibility, even when the goal is clear, is only addressed if it is prioritised by someone conscious of the issue.

Individuals with impairments, or at least familiarity with them, who were

involved in the development process were able to advocate for these issues inherently.

- Pressure to adhere to standards has more impact depending on where the call to act on accessibility issues arises from. Internal positions of authority were more likely to be able to push issues to completion, and multiple participants mentioned legislation as another way to drive action from developers and publishers.
- The role of middleware, the engines used to develop games, has a major impact on how developers implement accessibility. For example, an engine may not support functionality that allows a game to implement accessibility. Furthermore, if the middleware had built-in accessibility support, it would prevent developers from having to consistently develop accessibility features over and over again.
- The final barrier concerns the difficulty of implementing assistive technology on consoles. This is due to consoles' complexity, which use their own systems and require proprietary identifying hardware. This increases the development cost, making developing and shipping for consoles harder.

The paper concluded that middleware is the solution to the accessibility problem. It solves the issue of compatibility across devices and cites nearly every participant acknowledging that introducing standardised accessibility features in middleware would dramatically accelerate the industry's adoption of accessibility guidelines.

Mangiron (2021) specifically focuses on the guidelines and frameworks for game accessibility, including:

- Accessible games websites by accessible gamers, focusing on design patterns for Accessible Player Experiences (APX).
- International Game Developers Game Accessibility Special Interest Group guidelines (IGDASIG).
- Although the paper credits IGDASIG, the game accessibility guidelines website was an independent collaborative effort between academics, studios, and specialists (Game Accessibility Guidelines, n.d.).
- Xbox Accessibility Guidelines.
- The specialized website, Can I Play That?
- Web Content Accessibility Guidelines.

The paper suggests that the best way to introduce accessibility is by including players with impairments among the play-testing participants, as accessibility guidelines are a good base checklist, but are one-size-fits-all. This user-centered custom fit-to-game approach is emphasized by the quote “Nothing about us without us” and the mention that *The Last of Us Part 2*, with over 60 accessibility features, was developed with game accessibility consultants of different disability backgrounds. The paper concludes that collaboration between stakeholders is the way forward for game accessibility and that we can expect an increase in game accessibility options following the *Last of Us Part 2*’s footsteps.

It is worth noting that the guidelines outlined in this paper were the most prevalent across the existing body of literature reviewed in this dissertation. While there are no set guidelines, a limited, well-accepted body of guidelines exists, supported by the existing body of literature, and the International Game Developers Association Game Accessibility Special Interest Group (IDGA GA-SIG, n.d.).

Sodhi, Girouard, and Thue's (2023) planned methodology is similar to Porter and Kientz's (2013), as they conducted interviews with game designers and gamers with disabilities. The paper attempts to design an accessibility framework for developers, acknowledging the existence of many of the frameworks mentioned by Mangiron (2021), who cites that the game industry lacks a universally recognized standard. They argue that customisation remains a largely unaddressed issue, highlighting that many accessibility settings are static rather than customisable. Their interactive process modelling framework aims to bridge the gap by mapping how customisable functionality can adapt to meet player needs. This aligns with the broader discussion on literature with Porter & Kientz (2013) that middleware and standardized tools could accelerate accessibility adoption; however, they focus on the importance of customization over standardization. While the framework is still a work in progress, it shows the importance of focusing on customisation as rigid frameworks might not meet diverse needs.

Table 3*Comparison of the Papers*

| Aspect | Sodhi, Girouard, & Thue (2023) | Mangiron (2021), | Porter & Kientz (2013) |
|------------------------------|---|--|---|
| Main Focus | Aims to design a framework, focusing on the lack of customization in accessibility features | Examines accessibility guidelines and frameworks for games | Identifies barriers preventing accessibility from being widely adopted |
| Methodology | Work in progress, through interviews with game designers and disabled | A systematic review of accessibility frameworks | Used surveys and industry interviews with 55 disabled gamers and game developers. |
| Key Accessibility Challenges | Accessibility features are often static settings rather than customizable options | Many existing accessibility guidelines lack consistency, | Developers face technical barriers and lack of expertise, resulting in a lack of accessibility prioritisation |
| Proposed Solutions | An interactive framework that emphasizes customization | Suggests integrating accessibility within broader HCI frameworks | Advocates for middleware standardization |

Summary of Accessibility Barriers in Gaming

The barriers to accessibility extend beyond the limitations experienced by certain players.

These barriers can be classified into player-related and industry-related:

- Player-related barriers include challenges faced by those who suffer motor, visual, auditory, or cognitive impairments, leading to issues in interacting with games due to inaccessible controls, poor UI design, and reliance on rapid decision-making.
- Industry-related barriers are present due to limited awareness, lack of accessibility testing, and no universal framework for accessibility testing and benchmarking.

Impact of Accessibility Options on Player Experience

Accessibility options prominently impact usability, engagement, and immersion as they shape the overall player experience. The existing body of literature highlights that accessibility is not just about inclusion but rather enhancing user satisfaction, increasing audience reach, and contributing to game design best practices (Yuan, Folmer, & Harris, 2011; Beeston et al., 2018; Nuchprayoon, 2024). This section will explore how accessibility options impact player experiences in relation to theoretical frameworks such as Accessible Player Experiences (APX) and Flow Theory.

The Role of Accessibility in Enhancing Engagement and Usability

The primary purpose of accessibility options is to remove barriers that hinder player engagement. These can be classified into two types:

- Critical – Players are not able to interact with the game.
- Non-Critical – Players can interact with the game but with a reduced level of interaction and enjoyment (Yuan, Folmer, & Harris, 2011).

A lack of accessibility options can result in exclusion; players who cannot receive feedback, control input devices, or interpret in-game cues may not be able to engage at all (Caroux et al., 2015). Additionally, inaccessible game design that increases motor or cognitive load can make it harder for the player to achieve a state of flow (Csikszentmihalyi, 1990; Johnson & Wiles, 2003).

Studies suggest usability improvement benefits all players, not just those with disabilities (Glinert, 2008). Features like button remapping, text scaling, and difficulty adjustments optimise usability (Sousa, Neves, & Damásio, 2022). Therefore, accessibility features not only support disabled players but also contribute to better game design practices, enhancing game experiences for all players (Kämäräinen, 2023; Yuan, Folmer, & Harris, 2011).

Flow Theory and Accessibility

Flow theory (Csikszentmihalyi, 1990) suggests that the optimal player experience occurs when there is a balance between challenge and skill level. Accessibility features greatly impact the flow state by allowing players to maintain the balance by adjusting difficulty, control responsiveness, and UI readability (Nacke & Lindley, 2010; Spyridonis & Daylamani-Zad, 2020). Without these options, players may face overwhelming challenges due to their impairments (Yuan, Folmer, & Harris, 2011), whereas with the options players

can modulate the game's difficulty to better align with their skill level and ensure engagement can be maintained without frustration (Palmquist et al., 2024; Rashed et al., 2025).

