

GemQuest VR Usability Testing



**“If a picture is worth 1000 words, a
prototype is worth 1000 meetings.”**

-IDEO

Almost a year ago, Eric and I decided to don our sheriff badges and ten-gallon-hats to adapt the laws of human-centered design to the wild wild west of virtual reality (VR) gaming. After several iterations, GemQuest VR was born. Our team’s emphasis on pleasurable design coupled with a lack of hard guidelines for VR design meant that we had to find out a lot of things for ourselves.

We accomplished this through continual heuristic testing and usability tests.

Our latest usability test focused on two major problems in current VR software: discoverability and comfort.

Heuristic Testing

Through iterative heuristic testing, members of our studio constantly identified and squashed bugs as well as other issues. Frequently one team member would be jacked in, giving real-time feedback to another team member making in-engine adjustments on the computer.

This form of testing was valued for its speed and efficiency in identifying problems. We solved problems with hand orientation, player height, teleportation, pick-up animations, scale, and much more using this system.

Demo Testing

It’s hard to fake VR - so for the most part we didn’t. Our team has spent the last eight months building a VR demo on top of the Unity game engine.

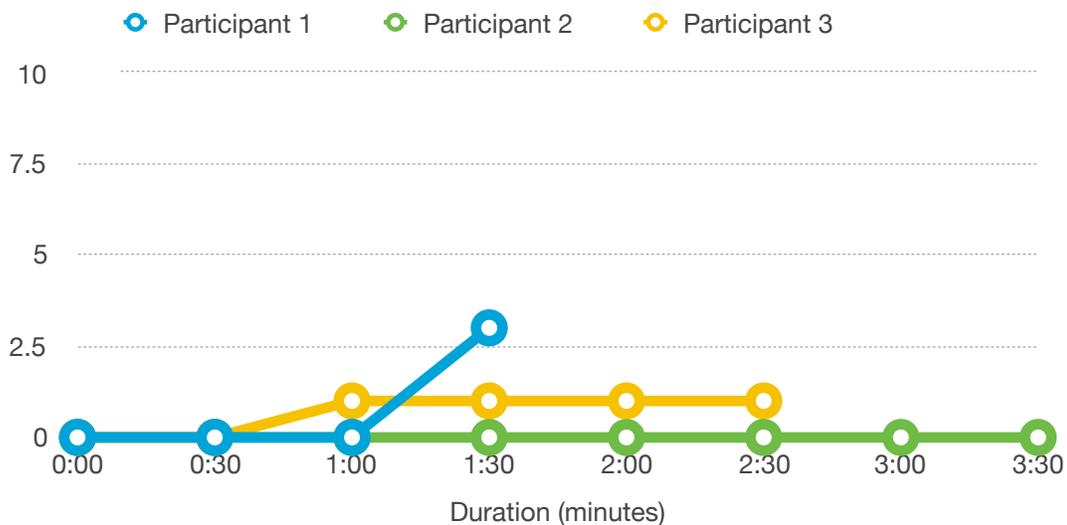
The demo used for these tests features an iteration of the game where players are moved using a keyboard (for longer distances) or by physically walking (for shorter distances). Participants held two motion controllers. Once inside of our prototype, these motion controllers turned into a hand (capable of picking up objects) and a sword (capable of slicing baddies). One monster was available to battle (an orc that won't be used in the final version of the game) and one item was available to be picked up.

Comfort Technique

In order to measure comfort, we employed the [Fast Motion Sickness \(FMS\)](#) scale developed by Bavand Keshavarz of M.I.T. and Michael Hect of Princeton. The FMS scale was originally developed for use in academic research surrounding virtual reality locomotion. Since this is a tested scale, isn't obtrusive, and can be effective even in short bursts of time, it is the perfect fit for a fledgling indie VR game.

Every thirty seconds, the designer conducting the test asked the participant to rate their feeling of discomfort from one to ten (one being perfectly comfortable, ten being extreme nausea).

Comfort Results



The comfort and discoverability tests were conducted on participants simultaneously. The comfort test showed that the current locomotion system used in the demo (keyboard movement) is unsustainable.

One participant played for over three minutes and thirty seconds without any apparent nausea. Another participant felt slight discomfort after a minute of gameplay but continued to play for another minute and a half. Finally, one participant reported a three on the FMS scale after a minute and thirty seconds.

GemQuest VR aims to be a comfortable experience for non-gamers. All three participants had played VR games in the past. They're still within our target audience, but it would be valuable to include people who have no preconceptions about VR in future studies.

Session length wasn't kept constant and participants jacked out at their leisure. Session length was also a lot shorter than it will be in the final game. So this measure isn't as accurate as we'd like it to be.

In order to solve early issues with comfort, our team is hard at work on a teleportation system employing blinking. This is quickly becoming a standard for VR locomotion because blinking is imperceptible and spares players' vestibular systems.

Discoverability Technique

GemQuest VR uses cutting-edge 360° audio technology through the Unity game engine. We employ this through the motion and voice of Notchi - your adorable guide to the worlds of GemQuest. Notchi's vocals weren't available in the demo we used for testing, so the designer conducting the usability testing emulated Notchi by moving around the room and speaking with the participant in the way that Notchi would.

Users were guided by Notchi to move toward a certain direction in order to complete a fictional task. Success was determined by whether or not the participant responded to "Notchi" by moving toward her.

Discoverability Results

This test went really well. All three participants responded almost immediately by looking and moving in the direction of Notchi's voice. This served to reinforce our idea that Notchi's voice will be a helpful way to guide the player.

There are definitely still assumptions being made. For instance, all three participants were friends of the designer emulating Notchi. Because of this they may have been more likely to listen and respond. The same can be said of participants being in a lab where they are likely expecting they will need to listen to the designer conducting the test.

Key Takeaways

Our usability tests and conversations with participants have already had an impact on our game design. Moving forward we'll continue testing even more frequently.

Since GemQuest VR is intended to be a long form game, we're taking motion sickness data extremely seriously. Because of this, we have a variety of methods we'd love to A/B test including: giving characters noses, adding teleportation, and upping frame-rate.

We were happy to see Notchi as a tool for feature and objective discovery. As we build out the actual Notchi in the game we'll continue testing different voices and prompts from her and ensure that her dialogue triggers at helpful times.