The Lack of Accessibility Options in Gaming: E for Everyone

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ABSTRACT
Gaming has become a big industry over the last few decades; however gaming has not been made easily accessible to people with disabilities. The best way to promote accessibility is to create a game with accessibility options in mind. The first phase of the design would involve developing a simple game that most people can enjoy playing. The second phase would involve implementing the accessibility options that make sense for the game. Once the bulk of the game is finished, testing must be done to find any bugs or glitches that might hinder player experience. A beta test should also be done to get feedback about the game itself and about the accessibility options implemented.

1. INTRODUCTION
Why do accessibility options need to be implemented in games? Games are just a form of entertainment to pass the time, disabled people can just enjoy other forms of entertainment like movies. A statement like this does not take into account the disabled people who actually want to try out games. A person with disabilities might try out a game and quit due to their disability making play not enjoyable. For example, a color-blind person might not see the colored prompt telling them to press the A button. The blind person might then spend a lot of time trying to figure out what the game is trying to tell them to do. Disabled people deserve the right to enjoy and play video games.

Accessibility in gaming has improved compared to how it was in the past. At the beginning of gaming, the priority was pushing the new concept of gaming to the masses. However, in this modern era, accessibility should be more of a priority. Some games are still lacking and many disabled gamers have complained about the lack of consideration for their needs. Games have to be modified to accommodate these users, and the responsibility for making the games accessible should be placed on the developers, not the players. Time and resources should be used to implement accessibility options into games to allow disabled gamers the opportunity to enjoy and play them.

2. RELATED WORKS
Progress toward accessibility started near the beginning of gaming, even if unintentional. Kiecko (2024) discussed the history of accessibility in gaming explaining how Atari implemented a "child mode" in the games for the 2600 console (VCS). As the name suggests, this mode was made for children and reduced the difficulty of the games. However, the feature of a difficulty setting for children can allow disabled people to go at a slower pace and enjoy the game. An individual's disabilities can greatly enhance the difficulty of a game,

which is why the option of a lower difficulty is great for disabled gamers.

Accessibility has improved over the years. However, there are still shortcomings when it comes to video games. One of the main issues is the video game developer's lack of time and resources. Porter & Kientz (2013) showcased the findings of two studies about video game accessibility. One of the studies involved having individuals in the game industry discuss their thoughts on accessibility. One of the participants remarked that implementing accessibility options is not so simple to do. Due to the industry standard of not sharing code, game developers typically have to start from scratch if they want to implement an accessibility feature. Features like text-to-speech can be complicated to implement, especially from scratch. Game developers would rather not spend the time and effort needed to implement accessibility features if it means not making the deadline for the game release.

3. PROJECT DESIGN
This section will provide general information on how a game that I created will implement accessibility options.

3.1 Review of Game Design
The game will be created with the Unity game engine with accessibility in mind. The game theme will be based on Halloween due to it being developed in October. The player will control a witch as she travels across the sky. The player can shoot enemies and obstacles in their path. The name of the game is *Witch's Flight.*

3.2 Requirements
My game will have to meet some criteria to be considered a success. These criteria will be discussed in the following two subsections.

3.2.1 Player Needs
The game will be playable by gamers and gamers with disabilities. There will be a toggle on the main menu where the player can turn on color-blind mode. In color-blind mode, the color of certain game objects will be changed to be easier to see for a person with colorblindness. Deuteranomaly will be the colorblindness that I will try to accommodate for with the color blind mode.

3.2.2 Limitations
The game will be developed in less than a month. With such limited time, the game will be relatively short. The limited time also means that not all types of accessibility options can be added. Available options will mainly focus on visibility disabilities.

3.3 Key Components
The following three sections will detail the process of developing the game.

3.3.1 Specifications
In *Witch's Flight*, the player can move the witch right to left and up and down as she flies across the sky. The witch can fire a magic spell when the player presses the specified button. The magic spell will destroy enemies and obstacles in the way. The player can collect certain power ups to boost their shoots and defeat enemies more quickly. If the witch touches an enemy or obstacles, she loses a heart. If the witch loses all three hearts, then the player will have to start again from the beginning. If the player toggles on the color-blind mode, the color palette of the game will be changed to be more color-blind friendly.

3.3.2 Challenges
One of the major challenges that will pop up in the development of *Witch's Flight* are bugs or errors. The collision between the

witch and the various enemies and obstacles has to work correctly. If the collision is not correct, the witch might be hit unfairly, resulting in player frustration. If the color-blind mode does not work then color-blind gamers will be annoyed.

3.3.3 Solutions
One way to resolve bugs or errors is through trial and error. The loop of looking through the code, adjusting it a bit, and checking if the error still occurs can help resolve many bugs. Another way to approach bugs is to do some research. Game developers probably encountered the same issues in the past and posted solutions on how to get rid of bugs.

4. ANTICIPATED RESULTS
The resulting game will be short, likely having only one or two levels. There will only be a few enemies and obstacles in the game. At most, there will either be one or two powers available. The main menu should have a start game button as well as a settings button. In the settings tab, the player can see the accessibility options for color-blind mode.

Once the build of the game is done by the end of October, some feedback can be gathered. A quick questionnaire could also be done to try and get players' thoughts on the gameplay, mechanics, and the implementation of color-blind mode. The questionnaire will be primarily sent to people with disabilities, though other people are welcome to fill it out.

5. CONCLUSION
This project aims to find ways the average game developer can implement accessibility using a game engine such as Unity. Using the tools of Unity made me realize the amount of work that game developers have to go through. I had to get a bit creative with implementing a colorblind feature. If Unity had built-in accessibility functionality then I would have an easier time changing the sprites to better suit people with color-blindness. This project also helped me learn how to use the various tools of Unity so I can create more games in the future. I believe that even though accessibility can be difficult and time-consuming to add, it is still worth it so more people can enjoy the game I create.

6. FUTURE WORK
The next step for this project would be to implement more accessibility options. Different settings for each type of colorblindness would be a good direction to go in. The addition of a difficulty setting could also be a good idea. Lowering the difficulty of a game can make it more accessible to those inexperienced with gaming. It can also lower the amount of visual information that needs to be processed, since a lower difficulty would mean fewer enemies to worry about. Some feedback from a questionnaire could also give me some guidance on what other accessibility options could be added and ways I can improve the game.

REFERENCES
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