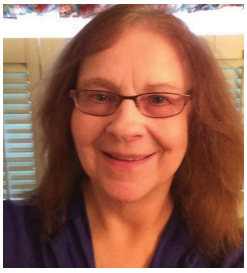
COLLABORATIVE HEALTHCARE
INTERPROFESSIONAL PRACTICE, EDUCATION, AND EVALUATION

Preparing the Healthcare Workforce of Tomorrow through Interprofessional Simulations: A Review of Simulation Technologies used at Jefferson Center for Interprofessional Practice & Education



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Interprofessional (IP) collaborative practice is believed to be an essential component of healthcare system transformation via the "Quadruple Aim" (IPEC, 2016). IP simulations provide invaluable opportunities for learners to practice, discuss, and improve teamwork and communication skills for clinical situations (Thistlethwaite, 2012). Furthermore, IP simulations help students gain a nuanced understanding of, and appreciation for, the roles and responsibilities of colleagues from different professions (Thistlethwaite, 2012). As a result, students increase their understanding of how practice is enhanced as they gain additional perspectives on care and improve their ability to engage in effective IP teamwork (IPEC, 2016). IP simulations allow an opportunity to explicitly address teamwork issues that arise frequently in clinical practice.

We describe three delivery methods for IP simulations used at the Jefferson Center for Interprofessional Practice & Education (JCIPE): in-person, virtual video conferencing (VVC), and virtual reality (VR). Each provides different benefits and challenges. Below we will briefly describe these delivery methods and results from the three programs. For more in-depth review and discussion of the methodology and results, please see previously published studies on these programs (e.g., Forstater, King & Gassman, 2021; Forstater, Sicks, Collins & Schmidt, 2019; Herge & Hass, 2022; Kates, Toth-Cohen & Hass, 2022; King, Gerolamo, Hass, Libros & Forstater, 2021; King & Forstater, 2021; Toth-Cohen, Kates & Hass, 2022; Toth-Cohen & Smith, 2019).

Simulations have been conducted both in-person and via VVC, with increased use of VVC during the COVID-19 pandemic. VR has been used for simulations since the 1960's (Ziker, Truman, & Dodds, 2021), and while creation and implementation have increased exponentially, fewer IP training programs are conducted with VR than in-person or with VVC. However, recent trends demonstrate an increased focus on simultaneous use by more than one healthcare profession. (Qiao, Xu, Li & Ouyang, 2021).

Many different technologies encompass VR, which is frequently referred to as extended reality (XR). In this conceptualization, XR serves as the umbrella term for VR, assisted reality (AR), and mixed reality (MR), rather than XR referring to a specific technology (Lee et al., 2021). Additionally, many view specific distinctions between technologies within the VR umbrella. For example, Bracq et al. (2019) categorize VR into:

1) screen-based systems commonly used to simulate skilled techniques such as colonoscopy;

2) virtual worlds (VW) accessed through laptops or desktops, and in some cases, other devices; and,

3) immersive VR, which encompasses delivery through head-mounted displays, (including standalone headsets like Meta Quest) and through Igloo and CAVE systems (shared VR spaces within a physical location).

JCIPE Simulation Programs

Team Care Planning is an in-person simulation in which IP student teams collaborate to develop a treatment plan for a patient, plan a family meeting, and engage in a meeting with a patient and caregiver (standardized patients [SPs]). Following the simulation, students debrief with faculty facilitators and receive direct feedback from SPs. Simulation cases include clinical discharge planning for an elder adult post-stroke and developing a birth plan to support Black maternal health. Due to the large number of students, some participate in the family meeting while others observe. Our data reveals no differences between participants and observers in the value of the learning activity and teamwork experience (Herge, et. al., 2022). Both groups identify experiential learning as an important theme in response to open-ended questions. Despite the scheduling challenges that

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are inherent in IP work, the benefits of in-person simulations include the richness of in-person discussions and the opportunity to learn to react to elements in one's surroundings, including patient and caregiver body language.

