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Advancing Game Accessibility With Audio Description: User Perspectives and Recommendations

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Abstract

Since 2020, game accessibility has gained significant attention from both industry and academia. For players with visual disabilities, features such as screen readers, sound cues, contrast settings and, more recently, audio description (AD) have been a game changer. In fact, research on game AD is still in its early stages, and more studies are needed to explore user needs and preferences. This paper examines AD as a crucial accessibility feature in games, beginning with a review of its current implementation, which primarily focuses on non-interactive game content. It then outlines findings from the Researching Audio Description: Translation, Delivery and New Scenarios (RAD) Project, specifically focusing on insights gathered from fifteen interviews with blind and low-vision adults in Spain. The interviews cover three topics: lack of game accessibility, potential features for AD in games, and next steps for improving game accessibility. Key interview results highlight the potential of incorporating AD into game design to improve access to non-interactive content. The paper concludes with ten guidelines addressed at developers, researchers, and other stakeholders to enhance game accessibility, stressing the importance of integrating accessibility at all stages of development in collaboration with players with disabilities.

Key words: audio description, blind and low vision players, game accessibility, interviews, visual disability.

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Introduction

Video games, as interactive software, have traditionally been studied in the field of Audiovisual Translation from a localisation perspective (Bernal-Merino, 2014; O'Hagan & Mangiron, 2013). In recent years, the focus has started to shift towards game accessibility, which aims to remove the interaction barriers that prevent a person from playing video games, particularly those with disabilities (Mangiron, 2021). Many modern games now feature accessibility menus, allowing players to select options such as subtitles or difficulty levels, which helps to personalise the gaming experience based on individual needs and preferences.

One accessibility feature that has gained momentum since 2020 is audio description (AD), which makes games more accessible for people with visual disabilities by orally narrating visual elements on the screen. So far, efforts have focused on the AD of non-interactive content, such as cinematic scenes and scripted events, which take place without direct player control. This type of non-dynamic AD provides pre-scripted descriptions of visual elements without needing to adapt to real-time gameplay changes. However, applying AD to interactive sections of games presents additional technical and linguistic challenges, namely dynamically adjusting to players' actions and unpredictable in-game events in real time. Given the early stage of game AD, research is needed to explore the needs and preferences of players with visual disabilities, which will inform the broader implementation of this accessibility service in video games.

This paper presents the results of a set of interviews conducted in March 2021 with 15 adults with visual disabilities living in Spain. The study is part of the Researching Audio Description: Translation, Delivery and New Scenarios (RAD) Project and builds on the results of a previous survey about the gaming habits and needs of 106 blind and low vision adults in Spain (Larreina-Morales & Mangiron, 2024). After describing the current state of the art of game AD in both the industry and academic research, the paper outlines the methods and results of the interviews, focusing on three key topics: lack of game accessibility, potential features for AD in games, and the next steps for improving game accessibility. Results are then discussed, leading to the proposal of ten guidelines that aim to enhance game accessibility for blind and low vision players. The paper concludes by highlighting its main contributions, addressing its limitations, and suggesting directions for future research.

1. Audio Description in Video Games

Game accessibility is as old as video games themselves (Hamilton, 2022). The first accessibility features that were included in games were the option to adjust the level of difficulty, as in *Bertie the Brain* (Joseph Kates, 1950), and the option to adjust the font size and colour, as in the conversational adventure games developed by Infocom in the 1980s, such as *Zork* (1980). Later, in 1997, *Zork: Grand Inquisitor* (Activision, 1997) became the first commercial game to include subtitles for dialogues and sound effects, followed by other games, such as *Half Life 2* (Valve Corporation, 2004) (James, 2024).

In 2008, Ubisoft started to include subtitles in all of its in-house developed games to promote accessibility for the deaf and hard of hearing (Deleon, 2008).

Accessibility for players with reduced mobility was addressed for the first time in 1988, when Nintendo released the NES Hands Free Controller, featuring a joystick that players could control with their chins and a blow-and-suction device for activating buttons (Ellis, n. d.). In the 1990s, several popular games, such as *Street Fighter 2 Turbo* (Capcom, 1992), introduced customisable controls to enhance accessibility for players with mobility issues (Konvoy, 2024). In the early 2000s, some games started to include a practice mode, such as *Everybody's Golf* (Clap Hanz, 2000), and several games included adjustable levels of difficulty and the option to pause the game, such as *Dragon Age Origins* (Bioware, 2009).

However, the first turning point in game accessibility happened in 2003, when the International Game Developers Association's Game Accessibility Special Interest Group (IGDA GA-SIG) was founded to share knowledge and drive change in the industry to make gaming more accessible to all. Since then, continuous efforts have been made to enhance accessibility. For example, in 2015, *World of Warcraft* (Blizzard Entertainment, 2004–present) introduced a colourblind mode, which adjusts the game's colours, contrast, and visual cues to help players distinguish important elements more easily. In 2016, Naughty Dog released *Uncharted 4: A Thief's End*, featuring an accessibility menu with customisable options such as subtitles, automatic enemy targeting, and the option to hold or press a button once to perform an action (Europa Press, 2016). In 2018, the indie game *Celeste* (Matt Makes Games) introduced an assist mode, allowing players to adjust speed, become invincible, or skip levels.