Furthermore, inaccessible game development can have the opposite effect and break a player's immersion when players are forced to compensate for design limitations rather than focus on gameplay (Kiecko, 2024; Glinert, 2008). For example, quick-time events (QTEs) that require rapid button pressing can break immersion for players with motor impairments, disrupting their sense of flow (Kiecko, 2024; Johnson, 2015). Conversely, games that support input customization foster engagement by adapting to the player's needs (Yuan, Folmer, & Harris, 2011).

Accessible Player Experiences Framework

The Accessible Player Experiences (APX) framework (Beeston et al., 2018) provides a structured model for understanding the effects of accessibility on the player experience. It highlights three key components:

- Access - Players need to be able to access the game, including perceiving, interacting, and understanding it.
- Challenge - Regardless of ability, players should be able to engage meaningfully with game mechanics.
- Experience – Players should feel included, immersed, and emotionally connected with the game.

A lack of accessibility options can result in players failing to meet these conditions, leading to feelings of frustration, disengagement, or inability to participate (Grammenos et al., 2009; Glinert, 2008). By designing with APX principles, developers can create games that players of varying ability can fully enjoy without frustration.

Summary of the Impact of Accessibility Options on Player Experience

The impact of accessibility options extends beyond including disabled gamers; it is essential to game usability, engagement, and immersive design. Games with accessibility options promote longer play sessions, higher retention, and broader audience appeal (Dudley et al., 2023; McCallum, 2012; Przybylski et al., 2010). Theoretical models such as Flow Theory and APX provide valuable foundations for how accessibility affects the player experience (Kämäräinen, 2023). By integrating accessibility options at the design stage, developers enhance the overall game quality, especially in relation to a supporting framework.

Current Perceptions

Perceptions about game accessibility have seen a major shift in recent years, with growing awareness and recognition. However, misconceptions and inconsistencies in implementation persist. This section will explore various perspectives on game accessibility.

Developer Perspectives

The increasing presence of accessibility options is primarily driven by industry-wide advocacy for meeting accessibility needs; however, prioritising these features depends on factors such as resources, development constraints, and internal policy. Porter and Kientz (2013) highlight middleware as being a bottleneck in the introduction of accessibility features, as current game engines lack built-in support, which forces developers to create the features from scratch consistently. This role of middleware often leads to game accessibility being treated as an afterthought rather than an industry standard (Sodhi, Girouard, & Thue, 2023). Furthermore, the degree to which accessibility is implemented often depends on whether internal leadership advocates it. Developers with accessibility-focused teams, such as Naughty Dog, have integrated comprehensive accessibility features, whereas studios without

accessibility specialists may lack awareness or prioritisation (Mangiron, 2021; Porter and Kientz, 2013). Some industry professionals also believe that government regulation and laws could help enforce accessibility in gaming, similar to web accessibility standards (Shimabukuro et al., 2024)

Player Perceptions

Players have become increasingly vocal about accessibility needs, leading to increased expectations of inclusive game design, especially for AAA studios. Games that have good accessibility will receive praise for it, such as *The Last of Us Part 2* (Kiecko, 2024) or *Prince of Persia: The Lost Crown*, which won an accessibility award, even though it was hard, it was built with accessibility in mind (Carpenter, 2024). Conversely, games that lack it will often receive harsh criticism from disabled communities, including game series such as *Dark Souls*, as they unintentionally exclude disabled gamers due to their difficulty (Vanessa / PleasantlyTwstd, 2021; Volpe, 2022). There is also increased awareness about which games are accessible due to various advocacy groups and websites such as *Can I Play That?*, which contains accessibility reviews for games (*Can I Play That?*, n.d.; Mangiron, 2021).

Industry Trends

The industry has seen a greater awareness of accessibility needs in recent years. According to the 2024 State of the Gaming Industry Report, 48% of developers reported implementing accessibility features, up from 31% in 2021 (Game Developers Conference & Game Developer, 2024). This shows a growing trend of prioritising accessibility features in games. Public awareness of the issue will only continue to rise in the industry with groups

such as IDGA GA-SIG and Able Gamers promoting accessible play (Mangiron, 2021).

Developers also increasingly engage with disabled communities during game development phases (Mangiron, 2021; Porter & Kientz, 2013). Despite progress, some developers may continue to hold misconceptions that implementing these features could be costly or negatively impact their game when existing research appears to show the opposite is true (Sousa, Neves, & Damásio, 2022). Early implementation is cost-effective and likely to increase player engagement (Porter & Kientz, 2013; Sodhi, Girouard, & Thue, 2023).

Table 4

The top ten bestselling PC games of 2024's adherence to the IGDA GA SIG's 2010 game accessibility guidelines

Guideline fully met: ✓ Guideline partially met: — Guideline not met: ✗

| Game Title | Controller Reconfig | Alternative Controllers | Sound Alternatives | Volume Control | High Visibility | Colorblind Friendly | Difficulty Control | Speed Control | Practice / Tutorial | Accessible Menus | List Features |
|---------------------------------------|---------------------|-------------------------|--------------------|----------------|-----------------|---------------------|--------------------|---------------|---------------------|------------------|---------------|
| Call of Duty: Black Ops 6 | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| EA Sports College Football 25 | ✓ | — | — | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| Helldivers 2 | ✓ | — | ✗ | ✓ | ✓ | ✗ | — | ✗ | ✓ | ✓ | — |
| Dragon Ball: Sparking! Zero | ✓ | — | ✗ | ✓ | ✓ | ✗ | ✓ | ✓ | ✓ | ✓ | ✗ |
| NBA 2K25 | ✓ | — | ✓ | ✓ | ✓ | ✗ | ✓ | ✗ | ✓ | ✓ | — |
| Madden NFL 25 | ✓ | — | — | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| Call of Duty: Modern Warfare 3 (2023) | ✓ | — | ✗ | ✓ | ✓ | — | ✓ | ✗ | ✓ | ✓ | — |
| EA Sports FC 25 | — | — | ✗ | ✓ | ✓ | ✓ | ✗ | ✗ | ✓ | ✓ | ✓ |
| Elden Ring | ✓ | — | ✗ | ✓ | ✗ | ✗ | ✗ | ✗ | ✗ | ✗ | ✗ |
| Hogwarts Legacy | ✓ | — | ✓ | ✓ | ✓ | ✓ | ✓ | ✗ | ✓ | ✓ | ✗ |

Note. EA Sports MVP Bundle is the 10th best-selling game, but as this was a bundle of two higher-ranked games, this was excluded, and the 11th best-selling game Hogwarts Legacy, was included instead.

Table 4 follows the same format as Porter and Kientz (2013) for evaluating how well the best-selling games (Clement, 2024; Garcia, 2025) of 2024 performed against the criteria. Notably, whilst there is some increase in the advertising of accessibility features, there is a widespread decrease in sound alternatives and colour-blind accessibility. This indicates that whilst there is increasing awareness, many developers still do not prioritise accessibility features.

