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Using Virtual Reality Simulations to Develop Social Work Practice Skills

Stone, Raines and Gray

Abstract

This paper explores the increasing use of Virtual Reality (VR) simulations in education. A discussion of the recent adoption by social work educators of VR simulations is also provided. The authors next provide a description of a recent project within an undergraduate social work program in which VR simulations are used to enhance the knowledge and skills of students in an advanced social work practice class. Student reactions to the experience are discussed along with limitations of the project. Implications for future educational use and research are presented.

Using Virtual Reality Simulations to Develop Social Work Practice Skills

Historically, social work education has provided training through the traditional methods of classroom experiences and field settings (Wilson, Brown, Wood, & Farkas, 2013). While these have proven effective in their own right, many within social work and other professional disciplines have looked toward emerging technological advances to enhance the transference of information on practice knowledge and skills. One such emerging technology is in the area of virtual reality (VR) simulations, especially in the form of full-immersive VR options that commonly involve head-mounted displays and motion detecting systems to stimulate the participant's senses (Simone, Schultheis, Rebimbas, & Millis, 2006). At Ball State University, we have implemented a suite of VR training activities into our social work practice courses to address salient community issues surrounding drug use and disproportionality. The simulations take users through home health and safety assessments, reinforcing practice skills surrounding engagement, assessment, intervention, social justice, and physical safety within a virtual home environment. As this simulation curriculum has shown promise inside the classroom, we believe that human services professionals in the field can also benefit from engaging in these cost-effective, safe, and efficient practice activities.

Benefits of 3D Immersive Virtual Reality Experiences with Head-Mounted Displays

Simulation development and technology using virtual reality (VR) technology is still relatively new, especially in social work. There is an important distinction that we make when referring to simulations in virtual reality: 3D immersion simulations are those that utilize head-mounted displays (HMD), placing users' entire visual field inside the experience. Contrast this to (less-immersive) 2D virtual experiences commonly using a desktop computer and keyboard, technology that has already found its way into social work education. For example, Vernon, Lewis, and Lynch (2009) discussed the various ways in which social work educators could take advantage of virtual worlds such as "Second Life." They note how virtual worlds can be superior to mere textbook readings as they "can provide well developed three dimensional visual settings that can be extremely engaging" (p. 177). It was their contention that the "Second Life" environment could provide experiences at both the micro and macro levels of social work practice.

While the use of "Second Life" represented an early milestone in social work education's use of technology in the classroom, this desktop-based avatar system represents two-dimensional immersion and cannot totally immerse an individual in the virtual world (Silva & Moioli, 2017). Thus, environmental distractions become key issues when considering the benefits of 3D VR simulations on presence and immersion. Several researchers, like those at Stanford's Virtual Human Interaction Lab (VHIL), have examined how immersive, 3D VR environments effectively promote learning outcomes through inducing feelings of empathy, embodiment, and presence in individuals (see: Groom, Bailenson, & Nass, 2009; Oh, Bailenson, Weisz, & Zaki, 2016). Kyaw et al. (2019) examined the

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effectiveness of 3D immersive VR simulations with health professionals specifically, whose meta-analysis demonstrated the technology's ability to increase knowledge acquisition, cognitive skill development, attitudes, and satisfaction with their work. Markowitz, Laha, Perone, Pea, and Bailenson (2018) also concluded that, overall, 3D immersion in VR is effective at facilitating learning outcomes. But they also point out instances where the use 2D and 3D VR were equally effective. In these studies, however, the training content tended to include science and botany information.

We argue that these instances include activities and subject matter (i.e., biology/natural sciences content) that do not include a strong behavioral engagement component for VR simulation. That is, this kind of learning required more memorization and recall, and learners consumed the information in 3D VR just as they would from 2D experiences or notes slides. For example, when considering surgical simulation applications, it becomes clear how full immersion 3D VR can be used to engage strong behavioral indicators of performance.