Regarding motor accessibility, in 2018 Microsoft launched the Xbox Adaptive Controller, a device for Xbox consoles and Windows PCs, designed for people with reduced mobility. It features large programmable buttons, a large directional pad, and 19 ports for connecting various peripherals such as pedals, switches, and other controllers (Microsoft, n. d.). However, accessibility for blind players remained a pending issue, probably due to the visual nature of the video game medium and the misconception that blind people cannot play video games.

Nevertheless, this started to change in 2020, a year that can be considered the second turning point in the history of game accessibility, marked by a series of significant events. First, Ubisoft started including AD in their game trailers, such as *Assassin's Creed Valhalla* (2020) and *Watch Dogs: Legion* (2020). In 2019, Ubisoft was approached by Descriptive Video Works, a Canadian company that specialises in AD. At the time, they were researching how to include AD in games to make them more accessible. They decided to start collaborating with game trailers, as this type of AD is similar to the AD used in other cinematic products (Bayliss, 2021). This was the first time that AD was applied to game-related content, although it was not included in the actual games. It should be highlighted that Ubisoft has always been committed to accessibility, gathering feedback from users and working with disability advocates and accessibility consultants during the development process (Bayliss, 2020). In addition, the gaming community has become more vocal about their needs in recent years, prompting companies to listen and collaborate with users to improve game accessibility.

Another important event that took place in 2020 was the inclusion, for the first time ever, of the Innovation in Accessibility category in the Game Awards, the most prestigious and widely recognised award ceremony in the video game industry, in recognition of the efforts developers are making to foster accessibility. Finally, 2020 was also the year in which *The Last of Us Part II* (Naughty Dog, 2020) was released, which was hailed as "the most accessible game ever" (Molloy & Carter, 2020), as it included over 60 accessibility features and three presets for visual, hearing and motor accessibility (PlayStation, n.d.). It was developed with the collaboration of disabled players, which is in fact the latest trend in the industry, as accessible game design should be user-centric and focus on user needs and preferences.

Despite its multiple accessibility options, *The Last of Us Part II* did not include AD. As noted by players, AD of non-interactive game content (also known as *non-dynamic AD*) would enhance accessibility for users with visual disabilities. The implementation of non-dynamic AD is straightforward, as it follows the same conventions as AD in audiovisual products with no interaction, such as films (Sightless Kombat, 2020; Dale, 2021). Taking this feedback into account, Naughty Dog included AD in cutscenes across all localised languages in the remake of *The Last of Us Part I*, released in 2022. Other developers have followed suit, and a number of high-budget, major studio releases (commonly referred to as *AAA games*) now include AD for non-interactive sections of games, such as the finishing gruesome attacks to opponents (called *fatalities*) in *Mortal Kombat 1* (NetherRealm Studios, 2023), the state of the racing track in *Forza Motorsport* (Turn 10 Studios, 2023), and cutscenes, scripted scenes and quick time events in *Marvel's Spider-Man 2* (Insomniac Games, 2024).

However, providing AD for interactive sections in video games presents technical and linguistic challenges, as the narration must adapt to live gameplay, including player actions and randomly generated in-game events. Standard conventions for its features and integration into the game development process are still to be established for dynamic AD, which is only available in a handful of games. Examples include *Brok the InvestiGator* (COWCAT Games, 2022), *Cyberchase: Duck Dash* (Bridge Multimedia, 2022), and *Stories of Blossom* (Soft Leaf Studios, 2022). These titles were not discussed in the interviews presented in this paper, as the study was conducted before any games featuring dynamic and non-dynamic AD were released.

On the one hand, *Cyberchase* integrates AD through its programming, using variables that account for all possible player interactions. This means the game's code is designed to trigger relevant audio descriptions based on the specific actions a player takes. At the beginning of the game, the player controls a flock of birds that must avoid a series of obstacles on a three-lane track. The type and location of the obstacles are randomly generated and integrated into the code as variables, which are then addressed by the AD. For example, when the AD narrates: "A *thick cloud* appears in the *top* lane," *thick cloud* and *top* are randomly generated variables that change in each gameplay. When the player avoids the obstacle by moving to a different lane, the AD informs them of the flock's new location, such as: "The flock is in the *middle* lane."

On the other hand, the AD in *Brok* and *Stories of Blossom* describes characters, scenarios and objects, and it is triggered when the player interacts with them. This is an example of the opening sequence in *Brok*, with the AD describing the scene:

> Brok wakes up in a small apartment on fire. There are two doors, one on the right side of the room and one on the left. There are flames and debris blocking the door on the right, as well as some debris around.

If the player selects the door on the left, the screen reader reads: "Front door." Then Brok, the character, provides additional details about the object, integrated into the dialogue: "Nope. Front doors are usually impregnable. There must be another way to escape."

Although these games show that developers are making efforts to introduce both dynamic and non-dynamic AD in games, it is still at an early stage, and research is needed until it becomes standard practice in the industry. In the next section, an overview of recent research on game accessibility for players with visual disabilities is presented, with a focus on studies about the application of AD to video games.

