Pre-Questionnaire

Participant #: \_\_\_\_\_ Condition: ⃣ Control ⃣ HoloLens 2

Demographic Information

Gender: ⃣ Male ⃣ Female ⃣ Other ⃣ Unspecified

Age (years): \_\_\_\_\_\_\_\_\_\_\_\_ Major: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Highest educational degree:

⃣ Bachelors ⃣ Masters ⃣ PhD ⃣ Other Professional Degree ⃣ Unspecified

Augmented reality is a technology that superimposes a computer-generated image on a user's view of the real world, thus providing a composite view. The examples of augmented reality systems range from Pokemon Go on mobile devices to Minecraft-on-HoloLens.

**Augmented Reality and Chemistry Training Experiences**

1. How often do you use augmented reality systems?

Never Very Rarely Rarely Occasionally Frequently Everyday

1 2 3 4 5 6

2. Which platform do you mostly use for augmented reality systems? (Select as many as appropriate.)

⃣ Desktop/Laptop ⃣ Tablet ⃣ Mobile Phones

⃣ Other (e.g., HoloLens or other AR glasses.) \_\_\_\_\_\_\_\_\_\_

3. How often do you play video games?

Never Very Rarely Rarely Occasionally Frequently Everyday

1 2 3 4 5 6

4. How often do you use chemistry labs?

Never Very Rarely Rarely Occasionally Frequently Everyday

1 2 3 4 5 6

5. How familiar are you with flow chemistry?

Not at all a little familiar familiar quite familiar I could teach it

1 2 3 4 5

6. How would you rate your ability to recall material you have learned in a formal setting like a laboratory or a classroom?

I have no difficulty I have a little difficulty I often have difficulty I always have difficulty

1 2 3 4

7. How comfortable are your constructing something if you are given the instructions and all the materials you need?

I have no difficulty I have a little difficulty I often have difficulty I always have difficulty

1 2 3 4

8. How often do you build things with your hands?

Never Very Rarely Rarely Occasionally Frequently Everyday

1 2 3 4 5 6

9. How would you describe your interest in a flow chemistry set up?

10. In the past, what kind of things or events have impacted your ability to process learning or training materials?

Post-Questionnaire

Participant #: \_\_\_\_ Condition: ⃣ Control ⃣ HoloLens 2 ⃣

1. *Suppose you had access to an AR system that could teach you about building things like the flow chemistry setup any time you wanted to.*

How likely would you choose learning the material through the AR system over learning in a traditional classroom?

Never Very Rarely Rarely Occasionally Frequently Everytime

1 2 3 4 5 6

2. Rate your experience about learning flow chemistry.

Very Difficult Difficult Somewhat Difficult Somewhat Easy Easy Very Easy

1 2 3 4 5 6

3. Rate your ability to recall the flow chemistry procedure.

Very Difficult Difficult Somewhat Difficult Somewhat Easy Easy Very Easy

1 2 3 4 5 6

4. Rate your ability to recall the parts required for the flow chemistry procedure.

Very Difficult Difficult Somewhat Difficult Somewhat Easy Easy Very Easy

1 2 3 4 5 6

4. Rate your experience of the training content.

Completely unclear Mostly unclear Unclear Clear Mostly Clear Completely Clear 1 2 3 4 5 6

5. Rate your experience of building a flow chemistry set up

Very Difficult Difficult Somewhat Difficult Somewhat Easy Easy Very Easy

1 2 3 4 5 6

5. Rate your experience of the clarity of the steps in the flow chemistry set-up

Very Clear Clear Neither Clear Nor Unclear Unclear Very Unclear

1 2 3 4 5

6. Rate your overall training experience.

Extremely boring Mostly Boring Boring Sort of engaging Engaging Extremely Engaging

1 2 3 4 5 6

7. Which step, if any, was the most difficult for you to accomplish? How would you change it, if at all?

8. Which step, if any, was the easiest for you to accomplish? How would you change it, if at all?

9. What would you change about your learning experience? Why?

10. In your opinion, what was the most memorable or enjoyable part of your learning experience? Why?