

Training Counselors Using Virtual Reality

Courtney M. Holmes¹, Fatima Tariq², Karena Heyward³ & Denise Hall⁴

Abstract

Virtual reality (VR) has the potential to expand experiential learning opportunities in counselor education. This article discusses how semi- and immersive VR can provide students a diverse range of experiences to increase both counseling skill and empathy development for clients with a myriad of identities, diagnoses, and presenting counseling issues. Suggestions and implications for counselor education are discussed.

Aim & Scope: Emerging, Experimental and Current Topics Relevant to Technology in Counselor Education, Supervision and Practice

Keywords: counselor education, virtual reality, empathy, experiential learning

The COVID-19 pandemic accelerated the ubiquitous adoption of telemental health services. One innovative way that technology continues to impact the counseling profession is through virtual reality (VR). Virtual reality is a fully digital experience that can either simulate or differ completely from the real world and uses 3D simulation technology (e.g., graphics, animation, and speech recognition) to create an immersive and engaging environment (Miller & Polson, 2019; Poetker, 2019). Virtual reality has been shown to be useful in the treatment of mental health disorders, clinical training, and empathy development (Park et al., 2019; Ruthenbeck & Reynolds, 2015; Schutte & Stilinović, 2017). Documented gains in symptom management, skill development, and overall well-being support the proliferation of VR options to support the treatment of a wide variety of mental health disorders (e.g., panic disorders and post-traumatic stress disorder; Park et al., 2019). Health professional education programs such as Nursing and Medical Education have begun to implement virtual reality technology in

student training (Ruthenbeck & Reynolds, 2015). The use of virtual reality for professional training in counselor education remains open for exploration. This article will outline the current uses of semi- and immersive virtual reality and discuss potential opportunities for development in counselor education particularly as they relate to experiential learning.

Immersive Levels of Virtual Reality

VR can be experienced on three different levels including non-immersive, semi-immersive, and fully immersive. Non-immersive is described as a person is simply interacting with a virtual environment on a screen (e.g., computer video games) using a keyboard or mouse, which is the least real-life experience. Semi-immersive is produced through a computer and projected onto a big screen (often used in simulations or education) and the user is personally involved in the environment through an avatar or physical representation of themselves, such as multi-user virtual environments (MUVE). Virtual worlds are simulated environments in which users interact as

¹ Virginia Commonwealth University

² Virginia Commonwealth University

³ Southern New Hampshire University

⁴ Virginia Commonwealth University

graphic avatars. This type of software offers a continuous, multiplayer, 3-D environment, allowing for expanded opportunities for learning and engagement (Jencius, 2009; Skiba, 2007). Second Life (SL) is an example of a well-recognized, semi-immersive, virtual world that has been used in counselor education and social work for teaching and research purposes (Jencius, 2009; Greenidge & Daire, 2005; McGhee et al., 2012; Wang et al., 2014).

Fully immersive is the most real-life and indicates that the user has a first-person perspective (Salamin et al., 2010). Spatial immersion occurs when a person feels the simulated world is perceptually convincing enough to feel as if they are physically in the created environment (Freina & Ott, 2015). This type of experience requires headsets or goggles and may include external stimuli or equipment (Miller & Polson, 2019; Poetker, 2019). Through immersive virtual reality, users can interact with an environment in ways that are unusual or impossible in the physical world (Bailey et al., 2016).

Embodiment VR is a particular type of fully immersive VR wherein the user wears a headset that either plays hemispherical video (live or pre-recorded video-like images) or animation that has been created and formatted for the VR experience. Immersive embodiment virtual reality has been successfully used to generate illusions of ownership over virtual bodies different in race, age, and gender (Banakou et al., 2016; Hamilton-Giachritsis et al., 2018). The user actively becomes another person through this experience and the VR video allows the user to move through the digital world embodying another's body type and perspective (Hamilton-Giachritsis et al., 2018; Herrera et al., 2018; Wijma et al., 2017). Essentially, this allows users to "walk a mile in another's shoes" and experience interacting as if they were another person. The feeling of inhabiting another person's skin and controlling another body's movement, can facilitate the development of empathy (Milk, 2016). Virtual reality is an accessible technology for the enhancement of empathy in myriad areas (e.g., gerontology, chronic illness, homelessness, parenting strategies; Hamilton-Giachritsis et al., 2018; Herrera et al., 2018; Wijma et al., 2017), and has been referred to as the "ultimate empathy machine" since it allows users to experience

any situation from any point of view (Herrera et al., 2018, p. 1). Embodiment VR has been used to increase perspective taking in a myriad of social contexts including bullying, aging, chronic illness, parenting strategies, homelessness, and racial prejudice (Behm-Morawitz et al., 2016; Hamilton-Giachritsis et al., 2018; Wijma et al., 2017).

