



VR Literature Summary: Worker Safety

THE OVERVIEW

Few controlled experiments have been done regarding the effectiveness of virtual reality training versus traditional training methods. However, virtual reality training simulations have been developed for multiple industries, and workers typically self-report both enjoying the training and finding it to be effective in preparing them to follow plans or procedures they were able to practice in VR.

VR has many other potential applications in labor, including operations management (for example, planning and optimizing a factory layout), design (sketching new products, experiments, and prototypes in VR), and assembly process optimization.

DEVELOPED TRAINING MODULES/APPLICATIONS

A prototype VR simulation for mine safety has been developed for use in South African gold mines. In this case, an experiment with a control group was conducted, wherein one group of workers was exposed to video training only, and another group of workers was exposed to video training and VR.ⁱ However, the “effectiveness” of the training was not measured between groups.

- 94% of subjects in the VR group preferred VR as a medium compared to video.
- The conventional video material was rated 94% easy to understand, versus VR’s 81%.
- The conventional video material was rated 94% realistic, versus VR’s 77%.

Another mine safety simulation has been developed that allows participants to practice escaping from a mine in groups of four. This study did not use a control group to isolate VR’s effects, though miners who use VR to simulate evacuation scenarios reported that they feel more prepared to follow an evacuation plan in the real world.

MediSim, a virtual trainer for medical first responders, has been designed to improve situational training. Participants can diagnose and stabilize multiple the “patient” they observe in multiple ways. They are then able to diagnose the injury and decide on a treatment method. If the medic does not properly diagnose the injury, the “patient” dynamically worsens, requiring timely treatment.ⁱⁱ

“Steve,” a “team agent” (or virtual team member) has been developed for use in training for naval operating procedures. Virtual agents are virtual humans that can be trained to fulfill team tasks (such as passing on information) in a collaborative environment, or “stand in” for other team members if their role in the collaboration can be taught.ⁱⁱⁱ Limitations in virtual human agents include handling tasks with shifting roles and unstructured communication among teammates. Also, they are unable to effectively handle tasks that involve simultaneous physical collaboration and perception.

ⁱ “Virtual reality for mine safety training in South Africa” - A.P. Squeich, 2001

ⁱⁱ “MediSim: A Prototype VR System for Training Medical First Responders” -Sharon Stansfield, Dan Shawver, Annette Sobel, 1998

ⁱⁱⁱ “Virtual Humans for Team Training in Virtual Reality” -Jeff Rickel and W. Lewis Johnson, 1999