

## Chapter 6

# Designing Serious Games for People with Disabilities: Game, Set, and Match to the Wii™

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### ABSTRACT

*Serious games are effective and engaging learning resources for people with disabilities, and guidelines exist to make games accessible to people with disabilities. During research into designing accessible interfaces and games, it was noted that people who are blind often report enjoying playing Wii Sports. These games are pick-up-and-play games for casual and non-gamers. They have simplified rules and a natural and intuitive feel. Games designed specifically for players with particular disabilities are often not of interest to other players and take a lot of development time. Because of their niche market, these games are not widely available, developed, or maintained. In contrast, games like Wii Sports are cheap and available, and represent an exciting opportunity as inclusive games. Two blind players were introduced to the games and found Wii Tennis the most accessible. The blind players learned to play the game quickly and easily, found it enjoyable and engaging, and could play competitively against each other, as well as a sighted opponent. Small accessibility enhancements of the existing game could enhance the game for other players. In this paper, implications for the design of accessible, inclusive games are discussed.*

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## INTRODUCTION

Brown et al. (2010a) discuss the potential of serious games as effective and engaging learning resources for people with learning and sensory disabilities. A suitable design methodology and its application are detailed, followed by the description of games that have been successfully developed for target groups with a range of disabilities, and an explanation of accessibility guidelines. They conclude that there is great potential in the wide range of possible areas of research into, and development of, serious games for supporting people with learning and sensory disabilities, which would contribute greatly to their inclusion in society. An example of such an application is mobile location based learning, developed by Brown et al. (2010b), which aims to support people with disabilities in employment and training.

During research into creating accessible interfaces and accessible serious games, it was noted that people who are blind often enjoy playing games from the Wii Sports bundle. While these games are not necessarily serious games in the sense of Brown et al. (2010a), they can often have a purpose other than just for entertainment, such as for health. To make serious games accessible for people with disabilities, designers usually follow some form of user-centred design process and consider accessibility guidelines, as detailed in Brown et al. (2010a, 2010b). The games in Wii Sports have not been targeted specifically at people with disabilities, but their target audience is non-gamers and casual gamers, which will include people with a wide range of abilities and skills (Casamassina, 2006). The games have simplified rules and are designed to use the Wii™ remote “to provide a natural, intuitive and realistic feel” (Nintendo, 2010). Since the games are designed for a diverse target audience, it would be expected that some sort of Universal Usability approach (e.g., Horton, 2006) was taken and some form of user-centred design involved. Given that people

who are blind report playing these games, it is worth evaluating their accessibility.

In the past a few relatively unsophisticated audio games were available for people who are blind; more recently there has been greater interest in audio games for a wider range of reasons (e.g., sound artists, accessibility researchers, mobile games developers). Additionally, people with disabilities are no longer willing to accept being excluded from mainstream technologies (Higginbotham, 2010), and as more and more of them grow up to be digital natives, and legislation against exclusion becomes tougher, greater developments may be expected in this field.

In Human Computer Interaction (HCI), Universal Usability (e.g., Horton, 2006), is emerging as a prominent approach to system design. This approach acknowledges the wide variability in people's abilities, and, rather than designing for the “average” person, advocates a Design-for-All approach - it has both accessibility and usability in mind with the aim being to “provide for diversity through design rather than accommodation” (Horton, 2006, p. xvi). This and similar approaches to system design will facilitate the development of accessible games.

There are currently some successes in terms of accessible games. For example, *Lone Wolf*, by GMA games (2008), is a full-featured World War II submarine simulation audio game. It is a complex game based on complex stereo sound which has been designed for blind and visually impaired players. Lack of any visual representation means that the game wouldn't have general appeal for sighted players. Going a step further, *Terraformers* is playable by players who are blind, who can play the game against sighted opponents (Westin, 2004). *Terraformers* offers auditory navigation and game information, which blind players can use successfully to navigate its virtual environment and to play the game. It also offers a graphical interface, so that blind and sighted players can play against each other. The team at ICS-Forth has developed a number of accessible

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