Effectiveness of Virtual Reality (VR) in Educational Applications

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Link to the Observable Notebook

Overview

01. Project Introduction
02. Objectives
03. Data Source
04. Visualization Showcase
05. Conclusions and Reflections

1. Project Introduction

- What is VR?

  Virtual Reality is a fully immersive digital environment that completely takes over your sense of sight and often hearing.
- What are the current most widely used applications of virtual reality?

1. Entertainment and Video Games
2. Healthcare
3. Engineering

1. Project Introduction

What about VR in Education?

2. Objectives

Accessibility and Usability

Technical Quality

Social Interaction

Content Relevance

Interactivity

Feedback and Assessment

Immersion

Cognitive Load

Instructor Role

Ethical and Emotional Considerations

2. Objectives

How does the use of VR technology in educational settings impact student learning outcomes, engagement, and comprehension compared to traditional learning methods?

What are the pedagogical implications of integrating VR into educational curriculums across various academic disciplines, and how can educators effectively implement this technology to maximize learning?

3. Data Source

NOMR Lab Data

Student learning outcomes and experience

kaggle Supplementary VR Data

Immersion level of VR environments

User experience in VR environments

3. Data Source - Schema

NOMR Lab Data

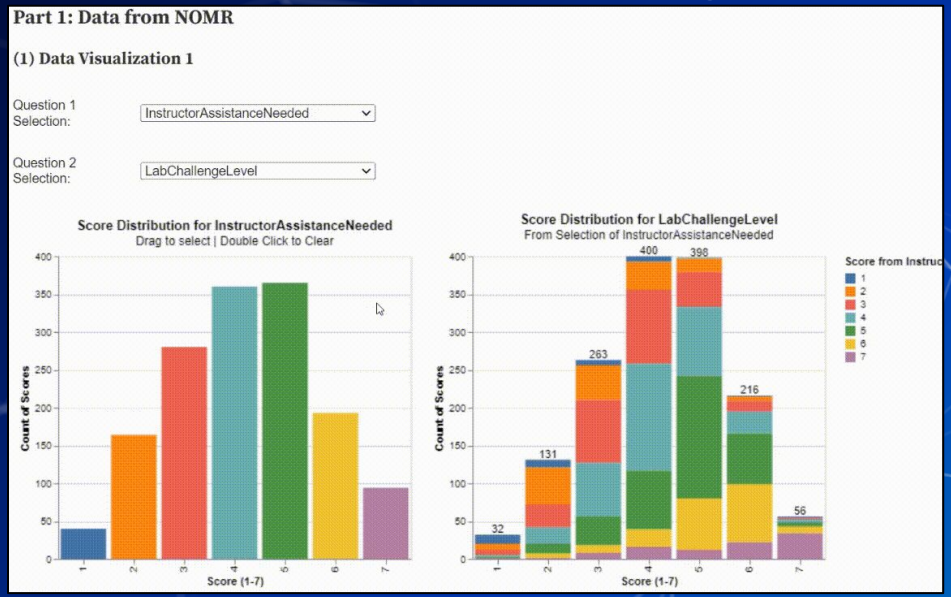
- Time
- InstructorAssistanceNeeded
- TaskGoalClarity
- TaskProcedureUnderstanding
- PerformanceAwareness
- LabChallengeLevel
- KnowledgeAndSkill
- LabEnjoyment
- LabIdentifier

Supplementary VR Data

- UserID
- Age
- Gender
- VRHeadset
- Duration
- MotionSickness
- ImmersionaLevel
- IPQ1, IPQ14, VRN2

