Preparing for work-integrated learning during COVID-19: How a new virtual orientation tool facilitated access for all

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Student success in nursing degree programs is contingent upon work-integrated learning (WIL) success, particularly given the mandated curriculum requirement for clinical hours in WIL environments. The impacts of COVID-19 disrupted study and resulted in anxiety for nursing students. For most first year nursing students this also included an interruption of their socialization to university, provoking uncertainty. This paper presents a case study of the development and implementation of a new virtual environment explorer tool for simulated learning at one multi-campus university in Australia (February-June 2020). COVID-19 illuminated the extended utility of this tool, for supporting ongoing nursing student orientation to the university environment and to the materiality of the simulated clinical setting. Educational theory is drawn upon to discuss the implementation and evaluation, of this tool, within the COVID-19 context. Findings suggest inclusive teaching practices underpin effective preparation for WIL, especially in uncertain times, and must be valued more highly.

Keywords: COVID-19, clinical settings, inclusion, nursing, simulation laboratories, student-centered, virtual orientation

Nursing students have been undertaking their education in Australian universities since the mid-1980s. Work-integrated learning (WIL) is a key component of nursing degree programs (Mason, 2013) and it takes place in a variety of clinical settings, in line with the goal of maximizing clinical skill development in clinical environments (Nolan, 1998). Simulated environments in nursing degree programs prepare students for WIL, providing students with a safe setting to develop skills in teamwork and patient care, to prepare for integration into clinical teams (Foster, et al., 2019; Armstrong, 2019). This helps foster a sense of belonging in clinical contexts, considered to be integral to the success of nursing students and newly qualified nurses (Gilbert & Brown 2015; Levett-Jones & Lathlean 2008).

The first WIL experiences for nursing students are commonly positioned in the first year. While the simulated hospital environment is designed to be supportive for nursing students, to prepare them for WIL placement in clinical practice settings, the simulated environment can also be extremely confronting for students, and students react in a range of ways, including fainting. Nursing student cohorts are diverse (Wray, et al., 2017) and educators are largely unaware of the experiences and histories that students bring with them (Holland & Lave, 2001) that may induce sensitives to clinical environments.

The following case study (Yin, 2017) will describe the setting and outline the rationale, development and implementation of a virtual environment explorer tool that aimed to provide an accurate visualization of the simulated hospital environment across multi-campus sites to support student

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familiarization with this context. The COVID-19 pandemic, and associated restrictions, impacted on the learning and teaching experience of this first year, commencing, student group. As suggested by Jowsey, et al. (2020) "At no time in history has there been such a massive sudden transition towards blended learning". The case study evaluation includes student learning and feedback data, and teaching team reflections on the changes and challenges experienced. Central to the discussion is the influence of COVID-19 on the process of implementing the new virtual environment explorer tool, and the subsequent repurposing of the tool, to support all learners in their orientation to the simulated clinical setting and in their preparation for WIL.

The Griffith University Human Research Ethics Committee confirmed permission to use anonymous subject evaluation data in this case study, full ethical review and approval was not required (June 2020).

METHODOLOGY

A case study approach is utilized to explore the rationale, development, implementation and evaluation of the virtual environment explorer tool. A case study is a form of empirical inquiry employed for investigating phenomena in a real-life context, and therefore well suited to this work. Of relevance to this case, a case study can accommodate different evidence sources and changes in context (Yin, 2017). Evidence sources in this case study include student feedback and teacher reflections, additionally the learning and teaching context changed with the emergence of COVID-19.

Student feedback regarding student experience was obtained via end of trimester surveys administered centrally by the university, including feedback related to the use of the virtual environment explorer tool. The two centrally administered surveys collected student evaluation of teaching and student evaluation of subject data via Likert-scale questions and free text questions. The following are examples of questions, on a five-point Likert scale, from 'strongly agree' to 'strongly disagree': overall I am satisfied with the teaching of this staff member; the learning resources . . . provided for this subject assisted my learning; overall I am satisfied with the quality of this subject. Free text questions included: What did you find particularly good about this subject? What aspects of this staff member's teaching were most valuable to your learning? Qualitative responses were categorized into themes drawing on grounded theory (Charmaz, 2006).

