International Student Perspectives on Simulated Preservice Induction

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Abstract: Responding to an expanding cohort of international pre-service student teachers, the College of Education at Charles Darwin University instigated a pilot study into the viability of SimLab[TM] as a platform for induction into Australian classroom dynamics prior to placement. SimLab is a mixed reality platform that can be configured to simulate a variety of real-life experiences that preservice teachers on placement will likely encounter. In recent years, it has been used successfully by several Australian universities as an embedded component within initial teacher education courses. A series of 15-minute sessions were provided to three cohorts of international students (n=52). Based on a simple 5E pedagogical model that prioritizes *engagement* as a foundation for all teaching, students were tasked with getting to know their students and to deliver at least one micro-teaching session. Additionally, they were provided with opportunities to have conversations with the school principal and their assigned mentor teacher. Initial findings suggest a favourable overall evaluation. The College is now extending this research by providing this opportunity to all incoming preservice teachers.

Keywords: SimLab, simulation, teacher education, preservice, international, mixed reality

1. Introduction

Providing Pre-Service Teachers (PSTs) with sufficient exposure to pre-employment classroom experiences is a constant challenge for universities and colleges of education. While PSTs may complete the required theory-based learning, they may not necessarily transfer this knowledge into applied teaching practices. To assist them, various engagement strategies have been implemented such as facilitating peer-feedback (Benton-Kupper, 2001) or enabling them to reflect on their video recorded micro-teaching performance (Önal, 2019). Effective scaffolding has also been reported through enabling students to ask questions based on their interactions with their own performance data using smart technologies (Khan, & Mason, 2017, 2018).

The research literature on utilising technology for supporting PST training also identifies micro-teaching as a viable pedagogical approach, particularly within technology enabled contexts (Arsal, 2015; Ping, 2013). While micro-teaching now has broader connotations (Scagnoli, 2012), we refer to Cruickshank and Metcalf's (1993) definition in which it is presented as a way for PSTs to practice teaching and demonstrate their teaching capabilities, strengths and weaknesses for a small class for a short time. Thus, using video-based micro-teaching, Kennedy and Lees (2016) report on a project that encouraged participants to receive feedback from coaches. Key outcomes were that participants "reported few technical difficulties in filming" and developed "a clearer understanding of their perceived strengths and weaknesses" (p.377) (see also Black et al., 2016).

With technological advancements such as digital classroom simulation, encouraging students to participate in video-recorded micro-teaching seems easier. For international students, it also provides a less threatening option for initial exposure to a classroom than real-life. After identifying the availability of trialing SimLab for an extended period without too much cost, this research project was therefore developed to offer international students experience in teaching practice within a simulated Australian classroom context as part of their preparation.

As a "controlled learning environment" that reduces real classroom challenges, SimLab enables students to acquire some foundation skills and aptitude to manage a classroom (Ledger & Fischetti, 2020, p. 37). In related research, Black et al. (2016) and Hudson, Voytecki and Zhang (2018), report that digital classroom simulation environments provide participants with experience to a selected risk

and stress free, context. With the capability to configure a range of scenarios to interact with, SimLab is managed and operated by a real academic that follows a script whilst playing various roles of selected characters in an avatar shape. Scenarios used in our project varied from meeting the principal, teaching in a classroom, and meeting a mentor (see Figures 1 to 3 below). Brought to life by real-life interactors, the characters can raise their hands or move on their chairs, although they cannot stand up or move beyond their desks. It is also possible for a supervisor to monitor interactions within this environment.

Figure 1. Meet the Principal   *Figure 2.* Meet the Students   *Figure 3.* Meet the Mentor
Images courtesy of Murdoch University with permission

The PST interacts with the class with limited assistance for about fifteen minutes. Initially, this is focused on becoming acquainted with the digital student characters. This is followed by an opportunity to deliver a lesson. The primary objective of this pilot study was to assess whether international PSTs would find the experience beneficial. A secondary objective was to enable post-experience observation of the interactions for both students and researchers. As Dieker et al., (2014) report, simulation-based teaching environments offer students with a digital interactive classroom setting to practice their understanding of various teaching strategies and approaches in a risk-free context. This research, then, was designed as a pilot study of SimLab to determine whether it is an effective induction experience for international PSTs into Australian classrooms.

2. Methodology

This research used mixed methods involving triangulation of data collection. All participants first completed a pre-test survey informed by the Technology Acceptance Model. Observation of PSTs of video-recorded SimLab sessions provided a rich source of interaction material. Participants then engaged in a short interview following the sessions and completed a post-test survey. It also draws on the 5E pedagogical model originally developed by Bybee and Landes (1990) and used extensively within the Australian schooling system. This model places emphasis on engagement as the crucial first step in teaching. Related research (Ledger & Fischetti, 2020) clearly demonstrates the effectiveness of this platform for PSTs; this project, however, was focused only on international PSTs.