Counselor Development Through Virtual Reality Experiences

Experiential learning, a hallmark of counselor education, suggests that learning is acquired through action, and that this action and subsequent reflection changes both attitudes and understanding (Warren et al., 2012). In counselor education, experiential learning is the pedagogical base for a wide range of training issues such as addictions, multicultural, counseling skills, and group therapy (Green et al., 2014; Ohrt et al., 2014; Sanabria & DeLorenzi, 2019; Warren et al., 2012). Activities include case studies, group work, and immersive clinical experiences such as practicum and internship (Cramer et al., 2012). Role play is another example of a common experiential learning activity and is an effective way to prepare students for clinical work (Clarke et al., 2017; Paladino et al., 2011; Smith, 2009). However, the use of role play has several inherent challenges including the potential for multiple relationships among students, lack of effective feedback, and inaccurate representation of assigned client roles (Clarke et al., 2017). Traditional role-playing sessions using peers and/or standardized patients have significant limitations such as the inability to represent clients from marginalized groups such as disability, sexual orientation, gender identity, and race.

Virtual reality has the potential to further the efficacy and accessibility of experiential learning possibilities. VR has the potential to expand two specific areas in clinical training: 1) the development of skills to work with a wide range of clinical presentations (Lowell & Alshammari, 2019), and 2) empathy development (van Loon et al., 2018; Wijma et al., 2017). Access to VR training environments can allow skill development in risk-free situations that are otherwise inaccessible or precarious while in a clinical training program (Freina & Ott, 2015; Gavarkovs, 2019).

Counseling and Diagnostic Skills

Existing literature supports the use of immersive VR technology in conjunction with traditional teaching to improve learning outcomes in medical and nursing students (Kyaw et al., 2019). Virtual reality has been used successfully in medical education to improve clinical skills, simulate surgeries for student practice, improve empathic communication, and enhance the ability to provide immediate feedback by instructors (De Ribaupierre et al., 2014; Knight et al., 2010; Ruthenbeck & Reynolds, 2015; Sapkaroski et al., 2022). Despite its documented utility in other health professions, little attention has been paid to how virtual reality can be used to educate and prepare counselors-in-training (Barsom et al., 2016; Kyaw et al., 2019; Lowell & Alshammari, 2019; Shorey et al., 2019).

Semi-immersive experiences provide counseling students the ability to develop, implement, and improve clinical interviewing and diagnosing skills with various populations in a safe and controlled setting. For example, through interaction with virtual clients presenting with eating disorders and self-injury, students showed significantly higher learning in the 3D participation when compared with a literature or video review (Lowell & Alshammari, 2019). Anderton and King (2016) used the 3D MUVE game, *Oblivion*, to develop multicultural competencies with graduate-level counseling students and reported increases in cognitive empathy and self-awareness. When compared with other types of experiential learning exercises (e.g., case studies, or watching a video) virtual reality is able to increase the sense of “realness” of being with another person (Gunawardena & Zittle, 1997; Oh et al., 2018), thus enhancing the learning experience and outcomes (Holmes et al., 2020).

Body language, stress tolerance, empathic communication and adaptability in extraordinary conditions, such as crisis situations, are all tools that counselors-in-training must also establish to be successful in the field. These skills have traditionally been developed using role-play with peers, however roleplaying has various shortcomings that virtual reality has the potential to overcome. Researchers found that medical students who participated in a virtual reality learning environment for empathic

clinical communication showed significantly higher confidence and effectiveness in utilizing empathic communication with patients than students in the role-play group (Sapkaroski et al., 2022). Immersive VR has been used to train employee interpersonal skills, such as body language, stress tolerance, and adaptability in a human resource context (Mast et al., 2018). Nursing student self-efficacy and confidence around communication with different types of patients significantly increased for those who participated in the VR condition when compared with those who received standard training (Shorey et al., 2019).