2. Research on Visual Game Accessibility and Audio Description

In addition to industry developments, academia has started to show an interest in visual accessibility for video games, including the potential implementation of AD, with the objective of providing a more inclusive and enjoyable gaming experience for people with visual disabilities. As early as 2016, Mangiron and Zhang proposed that AD should be included in video games to make them more accessible to players with visual disabilities. They suggested including AD in cutscenes, as well as audios that would describe the visual elements in menus and the Heads-Up Display (HUD), where information useful for gameplay is displayed. They also highlighted the need to mix AD with other types of sounds in games without interfering with their function. Story-based games, such as adventure games, Role Playing Games (RPGs), and visual novels could be an ideal testbed for the application of AD (Mangiron & Zhang, 2016).

In 2018, researchers from Columbia University developed the Racing Auditory Display, an audio interface whose goal is to make racing games accessible to blind players (Smith & Nayar, 2018). The system may be implemented in existing racing games to improve their accessibility, and blind players may compete with the same speed and control as their sighted counterparts. The auditory display works with two sonification techniques: the sound slider, which helps the player understand their car's speed and trajectory on a racetrack, and the turn indicator system, which alerts players of direction, sharpness, length, and timing of upcoming curves in advance. The auditory display was integrated into a prototype racing game and tested with fifteen participants, including three blind users and twelve who were blindfolded. Results showed that, using the auditory display, an experienced blind player and a less experienced sighted player could play without significant differences between lap times or driving paths (Smith & Nayar, 2018).

The Researching Audio Description: Translation, Delivery and New Scenarios (RAD) Project, in which this paper is framed, started in January 2019 and finished in September 2022. One of its main objectives was to elucidate the needs and preferences of blind and low vision players in Spain regarding game accessibility and to garner their opinions about the potential inclusion of AD in games, as AD had not been implemented in video games at the time the project started. User research was carried out by means of a survey, which received 106 valid answers (Larreina-Morales & Mangiron, 2024), and follow-up interviews with 15 participants, which are the focus of this paper. Most survey participants (89.6%) were interested in game AD. They also thought that visual game accessibility should be addressed by "improving screen reader compatibility, enhancing sounds, and exploring AD in real-time game action" (Larreina-Morales & Mangiron, 2024, p. 578). Results also indicate that game accessibility for players with visual disabilities could be strengthened by combining the AD of graphics and images with a screen reader narration of on-screen text, such as menus, dialogue, and instructions.

In 2020, French company Be Player One conducted a survey addressed to disabled players to elicit the expectations and the barriers they encounter when playing games (Nourry, 2020). They received 330 responses, mainly from French-speaking participants, a hundred of which were from people with visual disabilities. Results show that participants considered that games did not provide enough accessibility options and that people with disabilities should take part in the design and evaluation of game accessibility (Nourry, 2020).

In 2021, the Brigstow Institute at Bristol University in the UK carried out the AD4Games project to "improve game accessibility by working with professional audio describers, game developers, and visually impaired participants" (Zhang, n. d.). The project tested three different methods to improve accessibility with AD, using the *Before I Forget* game (3-Fold Games, 2020). The first method involved audio describing game streaming, so that people with visual disabilities could enjoy the live streaming of gamers playing the game. The second method was AD-assisted game playing, whereby a player with a visual disability would play the game together with an audio describer, who would describe the visual elements in the game live, based on their actions. The third method involved implementing AD in the game to enable players to play independently. This also allowed researchers to conduct reception studies by observing how players interacted with the game and responded to the AD during gameplay (Brigstow Institute, 2022). In a follow-up project in 2022, TransAD4Games, AD was implemented in the localised Spanish version of the game using two different methods: translating the original English AD script and creating AD from scratch. The aims were to compare the two AD styles, to identify which method was faster and more cost-effective, and to carry out a reception study to determine which version of AD blind and low vision players preferred (Brigstow Institute, 2022).

A survey about game accessibility for people with visual disabilities was also conducted in 2021 by the Royal National Institute for the Blind (RNIB). It received 464 valid replies, both from people who play video games and people who do not play, mainly based in the United Kingdom and the United States (RNIB, 2022). Amongst them, 348 participants were blind or had low vision. Participants stated

that video games do not include enough accessibility options, although they would be willing to play more if games were more accessible. Participants also indicated a preference for audio-based accessibility solutions, such as screen reader compatibility, AD, audio triggers, and adaptable audio settings and sound mixes, including spatial audio, which creates a three-dimensional sound environment to help players perceive direction and distance (RNIB, 2022).

In 2022, Mangiron and Zhang published another paper about AD and video games, where they put forward the idea of including audio introductions in games to provide information about scenarios and characters. In addition, they highlighted the challenges inherent to the implementation of AD in sections of interactive games due to their non-linear nature. They also emphasised the need to integrate AD with other game sounds and suggested that the describer's voice should be different to the characters' voices to facilitate their identification (Mangiron & Zhang, 2022).

