

Virtual Reality for Teaching and Learning in Crime Scene Investigation **Supplementary Information**

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1 Further Methods & Results

1.1 VR Development Specifications

The hardware setup for the development machine were as follows.

- 650 W Power Supply
- 32 GB DDR4 RAM at 7.8 GHz
- Intel i7-9700k CPU at 4.8 GHz
- NVidia RTX 2080 Super with 8 Gb GDDR6 RAM

Development was conducted on an Oculus Rift (Facebook, USA) wired headset, before the application was ported to Android for the production Oculus Quest headsets.

1.2 Video Description

The supplementary video (attached or available at https://youtu.be/1z_TI160xnU) shows a guided walkthrough of the VR environment. Snap turning is demonstrated after which the three pieces of evidence are shown, then markers are placed on each evidence source using the grabbable item feature. Note that as the rendered display shows only the left eye in the absence of 3D, the view shows approximately 30% of the total field of view in VR.

1.3 Experiment Scenario

A call was received from Mr Jason PETERS at 22:30 hours. He reported that he had returned home from the pub to find a IC1 male in his living room. He confronted the man who was holding a knife, there was a small struggle before the intruder fled the scene. Mr PETERS was not injured and is currently being questioned further by police officers in the kitchen

1.4 User Questionnaire

Answers are graded on a Likert scale of 1–5 where 1 indicated ‘strongly disagree’, three indicated ‘neutral’ and five indicated ‘strongly agree’.

1. The briefing provided amply prepared me for using the VR headset
2. It was easy to move around the virtual crime scene house
3. The test made me feel sick/gave me vertigo
4. The control scheme for interacting with the virtual world was intuitive
5. The crime scene was immersive
6. I feel that the crime scene had ample resources to allow me to learn about crime scene investigations
7. I enjoyed the experience
8. Free movement with the analogue sticks was preferable to physically walking around the environment

1.5 User comments

Please see the table below.

User number	Comments
Staff 1	Great experience, include more rooms
Staff 2	Make all items moveable. Felt sick. Boxed area for photo tool
Staff 3	Felt sick, possibly because I sat down
Staff 4	Include blood spatter interpretation
Staff 5	Area markers in game suitable for colour blind users?
Staff 6	Walking speed too quick compared to free move, felt sick
Student 1	Add ruler and numbered markers
Student 2	Windows not solid objects
Student 3	Character collisions with markers
Student 4	Larger play area desirable
Student 5	Controls easy to use
Student 6	Great experience, I learned a lot
Student 7	Add option to change lighting. Fun experience
Student 8	I was happy with my performance

Table 1: User comments. All comments have been deidentified and condensed.

1.6 Costing of Practical and VR Crime Scenes

The attached spreadsheet contains three tabs:

1. Approximate cost of VR suite setup
2. Calculated cost of a typical crime scene practical for a cohort of 90 students
3. Estimated cost of a VR practical for a cohort of 90 students