2.1 Participants

All international PSTs located on campus within an initial teacher education course offered by the College of Education were invited to experience the SimLab classroom environment to prepare for their professional placement. Fifty-two students signed the consent form and agreed to participate in the study. A teaching schedule was organized, and students were invited to trial the SimLab environment first through meeting the 'students' and to follow this by delivering a lesson of their choosing. They were also asked to complete a pre-test survey. The survey showed most students (n=40) participants had no prior professional experience while about one fifth (n =11) students indicating, having already experienced their first placement in their current teaching course. With regards *to having competence with using technology for learning*, participants reported *strongly agreeing* (*n=31*) *moderately agreeing* (*n=10*) and *somewhat agreeing* (*n=3*) with the statement. Some students chose not to answer these. The volunteering participants seemed to have no bias or inclination towards the SimLab.

2.2 Research design

In designing the overall PST experience, we chose to designate a purpose-built room for this research. Because all participants were based on campus it seemed easy to do this, although students still had to physically go to this venue rather than sitting with their own computer in a familiar setting. Doing this thereby added another dimension to the simulated experience – that is, the students did not know precisely what they would first encounter. The room selected included a large television monitor fitted with speakers, a webcam with a microphone, all connected to a computer (see Figure 6 & 7 below). The sessions were organized via Zoom and the performance recorded on the computer.

An invitation to participate was circulated to all international Pre-Service Teachers located on campus. This was followed by a simple sequence of steps with each participant:

- Completion of a pre-test survey to determine levels of technology familiarity and competence
- An initial 15-minute session focused on gaining familiarity with the SimLab environment
- Delivering a 15-minute lesson in SimLab classroom.
- Meeting with the Principal and/or Mentor teacher prior to experiencing a disruptive session.
- A short interview about the session was conducted.
- A post-test survey was completed.

Figure 6. Room set up   *Figure 7*. Hardware setup   *Figure 8*. Class interaction

As mentioned, research design included pre- and post-surveys, with a SimLab experience in between. The pre-survey collected demographic background information about the students prior learning experiences. The SimLab experience consisted of volunteers either meeting and/or delivering a lesson to a group of five digital avatar-based classroom students, for a period up to 15 minutes, which also included a brief introduction to SimLab, and an exit discussion about their digital experience. Finally, at the start of the following semester, participants were invited to answer a post-survey to gauge their recollections and opinions about their SimLab experience. Both pre- and post-surveys were conducted online using Qualtrics.

Nine statements were included by participants in the post-test survey in addition to a Likert scale to gauge levels of agreements or non-agreement:

1. *I had a very good experience.*
2. *The SimLab session resembles a real classroom experience.*
3. *I get to know better about Australian classroom after the session.*
4. *I know better of the importance of classroom management through this experience.*
5. *I know better of the importance of lesson planning through this experience.*
6. *The training in SimLab is an effective way to practice classroom skills.*
7. *I am better prepared for my placement or to teach lessons after my SimLab session.*
8. *After SimLab sessions, I am more confident that I can engage students in the future.*
9. *If there are more SimLab sessions in the future. I am willing to attend again.*

3. Data Collection and analysis

The pre-test survey collected information about student demographics. For the SimLab sessions, observations were made based upon the performance of students in this environment. Following their SimLab sessions, a short interview was conducted with focus on the student's experience of SimLab. Each interview was short, lasting about 2 minutes. In addition, a summary of their performance was

recorded. The typical five-level Likert items were used (*definitely yes, probably yes, might or might not, probably not*, and *definitely not*) to classify responses. The percentage of each item is retrieved from the Qualtrics report. The qualitative data were coded following thematic analysis. The quantitative data from Qualtrics report were used to complement the qualitative findings.

4. Summary of Findings

The evidence provides some critical insights into the SimLab experience from the point of view of a Pre-Service Teacher and in line with research objective. Much of it matches expectations, particularly after talking with students directly after their experience.

As a summary evidence, students found the experience appealing and engaging and believed they gained benefit from doing so. For the researchers, observing the video recordings confirmed this – there was significant diversity in the style of interaction while most students achieved good rapport within the simulated classroom. Following sections describe these findings in greater detail.

4.1 Engagement opportunities

In total, 52 PSTs participated in the study and took part in pre-survey. Of these, 28 participants answered the post-test survey. Data from this survey indicated that a significant majority of PSTs felt better prepared for placement after their SimLab experience.

To the question regarding their experience of SimLab, 64.29% (18 out of 28) participants responded *definitely yes* and 32.14% (9 out of 28) participants chose *probably yes.*

Participants indicated that through SimLab they gained a better understanding of the importance of classroom management with 39.29% responding *definitely yes*, and 35.71% indicated *probably yes*. 21.43% were somewhat ambivalent, responding *might* or *might not*. 3.57% indicated *probably not*.

On better understanding of importance of lesson planning through SimLab 42.86% indicated *definitely yes,* 39.29% showed *probably yes*, 14.29% indicated *might* or *might not*. Only 1 participant indicated *definitely not*.