Expert Insight

Marijn Rongen, website operations and regular contributor at Can I Play That? (Can I Play That? n.d.), responded with insight into the accessibility topics I inquired about.

1. *Engagement - What single accessibility feature, in your view, most improves player engagement?* Rongen highlighted legibility as a critical factor in improving player engagement. They pointed out that the small text, poor contrast, and a lack of narration can prevent players from easily perceiving information, causing frustration described as the poison of meaningful engagement. This aligns with the understanding that accessibility barriers can affect a player's ability to maintain a flow state, as described in flow theory, which emphasises the importance of balancing challenge to avoid frustration.
2. *Usability barrier - Which common design choice still creates the greatest usability barrier in 2025?* They suggested legibility could also be an answer to this question; however, they acknowledged control remapping as a significant usability barrier. They highlighted how some buttons, notably thumbstick presses, can be physically hard to press. This leads on to their point that this can impact a player's ability to participate, and whilst they mention tools for system-wide remapping exist, it can be inconvenient. Games should include these features to address their barriers.

3. *Workflow practice - When studios succeed with accessibility, what is the one workflow practice that makes the biggest difference?* Rongen highlights how the most impactful practice is engaging with accessibility at the earliest design phases. These considerations can assist developers in identifying and mitigating preventable barriers such as game mechanics reliant on colour or lacking functionality to scale small text.
4. *Looking ahead - What emerging accessibility trend or technology isn't getting enough attention for the next five years?* Rongen believes that blind accessibility, particularly narration, remains a difficult topic for many studios. They also go on to discuss trends of prioritising profit, lack of vision, and corporate management not valuing human insight as wreaking havoc on the industry, citing that accessibility can only thrive when people are given the opportunity to make a difference.

Case Studies

In this section, the focus will be on various case studies that will examine the effect of accessibility options on a game. It will consist of varied cases from big studios to indie games. Statistics will accompany each game to give background information and various insights into each game.

Table 5

Comparison of the games against IDGA SIG Top Ten 2010

Guideline fully met: ✓ Guideline partially met: — Guideline not met: ✗

| Game Title | Controller Reconfig | Alternative Controllers | Sound Alternativ | Volume Contro | High Visibilit | Colorblind Fre | Difficulty Contr | Speed Control | Practice/ Control | Accessible Tuto | List e Menus | Features |
|-------------------------|---------------------|-------------------------|------------------|---------------|----------------|----------------|------------------|---------------|-------------------|-----------------|--------------|----------|
| The Last Of Us Part Two | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| Marvel Rivals | ✓ | — | — | ✓ | ✓ | ✓ | ✗ | ✗ | ✓ | ✓ | ✓ | ✗ |
| Cuphead | ✓ | — | ✗ | ✓ | — | ✗ | — | ✗ | ✓ | — | — | ✗ |

Table 5 shows that games with a focus on accessibility easily meet the IDGA GA-SIG top ten guidelines. It also shows that both popular indie and large studios still struggle to meet the basic needs of disabled users.

The Last Of Us Part II

The Last of Us Part Two by Naughty Dog was chosen as a prime case study for what accessibility in games should look like, as it has been previously established as a standard that other games should aspire to (Kiecko, 2024). The game design methodology included making accessibility a top priority and achieving high standards by hiring consultants with varying disabilities (Bayliss, 2020b). This is further evidenced by the early prototypes, such as low vision mode, that date back to 2018 (Bayliss, 2020a).

Figure 1

Early low vision mode prototype from 2018

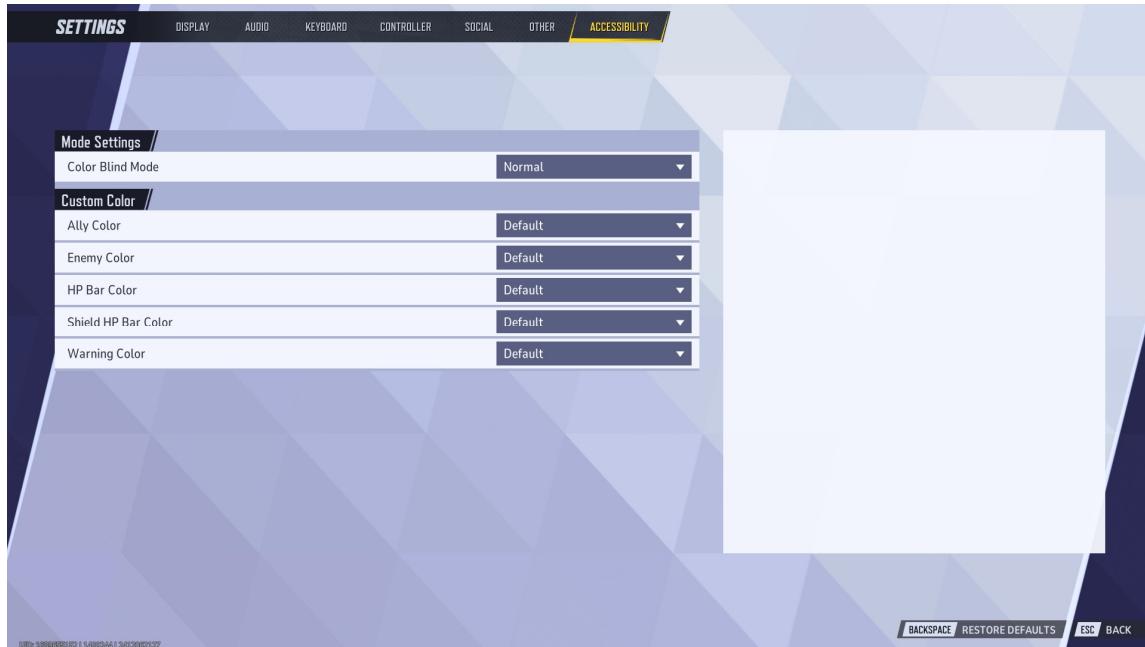


Note. This figure showcases a low-vision mode accessibility prototype created in 2018 and posted to Lead Systems Designer at Naughty Dog, Matthew Gallant's YouTube channel at <https://www.youtube.com/watch?v=-sGRc9TttGk>.

The result is a game with virtually no barriers due to the sheer number of options, over 60, which sets a new standard of accessibility in gaming (Moscoso, 2020; Kiecko, 2024). This removal of barriers allows for an improved, enjoyable player experience for those with hearing, vision, or motor issues. This player agency is afforded to the player by way of including accessibility options, further supporting the wider player base in customising player experience to suit a variety of preferences, as supported by anecdotal evidence in a Reddit thread (Reddit, 2022). The game has sold over 10 million copies, making it one of the biggest commercial successes in the industry (Francis, 2022). Whilst there is no direct link that can be made between accessibility options, it can be suggested that the game's comprehensive accessibility suite impacted the broader audience appeal by offering a customisable experience, and making the game inclusive for disabled players. Consultants who worked on the game described the importance of inclusive design by increasing the potential audience that can play and enjoy the game, even if it is picking the “Low-Hanging fruit” of accessibility (Bayliss, 2020b).

