

# Chapter 44

## How Can Accessibility for Deaf and Hearing-Impaired Players be Improved in Video Games?

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### ABSTRACT

*This research investigates how the accessibility of video games can be improved for deaf and hearing-impaired players. The journal is divided into several areas, first, examining the use of subtitles and closed captions used in video games; and second, how visual cues can be used to provide better accessibility for deaf and hearing-impaired gamers. This includes effectively creating suitable atmospheres and mood in games through lighting as well as having a varied environment that prevents the players from getting bored with the setting of a game and finally exploring current best practices within the gaming industry. Through this research data the issues with accessibility can be found as well as how a lack of accessibility affects deaf and hearing-impaired gamers. Research from this investigation supports some of the evidence from other researchers in the field that accessibility features for deaf and hearing-impaired can be considered and implemented.*

### 1. INTRODUCTION

As video games are an ever-growing industry breaking down accessibility barriers to provide entertainment through this platform to as many people as possible allows for broader audiences and inclusion of more people into this medium. Gamers with disabilities are increasingly part of what is an evolving and

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dynamic expanding growing community as, UKIE points out “32% of UK players play mobile, console and PC games. In 2016, there were 31.6m players in the UK, approximately 50% of the total population” and “in 2017, 32.4 Million people played games in the UK” (UKIE, 2018). Previous literature within the field of disabilities and accessibilities have focused on establishing modern technologies to assist and bring forward successful ways of integrating tools to controllers, as a way of providing much needed engagement. It is this aspect of engagement, that individuals, who are disabled or have accessibility issues, will miss out on the full immersion and realism of the experience (Prates, and Chaimowicz, 2011; Dong, 2016; Beeston, Power, Cairns, and Barlet, 2018). Due to the advancement of technologies like that of Virtual Reality (VR), we can assist individuals with visual and audio feedbacks. Human Computer Interaction (HCI) can bring a whole lot more to support the different scenarios and participants, within the gaming world (Dong, 2016; Costello, 2018). According to Centers for Disease Control and Prevention (CDC), “More than 3.4 million (3%) Americans aged 40 years and older are either legally blind (having visual acuity [VA] of 20/200 or worse or a visual field of less than 20 degrees) or are visually impaired (having VA of 20/40 or less)” (CDC, p1), and to add additional information to this, the American Foundation for the Blind (AFB), indicates in 2016, that “from January 2016 there are approximately 63,657 U.S. children, youth, and adult students in educational settings who are legally blind” (AFB, 2017, p. 2). The Royal National Institute of Blind People (RNIB) indicates in 2016, that certain games can support visually impaired players, like that of First Person Shooters (FPS), Fighting Games, Action Games, etc. However, as long as the computer games have a way of communicating to the player, through aspects of sound cues, to assist in their impairments, then they can immerse themselves. The National Library Service for the Blind in the USA (2018) indicates that “many resources are available for gamers with disabilities. Computer programmers have developed audio games (or audio adaptations of games) that can be played by people who are blind or visually impaired” (National Library Service for the Blind, 2018, p1). In 2012, a set of guidelines were published to assist the gaming industry that explored aspects of supporting features for disabilities and accessibility for gamers from sensitivity to button controls to sudden unexpected movement or events, (Game Accessibility Guidelines, 2012). According to Game Accessibility Guidelines (2012) & Alcázar, Luján-Mora, and Salvador-Ullauri, (2018), accessibility means avoiding unnecessary barriers that prevent people with a range of impairments from accessing or enjoying game(s). Maenpaa’s (2014), and Alcázar and Luján-Mora (2017) suggests there is evidence and research to show there are general guidelines and recommendations for construction of accessibility features into games; however, there should be a greater influence from the gaming industry that still needs to be formalised.

This greater influence can have a major impact not just with accessibility but with other health aspects as pointed out by Morelli, Foley, and Folmer (2010). Through addressing accessibility issues alone within games, individuals with health issues like obesity, poor self-related health issues (diabetes and heart diseases), to visual impairments could be addressed and engaged. These accessibilities could address issues of social interactions; support physical activities to improvement cognitive development and awareness. These approaches as adopted by Morelli et al., (2010) can be seen as “exergames”, but lays down some of the foundation for Game Accessibility Guidelines (2012) & Alcázar, Luján-Mora, and Salvador-Ullauri, (2018) that visual cues or subtitles and captions are needed to help steer the player. The research carried out by Morelli et al., (2010) does indicate the use of audio and visual cues to assist the player in a variety of different features relating to the game designs, from “speech cues, number of pins hit after each throw and score” (p. 4).

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