As a teaching team with several years of experience teaching together, in the foundation subject, the teaching team routinely engaged in reflective practice (Gibbs, 1988) through which incremental improvements were made to teaching processes and the subject content. During COVID-19 the changing context demanded a more in-depth critical reflection process: to guide the real time need to address emerging student concerns and, in order to consider the extent of these dynamics on the overall, and ongoing, student experience. Critical reflection is a higher order skill characterized by the capability of practitioners to move beyond day-to-day practice, to incorporate the examination of values, beliefs and assumptions that underpin practice (Bass, et al., 2017; Brookfield, 2017). Author 4 (LDF) initiated a process of critical reflection in relation to the influences on teaching and learning, and on the teaching team.

CASE STUDY

The Materiality of the Simulated Clinical Setting

The backdrop for this case study is a first year, commencing student, foundations subject in a Bachelor of Nursing program at one multi-campus Australian University. In practical terms this subject involves

seven weeks of tutorials, covering fundamental nursing topics such as reflective practice, the history of nursing, power and politics, cultural safety, Aboriginal and Torres Strait Islander health, nursing and social media, and five weeks of simulated clinical practice. In the simulated setting students are facilitated to engage in patient care activities including hand hygiene, teamwork, activities of daily living, fluid balance charts and pressure injury risk assessment.

The simulated clinical setting at each of the three campuses mimics the hospital environment. This is emblematic of the constructive alignment underpinning the curriculum (Biggs, 1996; Walsh, 2007) whereby experiences are designed to facilitate student engagement by being as close to real life as possible. Students who see their learning experience as directly relevant, develop an enquiring approach and are active in their learning (Boud & Miller, 1997). For students attending the simulated setting, sensory input confirms that this is a clinical space. The floor feels like a vinyl hospital floor, the noises of machines, such as pumps, are the same as those found in clinical environments. The hand wash smells the same as the local hospital and the lighting is the same as lighting in a clinical environment. Student learning possibilities are further shaped by the physical structure of the spaces they encounter, the layout and the resources available (Kemmis & Grootenboer, 2008; Patten, 2014). Artefacts congruent with clinical practice such as clinical charts and hand hygiene add to the learning experience and strengthen the WIL preparation potential, providing an authentic learning experience valued by the learner (Dewey, 1986). This authenticity also generates a response in learners. The simulated hospital environment can be extremely confronting for students.

Over a period of years, the foundations subject academic teaching team became increasingly aware of incidents that some first year, commencing, nursing students experienced during their initial encounters with the simulated clinical environment. Responses to the hospital-like environment included feelings of being overwhelmed, anxiety, nausea, and dizziness, with fainting incidents being the most concerning. Almost 30 students had fainted in nursing labs each year, in recent years. Their reactions were unanticipated and generally in response to past knowledge and/or experience of clinical environments. This emerged as a significant problem, the fainting incidents were a safety issue, but general feelings of being overwhelmed, anxious and nervous in the simulated clinical setting also impacted on students' ability to learn. Patten (2014) describes how student engagement in learning can be diminished when students feel confronted or uncomfortable by the learning context for example, when physiotherapy students viewed distressing patient situations they could not focus on the skills being demonstrated and their learning was negatively impacted.

Developing a Virtual Environment Explorer Tool: Supporting Authentic Student Orientation and Preparation for WIL

In consultation with educational designers and content creators Author 1 (CC) initiated the exploration of options for virtual orientation to the clinical simulation environment, drawing on the experience in other sectors (Patiar et al., 2017). The initial aims of the new virtual environment explorer tool were to support student success in the simulated clinical environment, to prepare students for WIL, and to assist in informing students about the reality of the physical space, health and safety challenges, and clinical practice elements of the simulated clinical environment. Another specific aim was to reduce the number of students fainting in the simulated clinical setting.

The virtual learning experience aimed to support students to be work-ready, by way of providing opportunities for high quality, meaningful connections to the workplace including real-world decision-making activities (Pantelidis, 2010). Another benefit is that learning experiences can be provided for a

large number of students, repeated more than once and, importantly for students sensitive to the clinical environment, students can be slightly removed from the clinical situation. Students may still feel confronted by the vision engagement with the clinical setting, however sensory stimulus (including soap smells or bright clinical lights) are removed or toned down so that the student is able to focus on the learning rather than an emotional reaction.