Marvel Rivals

Marvel Rivals is a “Superhero Team-Based PVP Shooter” developed and published by NetEase Games, the parent company of Riot Games. This game was chosen for a case study to examine the modern standards of accessibility implementation on big multiplayer AAA releases. *Marvel Rivals* has limited accessibility options, with only a dedicated accessibility tab for various colour-blind settings.

Figure 2*Marvel Rivals accessibility settings tab*

Whilst the game has been a commercial success, some accessibility issues have arisen. WallsiesDGP (2024) described an issue with the game not supporting third-party software required for his controller to work, and having to find alternate software to play the game. On Steam discussions, some players have brought up issues with the visual display, such as screen shake causing pain due to a neurological condition (Squirrel_at_war, 2025), and the flashy UI elements causing headaches (Succ Nasty, 2025). Green (2024) described the accessibility suite as standard but limited when compared against other online shooters. Before the game's release, developers talked about the importance of player accessibility to them in terms of introducing new players who may have never played the genre by allowing the freedom to learn in practice modes and custom games (Fiddis, 2024). Notably, including censorship in *Marvel Rivals* (O'Keefe, 2025) could pose an accessibility issue to those who rely on text chat communication (Ellcessor, 2016; Powers et al., 2015).

This game has focused on the low-hanging fruit of accessibility, including colour-blind options, button remapping, and subtitles, resulting in reasonably high user satisfaction rates. While it does not accommodate all users, those accommodated have customisation options that can positively affect their gameplay experience.

Cuphead

Cuphead is an indie game developed by Studio MDHR in 2017. Importantly, this game was picked for a case study due to its popularity combined with the difficulty of the game. Evans (2024) describes the game as mechanically complex, mocking the player's death count and drawing on comparisons from *Celeste*, which is described as being more empathetic. These differences extend into accessibility, as although the game has 22 accessibility options to prevent unintended barriers to the gameplay (Family Gaming Database, n.d.), difficulty assist modes similar to *Celeste* can only be replicated in *Cuphead* by the use of mods (Bayliss, 2020c). The game has a distinct art style, leading to critical acclaim and commercial success, namely selling over one million copies in the first two weeks of its release (McGowan, 2019). However, whilst the challenging “run-and-gun” gameplay can be a valid artistic choice, it is worth considering if this approach alienates potential players who will be unable to experience aspects of the game such as art and story (Kuchera, 2017; McGowan, 2019). Ultimately, difficulty is the player experience for the game; however, designing difficulty accessibility is not about removing challenge and engagement, but rather offering customisation options so that the game difficulty can be adjusted to cater for players with varying levels of skill or impairment (Vanessa / PleasantlyTwstd, 2021).

Accessibility Survey

This section will focus on the data received from an accessibility survey (Appendix B) posted in the Reddit communities r/DisabledGamers and r/Gaming.

Table 6

Respondents of the survey

| Respondent | Disability | Most Used Accessibility |
|-------------------|--|---|
| | | Feature(s) |
| Respondent 1 | Fibromyalgia, neuropathy, and Post-traumatic stress disorder (PTSD) | Subtitles; Difficulty tweaks; joystick mapping options and physical locations of joysticks during gameplay, also what value a violence on and off button has on many games; |
| Respondent 2 | Autism, Fibromyalgia, and joint hypermobility syndrome | Subtitles; Those cool filters that turn off depth of field, film grain, and all the other artsy stuff a game does not need; |
| Respondent 3 | Postural orthostatic tachycardia syndrome (POTS), fibromyalgia, nerve hypersensitivity to pain, and migraines | Subtitles; Key rebind, using toggle instead of hold down (ex., Minecraft shift and ctrl); |
| Respondent 4 | No disability | Subtitles |
| Ila | Nerve damage right shoulder, rheumatoid arthritis (Especially in hands), degenerative disc disease (back, hips), osteoarthritis (all joints) | WASD device from www.reddit.com/user/VCRchit |
| S. Kyle McKenzie | Peripheral neuropathy, near-total loss of function in the dominant right hand, auditory processing disorder | Subtitles; Not generally considered an accessibility feature, but the ability to remap every control is vital. |

| | | |
|--------------|--|---|
| | (APD), and probable autism spectrum disorder | |
| Respondent 7 | Functional neurological disorder (FND), fibromyalgia, and autism | Subtitles and Difficulty tweaks |
| Respondent 8 | Congenital heart defect, cerebral palsy, legally blind (due to lack of peripheral vision), autism, and dyslexia. | Subtitles; Keybind remapping, and HUD size adjustment (zoom); |

Note. This table shows the answers of eight respondents from the accessibility survey.

Table 6 indicates that subtitles, keybind remapping, and difficulty tweaks are the most commonly used features across the participant pool. This highlights the theme that player-oriented accessibility is vital to improving usability engagement. Notably, many of the features mentioned rely on configurable options like remappable controls.

Most respondents enable at least one accessibility option when playing a new game; there was also a consensus that accessibility options in games, both indie and triple-A, met their needs. Respondents also, for the most part, acknowledged that accessibility significantly impacts the usability of games and their player experiences. However, uniquely, the impact of accessibility on the player experience was rated higher than the impact on game usability.

Participants were asked to share a game whose accessibility either impressed or disappointed them, and their current perception of the industry's accessibility. Whilst responses were mixed, several recurring themes emerged. Firstly, many respondents praised the customisation of games, and only one participant noted that they were both impressed and disappointed with *The Last of Us Part I* on PC, citing it being designed for controllers, leading to awkward key binds. There was a vast array of accessibility features that highlight how accessibility needs can often differ depending on the game itself, although many accessibilities need remain prevalent across game genres. Perceptions about accessibility

were surprisingly mixed, respondent 1 believed the industry is on the upswing, and commonplace. Respondents 4 and 8 think the industry has improved and does quite well but still has some big steps to make. Ila and McKenzie cite that the industry does not care about accessibility, with points about the idea of accessibility being more important to studios and accessibility often being an afterthought as a result of ignorance or blatant disregard.

Respondent 3 criticised the industry for targeting the low-hanging fruit of accessibility. Conversely, Respondent 7 noted that the industry did very well to accommodate them, and they were concerned that the industry would change due to the disabled community pushing those features as shameful. These differing views illuminate how accessibility needs are diverse and can affect individual experiences, expectations, and frustrations. Whilst several participants feel the industry is progressing, others remain sceptical. Particularly noteworthy is the contradiction between technical implementation and the game's reception, as implementing accessibility features may be undermined by the player base, as is the case with *The Last of Us Part I*, leading to disappointment due to those expectations. These views not only emphasise inclusive design but also support advocating and normalising accessibility within the games industry.