With immersive virtual reality, counseling students may be able to practice counseling skills with a wide range of diagnostic presentations that would typically not be available in a traditional environment (McGhee et al., 2012). For example, a simulation environment can be created where an avatar diagnosed with any type of mental health disorder is presenting for counseling (e.g., bipolar disorder, borderline personality disorder). Using the VR environment, the student can practice the process of intake and assessment with the avatar. The avatar can be programmed to respond in certain ways based on key words or phrases that the student uses. This type of interaction allows for the student to practice asking intake or diagnostic questions with the avatar, allowing for a risk-free opportunity to explore differential diagnoses or biopsychosocial history.

Another opportunity includes the practicing of crisis intervention without human risk. For example, a counseling student could embody a counselor providing a virtual risk assessment to a client with suicidal ideation. The student can have a first-person experience providing the risk assessment to the client, without the actual risk of treating a client with active suicidal ideation. Students can also practice specific skill sets such as Motivational Interviewing, Trauma Informed Care, or Cognitive Behavioral Therapy. Students would be able to practice working with clients with diagnoses such as schizophrenia, substance use disorder, or bipolar disorder, or other diagnoses not seen in an internship or practicum placement. Additionally, VR allows students to repeat scenarios to practice ongoing skill development. Furthermore, students could practice

leading groups or providing family counseling, modalities that some students may not otherwise practice regularly or at all in their training programs.

Empathy Development

The development of such a skill as empathy can be intentionally increased with practice and experience (van Loon et al., 2018). Empathy is the ability to view the world from another person's perspective combined with an emotional reaction to that perspective, including feelings of concern for other people and their situations (Davis, 1983). Empathy contributes to our ability to understand and respond effectively to others' emotions as well as engage in prosocial behavior (Spreng et al., 2009; Szalavitz & Perry, 2010). Effective interpersonal communication and healthcare practices including counseling and therapeutic outcomes are reliant on provider capacity for empathy (Colliver et al., 2010; Decety & Fotopoulou, 2015; Miller & Moyers, 2021; Moyers et al., 2016; Rogers, 1957). Affective aspects of empathy include experiencing another's feeling and having an appropriate emotional response to another person's situation (Batchelder et al., 2017). Cognitive aspects of empathy include understanding another person's perspective and being able to judge and understand the intentions of others (Batchelder et al., 2017). Empathy is thought to be a skill that can be developed over time with intentional practice and guidance; however, counselor education programs may be missing opportunities to develop empathy in counselors-in-training (Bloom et al., 2018), perhaps opening a door for the inclusion of virtual reality.

To date, embodiment VR has not yet been used for counselors-in-training, despite the documented capability of VR to increase empathic response in other settings (van Loon et al., 2018; Wijma et al., 2017). VR has been used with success in medical education training to increase student empathy around issues such as age-related health problems such as dementia and vision/hearing loss (Dyer et al., 2018). Perspective taking through VR has been shown to increase empathic feelings toward other populations and situations as well as increased willingness to provide help (Dyer et al., 2018; Schutte & Stilinović, 2017). For example, participants who took part in embodiment VR focused on the experience of being a child refugee

experienced higher rates of empathy development when compared with the control group (Schutte & Stilinović, 2017). VR participants showed higher levels of empathy and pro-social behavior (e.g., monetary donations for people experiencing poverty; Hernández-Ramos et al., 2019). Participation in VR embodiment interventions increased empathy toward people with schizophrenia as well as family members' understanding of physical and mental health disorders (Kalyanaraman et al., 2010; Wiederhold, 2020).

Cultural Competence

Multicultural competence is imperative and the inclusion of diversity curriculum is mandated by CACREP (2016). Marginalized, minority-identifying, and socially oppressed groups have higher instances of mental health disorders, suicide, substance use disorders, and other social and emotional challenges (The American Psychiatric Association [APA], 2021). Counselors must both provide safety for clients and have a working knowledge of systemic oppression and other social biases and barriers that negatively impact minority populations (Haskins & Singh, 2015). Therefore, counseling programs must provide training opportunities related to racial identity development, power/privilege, systemic racism, inherent bias and multicultural competence (Haskins & Singh, 2015), all of which are related to empathy and perspective taking. VR has been shown to increase empathy in healthcare workers for racial minority patients (Roswell et al., 2020) as well as decrease implicit racial bias in white participants (Banakou et al., 2016), suggesting potential for the utilization of VR in counselor education.

