

Audio Game Survey Results

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Abstract

Audio games are games that exist entirely in sound allowing accessibility for blind gamers; this report highlights the main problems areas with current audio games. They are often very hard to learn which can be off-putting, especially for novices with no audio game experience; these learning curves for audio games need to be decreased to allow accessibility for a wider range of players. Another major problem with current audio games is that they are not as exciting or immersive as many mainstream video games, therefore large groups such as sighted gamers may be repelled. A questionnaire was created and sent out to existing audio gamers to examine the types of people who play audio games and what they want out of their games, the most popular game genres, and the most significant difficulties audio gamers have while learning how to play the games.

1 Introduction

The questionnaire was designed to specifically examine the following points:

- If participants are visually impaired, the severity and how long they have been visually impaired?
- If they use screen readers at all, which screen readers and do they use them with games?
- Have they ever played, or are they aware of audio games?
- Do they play video games as well as audio games?
- Which genres of game do they prefer to play?
- What aspects of audio games make them hard to learn?

1.1 Blindness and Screen Readers

A wide sample of people was asked to participate, including sighted, partially sighted, colour blind and blind people. They were asked if they generally use screen reader software to allow accessibility. The most popular screen readers were identified, as well as the popularity of using screen readers for games over self voicing games.

1.2 Most Popular Genres

Participants were asked whether they play video and/or audio games, and which genres they enjoy playing. They were also asked which genres of audio games they would like to see more of in the future. The genres were categorized as follows:

- Adventure – Defined as a game where the progression of the story is one of the most important aspects. Includes text adventures, 2D and 3D exploration.
- Survival Horror – Similar to adventure games, with the story and environment focusing on producing a fear response.
- First Person Shooter – Action shooting game with emphasis on a first person perspective.
- Beat-em-up – Includes ‘one on one’ combat games such as Street Fighter as well as 3D and side scrolling ‘one on many’ combat games such as Double Dragon.
- Role Playing – The gameplay is driven via a prominent storyline, usually involving dialogue interaction with other characters and battles.
- Massively Multiplayer Online Games – Games where potentially thousands of players can play simultaneously over the internet.
- Platform – Often involves controlling characters to jump between 2D or 3D platforms while combating enemies.
- Simulation – Games that realistically simulate a real life experience, includes ‘god games’ such as The Sims.
- Sports – Simulates playing of a particular sport.
- Racing – Involves control of a vehicle to race against other vehicles or time.
- Rhythm Action – The gameplay usually involves pressing certain buttons in time with music.
- Strategy – Games that focus on thinking and careful planning to achieve victory.
- Puzzle – Games where the main objective is to solve a logic puzzle.
- 2D Shooter – Shoot em ups which often have an emphasis on shooting enemies from third person perspective.
- Maze – The playing field is entirely a maze, can be action based or puzzle based navigation.
- Traditional Board and Card Games – Software simulation of board and card games such as solitaire and backgammon.

Participants were asked open questions about their favourite audio games to gather what specific things they enjoy about them.

1.3 Common Problems with Audio Games

The participants were asked which aspects of audio games they find is hardest to learn. They were asked for suggestions how these difficult aspects of audio games can be improved to make the game learning

experience easier. The people who don't play audio games will be asked the reasons why they haven't played audio games or dislike playing audio games, these reasons should be considered important for audio game developers.

2 Results Analysis

People from a wide range of backgrounds and ages were asked, however the majority of the participants were blind or visually impaired and enjoyed playing games. 71% of participants were blind with 49% of them being blind from birth, 19% considered themselves to be partially sighted with the rest being colour blind (5%) and fully sighted (5%).

79% of the respondents were male and 39% of participants were aged 20-29, therefore the average audio gamer is a male aged 20-29 and is blind from birth. There are also a significant number of older audio gamers with 22% aged 30-39 and 12% aged over 40 years old.