As consultation and development evolved, the extended possibilities of this idea became even more apparent. Over time Location Explorer (the virtual environment explorer tool resource), was developed for Bachelor of Nursing students. The aim of the tool was to introduce and prepare students for the simulated clinical environment by providing an accurate visualization of the simulated environment across the multi-campus clinical simulation sites. The Location Explorer was embedded in the subject Blackboard (a learning management system) site and included the detailed elaboration of the artefacts and technologies displayed in these environments.

The Location Explorer was designed to align and support the subject learning outcomes, for example the process of providing visual access to the simulated clinical environment supports students to demonstrate professional caring when working with clients in simulated settings (subject learning outcome). As a foundational subject with a focus on the development of clinical skills the tool incorporated a focus on skills such as hand hygiene, patient safety and general familiarity with the environment. A 360-degree camera was used to capture the SimLab environment. Within the *Location Explorer* resource, labels were added to images, and images were grouped and similarly colored according to their purpose (purple, red, green or blue). These groups are called *the context.*

Students can look at all grouped items easily to simplify the visual experience (Figure 1). Each labelled artefact has further information to be accessed by clicking on the label. For example, when clicking on the "taps" label in the Location Explorer further information is provided about the specialized taps that can be switched off using an elbow. Another example is the label "Manikin in Fowler's position", upon clicking this label a video plays instructing the process of placing a patient in Fowler's position. The information available by clicking on the clinical artefact and label can be grouped under several headings (Table 1).

As this subject is offered across three campuses, three different SimLab environments were included in the Location Explorer (Figure 1). This enabled students to translate the knowledge gained in one setting and apply this to a simulation environment with similar physical characteristics configured in a different way. This mimics the familiarization problem solving process that occurs when students first encounter a new WIL setting in clinical/hospital placements.

Experiential learning is learning by engaging into the real experience (Dewey, 1986). Location Explorer supports this as knowledge and skills can be linked. For example, by moving the cursor to the alcohol-based hand rub (ABHR) prompts appear with a link to more information. The student can link to information including: when to use the ABHR; where it can be found in the clinical space and; the theory of the "five moments of hand hygiene" (Sax, et al., 2007). This enables the student to become familiar with ABHR in the virtual clinical space (Table 1).

FIGURE 1: Location Explorer example (Duffy, 2020)

