The Effect of Augmented Reality Feature in Complete Anatomy Application on Educational Outcomes in Students with Autism Spectrum Disorder

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Background

- Autism Spectrum Disorder (ASD) is an early appearing neurological disorder characterised by features that affect how people communicate, interact and learn from their environment. Common features and signs include:
  - Deficiency in social communication skills
  - Symptoms that can affect day-to-day functioning and learning
  - Hyperfocused interests
  - Repetitive behaviors
- Augmented Reality (AR) is an interactive experience that inserts computer generated images onto real world environment, as seen on technological devices.
- Recent developments in AR are being studied and used in educational institutions to enhance learning experiences and outcomes in students.
  - Complete Anatomy is an iOS/Android application which is used by students to get a better understanding of human anatomy. One special feature of this application is the AR perspective of human anatomy.

Figure 1: Human skull as seen in Complete Anatomy through the AR feature

- Past studies have shown improved educational outcomes when using AR to study human anatomy by students in undergraduate and medical universities. Additionally, studies have shown better outcomes in Global Reading when students with ASD used AR technologies to learn.

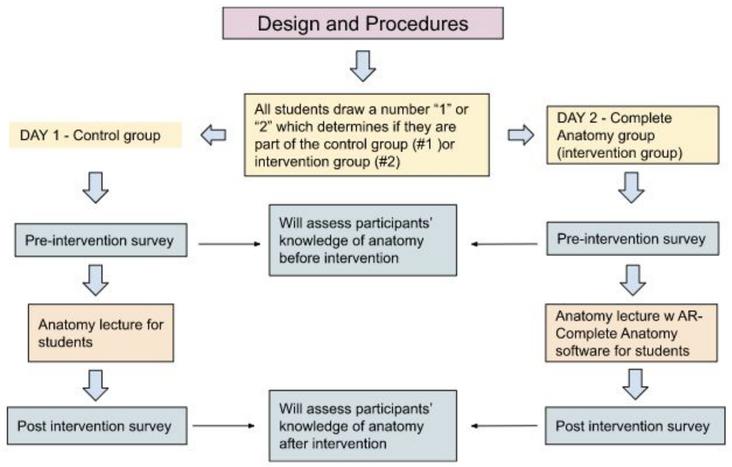
Purpose

The purpose of this study is to determine the effect of using the AR feature in the Complete Anatomy application, on educational outcomes in students with ASD who are taking the Human Anatomy elective as a part of their high school curriculum.

AR feature of Complete Anatomy improves the educational experience of students with ASD

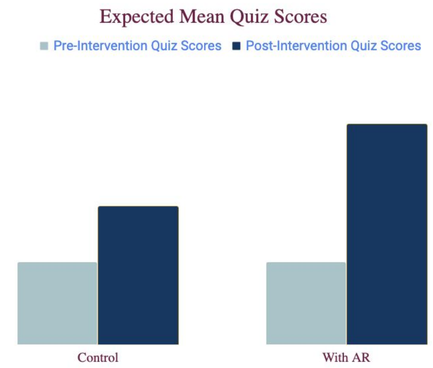
Methods

- Location: A local high school in Provo, Utah
- Participants: Students diagnosed with ASD, currently attending the same high school
- Method
  - The students are randomly divided into control and intervention groups.
  - The control and intervention groups will receive a 30-minute lecture about extremity muscles using Microsoft PowerPoint, on separate days.
    - Intervention group will receive 20 minutes to use AR in Complete Anatomy.
  - Both groups will complete and submit a pre- and post-intervention questionnaire of 10 multiple choice questions each.
- Data Analysis: Quizzes will be scored out of 10 and plotted on bar and line graphs in Microsoft Excel for analysis.



Expected Results

- Based on existing studies, we expect to see an improvement in the post-intervention quiz score averages of both groups when compared to mean scores of pre-intervention quizzes.
- Mean post intervention quiz score will be higher for the intervention group learning with AR compared to mean scores of control group.



Conclusion

- AR feature of Complete Anatomy may improve the educational experience of students with ASD.
- The results from this study may be applied to reform anatomy education for students with ASD in order to implement a more student-centric curriculum.

References