In conclusion, the survey responses support that accessibility significantly impacts usability and engagement within games, especially by including configurable accessibility features like key remapping and difficulty options. They support the idea that designing for individual experiences is the best practice for inclusive design. However, it also revealed a greater need for better communication and more consistent design practices, not just as an afterthought to meet disabled needs but as a core design value.

Discussion of findings & Analysis

From case study analysis, it is clear that accessibility implementation varies greatly depending on the studio. Whilst games like *The Last of Us Part 2* have excellent implementation, other commercial successes often do not have very good implementation of game accessibility. Industry reports clearly show that developers are becoming increasingly aware of the diverse needs of their players. However, many games are still not prioritising accessibility and falling short of making their games accessible. This inconsistency demonstrates a lack of industry standardisation and could link back to the lack of a universal framework. Moreover, even when studios are aware of accessibility, they may lack the knowledge or resources for successful accessibility implementation. This is where a framework could support developers in at least having a starting point for implementing accessibility options.

Contrary to some beliefs, the literature appears to support the idea that accessibility options enhance player engagement and usability. It shows that inclusive game design is not only economically viable but also benefits the wider player base by allowing for more customisable experiences. These accessibility options can support players in achieving the flow state by reducing unnecessary frustration from gameplay, allowing for a more enjoyable experience. As suggested by flow theory, attaining the right balance between challenge and skills is the way to increase player enjoyment, and accessibility is a way of balancing these elements for players with impairments, making it easier for them to reach a flow state.

Survey data also supports these findings, as the majority of respondents, including the participant without a disability, agreed that accessibility options had a positive impact on their usability and engagement metrics. Features such as key remapping, difficulty tweaks, and subtitles were most commonly used amongst the participant pool, indicating a demand for customisable experiences. This ties in to accessibility features, not only supporting disabled

users' needs but also improving the overall player experience by catering to players' individual preferences and needs.

Developer perceptions and middleware play a critical role in implementing accessibility options. Without internal advocacy, many games will not even implement the low-hanging fruit of accessibility. Some accessibility options are less likely to be implemented, while others are seen time and time again when it comes to cognitive impairment; as these are less visible, they may be unaccounted for. Furthermore, when it comes to disability, games may fail to implement adequate accessibility features to ensure the challenge remains as intended. Developers may also hesitate to change core game mechanics when they perceive this to be a part of their game's identity, particularly in games that view difficulty as a part of their core game loop.

One big issue raised was how developer internally frame accessibility within their organisations. When accessibility is a burden and lacks advocacy, it is more likely to be implemented later in the development pipeline, which makes its implementation more difficult. As Marijn Rongen highlighted, implementing accessibility in the early stages of the development lifecycle is the best practice as it makes handling these features easier. This sentiment was echoed by several survey participants.

The data also revealed some contrasting views within the disabled community, with each respondent having their own unique view of the state of accessibility in the games industry. Several believe it's headed in the right direction, but others do not, and each participant often mentions a concern or reservation they have about game accessibility. This split in opinions might give insight into gaming culture, where accessibility is used politically or misunderstood despite its considerable benefits. This indicates further research may be required in this area to accurately ascertain the differing views of disabled gamers; however,

regardless, it is clear studios should prioritise individual experiences over generic implementations.

Unfortunately, while there is increased awareness of game accessibility, it is still very much an untapped area of game design. This can allow developers to target an underrepresented target audience; however, it may be difficult for developers to achieve this with the lack of middleware support or a standardised universal framework. Due to this, many barriers will still go unaddressed in modern game design. Furthermore, the accessibility survey that was conducted shows how difficult it can be to implement accessibility to a satisfactory level at times.

In many cases, middleware such as Unity or Unreal Engine underperforms in offering game-ready accessibility tools, which means developers have to constantly recreate these tools for each game they work on, which is repetitive and time-consuming. This can be expensive and a resource burden, especially for indie studios. Introducing better engine support could simplify the implementation of accessibility features, improving the accessibility of accessible game design and encouraging developers to design more accessibly. These shared tools could benefit developers as they could contribute towards a universal accessibility framework. Middleware has been cited as a major barrier to industry adoption of game accessibility. By introducing these tools into game engines, they could also attract accessibility focused developers and offer a chance for other developers to learn about inclusive design practices.

This leads to the next issue, the lack of a universal framework. Without a universally accepted framework, developers can not know if they have done enough to meet accessibility requirements. This is only amplified by limited feedback from disabled players. Introducing a framework within the organisation could help develop accessibility in-house. Games could

also be given ratings dependent upon accessibility features, which would also inform players what features a game includes. One prevalent issue was that once a game had made an effort to implement accessibility features, they did not advertise this feature anywhere visible to let players know. Ultimately, many games do not include accessibility options, and the player isn't going to know unless the developer tells them it has accessibility support. Moreover, when games fail to advertise these features, they would have invested in them for little reason, especially if the feature lowers accessibility barriers for certain groups of people. One solution to this is dedicating an accessibility page to inform potential players what features are included.

Recommendations for Practice

Improving accessibility in games not only requires a structured approach to implementing features but also a foundational change to core values to place a strong belief in accessible game design. The following recommendations are synthesised from the conducted research to offer a realistic approach to successfully implementing accessibility within games.

An understanding of game accessibility and its benefits.

A fundamental recommendation is that studios understand the importance of implementing accessibility options within their games. It is not a checklist or afterthought; it is a core principle of inclusive design. This can allow developers to understand why they are implementing certain options and find unique solutions to making game mechanics accessible, as every game will have individual needs. Many developers believe that accessibility options only benefit players with impairments, bringing attention to the importance of developing a strong understanding that accessibility options benefit all players, which can also ensure that accessibility remains a priority. Features such as key remapping, sound indicators, or subtitles can improve the experience for all players as they can better

meet their individual preferences. Developers must also acknowledge that accessibility and usability go hand in hand, as disabled players may require accommodations to enjoy their game. Designing for everyone can increase the audience that can play their game, increase reach, and enhance the overall game quality. Developers who understand the broad impacts of accessible game design are more likely to start including the practice in design phases, which is the most important place for these considerations.

Following a framework for implementing accessibility options

Adoption of an existing framework is highly recommended to achieve accessibility goals and guide accessible game design practice. By following a framework, such as game accessibility guidelines or accessible player experiences, developers can aim to improve the accessibility of their games by following a standardised approach. These frameworks can provide a point of reference for designing accessibility. They can highlight potential accessibility barriers and ensure a thorough level of accessibility implementation in all aspects of the game. Frameworks can provide checklists and design theories for cognitive, motor, auditory, and visual impairments. This means that developers can have an understanding of what different disabled players may require within their game and give specific aims for developers to introduce accessibility features to support them. For smaller studios, indie developers, or solo developers, a framework can substitute for the lack of accessibility specialists who would be able to give feedback on various limitations within the game.