In 2022, Larreina-Morales et al. (2023) collaborated on a project to integrate dynamic AD into gameplay. A first-person point-and-click game, *Death of Internet*, was developed by a team of eleven students from the Master's degree in Video Games & Interactive Media at the French academic institute Cnam-Enjmin (*École nationale du jeu et des médias interactifs numériques*). The game includes a Blind Mode for people with visual disabilities, which consists of AD, point-of-interest (POI) navigation, and a screen reader (Larreina-Morales et al., 2023). AD is automatically triggered when the player arrives in a scenario and provides information about the scene, POIs, and scripted events. The AD is in first person, voiced by the main character, while text-to-speech technology is used to read out the textual elements on the screen. In 2024, a series of playtests were conducted with 13 players with visual disabilities (Di Rosa et al., 2024). Players found the Blind Mode usable and enjoyable, particularly the AD, which contributed to the understanding of the narrative. Moreover, they stated that AD had enhanced their gaming experience.

In summary, existing research reveals that most video games are still not fully accessible to blind and low vision players, although steady progress is being made. Studies also suggest that AD can significantly enhance the gaming experience for blind players and emphasise the importance of a user-centred approach, integrating user needs and preferences from the design stage through testing.

3. Methods

As part of the RAD Project, between October and December 2020, a survey about the gaming habits and accessibility needs of people with visual disabilities living in Spain and over the age of 18 was conducted (Larreina-Morales & Mangiron, 2024). After completing the survey, participants were instructed to email the authors of this paper if they were interested in being individually interviewed on the topic of game accessibility. As participants were recruited through purposive sampling, results cannot be generalised beyond the study sample.

Interviews were semi-structured to allow for a certain flexibility in the participants' focus. An interview guide (available in the Appendix) was designed and approved by the Ethics Committee on Animal and Human Experimentation (CEEAH) at Universitat Autònoma de Barcelona in April 2020. It was structured as follows: opening remarks about the study's objectives and a request for the participant's informed consent to take part in the interview; sociodemographic questions about the participant's gaming habits, age, type of visual disability, and the onset of the sight loss; questions about the current landscape of game accessibility, particularly regarding barriers and strategies to overcome them; questions about game AD, particularly regarding potential user preferences and AD features; questions about the future of game accessibility, particularly regarding opportunities and challenges, and a closing statement by the researchers summarising the content of the interview and inviting the participant to correct or add information.

Interviews were conducted online in March 2021 due to the travel restrictions imposed by the Covid-19 pandemic. Both authors of the paper were present and involved in the interviews. The video conference software used was Microsoft Teams, which was chosen for its accessibility features. Out of the 106 participants in the survey, 20 volunteered to participate in the interviews. However, ultimately, 15 people were interviewed, as two did not meet the participation requirements (i.e. to have a visual disability, to be over the age of 18, and to live in Spain), and three ceased to respond to our emails. Among these 15 participants, two were selected for the pilot interviews based on their professional expertise in video games and accessibility. They provided positive feedback on the interview design and suggested that we provide further explanations regarding the study's objectives and technical terms related to game accessibility in the introduction. Both recommendations were implemented. Pilot interviews were included in the results of the study due to their relevance.

On average, the interviews lasted around 45 minutes, and they were recorded in video and audio. Then, they were transcribed and imported into Atlas.ti 9, a qualitative data analysis software. Data was coded through thematic analysis in an inductive and iterative manner, which resulted in three themes and eight categories: lack of accessibility (causes, barriers and strategies), AD (content, implementation and availability), and next steps (recommendations and challenges). These themes and categories are further explained in the next section.

4. Results

To contextualise the results, Table 1 presents the sample's sociodemographic characteristics. The participants were divided into two groups: players (P) and non-players (NP). This classification was based on whether participants considered themselves regular players or not. Those who reported rarely playing video games were categorised as non-players, while individuals who played multiple times a week or month and showed a strong interest in gaming were considered players. For greater consistency in future research, we suggest providing a clear definition of "regularly" in the interview guide.

For confidentiality reasons, participants were assigned a random number in the reporting of the results: from 01 to 08 for players (*n P* = 8) and from 09 to 15 for non-players (*n NP* = 7). As interviews were conducted in Spanish, all the quotes have been translated into English by the authors of the paper.

Table 1

Sociodemographic Characteristics of Interview Participants (N = 15)

Participant	Gender	Age (years)	Visual disability	Onset of sight loss
P01	Female	36	Low vision	Congenital
P02	Male	21	Low vision	Congenital
P03	Male	49	Blindness	Congenital
P04	Female	44	Blindness	Congenital
P05	Male	42	Blindness	Acquired (at the age of 7)
P06	Male	42	Blindness	Acquired (at the age of 8)
P07	Male	34	Blindness	Congenital (vision started to decline at the age of 16)
P08	Male	42	Blindness	Congenital (vision started to decline at the age of 15)
NP09	Male	38	Blindness	Congenital
NP10	Male	21	Blindness	Congenital
NP11	Male	46	Low vision	Congenital
NP12	Female	32	Blindness	Congenital
NP13	Male	39	Blindness	Congenital
NP14	Male	33	Low vision	Congenital (vision started to decline at the age of 17)
NP15	Male	45	Blindness	Acquired (at the age of 11)

The typical participant was a blind male player with congenital sight loss and an average age of 37.6 (*SD* = 8.3). In the sample, female participants, people with low vision, and those with acquired sight loss are underrepresented. These limitations stem from the use of a non-probability sampling method.

4.1. Lack of Game Accessibility

Participants considered that, at the time of the interviews, there was a lack of accessibility in the current gaming landscape due to two main causes: a lack of awareness regarding the needs of players with disabilities and a lack of resources in the industry to implement accessibility features.

