

Immersive Learning and Participatory Engagement: Connecting in the Online Classroom Through Virtual Reality


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ABSTRACT

Guided by constructivist theory, this study examines health professions student learning and engagement in the virtual classroom (VC) setting. Students (N=52) participated in a one-week VC prior to and during the COVID-19 pandemic. After participation, students were surveyed to discern their impressions of the experience, including the administration of a presence questionnaire, a key indicator of virtual environment (VE) efficacy. High student presence scores were significantly correlated with the perception that the VC facilitated learning ($r = .573$, $p = .001$). Conversely, students who perceived the course content as challenging were less likely to recommend the VC as a viable alternative learning platform. Furthermore, in terms of presence, undergraduate and graduate students were not significantly different. In summary, health professions students view immersive technologies favorably and may benefit from using such platforms as alternative or supplemental learning tools regardless of their academic level.

KEYWORDS

Health Professions Student Learning and Engagement, Immersive Learning, Virtual Classroom

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INTRODUCTION

In the pursuit of meaningful and effective training methods, the field of medical education has evolved over time. Medical simulation as a means for training health professions students gradually gained momentum in the 1960s with its introduction for the purpose of teaching cardiopulmonary resuscitation (Jones et al., 2015). Since then, advancements in technology have led to more widespread use of simulation in medical training (Jones et al., 2015). Traditional simulation usually occurs face-to-face in a laboratory with manikins or trained individuals serving as standardized patients (Rourke, 2020). This type of simulation allows students to practice clinical skills in a controlled environment but there are limitations including personnel and equipment availability as well as prohibitive costs (Bogossian et al., 2018).

As technological advances continued to grow, less resource-intensive virtual simulations were developed to interface with users at varying degrees of immersion (Cant et al., 2019). With the ability to manipulate the level of immersion came the ability to create interactions within a 3D environment that could provide experiences that more closely mimicked realistic scenarios (Repetto, 2016; Slater & Wilbur, 1997). An even deeper level of realism is achieved with augmented reality, a variation of virtual reality (VR) that draws on key environmental details to enhance the immersive environment by superimposing digital information on actual people or objects (Agency for Healthcare Research and Quality, 2020).

Online education allows students to satisfy degree requirements while learning at their own pace, on their own schedules and from any location (Martin, 2019). On the other hand, the online classroom, which often uses a discussion forum to engage students and faculty is usually considered less personal because many of the interactions found in the face-to-face classroom are lost (Andrew et al., 2021; Berry, 2017; Martin, 2019). Synchronous online instruction can provide an answer to this criticism of the typical online course by helping to increase engagement between peers and the instructor and in the process, support learning (Andrew et al., 2021; Giddens et al., 2021; Joksimović et al., 2015). In the face-to-face classroom, students are bound by time and location, in which their presence is required. If absent, students may miss valuable classroom interactions. The virtual classroom (VC) has the advantage of allowing either synchronous or asynchronous interaction with peers and instructor thereby having the potential to bring the best of both worlds to the learning experience.

The current evidence surrounding the utility of VR in medical education is inadequate as it paints an incomplete picture. Therefore, the objectives of this article are two-fold: (1) further explore the effectiveness of the Virtual Classroom and its effects on student learning and engagement; (2) evaluate differences in presence scores between graduate and undergraduate students. By addressing these two key research questions, the goal is to add to the body of knowledge surrounding the effectiveness of VR and bring the field closer to a consensus on whether its implementation produces a net benefit to health professions training programs.

BACKGROUND

As acknowledged by Pottle (2019), VR implementation in medical and nursing education has gained traction in recent years. Goldstein Market Intelligence (2020) experts forecasted the VR market for healthcare education and training would grow at a compound annual growth rate of 28% from 2019–2026, with the COVID-19 pandemic as a driving force behind this accelerated growth. In addition, a Canadian national survey of nurse educators from the Canadian Association of Schools of Nursing (CASN, 2021) reported that 31% of respondents utilized virtual simulation for the first time due to Coronavirus Disease 2019 (COVID-19) while 74% of educators had launched its use to replace clinical practice, in-person simulation, laboratory, and classroom time (CASN, 2021).

With the expansion of VR use in health care and health education research, the need for a common language in the literature became apparent. Cant et al. (2019) recommended a standardized

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