As the embodiment experience allows the user to interact with a virtual environment in another body, counselors-in-training may benefit from utilizing this technology to participate in an experience in a body outside of their own identity groups. More than half of all counseling graduate students are White (Espinosa et al., 2016), allowing for specific opportunities for students who identify with the majority race to have an experience embodying an avatar of a minority race. Implicit bias against the Black race has been shown to decrease when people participate in a neutral embodiment experience in a Black body, such as a Tai Chi session (Banakou et

al., 2016). Counselors-in-training may benefit from participation in a similar neutral experience where they embody a Black or other racial minority avatar, to gain the experience of participating in an activity in a different body from their own. Although there is no experience fully comparable to the lived experiences of oppressed groups, virtual reality technology can be an innovative way to aid in multicultural competency and empathy development.

Challenges and Future Directions

While opportunities exist for the inclusion of virtual reality with regard to both skill and empathy development, there are barriers to the adoption of such technologies. Many studies highlight the issue of cybersickness experienced by the user, limiting their participation in the VR experience (Hamilton-Giachritsis et al., 2018; Kim & Kim, 2020; Valmaggia et al., 2016). While the benefits of VR use in educational settings are well-documented, more studies need to be done on whether these benefits are a result of placebo-effects and previously completed simulations need to be validated (Barsom et al., 2016; Lowell & Alshammari, 2019; Ruthenbeck & Reynolds, 2015). Furthermore, VR simulations that require complex and realistic interactions with the users can take months to successfully develop (Ruthenbeck & Reynolds, 2015).

Not all counselor education programs may have access to such technologies, thus inhibiting wide range adoption for student training. Even if access does exist, hesitation may exist for both faculty and students. The development, testing, and design of technologies such as facial recognition and artificial intelligence software disproportionately wrongly identify or otherwise negatively impact people of color (Libby & Ehrenfeld, 2021). As counselor education seeks to adopt innovative technology, a guiding principle should be that the technology is “inclusive of all people regardless of race, sex, gender, sexual orientation, gender identity, age, origin, or background” (Libby & Ehrenfeld, 2021, p. 2). Consideration should be given to how the VR experience was created and potential bias that may be

included in the final product. Additionally, some data suggest a potential negative impact of embodying a person of a different identity or physicality (e.g., race, height, attractiveness; Groom et al., 2009; Yee & Bailenson, 2007). However, these studies are outdated and need to be validated with current technology and VR experiences. Virtual reality game play has also been shown to increase negative emotionality after participation (Lavoie et al., 2021). These results should be carefully considered prior to engaging in a cross-cultural embodied experience and appropriate participant management and support should be provided during participation (Lavoie et al., 2021).

Further research should focus on the utility of such technology in counselor training and measure outcomes such as student attitude, empathy development, skill acquisition, case conceptualization, diagnostic skill, cultural competence, and cost effectiveness. Studies should also examine whether successful skill acquisition within the virtual environment translates into successfully utilizing those skills in real life. Thus, caution should be applied when conceptualizing the generalizability of the impacts of a given VR experience.

Conclusion

Virtual reality is the next technological frontier in counselor education (Wiederhold, 2018). Experiential learning is a foundational pedagogy used in counselor education and virtual reality can be used to enhance this pedagogical method. Counselor education has an opportunity to advance its training practices to more effectively simulate a wide range of training environments, diagnoses, and clinical situations, ultimately enhancing skill development in counseling trainees. Additionally, VR can be used to enhance empathy development counselors-in-training, particularly for multicultural and diversity issues that are critical for competent practitioners. Further research in all areas of the uses of VR in counselor training is warranted.