On the one hand, society is generally unaware of both the interest and the participation of players with visual disabilities in gaming spaces. As P03 puts it, "I told my ophthalmologist that I play video games, and they told me they didn't understand how that was possible, because I'm not supposed to have enough remaining sight to be able to play." In fact, as game development software is not accessible, developers with disabilities find additional barriers to entering the industry: "If blind people had more opportunities to develop video games, there would be more accessibility across the industry" (P02).

On the other hand, even if developers are aware of game accessibility, they may not have enough financial or human resources to implement it. P06 clarifies that smaller studios may be especially subject to this limitation, although they may also be more open to feedback from players with disabilities: "Smaller studios don't have as many resources as big companies, but they generally respond to feedback and implement the changes suggested by players with disabilities, unlike major studios."

In any case, this lack of game accessibility creates barriers for players with visual disabilities, which results in a frustrating and generally unsatisfactory gaming experience: "As I child, after I became blind, I used to be in the room with my brother while he played. This was 30 years ago. He is still a gamer, and I still don't have access to video games" (NP15).

According to participants, players with visual disabilities face three main accessibility barriers: the absence of accessibility features in gaming platforms, the lack of such features in games themselves, and the limited availability of localised accessibility options. Gaming platforms, whether consoles, PCs, or mobile devices (such as smartphones or tablets), should allow all players to operate them autonomously: "If the gaming platform is not accessible, it does not matter if it offers a thousand accessible games, because I will not be able to play them" (P06).

Likewise, interaction between the player and the game must be ensured through accessible design and features. When asked which ones they would like to use, participants mention screen readers, sound cues, and contrast settings, all of which should be available and localised into every market where the game is sold. This includes translating all in-game text and dubbing character dialogue, instead of just subtitling, for blind and low vision players. Another common barrier is the lack of localisation of a certain accessibility feature, even though the game text has been translated. For example, *Mortal Kombat 1* (NetherRealm Studios, 2023) offers AD for certain non-interactive sequences in English. The game is localised into Spanish, but not the AD. Therefore, players with visual disabilities who do not speak English cannot access this accessibility feature.

When faced with these barriers, players with visual disabilities who participated in the interviews resort to one of four strategies. Firstly, they may utilise the game's visual, auditory, and haptic stimuli to navigate and progress through the challenges, although these elements have not been designed with accessibility in mind. For example, they may rely on colour settings to identify key visual elements on the screen, sound cues for enemy detection, or vibration feedback for movement. They usually find these features by chance: "I downloaded a game on my phone and found that it was fairly usable. Then I wrote to the developer to let them know, but they said: 'Oh, I didn't even know accessibility was a thing'" (P04).

Secondly, players with visual disabilities resort to the aid of sighted family or friends. This help is presented in two ways: the visually impaired player instructs the sighted player on how to manipulate the controller, or the visually impaired player manipulates the controller according to the instructions of the sighted player. Blind and low vision players may be able to memorise the game's menus, elements, and mechanics, but an assisted gaming experience is not as enjoyable as an autonomous one:

> I used to play *FIFA*, but I really depended on someone setting up the game for me and telling me: "Go right, go left, straight ahead, straight ahead, goal!" Sure, we laughed a lot, but that's not it. That's not it. I want to pick up a game, sit down, and play without having to ask my partner: "Lend me an eye." (P04)

Thirdly, participants use unofficial modifications, also known as *mods*, that offer accessibility features lacking in the original game. These community-driven solutions fill gaps left by developers, but reliance on mods can also present challenges, such as compatibility issues with future updates or lack of support across different platforms:

> There was a mod for *Grand Theft Auto* that was compatible with a screen reader. It told you your health percentage or how many enemies were around. It was great, but one simple update to the game broke it, and now it no longer works. All because of one update. Of course, Rockstar is against user modifications, because games could be used for things they weren't intended for. So, instead of creating an accessibility department, this is what happens. (P02)

To our knowledge, there is no formal literature on mods with AD, although there are some notable examples of AD resources created by players. For instance, the Game to Speech Project (Libeau, 2021) developed a custom mod for *The Sims 4* (Electronic Arts, 2014) and *Minecraft* (Mojang Studios, 2011) that transforms game actions and objects into readable AD. British blind gamer SightlessKombat leads The Transcribing Games Project[1], which provides AD transcripts for several commercial games, such as *Bioshock* (2007), *Mortal Kombat 10* (2015), and *God of War* (2018). The project's website also includes links to YouTube videos with audiodescribed scenes and trailers from

[1] Available at: https://www.sightlesskombat.com

other games. Additionally, certain YouTube channels, such as Soundwave Spectre[2], Michael Kera[3], and Audio Described Gaming[4], provide AD for game-related content, like game trailers and gameplays. These examples showcase player-led initiatives to improve game accessibility through AD, which should be further explored in future research.