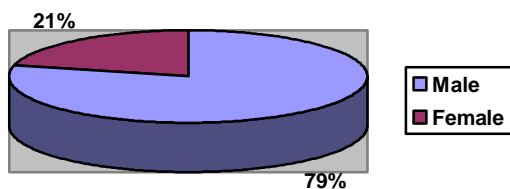


Figure 1: Gender

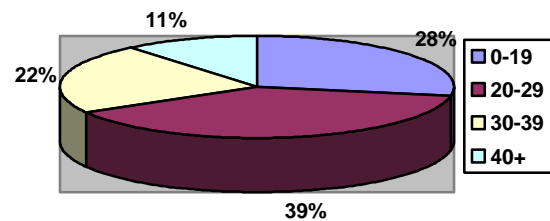


Figure 2: Age

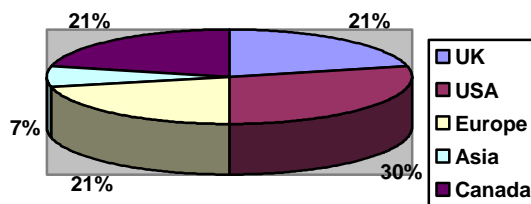


Figure 3: Location

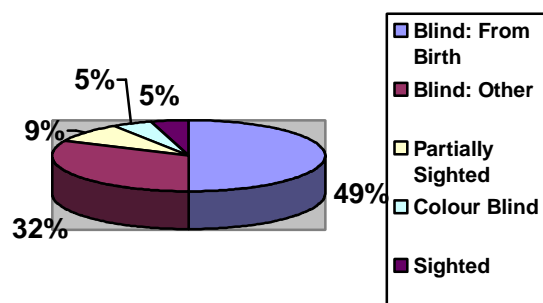


Figure 4: Blindness

2.1 Screen Readers

Over 90% of blind and visually impaired people surveyed generally use screen readers to allow accessibility with computer software. As probably expected, by far the most popular screen reader is Jaws, which is developed by freedom scientific. This is probably because the number of features that allow flexibility with text based and audio games.

Half of the audio gamers enjoy playing games that use screen readers such as text adventures and 24% of gamers actually prefer playing games that use screen readers to self voicing games. However, the majority of audio gamers prefers self voicing games with realistic human voices and enjoys playing both self voicing and games which require screen readers. Many text RPGs require the use of screen readers, and there are many other similar games that utilize Microsoft SAPI.

One of the common complaints from participants was that the use of synthesized 'human' voice can be very unrealistic and is detrimental to the overall audio game experience.

Figure 5: Which Screen Reader Do You Use ?

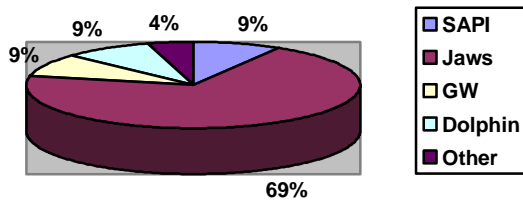
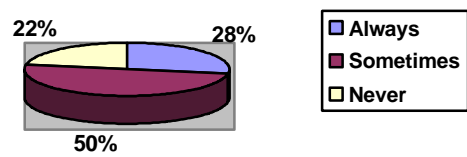


Figure 6: How Often Do You Play Games Using Screen Readers?



2.2 Genres

As you can see from Figure 7, there are significant differences in popularity of certain genres between audio games and video games. This is probably because some genres are more easily successfully implemented with the main focus on graphics. The most popular audio game genres were adventure, survival horror and RPG; this is significant as they are all genres that usually feature a predominant storyline.

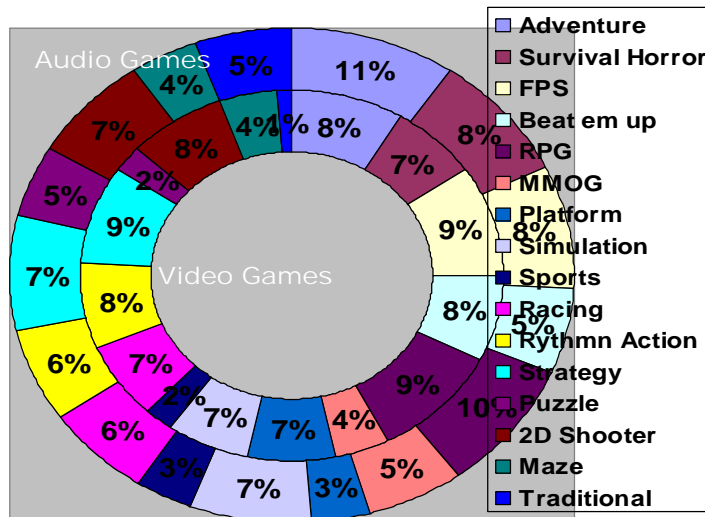


Figure 7: Current popularity of audio game and video game genres

Specific enjoyable aspects of audio games frequently mentioned by participants included:

- Gameplay: Multi User Dungeons (MUDs) and text adventures seem to be popular as they often have engaging storylines and ability to play with other gamers. As many audio games such as text

adventures are story based, many audio games lack action. Some of the more popular games are heavily action based such as *Shades of doom*, *Tank commander* and *Terraformers*. *Star Trek: Final Conflict* is one of very few 'licensed' blind accessible games, It was popular with many participants as it is a challenging strategy game that allows *Star Trek* fans to interact with characters familiar to them.