References

- American Psychiatric Association [APA]. (2021). *Mental Health Disparities: Diverse Populations*. <https://www.psychiatry.org/psychiatrists/cultural-competency/education/mental-health-facts>
- Anderton, C. L., & King, E. M. (2016). Promoting multicultural literacies through game-based embodiment: A case study of counselor education students and the role-playing game *Oblivion*. *On the Horizon*, 24(24), <https://doi.org/10.1108/oth-09-2015-0061>
- Bailey, J. O., Bailenson, J. N., & Casasanto, D. (2016). When does virtual embodiment change our minds? *Presence*, 25(3), 222-233. https://doi.org/10.1162/pres_a_00263
- Banakou, D., Hanumanthu, P.D., & Slater, M. (2016) Virtual embodiment of white people in a Black virtual body leads to a sustained reduction in their implicit racial bias. *Frontiers in Human Neuroscience*, 10(601). <https://doi.org/10.3389/fnhum.2016.00601>
- Barsom, E. Z., Graafland, M., & Scijven, M. P. (2016). Systematic review of the effectiveness of augmented reality applications in medical training. *Surgical Endoscopy*, 30, 4147-4183. <https://doi.org/10.1007/s00464-016-4800-6>
- Batchelder, L., Brosnan, M., & Ashwin, C. (2017). The development and validation of the Empathy Components Questionnaire (ECQ). *PLoS ONE*, 12, e0169185. <https://doi.org/10.1371/journal.pone.0169185>
- Behm-Morawitz, E., Pennell, H., & Speno, A. G., (2016). The effects of virtual racial embodiment in a gaming app on reducing prejudice. *Communication Monographs*, 83(3), 396-418. <http://dx.doi.org/10.1080/03637751.2015.1128556>
- Bloom, Z. E., McNeil, V. A., Flasch, P., & Sanders, F. (2018). A comparison of empathy and sympathy between counselors-in-training and their non-counseling academic peers. *The Professional Counselor*, 8(4), 341-354. <https://doi.org/10.15241/zdb.8.4.341>
- Clarke, P., Binkley, E., E., & Andrews, S. M. (2017). Actors in the classroom: The dramatic pedagogy model of Counselor Education. *Journal of Creativity in Mental Health Counseling*, 12(1), 129-145. <https://doi.org/10.1080/15401383.2016.1196156>
- Colliver, J. A., Conlee, M. J., Verhulst, S. J., & Dorsey, J. K. (2010). Reports of the decline of empathy during medical education are greatly exaggerated: A reexamination of the research. *Academy of Medicine*, 85, 588-93.
- Council for Accreditation of Counseling and Related Educational Programs [CACREP]. (2016). *2016 Standards*. Alexandria, VA: Author.
- Cramer, E. P., Ryosho, N., & Nguyen, P. V (2012): Using experiential exercises to teach about diversity, oppression, and social justice. *Journal of Teaching in Social Work*, 32(1), 1-13. <http://dx.doi.org/10.1080/08841233.2012.637463>
- Davis, M. H. (1983). Measuring individual differences in empathy: Evidence for a multidimensional approach. *Journal of Personality and Social Psychology*, 44, 113-126. <https://doi.org/10.1037/0022-3514.44.1.113>
- Decety, J., & Fotopoulou, A. (2015). Why empathy has a beneficial impact on others in medicine: Unifying theories. *Frontiers in Behavioral Neuroscience*, 8. <https://doi.org/10.3389/fnbeh.2014.00457>
- De Ribaupierre, S., Kapralos, B., Haji, F., Stroulia, E., Dubrowski, A., & Eagleson, R. (2014). Healthcare training enhancement through virtual reality and serious games. *Intelligent Systems Reference Library*, 68, 9-27. https://doi.org/10.1007/978-3-642-54816-1_2
- Dyer, E., Swartzlander, B. J., & Gugliucci, M. R. (2018). Using virtual reality in medical education to teach empathy. *Journal of the Medical Library Association*, 106(4), 498-500. <https://doi.org/10.5195/jmla.2018.518>
- Espinosa, L. L., Turk, J. M., Taylor, M., & Chessman, H. M. (2016). *Race and Ethnicity in Higher Education: A Status Report*. 22.
- Freina, L., & Ott, M. (2015). A literature review on immersive virtual reality in education: State of the art and perspectives. The 11th International Scientific Conference eLearning and Software for Education. doi:10.12753/2066-026X-15-020