Following their experience with SimLab, 32.14% of participants *strongly agreed* that they are more confident in being able to engage with classroom students in the future, 39.29% indicated that they *somewhat agree*. 17.86% *neither agree nor disagree* with that.

18 participants of 28 (64.29%) clearly indicated that they would *like* to attend SimLab in future. 25% responded *probably yes* to this. However, 10.71% indicated that they will *probably not* attend SimLab in the future.

4.2 Genuine interaction

Though most these PSTs failed to provide a well-prepared lesson for students in SimLab, the interactions between the PSTs and SimLab students were genuine. SimLab provided great flexibility with AI and interactor. The student avatars in SimLab responded naturally and spontaneously to the PST participants. Participants later stated they did not expect the student avatars from SimLab were real people.

Participants indicated from the post survey that SimLab session resembled a real classroom experience. According to the post survey, 32.14% of participants *strongly agree* and 57.14% *somewhat agree* that the SimLab session resembled a real classroom experience.

The data on participants reaching a high agreement on SimLab informing them about Australian curriculum remained inconclusive, with 38.46% of participant indicated *definitely yes*. 26.92% indicated *probably yes*, 15.38% think *might or might not*. 19.23% showed *probably not*.

For the question of whether training in SimLab provides an effective method to practice classroom skills, participants had diverse opinions. With 42.86% indicating *strong agreement* and 35.71% showed *somewhat in agreement*. However, 14.29% showed that they *neither agree nor disagree*. 7.14% participants *strongly disagree* with the idea.

As for whether SimLab better prepared student for their placement or to teaching, 32.14% expressed they strongly agree and 32.14% indicated somewhat agree with that. Yet 28.57% of

participant neither agree nor disagree. About 7.14% participants *strongly disagree*d that SimLab could help with their placement or teaching.

The post-survey also included an open-ended question engaging respondents to offer their opinion about the experience. In terms of SimLab providing participants helpful experience, to prepare with understanding the Australian School Systems, its policies and procedures in general, three respondents provided the following responses.

Case 1
> *I remembered 5 of the students that I have connected with. They were all different from one another. They were from different backgrounds and cultures. The variety gave me a choice to talk about various topics hence it gave me the opportunity to initiate ideas to include diversity.*

Case 2
> *I only spent 15 minutes with the students, but my most vivid memory was the challenge I had to interact with simulated representations of real people. Beforehand I thought it would be easy since most people like myself are used to interacting with computers and playing computer games. However, the experience was extremely intimidating. I believe that over time, one could get used to this. But in general, I thought it was a great opportunity, even if it was only to check my own preconceptions.*

Case 3
> *It was extremely difficult to not look past the fact that in the sim, you were working with visual representations and not the real thing. Similar to not confusing a character in a 3rd Person type computer game with a real human being.*

Overall, the outcome of this pilot experiment was of benefit to volunteer participants with the evidence indicating that international pre-service teachers were enthusiastic about experiencing and exploring a virtual classroom. It provided them with some confidence prior to undertaking their professional experience placement. In addition, session times of 15 minutes exposure to SimLab was enough for students to experience and explore topics or teaching attempts – importantly, it enabled them to focus on the situation at hand. Although the interactions were with avatars, the experience was dynamic and immersive which provided a sense of *real* engagement.

5. Limitations and Further Research

5.1 Limitations

Most SimLab interactions indicated that participants gained familiarity with the environment and their engagement with the avatars was through relying on general topics such as hobbies, favorite sports, international festival, and food. However, we also wanted them to focus on the important first step of the 5E pedagogical framework which is all about engagement. Given the funding constraints, this limited further exploration of the platform in terms of other aspects of the 5E framework.

There was a significant attrition rate between pre- and post- sessions surveys. The main reason for this is that many of the students felt they needed to compare the real-life experience of professional placement to be able to properly respond to the post-test survey, which they lacked at the time of this study. Despite this, however, the total number of participants were within the project protocol.

Another limitation concerned the equipment used. The microphone used was not of very high quality and some conversations were not well recorded.

5.2 Further Research

The evidence from this study can be considered as informative and as a first step to ongoing, more structured research framed by the 5E pedagogical framework. We aim to extend the SimLab experience to all students (domestic and international) enrolled in teacher education. Moreover, given the social distancing constraints that immediately followed this study due to the pandemic, we envisage a greater role with simulation technology in the future.

6. Conclusion

As the preliminary process and evidence suggests, testing SimLab as a digital simulation classroom environment, was successful for both students and researchers. While the infrastructure and approach may at times not have been the most effective, improvements to provide a full immersive experience and enhance the data collection process can be adapted. The evidence suggests that the volunteering participants appreciated the opportunity to meet with digital students and interact in a risk-free environment. SimLab is a professionally engaging simulation platform that international students were able to engage in, with and through, and this warrant further research in a growing industry.

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