Lastly, blind and low vision players may choose to play audio games, which are based on sound alone. However, players are disappointed by the simple mechanics of audio games, particularly due to the limited resources invested in the genre. These games typically feature minimal player interaction, linear gameplay, and basic controls, such as simple key presses or voice commands. Additionally, many audio games lack multiplayer features due to the technical challenges of synchronising audio cues for multiple players. The relatively small player base of audio games makes large gaming servers uncommon, further limiting social interaction:

> Audio games are mainly played by blind people. As there aren't that many of us, there aren't large gaming servers. You typically play with strangers or with a few friends you might know. Having access to more mainstream games would greatly expand the social aspect of gaming as well. (P05)

4.2. Audio Description Features

Most survey participants (89.6%) expressed an interest in game AD, as it would contribute to overcoming the lack of accessibility in video games and enhance the gaming experience (Larreina-Morales & Mangiron, 2024, p. 584). Based on these results, the interviews focused on user preferences regarding its potential implementation. It is important to note that, at the time of the interviews, this accessibility service had not been implemented in video games, so the opinions expressed here were not based on previous experiences with game AD.

Firstly, regarding the content that could be described through AD, participants suggest applying it to non-interactive scenes, such as cutscenes and scripted events, as this approach could follow the same implementation and linguistic conventions as film AD:

> I understand that providing real-time AD would require many resources and may not be feasible, but it would be very useful to navigate the game. For example, in *The Last of Us Part II*, I can hear that there is water, but I do not know if it's from a river, a swamp, a dam or a sewer. I would like AD to tell me where the sound is coming from. (P06)

Dynamic AD, however, should adapt to interactive gameplay, including player actions, customisable elements, and random events. Therefore, it cannot be an entirely prerecorded voice track, as in film AD. Instead, P08 suggests combining artificial intelligence, a screen reader and AD for interactive

[2] Available at: https://www.youtube.com/@SoundwaveSpectre
[3] Available at: https://www.youtube.com/@michaelkera209
[4] Available at: https://www.youtube.com/@GamesForEverybody01

content: “Artificial intelligence could account for the randomly generated events in the game, which could be read aloud by a screen reader integrated into the AD.”

Secondly, participants speak about the integration of AD in the game. On the one hand, it may be an independent feature, meaning that it is the user who activates the AD according to their preferences: “I would like to play first without AD, to see what I can understand, and then activate it if I want to get more details” (P03). In addition, there could be audio introductions or specific menus outside the gameplay where characters or scenarios are described, to enhance immersion and avoid time constraints in the AD. These constraints arise when dialogue, player actions, or fast-paced events limit the time available for descriptions: “I would like characters to be described before the game starts. This information could be unlocked as the game progresses, so that there are no spoilers” (P01).

On the other hand, AD may be embedded into the gameplay and triggered automatically. Some interviewees view this approach as more cost-effective and inclusive, as it provides the same experience for both sighted and non-sighted players:

> I don’t like the idea of having specific features for specific players. Descriptions should be integrated into the game in a way that they don’t bother other players who are not interested in a voice describing everything. For example, character descriptions could be woven into their conversations. (P02)

Similarly, NP10 suggests the use of a computer-generated voice for the AD, although this was not a specific question asked in the interviews: “AD could be read by a text-to-speech voice to reduce the production costs and accelerate the development and release process.”

Thirdly, some participants would be willing to download the AD from a website, but most participants would prefer AD to be offered in the game by default, following an equality principle: “If other players don’t need to download any extra features, a blind person who wants to play shouldn’t have to do any additional work either” (P05). In any case, accessibility should not come at an extra cost for its users: “Accessibility should be included in the price of the game, although I could understand if there was a symbolic fee to support the accessibility team” (NP13).

Finally, it is important to note that participants do not consider AD to be the ultimate solution to render games accessible. Instead, they suggest tailoring each gameplay interaction and event to an appropriate accessibility feature. For example, AD may be the most effective choice when there are no time constraints limiting the amount of description, while a screen reader may be used for texts, and sound cues for actions that require a quick reaction time: “Sometimes sound cues give you enough information. In this case, AD would not be necessary, as it could be overwhelming” (NP15).

4.3. Next Steps

After examining the state of game accessibility and the potential of AD in video games, participants shared their recommendations for improving accessibility and addressing future challenges. As for the next steps, they emphasise the need to raise awareness within the industry about the needs of players with visual disabilities, arguing that enhanced accessibility would lead to increased sales:

> When *The Last of Us Part II* came out, it sold millions of copies. I think accessibility had a really huge impact on that. There are probably many people who weren't able to play games like this before and bought *The Last of Us* because it offered them so many accessibility features. (P07)

Adding to this economic argument, government incentives and penalties could promote accessibility: "There could be an accessibility inspection for video games. If they pass it, studios could have access to subsidies or advertising" (P01).

Participants also bring up some improvements regarding the implementation of accessibility in the game development process. At the design stage, accessibility should be tailored to each gameplay interaction and event, as well as budgeted and optimised for future projects: "There are two ways of implementing accessibility: either you design it from the start, with all player profiles in mind, or you go putting out fires as they come up" (NP10). Similarly, throughout the production process, players with disabilities should be involved as accessibility developers, consultants and testers. In the publishing stage, accessibility should be properly marketed and labelled so that players can make informed purchasing decisions: "Information about a game's accessibility features should also be accessible. If I can't find the information, I assume the game is not accessible, so I don't buy it" (P06).