- Gavarkovs, A. G. (2019). Behavioral counseling training for primary care providers: Immersive virtual simulation as a training tool. *Frontiers in Public Health*, 7, 1-6. <https://doi.org/10.3389/fpubh.2019.00116>
- Green, J. H., Barden, S. M., Richardson, E. D., & Hall, K. (2014). The influence of film and experiential pedagogy on multicultural counseling self-efficacy and multicultural counseling competence. *Journal of the Scholarship of Teaching and Learning*, 14(5), 63-78. <https://doi.org/10.14434/josotlv14i5.12656>
- Greenidge, W. L., & Daire, A. P. (2005). The application of gaming technology in counselor training programs. *Journal of Technology in Counseling*, 4(1).
- Groom, V., Bailenson, J. N., & Nass, C. (2009). The influence of racial embodiment on racial bias in immersive virtual environments. *Social Influence*, 4, 231-248. <https://doi.org/10.1080/15534510802643750>
- Gunawardena, C., & Zittle, F. (1997). Social presence as a predictor of satisfaction within a computer mediated conferencing environment. *American Journal of Distance Education*, 11(3), 8-26.
- Hamilton-Giachritsis, C., Banakou, D., Garcia Quiroga, M., Giachritsis, C., & Slater, M. (2018). Reducing risk and improving maternal perspective-taking and empathy using virtual embodiment. *Scientific Reports*, 8(1), 2975. <https://doi.org/10.1038/s41598-018-21036-2>
- Haskins, N. H., & Singh, A. (2015). Critical Race Theory and counselor education pedagogy: Creating equitable training. *Counselor Education and Supervision*, 54, 288-301. <https://doi.org/10.1002/ceas.12027>
- Hernández-Ramos, P., Bachen, C. M., Raphael, C., Ifcher, J., & Broghammer, M. (2019). Experiencing poverty in an online simulation: Effects on players' beliefs, attitudes and behaviors about poverty. *Cyberpsychology: Journal of Psychosocial Research on Cyberspace*, 13(3). <http://dx.doi.org/10.5817/CP2019-3-1>
- Herrera, F., Bailenson, J., Weisz, E., Ogle, E., & Zaki, J. (2018). Building long-term empathy: A large-scale comparison of traditional and virtual reality perspective-taking. *PLoS ONE* 13(10): e0204494. <https://doi.org/10.1371/journal.pone.0204494>
- Holmes, C. M., Reid, C., Hawley, C., & Wagner, C. C. (2020). Social presence in online counselor education. *Journal of Counselor Preparation and Supervision*, 13(4). Retrieved from <https://repository.wcsu.edu/jcps/vol13/iss4/11>
- Jencius, M. (2009). Training and counseling in a virtual world. *Counseling Today*, 28-29.
- Kalyanaraman, S. S., Penn, D. L., Ivory, J. D., & Judge, A. (2010). The virtual doppelganger effects of a virtual reality simulator on perceptions of schizophrenia. *The Journal of Nervous and Mental Disease*, 198(6), 437-443. <https://doi.org/10.1097/nmd.0b013e3181e07d66>
- Kim, S., & Kim, E. (2020). The use of virtual reality in Psychiatry: A review. *Journal of the Korean Academy of Child and Adolescent Psychiatry*, 31(1), 26-32. <https://doi.org/10.5765/jkacap.190037>
- Knight, J. F., Carley, S., Tregunna, B., Jarvis, S., Smithies, R., de Freitas, S., Dunwell, I., & Mackway-Jones, K. (2010). Serious gaming technology in major incident triage training: A pragmatic controlled trial. *Resuscitation*, 81(9), 1175-1179. <https://doi.org/10.1016/j.resuscitation.2010.03.042>
- Kyaw, B. M., Saxena, N., Posadzki, P., Vseteckova, J., Nikolaou, C. K., George, P. P., Divakar, U., Masiello, I., Kononowicz, A. A., Zary, N., & Tudor Car, L. (2019). Virtual reality for health professions education: Systematic review and meta-analysis by the digital health education collaboration. *Journal of Medical Internet Research*, 21(1), 2959-2962. <http://www.jmir.org/2019/1/e12959/>
- Lavoie, R., Main, K., King, C., & King, D. (2021). Virtual experience, real consequences: The potential negative emotional consequences of virtual reality gameplay. *Virtual Reality*, 25, 69-81. <https://doi.org/10.1007/s10055-020-00440-y>
- Libby, C., & Ehrenfeld, J. (2021). Facial recognition technology in 2021: Masks, bias, and the future of healthcare. *Journal of Medical Systems*, 45(39), 1-2. <https://doi.org/10.1007/s10916-021-01723-w>