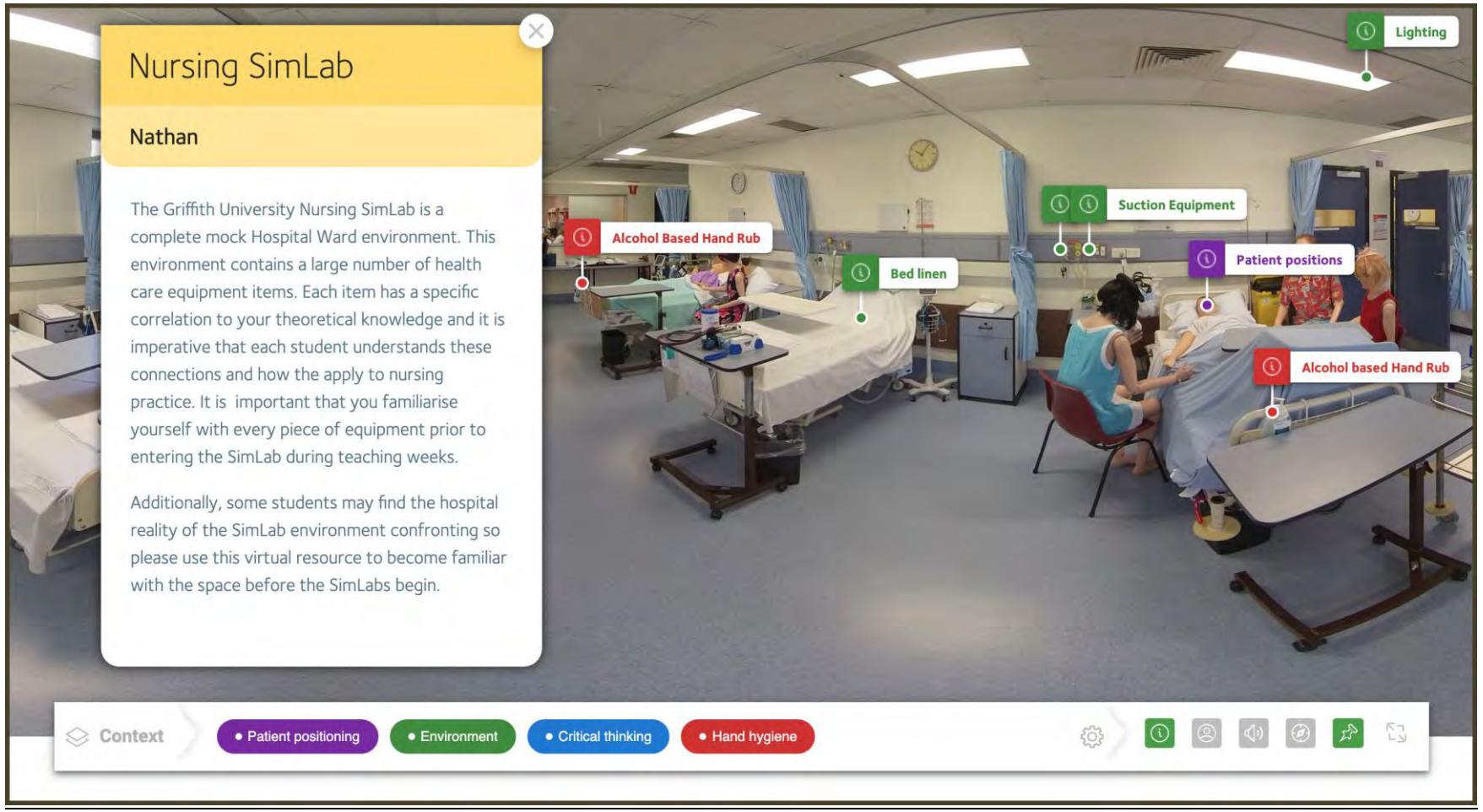


TABLE 1: Examples of artefacts in the Location Explorer, their purpose and meaning.

Artefact function	**Linking Concepts Nursing Theory and Practice**	**Familiarity/Location**	**Extended Learning**
Alcohol Based Hand Rub	Link to "The five moments of hand hygiene"	Found on the end of patient bed	COVID-19/Infection Prevention and Control
Suction Equipment-positioned at head of bed	Breathing/Airways	Larger picture of item	Advanced life support; Link to future learning
Curtains	Link to hand hygiene and alcohol-based hand rub	Many labelled in the room	Often curtains touched and hands are contaminated
Lighting	Link to patient rest	Found throughout (ceiling, above bed lighting for reading and procedures)	Health assessment and procedures require good lighting; Link to future learning
Bed brakes	Patient Safety. Link to moving patients to Xray or operating theatre	Movement of bed; brakes; use of other equipment e.g. hoists with bed	Mechanical automatic bed pictured, and information provided

This virtual orientation initiative was included in the foundations subject in the Bachelor of Nursing for the first time in Trimester 1, 2020 and was intended as a supportive educational opportunity for students to build towards success in WIL.

Repurposing of Location Explorer During COVID-19

As a result of COVID-19, the student experience in the foundations subject was significantly disrupted. COVID-19 forced the closure of SimLabs and the only means by which students could access the SimLab space was virtually using Location Explorer. Acknowledging this, the teaching team used a constructivist approach, discussing the Location Explorer in the online tutorials as an opportunity to build knowledge, referring to specific artefacts found in the location explorer to encourage interest in the Location Explorer (Table 1) (Vygotsky see Wertsch 1985; Bruner, 1966). Information was also emailed to students about the Location explorer with access links attached. Students were encouraged to access the Location Explorer tool to complete orientation checklists in their subject workbooks, an activity usually done in the SimLabs. During online tutorials, accessed via collaborate within the Blackboard (learning management system) site, students were directed to explore elements of the tool and answer relevant questions in class discussions.

EVALUATION

Teaching Team Reflection on COVID-19 Changes and Challenges

The critical reflection process of the teaching team occurred over a six-week period, via online team meetings, e-mail exchanges and collaborative writing. The teaching team shared journal articles, theoretical perspectives and developed understandings of their capacity to provide effective preparation for WIL including orientation to the clinical simulation setting, given the evolving context. They developed insight into the impact of their developing teaching practices during COVID-19. Quotes from individual teachers are labelled as T#, this refers to the participant number of the teacher.

