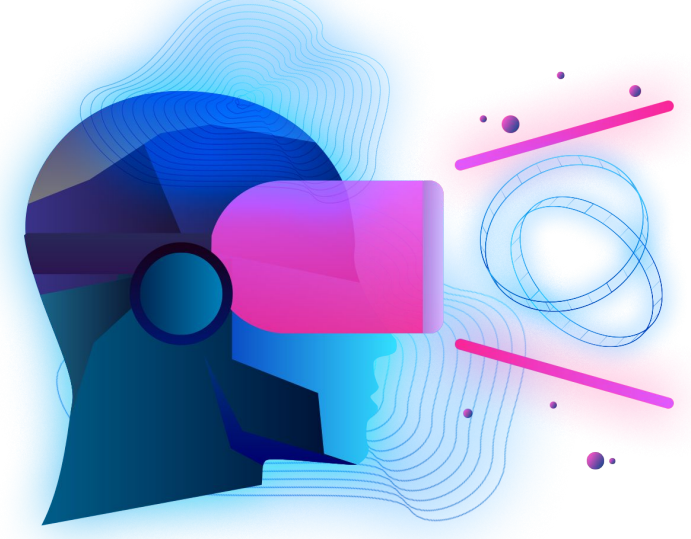




Building Empathy for the Colorblind with Virtual Reality

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Abstract

- Our goal is to increase empathy for people that are colorblind and work towards positive social change by creating an educational virtual reality (VR) game.
- In our VR game, there are multiple mini-game scenarios in which the player must complete an everyday task as someone who is colorblind, such as distinguishing between traffic light colors and cooking food.
- To test if the game had an effect on its players, a survey was conducted before and after they played the game. The survey consisted of various questions to gauge participants' empathy towards others.
- Our desired outcome was to see that participants' empathy levels toward colorblind individuals increased after playing.
- Looking forward, we plan to continue testing and gathering data to analyze whether this game successfully increased empathy. Furthermore, this approach can be applied to increase empathy for other disabilities as well.

Our Approach

GRAND CHALLENGE:
Colorblindness is not often classified as a learning disability and students with the disability are not given sufficient resources for learning.

SOLUTION:
To change the status quo, we must increase social awareness.

Education increases empathy. The more people know, the more they understand and feel.

We plan to do this by increasing empathy in hopes of bringing social change.

We believe that the "walking in someone else's shoes" experience will increase empathy.

Current education methods lack interactivity & immersion, an engaging environment, and are not effective to build empathy

Virtual Reality creates an immersive experience and allows for interaction.

Gamification is applying game elements to educate individuals about a serious topic.

The Virtual Reality Game



Fig. 1: Car interior for the traffic game scene



Fig. 2: Streets with traffic lights for traffic game scene



Fig. 3: Apple trees in nature scenery for the apple picking game scene

Author Contributions

- Emily: initial research on color blindness and empathy, initial game planning, pre and post survey questions, poster creation
- Isa: Research on color blindness, empathy, education, and Unity assets, game concept planning, built the 3D Unity environments and scenes
- Angela: Gamification Research, Initial Game Planning and Building, Poster Creation
- Nicole: Initial research, pre/post survey data analysis, and storyboard creation
- Meghna: VR research, coding the functionality for each scene, incorporating Oculus Integration and VRTK in Unity

What We Learned



- As researchers, we developed knowledgeable skills about researching data through our empathy pre and post-surveys and playtesting the game on participants.
- Much of this project was done during a pandemic, allowing us to develop soft skills in resilience, team work, and communication.
- Professionally, our group learned to reach out and ask for help from Chapman faculty for knowledge and finances.
- We also further developed our skills in software like GitHub and Unity

What's Next?

- Due to the COVID-19 pandemic, we were not able to play test the game further, therefore we are unable to make any conclusions. We plan to begin testing and gathering data when we return back to Chapman to determine the success of our game in building empathy.
- This approach of gamification with VR can also be applied to increase empathy for other disabilities, such as autism.
- Please refer to the QR Code above to find our GitHub Repository with our code, resources, and more.



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