There are also several challenges in the future of game accessibility. On the one hand, a balance must be achieved between usability and adaptability, meaning that, while accessibility features must effectively provide access, they should also preserve the intended difficulty of the game without oversimplification:

> In *The Last of Us Part II*, several adaptations were made that limited the user experience, such as automatically guiding players to their destination or reducing the number of enemies. Some adaptations are undeniably necessary, but others make the game too easy. (P08)

A strategy suggested by P01 to avoid the issue of reducing the difficulty level is to provide customisable accessibility settings, so that players can adjust their gaming experience to their needs and preferences: "I turn off certain accessibility features in *The Last of Us Part II*, but there may be other people who have less sight remaining than me for whom these features would not make the game easier, just more accessible."

On the other hand, an effort must be made to avoid excluding players with disabilities from the social and competitive aspects of video games. NP10 asks for a level playing field between blind and sighted players so that they can play together: "Complete equality might never be fully achieved, but there

can still be a certain level of fairness, such as a sighted person and a blind person competing against each other in chess." Cooperative multiplayer games may contribute to this goal: "If players with and without vision can't receive the information almost at the same time, tasks should be divided. For example, a blind player can find objects while the other team members fight enemies" (P06).

5. Discussion

The general opinion of participants about the state of game accessibility is that there are still barriers preventing them from fully interacting with video games. This negative view is shared by other participants in previous and recent research. In the Be Player One survey, players with visual disabilities rated game accessibility lower than players with cognitive, motor or hearing disabilities (Nourry, 2020). Similarly, participants with visual disabilities of the RNIB survey (2022) claim that accessibility barriers prevent them from playing certain games.

When faced with accessibility barriers, participants choose either not to play or to do so through several strategies, which have also been documented in the literature: leveraging the game's elements for accessibility purposes (Ellis & Kao, 2019; Gonçalvez et al., 2023; Martínez et al., 2024; Spöhrer, 2024), playing with other people's assistance (RNIB, 2022), modifying the game, and only playing audio games (RNIB, 2022).

The potential of AD as a game accessibility feature has already been identified in research (Mangiron & Zhang, 2016, 2022; Sansalone et al., 2022; RNIB, 2022; Zhang, n.d.) and game accessibility guidelines (Ellis et al., 2017; Microsoft, 2023; Smith, 2020). Among the 106 participants of the RAD Project survey, the great majority (89.6%) expressed a strong interest in game AD, as it would improve their understanding of the game's actions, settings, and characters, strengthen their social interaction with other players, and deepen their sense of immersion (Larreina-Morales & Mangiron, 2024, p. 584). In the follow-up interviews, participants suggested prioritising the implementation of non-dynamic AD in cutscenes, trailers, and scripted events, as well as incorporating audio introductions. By contrast, dynamic AD must adapt to the gameplay. One interviewee suggested combining AD with a screen reader using variables in the game's code, which is precisely the strategy implemented in *Cyberchase: Duck Dash* (Bridge Multimedia, 2022).

Game AD could be offered in various formats. Interview participants suggest options like automatic or manual activation, the use of human or computer-generated voices, and making AD available either as a default feature or through downloadable content. While these choices present both opportunities and challenges, they require further research. Ultimately, the more customisation options available, the better players will be able to personalise their gaming experience to suit their individual preferences and needs.

Participants outline the next steps that should be taken to improve game accessibility for players with visual disabilities. Their recommendations, combined with the review of recent industry and

academic advancements presented in this paper, are summarised into ten guidelines addressed to developers, researchers, and other stakeholders involved in game accessibility:

- Guarantee that the gaming platform is fully accessible, allowing players to independently set up and navigate the gaming environment.
- Implement accessibility across all game genres to encourage social interaction, rather than develop games tailored to specific user profiles (such as audio games).
- Integrate sound-based accessibility features, including a screen reader for texts, sound cues for quick-response actions, and AD for events without time constraints.
- Provide AD for both interactive and non-interactive content, where applicable, so that it enhances accessibility without disrupting gameplay.
- Maintain high-quality standards by incorporating accessibility from the design stage of the game, actively involving users throughout the development process, and ensuring usability and localisation across various languages and markets.
- Offer customisation options for accessibility features, enabling players to personalise their gaming experiences to align with their preferences and needs.
- Ensure a level playing field where possible, promoting collaboration in multiplayer games and avoiding additional costs related to accessibility.
- Raise awareness within the game industry and broader society to shift perceptions of accessibility from being seen as a simplification or advantage to understanding it as a means of removing barriers to gaming.
- Disseminate accessibility information widely to reach as many individuals as possible, including those who may not regularly play video games, by publishing it across mainstream and specialised media, digital distribution services, and user-driven websites.
- Foster collaboration between users, industry professionals, accessibility experts and the research community to advance in game accessibility.

The intended contribution of these guidelines is to start bridging the gap between user-centred academic research and implementable strategies in the game industry. In this sense, the interviews grounded and enriched the proposed guidelines by providing valuable insights into the experiences and expectations of those with visual disabilities regarding video games and accessibility. However, results must be interpreted within their limitations. Due to the small sample size and the use of a non-probability sampling method, the findings are not fully generalisable to the wider population. In addition, while the guidelines offer a comprehensive framework for improving game accessibility, their practical implementation may face challenges related to the availability of resources, rapid technological advancements, and resistance within the gaming industry.