- **Multiplayer:** Many audio gamers enjoy playing with other audio gamers online, text adventures are popular as they allow sighted players to play with blind users through use of a screen reader. First person shooter audio games such as *AudioQuake* also allow multiplayer gaming with both visual and sighted players.
- **Realism:** Wide range of realistic stereo sound effects in games such as *Great Toy Robbery* and *Tank Commander* is a step towards realistic audio environments. Realistic simulation of audio environments is important to create an engaging atmosphere and is very rarely achieved in audio games.
- **Storyline:** A non text adventure that was often mentioned to have a good storyline was *Superliam*, games such as this achieve story continuity with use of relevant audible cut scenes.
- **Ease of use:** Customisation of certain features is important to increase familiarity and allow accessibility. Games such as *Tarzan Junior* were considered by many to have an 'easy' learning curve that taught players with a good sense of humour. Games which have well designed interesting levels with minimal amount of dead ends are more enjoyable for audio gamers. *Lone wolf's* 'soundscape' function proved popular with many participants as it allows easy navigation of the environment.

2.3 Learning Audio Games

64% of blind and partially blind people surveyed also find some enjoyment from playing video games.

22% blind gamers surveyed have never played an audio game and solely play video games. Reasons that were considered to increase the learning curve of audio games included:

- **Navigation (26%):** An efficient auditory user interface (AUI) needs to be designed to allow the player to navigate easily through game menus as well as the level environment. This is especially true when navigating through 3D environments, when more advanced 3D audio techniques should be used to help the player easily determine the location of each audible sound source in the scene.
- **Memorisation of Audio Cues (24%):** As there are no graphical cues in audio games, the in-game objects need to be replaced by audio cues. To represent an object that emits sound in real life, it should be represented with a sound that allows instant recognition by the player. Objects that are not usually expected to make sounds, such as chairs, will often need to be represented in an audio game by abstract sounds. If there are many objects that each need to be represented by a different abstract sound, the player will need to memorise the meanings of a huge number of sounds to successfully identify each game object.

- Memorisation of Shortcut keys (28%): Some participants preferred a large number of keys available to them as controls, however these were often considered to be more advanced audio gamers which almost exclusively play games from the strategy and simulation genres. The majority of participants preferred the least amount of relevant keys to produce simpler, easy to remember game controls.
- Controls (16%): Sometimes keys aren't mapped intuitively and can be awkward for gamers to learn how to play. For example arrow keys or WSAD keys should be used for player movement as their function should already be familiar to the player. One participant said that they actually find almost all audio games easy to play, however they prefer to use console controllers rather than a PC keyboard. Game pads are preferred by many audio and video gamers as only relevant buttons are available and features such as analogue sticks allow more accurate control over the game.
- Objectives (7%) : This aspect of audio games are probably not considered to be a main factor affecting the difficulty of learning audio games, as they are generally similar to other video games and therefore already familiar to gamers. However if the overall game concept or an individual mission in the game is hard to grasp then it may confuse the player.

Taking these results and other suggestions from participants in mind, the following are some techniques which could be used to significantly improve the audio game learning curve:

- All relatively complex audio games should have training levels, such as a tutorial which teaches the player all aspects of the game. This should ideally use real voice acting over synthesized voice to increase user familiarity.
- The training level idea could be extended to provide a context dependant help system which gives the player extra hints while playing the game. This learning mode could be used by novice players whom may not have confidently grasped the games controls even after completing training; this mode should be optional so that it can be toggled off for advanced users.
- Audio cues to represent each game object should be carefully chosen to allow the player to instantly recognize the object.
- Heightened realism can immensely improve the audio game in many ways. For example, navigation would be improved if the player could accurately locate the object in 3D space just by its sound and they should also be able to determine if the sound source is in a different room from them.
- Intelligent level design is important to allow easier navigation. Level design can be still be complex and interesting; however some aspects of level design such as many dead ends can cause unnecessary frustration for the player. Levels can often benefit from being more enclosed where the player is always in proximity with many interactive game objects, this helps stop the player becoming frustrated or bored when attempting to navigate to a certain area of the game environment.

- Where possible, keys should be mapped intuitively and similar to other games so that the player will be instantly familiar with the keys function. Other keys used by the game should be mapped closer together on the keyboard so they can be found easier, especially for action based games. For the great majority of audio games a small number of relevant keys for a simple control system to allow easy learning.
- Missions and objectives in the game should be clear and audible hints should be provided if the player is having trouble. It would be ideal for the player to be able listen to the current game objective at any time throughout the game.