Involving disabled users in the developmental and testing phases

Acknowledging that a big part of game accessibility is customisation, it is important to gain valuable feedback while implementing features to ensure usability. This prevents accessibility from becoming an afterthought. This will also increase the game's potential

target audience, allowing for more sales on release. Involving disabled players in the design process will allow developers to create meaningful accessibility features during the prototype phases and refine these systems to meet the required accommodations. Bringing in these individuals during ideation phases can also ensure accessibility does not arise during game production, and consistent testing will ensure the game remains accessible through the development lifecycle. This will also align with how disabled players will actually play games, in contrast with theory and frameworks that can only help so much.

In conclusion, game accessibility is a complex concept that involves many moving pieces coming together to create inclusive practices. By understanding broader impacts, following a framework, and involving disabled gamers, developers can ensure their games have strong accessibility implementation that can improve the usability and engagement of their games.

Limitations of the Study

Due to the lack of research into this topic, the study heavily relies on secondary and non-academic sources, which can affect the quality of the arguments in the paper. Although the body of literature on game accessibility continues to expand, various research gaps exist, such as the percentage of disabled gamers. Furthermore, there is often a distinct lack of quantitative and qualitative data about accessibility options, leading to reliance on correlating patterns, forum posts, and user reviews to support arguments. This lack of data can result in differing viewpoints on similar areas. The fact that many games also fail to list or discuss accessibility features means that collated data could be inaccurate or outdated. To further the arguments, collecting primary data through structured surveys with interviews to answer the given question more aptly may have been complementary. Without it, opinions were collated

in a non-standardised way that could lead to misinterpretation or bias, affecting the study's methodological rigor.

Additionally, the limited size and scope of the primary data collected impact the accuracy of the responses. Reproducing the survey with a different sample group could result in a completely different dataset with contrasting arguments to the original survey answers. The small participant pool and the voluntary nature of the survey further amplify the fact that the participants could be a specific subset of the disabled gaming population. Moreover, the survey lacked primary data from non-disabled gamers, which could have acted as a control group and offered more unique insights into accessibility awareness outside the disabled community. This could mean the responses do not accurately represent most players' experiences regarding accessibility options, and less vocal players are even more likely to be excluded from giving valuable feedback.

A related limitation is the diversity of impairments featured in the participant pool, as many of the participants have similar or overlapping disabilities, meaning some disabilities may have been underrepresented. With accessibility needs differing vastly between impairment and individuals themselves, these generalised experiences might unintentionally exclude some impairments from receiving recognition or acknowledging the barriers they may face. While this dissertation has attempted to offer differing viewpoints, the limitations listed could lead to inaccurate conclusions that are not reflective of some player views.

Finally, there is the limitation of author bias. Although every effort has been made to ensure a rigorous, objective review of the data, it must be acknowledged that as a game designer and as someone without a disability, there is a distinct possibility these factors could have influenced which arguments were made, how issues were prioritised, and the choice of

sources to analyse. Whilst external, reliable sources of views on accessibility have been included, there remains potential for skew within the dissertation's findings.

Another limitation was the practical time constraints of this dissertation. With more time, it would have been possible to collect more data, conduct surveys with interviews, and even set up controlled environments to test the impact of accessible features on player experience. Additionally, time could have allowed for a thorough analysis of development pipelines or the ability to track the introduction of accessibility features over time on external projects to measure the impact, as many of the claims about accessibility within development pipelines rely on secondary data sources.

Future research could address these limitations by extending participant pools, involving more structured surveys with conducted interviews, and establishing frameworks for analysing case studies, theories, and primary data for fairer conclusions.

Conclusions

In conclusion, this dissertation explores how accessibility options influence player engagement and usability. Through a literature review, analysis of case studies, and analysis of an accessibility survey, it has become clear that accessibility options are not just a tool for inclusion but rather an essential element of effective game development. Accessibility promotes many aspects of universal design that allow for a more customisable, immersive, and enjoyable experience for all players. The findings of this paper highlight the importance of implementing accessibility options as early as possible in game development. Key frameworks such as Accessible Player Experiences and Flow theory support how game accessibility can align with overall game quality and player satisfaction. The research indicates that implementing accessibility options often comes with many positive traits, such as increased retention rates. The benefits of accessible game development often outweigh the

developmental costs, which raises questions about why more studios have not adopted accessibility-focused approaches.

The role of middleware has been identified as a critical barrier that prevents developers from implementing accessibility options, as they would continually have to develop the same functionality repeatedly. This can hinder the studios with accessibility awareness, which leads to the barrier that many developers are simply unaware of disabled players' needs. This is amplified by the lack of a universal framework for developing game accessibility options. Furthermore, a lack of inclusion of disabled players in the testing phases can be detrimental to ensuring games remain inclusive. These factors result in implementation relying on developer awareness, advocacy for accessibility, and the resources available. Whilst we have established that developer awareness is rising, middleware must be capable of fulfilling its role in allowing for accessible game design, as the consistency of accessibility options remains a key challenge for studios.

Case studies and survey data also support findings that the games industry needs a more accessible approach focused on developing games. To ensure games remain inclusive, accessibility considerations must be implemented in ideation phases. These sources also support the idea that accessibility options significantly increase usability and engagement. It is important for developers to consider how to use inclusive game design to ensure player bases can find a balance between challenge and skill as described by flow theory, increasing player engagement. Importantly, it is clear that accessibility features improve usability and engagement for all players regardless of whether they have a disability or not. Current perceptions and key data indicate that the industry is becoming more accessibility aware. However, it must be noted that advocacy is still required for industry adoption. Moreover, accessibility must remain a priority for studios to prevent it from becoming an afterthought in

the game development pipeline, with an emphasis on individual experiences over short-term profits.

Finally, accessibility is a vital part of inclusive game design that should not be treated as optional or secondary but as essential to creating high-quality games. Developers, particularly those with more significant resources, should lead the industry towards more standardised, user-centered game design practices.

Further Questions

Whilst this research has provided valuable insight into the way that accessible game design can impact player experiences and games themselves, there are still several important questions remaining:

1. How can disabled users be more involved in game design beyond the testing phases to help promote and advocate for inclusive game design practices?

This question looks into how people with disabilities can be more involved as more than testers but co-creators within the game industry. In the current climate, many accessibility specialisations already exist. However, it may be beneficial to include the wider disabled community in the game development to advocate for accessibility features that will allow them to play the games they are helping develop.

2. What role can accessibility play in eSports and competitive gaming, particularly regarding fairness and participation?

Accessibility in esports is a topic that combines fairness and inclusion. How can games be more inclusive of disabled players while maintaining fairness in competitive gaming

environments? What accessibility options can enable the disabled gamer to participate more easily in competitive gaming or even professionally?

3. How might middleware evolve to include native support for accessibility options, improving the feasibility of implementation?