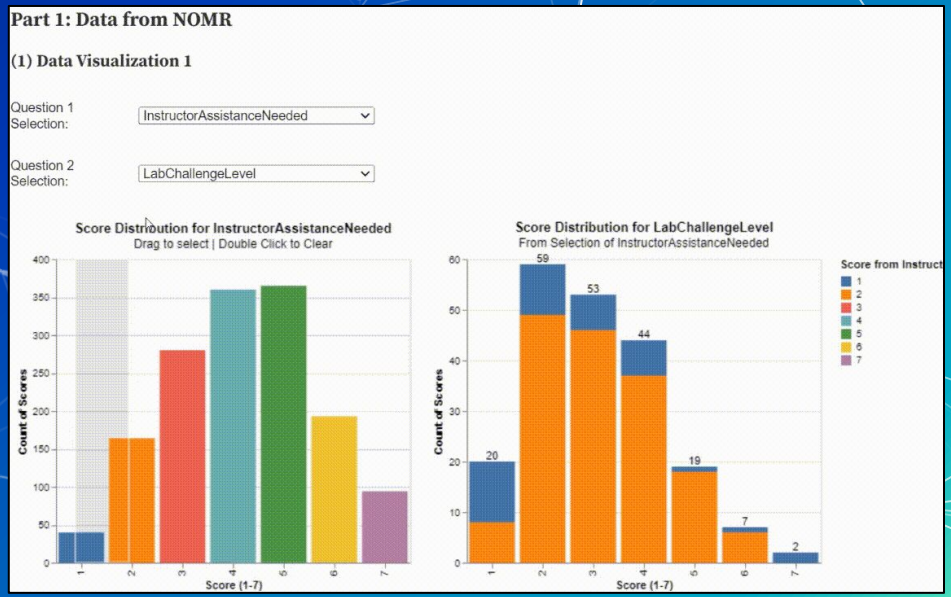
4. Visualization Showcase - NOMR Data

Assistance Needed | Lab Challenge Level



Participants ask for help when they are confused

Lab Challenge Level | Lab Enjoyment

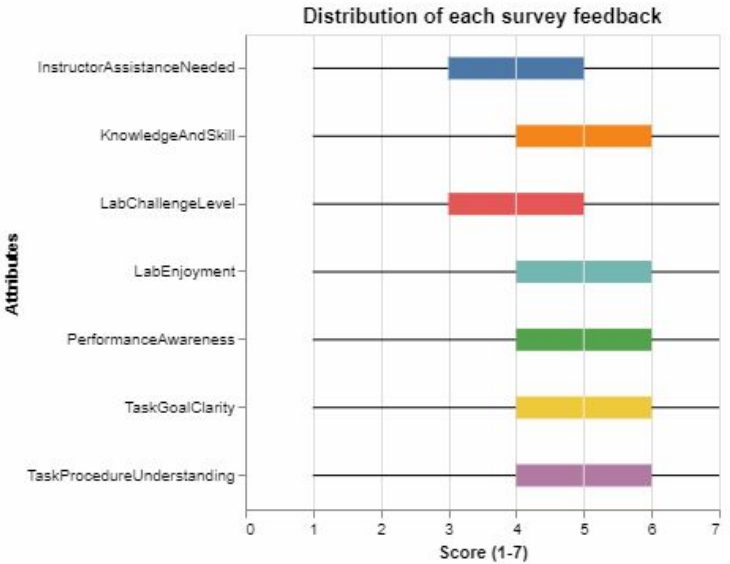


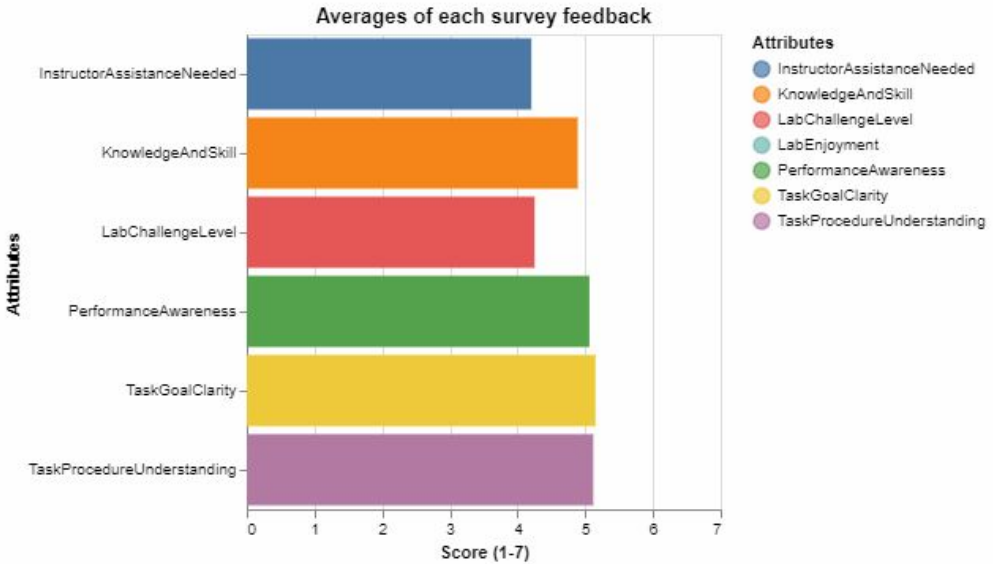
Labs are engaging despite participant difficulty/confusion