Many challenges emerged and were discussed amongst the teaching team. COVID-19 restrictions seemed to amplify all aspects of the student experience and student behavior. Both students and educators were experiencing higher levels of anxiety and it was difficult to allay student fears as the shifting landscape changed daily. Students that were already struggling with their study progress found the isolation of the COVID-19 learning experience particularly challenging.

Struggling foundations students would usually have an opportunity to meet academics to obtain face-to-face feedback, in which case it is much easier for students to recognize empathy and support. For academics accustomed to this style of face-to-face support it was more difficult to provide formative feedback to students in an online meeting or telephone conversation, especially first-time/commencing university students who were unfamiliar with the process. The conveyance of empathy and humanistic concern requires more work, more labor, in the online environment.

It was difficult to engage some students in online teaching especially students who were impacted by unexpected changing life circumstances, due to COVID-19, such as home schooling young children or job losses. The teaching team identified the need to more frequently reach out and to offer students multiple ways of engaging with educators and the subject content. One teacher observed: "Unfortunately there appeared to be more than the usual number of students who did not engage in the online sessions at all, presumably for many reasons. All on-line sessions were recorded so hopefully they listened to those" (T2).

The teaching team found new ways to engage students, to mediate their learning when unable to direct them in person.

> I found that being able to direct students to solid learning experiences such as the Location Explorer reassured them, gave students a focus and was a mode that we, as teachers, could connect with them. We were able to connect by discussing the SimLab venue, allowing the students to focus on the future when we would be able to be in the SimLabs and staying positive looking forward. There is a certain heightened excitement that students seem to experience when in the SimLabs compared to learning in tutorials or lectures . . . students can have a "real world" focus and the knowledge and skills they are gaining are relevant and important to them (T3).

The addition of evening collaborate sessions was another strategy that was very well accepted by students, and students requested more after-hours sessions. Like most student centered strategies these extra sessions required additional teacher time but were very worthwhile for students. This teacher finding is reinforced in the student feedback, see Theme 1: Student Appreciation below.

Student Feedback

The student evaluation survey data gleaned rich insights into the first year commencing student experience during COVID-19, and valuable feedback about the tools that were used to support student learning during this time, including the new Location Explorer tool.

Across the three campuses the aggregate response rate for the student evaluation of subject survey was 29.7% (168/565) and the response rate for the student evaluation of teaching survey was 25.5% (144/565). The student responses to five-point Likert scale questions suggested high levels of student satisfaction with the teaching and subject, even though the teaching was significantly disrupted by COVID-19 (Table 2).

TABLE 2: Aggregated responses to five-point Likert scale subject and teacher survey questions

Question (samples)	**Response**
Overall I am satisfied with the teaching of this staff member	4.6/5
Overall I am satisfied with the quality of this subject	4.1/5
The subject was well-organized	4.2/5
The learning resources… provided for this subject assisted my learning	4.3/5

Student feedback is reported here in three themes: Student appreciation; Student learning and; Student challenges. Quotes from individual students are labelled as A#; B# or; C#, this refers to the participant number of the student.

Theme 1: Student appreciation

Student feedback indicated that students benefitted from the new and evolving online learning support that was provided during a challenging trimester. Students acknowledged and appreciated the effort required of the teaching team to augment their experience, for example one student stated: "The remote learning that the teachers organized in such a short amount of time was impressive". (A30) Other students acknowledged and appreciated the engagement processes that the teaching team used to stimulate learning: "The good aspects were the online collaborate sessions. The teachers did an amazing job engaging people and making it a fun experience". (A58)

Teacher communication was valued highly in this foundations subject, during the COVID-19 disruption of teaching, as suggested by this comment: "Online learning was hard, but the lecturers made it fun and collaborate, always available for feedback and kind words" (B20).

Students specifically appreciated the flexible and responsive approaches taken to communication: "This subject did several sessions on a Monday night which was very helpful and I asked a lot of questions" (B13), and; "I actually appreciate how flexible the dates are, knowing that not everyone can come to a certain schedule only. It is good that they offer so many time slots and recorded sessions for those missed tutorials (B17)".