6. Conclusions

In the past few years, game accessibility has entered the mainstream through the release of AAA games with accessibility features and the publication of research on the topic. For players with disabilities, the implementation of screen readers, sound cues, and AD has been a game changer. However, there are still necessary improvements to be made to ensure that every player can have an autonomous and enjoyable gaming experience.

This paper has focused on the potential of AD as a game accessibility feature. First, a review of the implementation of game AD has been presented, revealing that there are only a handful of games with this feature and that it is mainly applied to non-interactive content. Then, recent research projects aiming to improve visual game accessibility have been described. Among them, the RAD Project aimed to collect user perspectives on game accessibility through a survey and a set of interviews. Here, the results of the 15 interviews with adults with visual disabilities living in Spain, conducted in March 2021, have been detailed.

The interviews covered three topics: lack of game accessibility, potential features for AD in games, and further steps to be taken in the field. Interview participants, eight of whom regularly play video games and seven who do not, advocate for a future where the game industry is committed to accessibility and equal opportunities through the active participation of the gaming community, with or without disabilities. They consider that AD has significant potential for improving access to non-interactive game content and that it should be built into the game's design. In addition, AD should be a customisable feature that is available at no extra cost.

Based on the review of recent industry and academic advancements, as well as the preferences voiced by people with visual disabilities, ten guidelines have been proposed to improve game accessibility. These guidelines are addressed to developers, researchers, and other stakeholders involved in game accessibility. They highlight the need for more and better accessibility at every stage of the game development process, including the design, implementation, and communication of accessibility features. In future studies, they could be applied to the development of a video game with dynamic and non-dynamic AD and then tested through user research. In addition, as video games with AD were released after the completion of the interviews, it would be interesting to replicate the study presented in this paper to determine whether the results are consistent with the current game accessibility landscape.

Moving forward, involving players with disabilities in the game development process is key to improving accessibility. Their expectations and feedback would inform developers and researchers on how to design accessibility features with usability in mind. In the same vein, ensuring the accessibility of game engines would also further integrate people with disabilities in the industry, while promoting more inclusive gaming spaces and experiences for all players.

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Appendix: Interview Guide

This section presents the interview guide used in this study. The original Spanish version is provided, followed by its English translation.

Interview Guide in Spanish

Introducción

- Bienvenida y presentación
- Aviso de grabación de la entrevista
- Solicitud de consentimiento informado (si no se ha proporcionado previamente por escrito)
- Preguntas del participante, si las hubiera

Información sociodemográfica

1. Hábitos de juego: ¿juegas habitualmente a videojuegos?
2. Edad: ¿cuántos años tienes?
3. Discapacidad visual: ¿qué tipo de discapacidad visual tienes?
4. Inicio de la pérdida visual: ¿a qué edad comenzó tu pérdida visual?

Falta de accesibilidad

5. Barreras de accesibilidad: ¿a qué barreras te enfrentas cuando juegas videojuegos? ¿Cuál es la barrera de accesibilidad que más te afecta?
6. Estrategias ante la falta de accesibilidad: ¿cómo juegas si no hay opciones de accesibilidad? ¿Qué opinas de los audiojuegos?

Caracterización de la audiodescripción

7. Interés: ¿Te gustaría que hubiera audiodescripción en los videojuegos? ¿Por qué o por qué no?
8. Caracterización: ¿en qué partes del videojuego te gustaría que hubiera audiodescripción? ¿Cómo te gustaría que fuera esta audiodescripción? ¿Cómo te gustaría personalizarla?

Próximos pasos

9. Recomendaciones: ¿cuál dirías que es el primer paso para mejorar la accesibilidad a los videojuegos?
10. Desafíos: ¿te parece importante jugar en igualdad de condiciones con otros jugadores? Si pudieras hacer un comentario o petición a los desarrolladores de videojuegos, ¿qué les dirías?

Cierre

- Resumen del contenido de la entrevista
- Comentarios o preguntas adicionales del participante, si las hubiera
- Agradecimiento por la participación y las aportaciones del participante

Interview Guide in English

Opening Remarks

- Welcome and introduction
- Notification that the interview will be recorded
- Request for informed consent (if not previously provided in writing)
- Questions from the participant, if any

Sociodemographic Information

1. Gaming habits: Do you play video games regularly?
2. Age: How old are you?
3. Visual disability type: What kind of visual disability do you have?
4. Onset of visual disability: At what age did you first experience sight loss?

Lack of Game Accessibility

5. Accessibility barriers: What barriers do you encounter when playing video games? Which one has the greatest impact on your experience?
6. Coping strategies: How do you play if there are no accessibility features? What is your opinion of audio games?

Audio Description Features

7. Interest: Would you like to use AD in video games? Why or why not?
8. Features: Where in games would you like AD to be used? How should it be designed? How would you like to customise it?

Next Steps

9. Recommendations: What should the first step be in improving game accessibility?
10. Challenges: Do you think it is important for all players to be on a level playing field? If you could speak to a video game developer, what would you tell them?

Closing Remarks

- Summary of the content of the interview
- Additional comments or questions from the participant, if any
- Thanking the participant for their time and contributions