- Lowell, V. L., & Alshammari, A. (2019). Experiential learning experiences in an online 3D virtual environment for mental health interviewing and diagnosis role-playing: a comparison of perceived learning across learning activities. *Educational Technology Research and Development*, 67(4), 825-854.
<https://doi.org/10.1007/s11423-018-9632-8>
- Mast, M. S., Kleinlogel, E. P., Tur, B., & Bachmann, M. (2018). The future of interpersonal skills development: Immersive virtual reality training with virtual humans. *Human Resource Development Quarterly*, 29(2), 125-141. <https://doi.org/10.1002/hrdq.21307>
- McGhee, T. W., Brown, M., Pressley, F., Browning, B., & Thomas, C. (2012). Second Life: Implications for Counselor Education. *Michigan Journal of Counseling*, 39(1), 19-30.
<https://doi.org/10.22237/mijoc/1325376120>
- Miller, W. R., & Moyers, T. B. (2021). *Effective psychotherapists: Clinical skills that improve client outcome*. The Guilford Press.
- Miller, E., & Polson, P. (2019). Apps, avatars, and robots: The future of mental healthcare. *Issues in Mental Health Nursing*, 40(3), 208-214, <https://doi.org/10.1080/01612840.2018.1524535>
- Milk C. (2016). How virtual reality can create the ultimate empathy machine [Internet]. TED: Ideas worth spreading.
https://www.ted.com/talks/chris_milk_how_virtual_reality_can_create_the_ultimate_empathy_machine
- Moyers, T. B., Houck, J., Rice, S. L., Longabaugh, R., & Miller, W. R. (2016). Therapist empathy, combined behavioral intervention, and alcohol outcomes in the COMBINE research project. *Journal of Consulting and Clinical Psychology*, 84, 221-229. <https://doi.org/10.1037/ccp0000074>
- Oh, C. S., Bailenson, J. N., & Welch, G. F. (2018). A systematic review of social presence: Definition, antecedents, and implications. *Frontiers in Robotics and AI*, 5(114), 1-35
<https://doi.org/10.3389/frobt.2018.00114>
- Ohr, J. H., Prochenko, Y., Stulmaer, H., Huffman, D., Fernando, D., & Swan, K. (2014). An exploration of group and member development in experiential groups. *Journal for Specialists in Group Work*, 39(3), 212-235.
<https://doi.org/10.1037/e569132013-059>
- Paladino, D. A., Barrio Minton, C. A., & Kern, C. W. (2011). Interactive Training Model: Beginning counseling student development. *Counselor Education and Supervision*, 50, 189-206. <https://doi.org/10.1002/j.1556-6978.2011.tb00119.x>
- Park, M. J., Kim, D. J., Lee, U., Na, E. J., & Jeon, H. J. (2019). A literature overview of Virtual Reality (VR) in treatment of Psychiatric Disorders: Recent advances and limitations. *Frontiers in Psychiatry*, 10, 1-9. <https://doi.org/10.3389/fpsy.2019.00505>
- Poetker, B. (2019, September 6). *G2 Learning Hub. What Is Virtual Reality? (+3 Types of VR Experiences)*.
<https://learn.g2.com/virtual-reality>
- Rogers, C. R. (1957). The necessary and sufficient conditions of therapeutic personality change. *Journal of Consulting Psychology*, 21(2), 95-103. <https://doi.org/10.1037/h0045357>
- Roswell, R. O., Cogburn, C. D., Tocco, J., Martinez, J., Bangeranye, C., Bailenson, J. N., Wright, M., Mieres, J. H., & Smith, L. (2020). Cultivating empathy through virtual reality: Advancing conversations about racism, inequity, and climate in medicine. *Academic Medicine*, 95(12), 1882-1886.
<https://doi.org/10.1097/ACM.0000000000003615>
- Ruthenbeck, G. S., & Reynolds, K. J. (2015). Virtual reality for medical training: The state-of-the-art. *Journal of Simulation*, 9(1), 16-26. <https://doi.org/10.1057/jos.2014.14>
- Salamin, P., Tadi, T., Blanke, O., Vexo, F., & Thalmann, D. (2010). Quantifying effects of exposure to the third and first-person perspectives in virtual-reality-based training. *IEEE Transactions on Learning Technologies*, 3, 272-276. <https://doi.org/10.1109/TLT.2010.13>
- Sanabria, S., & DeLorenzi, L. (2019). Social justice pre-practicum: Enhancing social justice through experiential learning. *Journal for Social Action in Counseling & Psychology*, 11(2), 35-53.
<https://doi.org/10.33043/jsacp.11.2.35-53>