Figure 8: Why don't you play audio games?

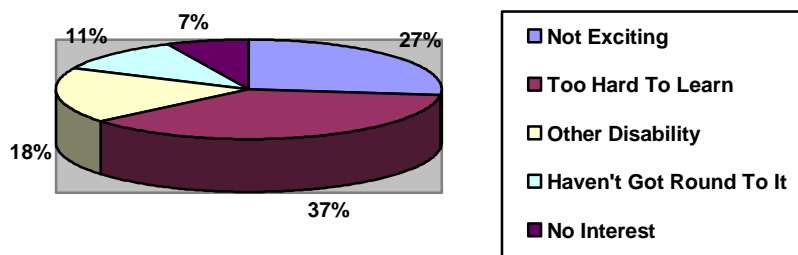


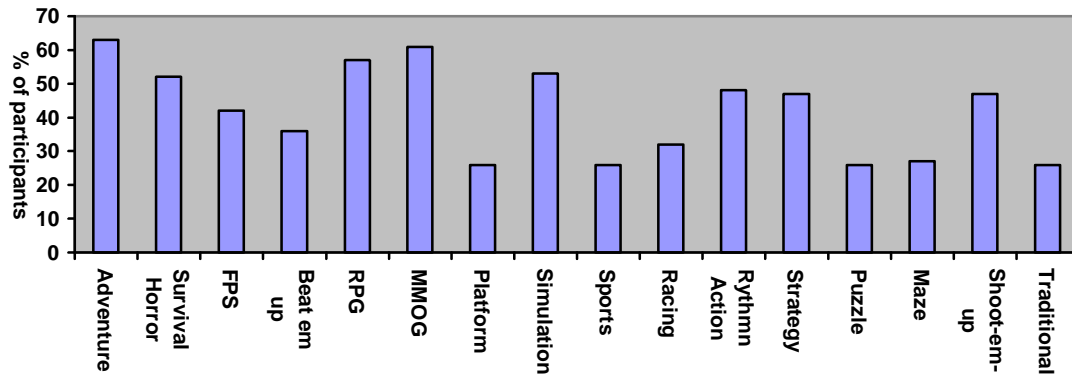
Figure 8, shows the reasons given by the 22% of participants who don't play audio games. Problems while learning audio games is the main reason in which non audio gamers do not play audio games; therefore it is important for audio game developers to ensure the learning curve is not too steep and off-putting for potential players.

2.4 Future of Audio Games

Mainstream video games are quite often played by blind gamers, sometimes with assistance from friends and family members. For the many gamers that cannot read printed text or see overly complex 3D graphics, the choice of mainstream games is rather limited. Console games are becoming less and less accessible for blind gamers as much of the focus of current generation tends to be on graphical realism and there is no software such as screen readers available that can be used with current generation consoles. There are few, if any, mainstream console games that allow accessibility for blind users through an audio description mode option.

Sighted video gamers however, very rarely play audio games complaining they are too hard to learn or not as exciting as most mainstream video games. However audio games have the potential to become just as exciting as video games, by employing the latest realistic 3D audio techniques and intelligent game design to create original games.

Figure 9: Which Audio Game Genres Would You Like To See More Of?



As shown in figure 9, the majority of audio gamers want to play games such as adventure games, survival horror games, RPGs and MMOGs. Games in these genres are usually longer and complex than games in other genres, specifically with engaging prominent storylines and realistic 3D atmospheres and very few audio games of this description exist.

There is also a lack of originality in the majority of audio games where many developers attempt to take exact game concepts from popular video games and develop them as an accessible audio game. The nature of audio games allows room for much more experimentation with game design where whole original genres can be created which may be exclusive to audio games.

3 Conclusion

Audio games are still almost exclusively played by blind and partially sighted gamers, mainstream video gamers have yet to realize the potential of a new challenge that exists entirely in sound. Audio games need to be significantly improved to allow the blind gaming community to experience games closer to the quality of current mainstream video games, as well as to start drawing in mainstream video gamers.

Current audio gamers feel that there is a lack of story based games set in realistic audio environments such as 3D adventure, survival horror and RPG games and many audio games lack originality. Audio game developers should attempt to make the game's user interface as accessible and easy to use as possible to decrease the often steep learning curve, focusing on intelligent uses of sound cues and navigation systems.

If you have found this article to be of any use or have any additional questions feel free to contact me on the above email address.