Theme 2: Student learning

While most students would have preferred to be on campus, students acknowledged the benefits of online learning materials. One student stated that:

> The teachers and the lecturers were open and willing to answer all questions, making it much more comfortable as a first year student. Although we didn't get to attend sim labs, I feel like the staff did their best to facilitate our learning and be as accommodating as possible. (A59)

Students acknowledged the contribution of strong facilitation skills that fostered interaction, for example: "Strong communication from all teachers, especially during the harsh times of the virus. Unfortunately no SimLabs but the use of online videos demonstrating roles/responsibilities has made it very helpful" (B4) and; "The tutorials and SimLabs are very interactive and helpful" (A12).

The Location Explorer tool was highlighted as a key contributor to students' satisfactory learning experience, for example: "I was looking forward to SimLabs but the virtual labs were a good substitute" (C3). Other students stated:

> The online simulation laboratories are good as students become familiar with the hospital environment and is a great learning tool… I just want to say that transition from on-campus to online Uni in this subject was seamless and smooth mainly because we were provided great learning tool resources as if we never left the campus. (C9)

> The best thing for this semester was the teaching staff, they were very understanding and supportive; and really did want us to succeed despite the circumstances with COVID-19. They made the content very engaging and it made me want to learn more and piece the content together. And I really found the Explorer Tool for the C Campus very useful, especially since we couldn't have labs on campus this semester. (C44)

Theme 3: Student challenges

Not all students considered the online environment to be an effective substitute for the on-campus learning environment, for example:

> I think it was quite hard to adjust to the online learning, though once got used to it, it was good. Enjoyed being able to learn at my own pace with doing the lectures when I wanted and being able to join other tutorials if I wasn't available for my one. However it was quite hard to learn the sim lab stuff without being in the sim labs (B6).

Some students identified challenges associated with the learning context that they were required to adapt to, for example home schooling:

> I really enjoyed collaborating and using the whiteboard to engage with other students and the subject content. It felt just like group work in tutorials. The flexibility was great and so were the after-hours catch ups, especially for those of us who were home schooling during the day. (C37).

Other students reported being distracted by their home environment, for example: "…online learning is difficult as being at home, procrastination is a bad motivator" (C20), and: "I was able to do online learning but I strongly prefer to learn on campus because I can easily get distracted at home and things just seemed to take longer to do at home" (A51).

> Students also faced individual challenges, for example cultural and language barriers online learning access, for example: "I think it's all good. Just about moving to the online program was a bit hard to adapt especially for me being an international student" (A20).

Students reported general challenges associated with the rapid shift to on-line learning during COVID-19, for example: "I don't do well with online learning but the staff were very supportive and understanding" (B8), and in many cases these circumstances were compounded.

DISCUSSION

Following the onset of the COVID-19 pandemic academic managers and teachers everywhere were grappling with the implications for nursing degree programs (Bogossian, et al., 2020). Anxiety levels were running high for health professionals worldwide (Shanafelt, et al., 2020) and nursing students became concerned with the impact of COVID-19 on their programs of study (Biangone, 2020).

As a result of the emergent COVID-19 context a significant learning and teaching pivot was required in this foundations of nursing subject, including the reconceptualization of face-to-face lectures, tutorials and preparation for WIL teaching, from a normative face-to-face on campus contact model, to entirely online learning. A strong boundary had previously existed between the foundation subject organization and online learning pedagogies, following the rationale that, for first year university students, an emphasis on in-person teaching facilitates belonging and socialization for student success. Therefore, with the onset of COVID-19 constraints, and associated cancellation of face-to-face contact, the teaching team needed to weaken this boundary and provide beginning and on-going scaffolded support to help the first-year student cohort to engage with online learning. During COVID-19 the teaching team took more control over the organization of curriculum in order to navigate the new boundaries imposed by COVID-19, undertaking the work necessary to enable continuing student learning. The emergent stressors during COVID-19 highlighted the need for new communication pathways, new ways of framing the experience (Singh, 2002; Whatman & Singh, 2015; Bernstein 1990). These new communication pathways required constant reiteration due to the changeability of the student equity support needs.