Could the evolution of middleware solutions in game engines such as Unity and Unreal support developers in implementing accessibility options, and would this improve the feasibility of implementation for smaller studios? Exploring this question might also involve discovering associated technical constraints or opportunities and monetary benefits of such a system, as they could attract accessibility-focused developers or studios.

4. Could future legislation standardise accessibility in the gaming industry, similar to web accessibility laws?

Frameworks such as the Web Content Accessibility Guidelines (WCAG) already ensure that web content is accessible. Similar frameworks could enforce the same game industry standards, undoubtedly impacting studio development and compliance practices. This would also further discuss what universal accessibility framework would be used.

5. What is the role of AI in accessibility, and how can it adapt in real time to player needs?

The rise of AI, especially in game development environments, begs the question of whether AI can be used for accessibility advantages. AI could assess player skill levels to adjust difficulty levels to help players maintain a flow state. It could also assist players in navigating menus or even completing parts of the game for them, should they get stuck. Removing many frustrations for accessibility purposes could not only have a profound effect on lowering accessibility barriers but also improve the experience for all players.

6. How can accessible design be taught more effectively in game design education?

Whilst there are many advantages to designing games accessibly as inclusive game design practices are good for all players, accessibility is often not taught in mainstream game design education. Placing more value on APX in relation to other theories that are already taught, such as flow theory, can help encourage inclusive design practices and allow developers to implement designing accessibly into the workflow at any early stage, allowing it to become second nature. This would also solve the issue of many developers simply being ignorant of player needs and accessibility barriers within their games.

Overall, answers to these questions could serve as a platform for expanding the outreach and impact of accessibility on the game industry. Moreover, contributing to the body of research could assist with making arguments for developers to do more to lower accessibility barriers and integrate inclusive game design practice.

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Appendix

Appendix A: Email Correspondence with Margin Rongen, Can I Play That?

Hi Jacob,

My answers follow below, I hope they aren't too long! Feel free to cite my name and our organisation if that is useful for this project.

Engagement:

What single accessibility feature, in your view, most improves player engagement?

I'm going to cheat a little and say legibility. Whether it's a too small text size that can't be adjusted, text colors that don't work well with the background colors, or missing narration. If players can't (easily) perceive the information the game provides they will experience frustration, and frustration is poison for meaningful engagement.

Usability barrier:

Which common design choice still creates the greatest usability barrier in 2025?

Here legibility could also be an answer, but I'll give this one to omitting the ability for players to change (remap or rebind) the controls of the game. Some buttons are hard to press physically, thumbstick clicks are notorious. Not being able to change controls can mean a player simply isn't able to play. System wide remapping is possible on consoles or through apps on PC, but that changes controls for everything which is not necessarily preferred. It should be included in the game, to address potential control barriers for that game alone.

Workflow practice:

When studios succeed with accessibility, what is the one workflow practice that makes the biggest difference?

Regardless of workflows and practices used in a studio, including accessibility from the start is the best practice. Including accessibility from the earliest design steps helps catch any potential accessibility issues before they are designed or developed into the game. That often means a barrier can be avoided entirely, like making sure nothing depends on the players differentiating colors. Options that are needed to mitigate other barriers can be identified and developed accordingly without undoing past work, such as making sure text size is adjustable.

Looking ahead:

What emerging accessibility trend or technology isn't getting enough attention for the next five years?

This is difficult to say, as accessibility is growing fast with innovations following each other rapidly. If I had to point to one thing, I fear blind accessibility and especially narration remains a difficult topic for many studios. If I had to point towards a trend, I would say the value of human experience and insight might not get enough appreciation from corporate management. The focus on quick profits and lack of vision is wreaking havoc in the industry, and accessibility can't thrive unless the people are given the chance to make a difference.

If there is anything else I can help with, feel free to send me follow-up questions. And I'm looking forward to the final PDF. Best of luck with the project!

With kind regards,

Marijn Rongen (he / they)
 Can I Play That? - Website operations
Fluent in English and Dutch (based in the Netherlands)

On Sat, Apr 19, 2025 at 6:07 PM Jacob Villard <J.S.Villard@edu.salford.ac.uk> wrote:

Hello Marjin,

I hope this email finds you well. I'd be grateful for **brief expert insight** from someone in your organisation.

Four short questions (bullet-points are perfect):

1. **Engagement:**
What single accessibility feature, in your view, most improves player engagement?
 2. **Usability barrier:**
Which common design choice still creates the greatest usability barrier in 2025?
 3. **Workflow practice:**
When studios succeed with accessibility, what is the one workflow practice that makes the biggest difference?
 4. **Looking ahead:**
What emerging accessibility trend or technology isn't getting enough attention for the next five years?
-

How your answers will be used

- Replies will be quoted **anonymously** unless you expressly allow your name and organisation to be cited.
- All data will be used solely for this academic project, which is due **25 April 2025**.
- Once the dissertation is marked, I'll be happy to send you the final PDF.

If you can help, simply reply to this email whenever convenient—any time before **24 April** would be fantastic.

Thank you very much for considering this request.

Best regards,

Jacob

Undergraduate Student – Games Design & Production
School of Arts & Media, University of Salford
j.s.villard@edu.salford.ac.uk

Appendix B: Accessibility Survey Questions and Results

| Response | Name (Optional if you want to be refenced by name, otherwise you will be anonymous) |
|----------|---|
| 1 | |
| 2 | |
| 3 | |
| 4 | |
| 5 | Ila |
| 6 | S. Kyle McKenzie |
| 7 | |
| 8 | |

| Response | Do you self-identify as having a disability that affects gaming? |
|-----------------|---|
| 1 | Yes |
| 2 | Yes |
| 3 | Yes |
| 4 | No |
| 5 | Yes |
| 6 | Yes |
| 7 | Yes |
| 8 | Yes |

| Response | Please list any disabilities you have (if comfortable). |
|-----------------|---|
| 1 | Fibromyalgia, neuropathy, ptsd |
| 2 | I got weapons grade Autism, this bitch be on the colour and tism spectrum. I got a bit of that hypermobility joint syndrome, these joints are as loose as my morals. I got that Fibro too because Dr's couldn't be arsed diagnosing me with something cooler. |
| 3 | POTS, fibromyalgia, nerve hypersensitivity to pain, migraine |
| 4 | |
| 5 | Nerve Damage - R shoulder from ex-husband RA especially in hands Degenerative Disc Disease back, hips Osteoarthritis in all my joints |
| 6 | Peripheral neuropathy, almost total loss of function in dominant hand (right), auditory processing disorder, probable autism spectrum disorder, |
| 7 | FND, fibromyalgia, autism |
| 8 | Congenital heart defect, cerebral palsy, legally blind due to no peripheral vision, autism, dyslexia, others that aren't important to this |

| Response | Rate how often you enable at least one accessibility feature when you play a new game. |
|-----------------|---|
| 1 | 10 |
| 2 | 10 |
| 3 | 9 |
| 4 | 2 |
| 5 | 7 |
| 6 | 10 |
| 7 | 9 |
| 8 | 10 |