Team Simulation and Fearlessness Education (TeamSAFE) is an in-person simulation in which IP student teams apply teambuilding and communication

▲ *Skill-building with Advanced TeamSAFE in-person simulation to improve patient safety*

techniques to patient encounters using the framework of Team Strategies and Tools to Enhance Performance and Patient Safety (TeamSTEPPS®), a national patient safety toolkit. During the COVID-19 pandemic, TeamSAFE simulations were conducted via VVC. Despite the challenges of VVC simulation, including difficulty suspending disbelief and engaging students in an online learning environment, students performed similarly on a pre-post knowledge assessment. Furthermore, they endorsed similar increases in their comfort levels relative to speaking up to advocate for patient safety, compared to pre-pandemic students. (Internal data available upon request.) Additionally, virtual delivery allowed for easier participation for students and facilitators located on different campuses and less complicated scheduling of sessions due to the lack of travel time for participants.

Virtual Reality (VR) programs presently used within JCIPE focus on training IP teams of health professions students and staff to work with vulnerable populations. Programs include Alzheimer's Virtual Interprofessional Training (AVIT), which focuses on persons with dementia and their caregivers, and Enhancing Services for Homeless Populations (ESHP), focusing on unhoused persons, both emphasizing communication, teamwork, and leadership development (Bracq et al., 2019).

An important aspect of VR simulations is their fit with intended educational objectives, particularly their focus on training students in complex procedural/technical skills versus non-technical skills (NTS) such as communication, teamwork, and leadership (Bracq et al., 2019). Both technical and NTS may be a focus in a given VR simulation, but typically one or the other predominates. Presently, JCIPE emphasizes the development of NTS in its VR programs. AVIT and ESHP use the VW SecondLife® as the platform, due to its capacity to incorporate simultaneous participation by students from different geographic locations.

Both AVIT and ESHP use a case format to structure student learning, with consumer, patient, provider, and observer roles (Okun & Kantowicz, 2014). This process of enacting different roles is considered crucial for building empathy and other key professional NTS (Rossland et al., 2022).

AVIT is designed to meet the needs of specific learners: students follow a person with dementia and her caregiver over time, from mild stage/initial diagnosis through middle- and late-stage dementia, in a series of three cases. AVIT is also designed to aid practicing clinicians, who complete one case.

ESHP consists of three distinct cases showing mobile and fixed-site outreach with different persons experiencing homelessness (PEH): a teenager with schizophrenia and substance use disorder; a 58-year-old Iraq war veteran who became homeless following job loss; and a mother with three young children who left her home for a transitional housing shelter after experiencing domestic violence. All cases focus on harm reduction techniques, strategies for using and customizing appropriate resources, and engaging and collaborating with PEH through motivational interviewing.

AVIT and ESHP programs use a sequence of pre-briefing, simulation, debriefing, and evaluation. Evaluations include a continuous quality improvement approach to enhance the programs by eliciting feedback from stakeholders (students, staff, administrators, and facilitators). Both

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▲ *Clinical Pharmacist conducts a medication review in Second Life*

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programs were developed in collaboration with community partners, including a continuing care retirement community (The Hill at Whitemarsh) for AVIT and a housing first organization, Pathways to Housing Pennsylvania, for ESHP. Both AVIT and ESHP have demonstrated consistent pre-post gains in self-efficacy over time (Toth-Cohen & Smith, 2019). 84-87.5% of students rate their satisfaction very good or excellent (Toth-Cohen, et. al., 2022). The main challenge associated with VR simulations is that some students may have difficulty using or accessing the technology.

Conclusion

Each simulation delivery method has unique challenges and benefits. VR is a rapidly changing field with an incredible range of opportunities for meaningful development to accomplish educational goals and optimally "grow" VR's use for IPE.

Data reviewed above indicate that each simulation method fosters learning (see cited work on p. 6). Therefore, when selecting which method is right for a given scenario, educators should consider the learning objectives they hope to achieve; the characteristics of their learners, including varying course and clinical schedules across programs, geographic location, and access to technology; and the instructor's resources, including interest, time, and money. Flexible frameworks and perspectives are essential for robust development and use. Key tenets for ongoing development that will take IPE into the future include multi-purpose usage for different learning venues and strategies, as well as expanding the number of participating disciplines while optimizing integration of IP simulations into curricula.

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