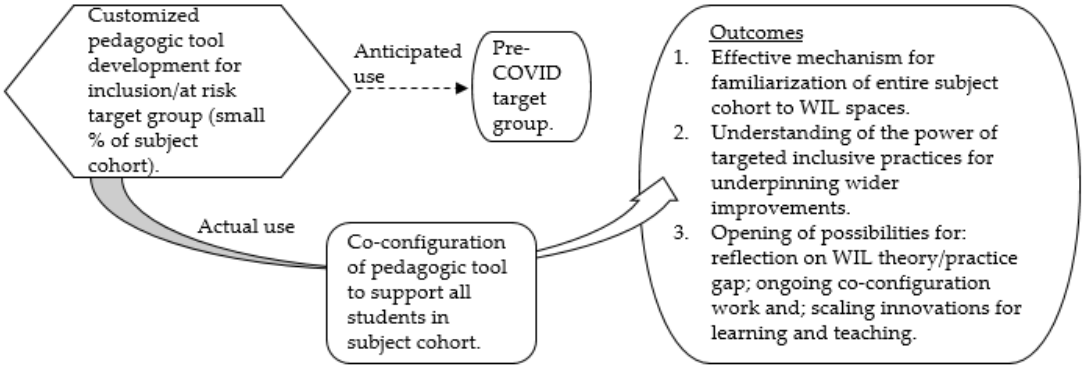
Numerous students remained slow to take up the pedagogical innovations, including students from culturally and linguistically diverse (CALD) backgrounds, sole parents, carers and the newly unemployed. COVID-19 certainly highlighted the complexities involved in orchestrating a rapid change to distance learning, and the diverse and evolving needs of the student cohort. The teaching team experienced stress, growth, increased professional knowledge and new levels of learning and teaching reflective and reflexive practice.

This case study illustrates the process of developing and implementing a new Location Explorer tool. The onset of COVID-19 meant that this tool, for supporting students at risk of fainting (and other physical responses to the environment) to transition to the simulated clinical setting, was helpful for supporting orientation for the broader subject cohort. The repurposing of the tool, in this way, was only possible because it had already been developed and was ready for use, an existing localized response that had considered the access needs of students (Campbell, et al., 2014). These findings further support notions that learning and teaching innovations that incorporate principles of inclusion and access should be considered central concerns, and not considered optional add-ons (Martins, et al., 2018).

Victor and Boynton (1998) described the evolution of work forms occurring on a cyclical continuum from craft to mass customization and co-configuration. Each form of work involves the application of different types of knowledge and learning. In mass customization "new knowledge generated by doing process enhancement work is leveraged and put into action… mass customization tends to produce

finished products or services." (Daniels, et al., 2007 p. 525). The development of the new virtual environment explorer tool for the simulated clinical setting, described in this case study, may be considered customization work. This customization work was the outcome of a localized response to an identified need for process enhancement, realized through reflection upon, and analysis of, learner needs. It had not been anticipated that the new virtual environment explorer tool would be co-configured, to become a conduit for broader student access (King, et al., 2018) (Figure 2).

FIGURE 2: Co-configuration of inclusive WIL practice through COVID-19



In response to the dramatic impact of COVID-19 this teaching team was drawn to a process of critical reflection (Bass, Fenwick, Sidebotham, 2017; Brookfield, 2017). Critical reflection enabled the team to gain perspective on the complexities and stressors of the trimester, it also afforded them the space necessary to draw on theory, to continue their development of awareness around existing and emergent influences on their teaching practice (Singh, 2002) (Figure 2).

Limitations

This case study involved one multi-campus university. The university is well resourced, and the student demographics may be considered typical of university nursing cohorts. This case study may be relevant to educators in similar contexts, looking to development virtual tools for student familiarization with the simulated clinical environments and preparation for WIL. Time constraints impacted on the extent of evaluation undertaken for this case study. It would be interesting to monitor the utilization of this tool over time, and the impact of this work on ongoing teaching practices, both in terms of how innovations are planned and their potential applicability to broader education inclusivity goals. It will also be interesting to evaluate the impact of this tool on the fainting rates when students are able to return on-campus or in subsequent years.

CONCLUSIONS

In situations when students cannot fully experience the university and simulated clinical environments a Location Explorer tool provides a mechanism for teaching staff to facilitate this familiarization process in an authentic way. Inclusivity in higher education calls for us to routinely consider the access needs of all students, in order to create equitable student-centered learning environments. A lesson for WIL

and educational design generally, from this COVID-19 case study experience, is that no one can predict the changing needs of student cohorts, and proactively addressing the access concerns of some students can result in exponential benefits for many students.

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