Designing an Immersive Environment for Preservice Teachers: Considering Learning Spaces When Planning for Teaching

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Abstract: Classrooms are complex environments, and preservice teachers (PST) face challenges regarding planning for unknown learning spaces in work integrated learning experiences. We describe the design of an immersive environment that considers different learning spaces in secondary schools. Drawing upon focus group data we examine the strengths and limitations of this immersive tool. PSTs reported increased awareness and confidence in considering all learning spaces to be flexible and noted the need for ambient environmental information.

Introduction and background

Immersive technologies blur the boundary between the physical and virtual worlds (Suh & Prophet, 2018), providing learners with opportunities for authentic, embodied experiences. Within Work-integrated learning (WIL) experiences, there has been an increase in the use of immersive technologies. This may take the form of virtual internships and field trips, online case studies, augmented reality role plays and authentic simulations to provide opportunities for university students to apply professional/occupational skills to real-world employment contexts (Edwards, Perkins, Pearce & Hong, 2015; Schuster & Glavas, 2017). Preservice teachers (PST) face challenges in considering learning spaces when planning for teaching during their WIL experience. Within Initial Teacher Education (ITE) WIL (also known as practicum or professional experience) is generally perceived as a vital component, both by the literature (Ure, Gough & Newton, 2009) and reports on teacher education (Department of Education and Training, 2015). During WIL experiences, PSTs need to develop knowledge of the use of different learning spaces and apply strategies to create effective learning environments. The current pedagogical approaches present a number of limitations.

In parallel, there has been significant investment in, and corresponding changes in the design of, learning spaces in schools (e.g. Kariippanon, Cliff, Lancaster, Okely, & Parrish, 2017) as well as universities (see Flynn, Thompson & Goodyear, 2018 for an overview) and there is emerging research connecting learning spaces with impacts on teaching and learning in classrooms as well as learning in informal spaces (e.g. Beery, Shell, Gillespie, & Werdman, 2013). In response to calls to improve the WIL component to better prepare pre-service teachers for the classroom (Zeichner, 2010), particularly given the changing nature of school classrooms, and the success of immersive technologies in other WIL contexts in which the location of the application of skills is important (e.g. Sacks et al., 2013), we suggest that the design of a task that includes a new immersive technology component may improve the preparation of PST for their WIL experience. In this paper, we report on the design of an immersive environment for PSTs that includes different types of learning spaces in a real school as well as the task in which PSTs engaged with the immersive tool. We draw on focus group data to investigate the strengths and weaknesses of the immersive tool to prepare PST for WIL experiences and inform further development of the tool.

Methods

We draw on an action research model (McKernan, 1996) as well as design-based research (Reimann, 2013). The results presented in this paper will be used to inform the continued design of the task both within the same course and adapted to meet the specific needs of additional courses for ITE.

The course that served as the focus of our study was Course A, at University B, Queensland, Australia. The topics addressed in this course include lesson planning, classroom management, building relationships with supervising teachers and building relationships with students. Each of these areas are influenced by the learning environment in which the PST practices. In this iteration of the course, the immersive technology was embedded to explicitly include an opportunity for students to consider the classroom learning environment, in particular in relation to transitions, movement, modifications for space issues and planning for teaching and learning in different teaching space configuration. During a lecture before commencing their WIL experience, PSTs were presented with images and scenarios generated through collaboration with a secondary school in order to develop decision-making skills in relation to the dynamic interactions between the teacher and the classroom environment.

In 2019 approximately 160 PSTs were enrolled in the course, representing 18 different teaching areas. This paper draws on the focus group conducted with eleven PSTs who had attended the lecture and completed their WIL experience. The focus group questions examined PSTs' perceptions of how the immersive images influenced their understanding of decision making about learning space, the impact on their practice while participating in the WIL experience and the ways in which the immersive technology influenced in preparation for WIL. Images and scenarios from the lecture were shown again during the focus group to understand changes in PSTs decision-making and to prompt discussion of this variation. Transcripts were then thematically coded to identify themes associated with the interactions between teaching, the organisation of learning experiences and PSTs' identification of and response to scenarios that considered learning spaces. In the findings section below, these are discussed in terms of the strengths associated with the use of the immersive technology and the limitations.

Findings and conclusions

PSTs identified a number of strengths related to the implementation of the immersive technology during the course. Some PSTs said that an exposure to immersive technology before placement increased their awareness of issues related to learning spaces once they started to teach in the real classroom environment. PSTs spoke about how their participation in the preparation using immersive technology ensured that they were aware of their responsibility for the organisation of the learning space, and they described either modifying their planning or the classroom to suit the planned learning experiences. The PSTs identified limitations of the images used. These included the restricted level of 'immersiveness' afforded by the technology.

The results of the analysis of the focus group showed a number of considerations for the utility of embedding an immersive technology in the course preparing PSTs for the WIL experience, particularly addressing the topic of decision-making in relation to learning spaces.

The PSTs comments show that the use of the immersive technology helped them see the scope for creativity, ownership and responsibility of the classroom spaces and the possibilities for change in response to students' needs. As WIL increasingly moves towards a plethora of blended and fully online learning, questions are raised around the space and place of immersive technology experiences both in ITE and beyond. In this project we have developed a theoretically informed, innovative tool for ITE. With further development of the immersive technology, the findings from this and future research may be transferable to other WIL contexts to prepare learners for complex situations that are difficult to replicate in university classroom contexts.

References

Department of Education and Training (Australia). (2015). *Action now: Classroom ready teachers.* Available from: http://www.studentsfirst.gov.au/teacher-educationministerial-advisory-group

Edwards, D., Perkins, K., Pearce, J., & Hong, J. (2015). *Work integrated learning in STEM in Australian universities: Final Report.* Office of the Chief Scientist. ACER.

McKernan, J. (1996). Curriculum action research. A handbook of methods and resources for the reflective practitioner. Kogan Page Limited: London.

Reimann P. (2013). Design-based research - designing as research. In: Luckin R, Puntambekar S, Goodyear P, Grabowski B, Underwood JDM, Winters N, editors. *Handbook of design in educational technology.* New York: Taylor & Francis. p. 44-52.

Sacks, R., Perlman, A., & Barak, R. (2013). Construction safety training using immersive virtual reality. *Construction Management and Economics, 31*(9), pp. 1005-1017.

Schuster, L. & Glavas, C. (2017). Exploring the dimensions of electronic work integrated learning (WIL). *Educational Research Review*, 21, 55-66.

Suh, A. & Prophet, J. (2018). The state of immersive technology research: A literature analysis. *Computers in Human Behavior*, *86*, 77-90.

Ure, C, Gough, N & Newton, R. (2009). *Practicum partnerships: Exploring models of practicum organisation in teacher education for a standards-based profession*, Australian Policy Online, Melbourne.

Zeichner, K. (2010). Rethinking the connections between campus courses and field experiences in college-and university-based teacher education. *Journal of Teacher Education, 61*(1-2), 89-99.