4. Visualization Showcase - NOMR Data

Averages and Overall Distribution of Scores

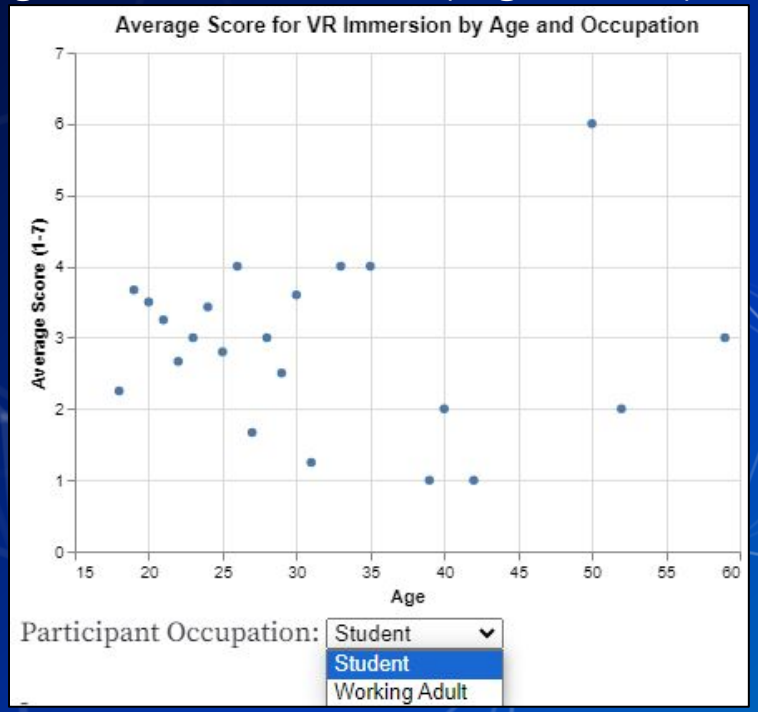
(2) Data Visualization 2





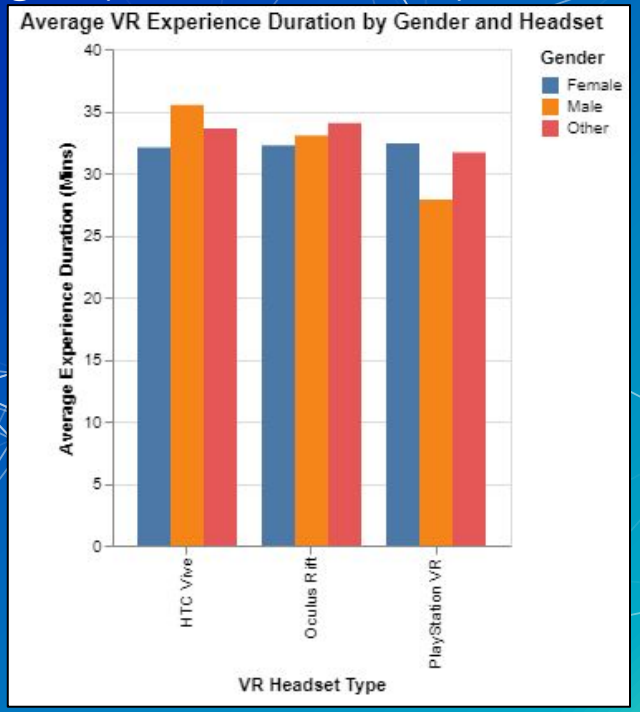
4. Visualization Showcase - Other Data

Average Score of Immersion by Age or Occupation



JCU Dataset

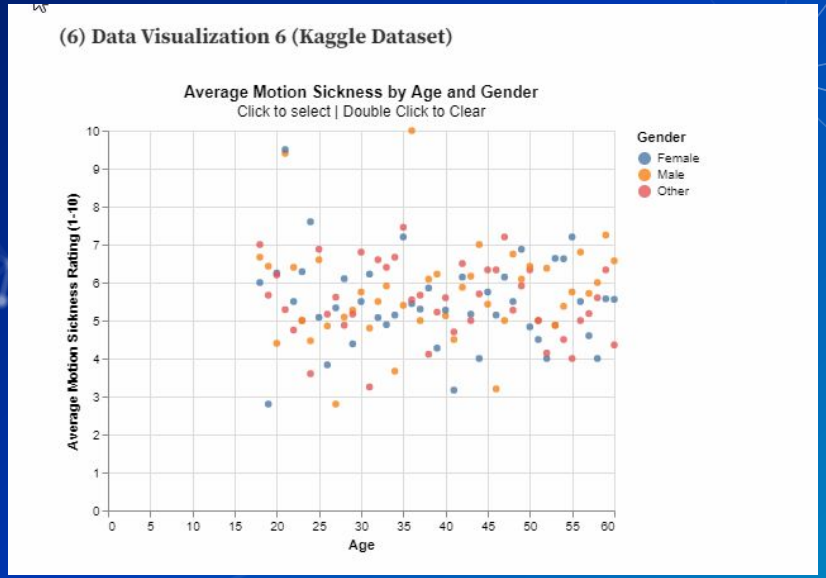
Average Experience Duration by Gender and Age



Kaggle Dataset

4. Visualization Showcase - Other Data

Average Motion Sickness Rating (1-10) by Age and Gender



Kaggle Dataset

5. Conclusions and Reflections

Our exploration into the effectiveness of virtual reality in educational applications reveals VR's significant potential to enhance learning experiences through immersive technology. By understanding its strengths and addressing its limitations, we can better harness VR's capabilities to revolutionize educational methodologies and engage learners in unprecedented ways.

Thank you so much!