| Response | Which accessibility features do you use most? |
|-----------------|--|
|-----------------|--|

| | |
|---|---|
| 1 | Subtitles;Difficulty tweaks;joystick mapping options and physical locations of joysticks during gameplay, also what value a violence on and off button on many games; |
| 2 | Subtitles;Those cool filters that turn off depth of field, film grain and all the other artsy bullshit a game doesnt need; |
| 3 | Subtitles;Key rebind, using toggle instead of hold down (ex. minecraft shift and ctrl); |
| 4 | Subtitles; |
| 5 | WASD device from https://www.reddit.com/user/VCRchitect/ ; |
| 6 | Subtitles;Not generally considered an accessibility feature, but the ability to remap every control is vital. ; |
| 7 | Subtitles;Difficulty tweaks; |
| 8 | Subtitles;Keybind remapping, hud size adjustment (zoom); |

| Response | The accessibility options in recent AAA games meet my needs. |
|----------|--|
| 1 | 6 |
| 2 | 10 |
| 3 | 9 |
| 4 | 8 |
| 5 | 4 |
| 6 | 6 |
| 7 | 10 |
| 8 | 9 |

| Response | The accessibility options in recent Indie games meet my needs. |
|----------|--|
| 1 | 9 |
| 2 | 10 |
| 3 | 8 |
| 4 | 8 |
| 5 | 4 |
| 6 | 7 |
| 7 | 10 |
| 8 | 10 |

| Response | How would you rate the impact of accessibility options on the usability of a game for you? |
|----------|--|
| 1 | 10 |
| 2 | 2 |
| 3 | 7 |
| 4 | 9 |
| 5 | 3 |
| 6 | 6 |
| 7 | 7 |
| 8 | 9 |

| Response | How would you rate the impact of accessibility options your experience as a player? |
|----------|---|
|----------|---|

| | |
|---|----|
| 1 | 10 |
| 2 | 1 |
| 3 | 10 |
| 4 | 8 |
| 5 | 3 |
| 6 | 6 |
| 7 | 9 |
| 8 | 10 |

| Response | Name one game whose accessibility impressed (or disappointed) you and why. |
|----------|--|
| 1 | <p>A lot of Nintendo's AAA games like Kirby the forgotten land, and Luigi's Mansion 3, and some other ones that don't allow button mapping one to another make it difficult. As certain buttons are much easier to access on my joysticks than others.</p> <p>For me accessibility tends to deal primarily with controllers. I only have a Nintendo switch as my hands have to be separated when playing for comfort sake and the split Joy cons are the only way to play any games that I own.</p> <p>Another accessibility option that I would enjoy in certain games would be a blood and gore off option. Some games like mortal Kombat 11 can get a little intense for me.</p> |
| 2 | <p>Never opened up a game and thought this games got accessibility, all my needs are met through basic accessibility. I have never once cared nor thought about a game having extra features. I'm not going to put a game down bc it doesn't have the option to remove camera shake or depth of field, especially not when these games are £80 a pop, fuck you nintendo.</p> |
| 3 | Minecraft, the subtitles and option to toggle instead of hold down a key like shift/ctrl to sneak/sprint really helps with my hand fatigue/pain |
| 4 | Fortnite, as they've got an onscreen visual audio option |
| 5 | SPIRE BLAST is a very fun game, you can use your mouse, but it doesn't have a zen mode. They have other games I would be interested in purchasing, but again, no zen mode. I don't see many people talk about this being an issue for those of us with disabilities, but for me and those of my friends who feel discriminated against because of the lack of a zen mode, we feel it is an issue. |
| 6 | I was impressed, but somewhat disappointed in the accessibility of the Last of Us Part I on PC. There were some really cool accessibility features, and they were very customizable. I found that they weren't as helpful as I would have thought given the amount of effort and thought that was put into them. I remember that the controls were pretty clunky for me, but I would have to play again before I could be more precise. The game was clearly designed for a controller, which generally means I'll face control problems even after remapping everything. Controllers are designed to require simultaneous input from two hands across multiple modalities, so the controls often require bizarre and impractical controls, like "while hold aim, use the right thumbstick to select from the radial menu. Pressing "Y" while hovering over a weapon in the radial menu will rotate through ammunition types." |
| 7 | Dredge, with its ability to toggle no-fail fishing, made a game that wouldn't have been playable for me into one that was, due to my sometimes unpredictable reaction times. |
| 8 | Honestly the game called The Long Dark was one of the first games to implement a separate way of doing a task for those who had trouble doing it normally (spam |

clicking mouse button to fight off a wolf or bear being replaced with just holding down the button.). It also was the first game I saw to include emetophobia settings as well.

| Response | What is your current perception of how well the industry includes game accessibility? |
|----------|---|
| 1 | I definitely feel it's on the upswing and I enjoy that a lot. I think it's common in over 80% of the games available today in one form or another. I wouldn't consider it universal enough for me too feel comfortable just buying any game sight unseen, but I do think it is improving |
| 2 | Ask me this when I eventually get the family inherited arthritis gene and need a £70 joystick to play house flipper. You cannot and will not ever be able to include everyone, there will always be someone or something missed or skipped and that is life. I cant have an opinion on this because my needs are basic, for me its great I dont know any better. Just like you don't because you're fine. If I was disabled enough or had unique needs where games were actively letting me down and not making stuff accessible, id be annoyed and have a stronger opinion. |
| | Its like wheelchair ramps, you dont think twice about a place having one or not until you're either with someone in a wheelchair or are in one yourself. Same goes for this. |
| 3 | Eh, some basic accessibility features are in most games but not many games go all the way with adding things past the bare minimum (subtitles, color filters) |
| 4 | I think a lot of games tailor for a good variety of people in terms of accessibility quite well but there is always more then could do go the extra mile to accommodate people who need more. |
| 5 | I do not think the industry thinks about game accessibility much at all. Whether they are truly ignorant of the fact that we exist, or they believe we exist in such small numbers, that we won't have an impact on sales, we aren't important enough for them to consider. |
| 6 | I think that, as I see in every industry, the idea of accessibility is much more important than actually making games accessible. This can be caused by anything from well-intentioned ignorance to blatant disregard for actual disabled users. I think that accessibility is generally an after thought, that there is a very narrow understanding of the range of disabilities, and that companies refuse to put the work in to help users with more than one issue. |
| 7 | The industry does great, at least for the accommodations I personally need. However, the community often pushes those accessibility features as shameful and I worry the industry will change when they hear those dominating voices. |
| 8 | It's definitely better than when I started gaming as a child but I think there are definitely some big steps needing to be made. |

| Response | I agree that my answers may be used in an academic dissertation. |
|----------|--|
| 1 | Yes |
| 2 | Yes |
| 3 | Yes |
| 4 | Yes |

| | |
|---|-----|
| 5 | Yes |
| 6 | Yes |
| 7 | Yes |
| 8 | Yes |