- Sapkaroski, D., Mundy, M., & Dimmock, M. R. (2022). Immersive virtual reality simulated learning environment versus role-play for empathic clinical communication training. *Journal of Medical Radiation Sciences*, 69(1), 56–65. <https://doi.org/10.1002/jmrs.555>
- Schutte, N. S., & Stilić, E. J. (2017). Facilitating empathy through virtual reality. *Motivation and Emotion*, 41(6), 708–712. <https://doi.org/10.1007/s11031-017-9641-7>
- Shorey, S., Ang, E., Yap, J., Ng, E., Lau, S. T., & Chui, C. K. (2019). A virtual counseling application using artificial intelligence for communication skills training in nursing education: Development study. *Journal of Medical Internet Research*, 21(10), e14658. <https://doi.org/10.2196/14658>
- Skiba, D. (2007). Nursing education 2.0: SL. *Nursing Education Perspectives*, 28, 156-157.
- Smith, A. (2009). Role play in counselor education and supervision: Innovative ideas, gaps and future directions. *Journal of Creativity in Mental Health*, 4, 124-138. <https://doi.org/10.1080/15401380902945194>
- Spreng, R. N., McKinnon, M. C., Mar, R. A., & Levine, B. (2009). The Toronto Empathy Questionnaire: Scale development and initial validation of a factor-analytic solution to multiple empathy measures. *Journal of Personality Assessment*, 91(1), 62–71. <https://doi.org/10.1080/00223890802484381>
- Szalavitz, M., & Perry, B. (2010). *Born for love: Why empathy is essential and endangered*. Harper Collins Publishers.
- Valmaggia, L. R., Latif, L., Kempton, M. J., & Rus-Calafell, M. (2016). Virtual reality in the psychological treatment for mental health problems: A systematic review of recent evidence. *Psychiatry Research*, 236, 189–195. <https://doi.org/10.1016/j.psychres.2016.01.015>
- van Loon, A., Bailenson, J., Zaki, J., Bostick, J., & Willer, R. (2018) Virtual reality perspective-taking increases cognitive empathy for specific others. *PLoS ONE*, 13(8), e0202442. <https://doi.org/10.1371/journal.pone.0202442>
- Wang, C. X., Anstadt, S., Goldman, J., & Lefaiver, M. L. M. (2014). Facilitating group discussions in Second Life. *MERLOT Journal of Online Learning and Teaching*, 10(4), 139-152.
- Warren, J. A., Hof, K. R., McGriff, D., & Morris, L-N. B. (2012). Five experiential learning activities in addictions education. *Journal of Creativity in Mental Health Counseling*, 7, 273-288. <https://doi.org/10.1080/15401383.2012.710172>
- Wiederhold, B. K. (2018). Are we ready for online virtual reality therapy? *Cyberpsychology, Behavior, and Social Networking*, 21(6), 341-342. <https://doi.org/10.1089/cyber.2018.29114.bkw>
- Wiederhold, B. K. (2020). Forging stronger bonds through technology: How virtual reality can instill Empathy. *Cyberpsychology, Behavior, and Social Networking*, 23(9), 577–578. <https://doi.org/10.1089/cyber.2020.29193.bkw>
- Wijma, E. M., Veerbeek, M. A., Prins, M., Pot, A. M., & Willemse, B. M., (2017). A virtual reality intervention to improve the understanding and empathy for people with dementia in informal caregivers: Results of a pilot study. *Aging and Mental Health*, 22(8), 1121–1129. <https://doi.org/10.1080/13607863.2017.1348470>
- Yee, N., & Bailenson, J. N. (2007). The proteus effect: The effect of transformed self-representation on behavior. *Human Communication Research*, 33, 271–290. doi:10.1111/j.1468-2958.2007.00299.x