Developing Practice Skills with VR

Explorations of expert skill development routinely engage the concept of deliberate practice. Research conducted by Anders Ericsson (Ericsson, Krampe, & Tesch-Römer, 1993; Ericsson, 2008; Ericsson & Pool, 2016) differentiates between deliberate, purposeful, and traditional self-initiated practice models. Deliberate practice requires intensive attention and clear performance objectives under the supervision of credible/professional instructors, who can prescribe and supervise intuitive practice activities, with purposeful and immediate feedback. This represents the key ingredients that guided the development of our VR simulation program, where we intervene with practice activities during the development of professional habits in order to maximize user outcomes. VR simulations provide a rich, failure-tolerant environment that is well suited to this deliberate and purposeful practice paradigm.

These findings are not exclusive to academia, software marketers, or gamers; industry has certainly noticed the value of this technology as a training tool. Companies such as Walmart, Kentucky Fried Chicken, UPS, and the National Football League (NFL) have all implemented VR training for their employees based on the idea of deliberate practice.

VRoom at BSU: Virtual Home Health and Safety Assessments

Two different Virtual Reality (VR) home visit simulations were implemented in a senior-level social work course focusing on practice with individuals and families in an accredited Baccalaureate Social Work program (see Figures 1 and 2). This course is the final micro/mezzo practice course taken just prior to entering a semester-long, full time practicum experience. Typically, about one in three BSU social work students will perform home visit activities during their practicum. While a number of hands-on learning experiences are available—such as role plays, videotaped practice interviews, an in-depth self-assessment of skills, and small group reviews of videotaped interviews by peers and the instructor—students often ask for more hands-on learning experiences in course evaluations. They also relate the need for more experiential learning to increase their readiness for practice. These VR simulations certainly offered the opportunity to increase hands-on learning of directly relevant practice skills in the class. Prior to the VR simulation, users were provided a basic overview of home visit activities (White, 2013). Specifically, they received information on assessment, consistent and accurate field documentation, and planning for effective interventions.

The simulations were developed for the HTC Vive and Oculus GO headsets. Students scheduled appointments to complete the simulation activities outside of class. Beginning with a user tutorial, the simulation software introduces users to the simulation's mechanics, the objectives of the simulation, and presents a fictionalized case (both audio and visual). After the tutorial/case background, users arrive at the home visit location. They are instructed to move about the home and inventory the risk and protective factors found throughout the space. As users identify elements of the family's home, they are asked to rate the strength of each risk/ protective factor identified, as well as audio record their verbal descriptions of a case/field

(DAP, or Data, Assessment, Plan) note. Users have 20 minutes to complete the activity.

The software then propagates user performance information into individual user reports. These reports include all the risk/ protective factors identified, how users rated each object, an average rating for risk and protective factors, and an audio file of their DAP note for that factor. These reports are given to users for discussion and reflection.

After participating, individual user performance reports are discussed with instructors, immediately relating different elements of their behavior in the virtual environment to key practice skills. Much like the military's "after-action review" methodology, this critical element forces instructors and learners to process what happened, why it happened, and how users can perform better next time. This reinforces purposeful practice and the development of strong, accurate mental models associated with engagement, assessment, intervention, social justice, and physical safety.

While the strengths perspective is consistently encouraged in class activities, most users forget to identify any protective factors present in the VR environment. Few users initially recognized this bias towards risk factors. Many users reported an increase in knowledge, confidence, and preparedness on steps to take, and what to look for, to complete thorough home visits in the future. They also noted the benefits of having a simulated environment where they could practice home visit skills without making costly mistakes or causing harm to a family on their caseload. All appreciated the review of their first VR home visits as well as additional information given in class lecture regarding the home visit process. During the second simulation, most students improved in their abilities to recognize and note strengths in the environment. Alternative assignments were given to anyone who could not complete the VR simulations (e.g., due to motion sickness/issues using HMDs).

Limitations

Users are routinely asked to provide feedback on their simulation experience in order to provide developers with validated learning on the software's effectiveness/inform and improve software iterations. First, users requested an even more in-depth "after-action review" of their results. They indicated wanting more individualized information relative to their performance, rather than in a group setting. Also, the size of the simulation environment was also limiting, given the best-practice time limits we imposed (20 minutes). Because the VR environment is new (many have never used this technology before), significant time was spent exploring the technology rather than performing the assessment task. Several suggested more pre-simulation content related to substance use disorders and specifics related to investigation of houses where suspected drug activity is taking place. Essentially, more time to prepare for and process the results of their simulation performance was a top recommendation made by users.

Benefits and Future of Virtual Training Programs

VR training offers several unique benefits. Perhaps the most salient and widely recognized is the failure-safe nature of these activities. Much like pilots at the controls of a flight simulator, this systems allows mistakes to take place in situations of minimal risk. As our students and users have indicated, they are interested in practical application exercises. As we've demonstrated, VR simulations help users learn new skills and build effective professional habits under professional supervision. Recognizing the broader applicability after three semesters of simulations with students, we have been in contact with our local Department of Child Services to explore collaboration and training opportunities for local child services professionals. The simulation activities allow users to transform knowledge into judgment (in-class materials/information), and judgment into action (simulation performance); and it is a process we can now measure with a fair degree of granularity.

Next, VR simulations are cost-effective ways to engage users. As the development of custom VR environments becomes more accessible, once developed, software requires only routine maintenance schedules to continue being viable for hundreds/thousands of users. The professional development landscape of today relies more heavily on digital technologies (e.g., web conferencing/webinars). This makes these kind of training exercises beneficial as primary lessons for new professionals, as well as professionals in continuing education settings. Embedding learning activities into technologies that generate intrinsically high levels of interest gives educators the opportunity to expose a broad range of users to effective learning activities that reinforce high quality professional habits/behaviors.

Last, this technology allows us to measure student behavior in new ways never possible until now. More specifically, as we developed our simulations, we borrowed feature development methodology from data scientists, building in data capture methods that allow us to use VR simulations as vehicles for digital experiments. These experimental methods are new and exciting areas of social science research, giving practitioners new ways to address classic problems of measurement. Salganik (2018) discusses digital research, describing measurement as “about inferring what your respondents think and do from what they say” (p. 94). VR simulations now allow us to bridge this gap: to build software that records and measures not just what users reportedly think, but *what they think, say, and actually do.*

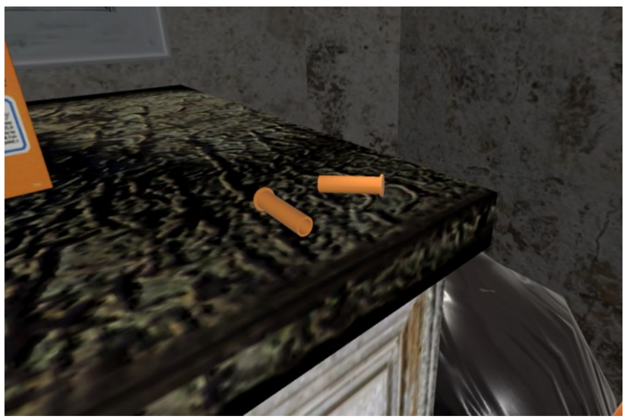

Figure 1. In-sim footage of a countertop that includes evidence of drug use. The simulations were designed with input from local police, BSU Faculty, BSU Staff, local Department of Child Services, and other local mental health and social work practitioners. These syringe caps on a counter were suggested by police as a common sign of IV drug use.

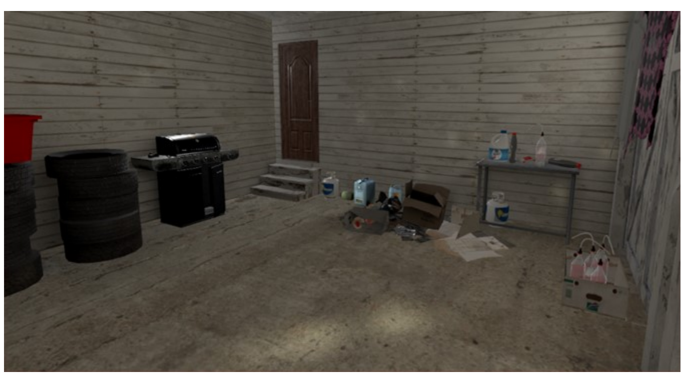

Figure 2. In-sim footage of a space suspected in the manufacture and distribution of methamphetamines.

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