



## Teaching and Learning Enhancement Fund

### TLEF Project – Final Report

Report Completion Date: (2024/05/01)

#### 1. PROJECT OVERVIEW

##### 1.1. General Information

<b>Project Title:</b>	Integrating and expanding simulation pedagogy: Refreshing practice education across the undergraduate nursing curriculum		
<b>Principal Investigator:</b>	Carla Ferreira		
<b>Report Submitted By:</b>	Carla Ferreira		
<b>Project Initiation Date:</b>	2022 April 1	<b>Project Completion Date:</b>	2024 April 1
<b>Project Type:</b>	<input checked="" type="checkbox"/> Large Transformation <input type="checkbox"/> Small Innovation <input type="checkbox"/> UDL Fellows Program <input type="checkbox"/> Hybrid and Multi-access Course Redesign Project <input type="checkbox"/> Other: [please specify]		

##### 1.2. Project Focus Areas

- |   |   |
|---|---|
| <input checked="" type="checkbox"/> Resource development (e.g., learning materials, media)                      | <input checked="" type="checkbox"/> Curriculum (e.g., program development/implementation, learning communities)         |
| <input type="checkbox"/> Infrastructure development (e.g., management tools, repositories, learning spaces)     | <input type="checkbox"/> Student experience outside the classroom (e.g., wellbeing, social inclusion)                   |
| <input checked="" type="checkbox"/> Pedagogies for student learning and/or engagement (e.g., active learning)   | <input checked="" type="checkbox"/> Experiential and work-integrated learning (e.g., co-op, community service learning) |
| <input type="checkbox"/> Innovative assessments (e.g., two-stage exams, student peer-assessment)                | <input type="checkbox"/> Indigenous-focused curricula and ways of knowing   |
| <input checked="" type="checkbox"/> Teaching roles and training (e.g., teaching practice development, TA roles) | <input type="checkbox"/> Diversity and inclusion in teaching and learning contexts                                      |
|   | <input type="checkbox"/> Open educational resources   |



### 1.3. Final Project Summary

The University of British Columbia's undergraduate nursing program saw a 25% increase in enrollment, rising from 120 students in 2021 to 150 students in 2022. The increase in student numbers was met with the ongoing shortage of available practice placements in and around Vancouver, prompting the School to explore alternative ways of educating future nursing professionals.

Before this large transformation TLEF project, nursing students completed all clinical learning in traditional settings (i.e., acute care and community-based settings). Nursing students spent over 1,000 hours in conventional clinical environments throughout the 20-month program. This project launched the thoughtful integration of simulation-based learning (SBL) experiences into the undergraduate nursing curriculum to replace a portion of clinical learning. Hayden et al. (2014) suggested that high-quality SBL experiences can replace up to 50% of traditional clinical practice. **Within the undergraduate nursing program, UBC students were exposed to different SBL modalities (i.e., manikin-based, screen-based, use of simulated participants or SPs, or combinations of the three modalities) to support their achievement of entry-level competencies for registered nurses set by the British Columbia College of Nurses and Midwives (2021). In the School of Nursing, SBL experiences taking place in practice courses such as NURS 360, 361, and 366 were called Standardized Simulation Learning or SSL.**

**SBLs were also introduced in other courses, particularly the clinical skills labs (i.e., NURS 323, 401, and 402),** exposing students to clinical scenarios that require a profound understanding of human behavior and interaction. For example, educators have often used case studies and role-playing to teach students the skill of performing a mental health status exam, conducting a suicide risk assessment, or engaging in motivational interviewing. While these teaching and learning modalities allowed learners to apply their knowledge of concepts, they do not often get individualized feedback on their delivery. The addition of SBL experiences, such as the use of screen-based simulation or simulated participants (SPs), provided UBC students the opportunity to practice assessing and interviewing patients/clients in the role of a student nurse and receive immediate personalized feedback on their technique/delivery. Feedback came from different sources depending on the SBL modality. For example, screen-based simulations tracked students' decision-making through a written report and delivered feedback through a debriefing log that students received at the end of a scenario. When an SSL involved manikins, students received immediate feedback from a simulation educator observing the scenario unfold. When SPs are used in a scenario, feedback comes not only from the educator but also the SP who offers insight into what it feels like to work with the nursing students from a patient's perspective. Through these SBL



experiences, UBC students are exposed to real-world scenarios that require them to adapt and respond effectively, increasing their capacity to respond to situations in the real-world.

By immersing learners in these scenarios in a simulated setting, UBC students can experiment, make mistakes, and learn from them without risking harm to actual individuals. Within the undergraduate nursing program, the table below outlines where (and how, in relation to the SBL modality) in the curriculum SBL experiences have been integrated.

Term / Academic Year	Course	Simulation-Based Learning title	Modality
Term 1 2022 Winter 1	NURS 360 <sup>a</sup>	Assisting clients with personal care	Manikin-based
		Head-to-toe assessment <sup>c</sup>	Manikin-based
		Safe Medication administration	Manikin-based
		Prioritizing care across multiple clients	Manikin-based
Term 2 2022 Winter 2	NURS 361 <sup>a</sup>	Preoperative and postoperative care	Screen-based + Manikin-based
		Postoperative complications <sup>c</sup>	Screen-based + Manikin-based
		Communication in Nursing	Screen-based
Term 3 2022 Spring/Summer	NURS 323 <sup>b</sup>	Motivational Interviewing <sup>c</sup>	Simulated Participants
		Mental Status Exam & Suicide Risk Assessment	Screen-based
	NURS 366 <sup>a</sup>	Pediatric simulation	Screen-based (Sentinel City)
Term 4 2023 Winter 1	NURS 401 <sup>b</sup>	Motivational Interviewing <sup>c</sup>	Simulated Participants
		Mental Status Exam & Suicide Risk Assessment	Screen-based
	NURS 366 <sup>a</sup>	Pediatric Home Environment Assessment	Screen-based
Term 5 2023 Winter 2	NURS 402 <sup>b</sup>	Deteriorating Patient: Code Blue	Manikin-based
		Care of Patients with Delirium	Simulated Participants

Replaced traditional practice experience<sup>a</sup>

Augmented traditional practice experience<sup>b</sup>

SET-M collected<sup>c</sup>



SBL is a signature pedagogy in nursing and has gained prominence in the past 20 years. Acquiring specific competencies related to simulation pedagogy is crucial in delivering effective SBL experiences (Jeffries et al., 2015; INACSL, 2021) and through this project, we created ways for nurse educators to receive relevant training to ensure that their practice aligned with the International Nursing Association of Clinical Simulation and Learning (INACSL)'s Healthcare Simulation Standards of Best Practice. We learned from students that "...the instructor makes or breaks the simulation", hence faculty development of simulation educators is essential in enhancing the teaching and learning experiences of UBC students.

## References

British Columbia College of Nurses and Midwives. (2021). *Entry-level competencies for registered nurses*. [https://www.bccnm.ca/Documents/competencies\\_requisite\\_skills/RN\\_entry\\_level\\_competencies\\_375.pdf](https://www.bccnm.ca/Documents/competencies_requisite_skills/RN_entry_level_competencies_375.pdf)

Canadian Association of Schools of Nursing. (2023). *Registered nurses education in Canada Statistics, 2021-2022*. <https://www.casn.ca/wp-content/uploads/2023/11/2021-2022-RNECS-Report-EN-Final.pdf>

Hayden, J. K., Smiley, R. A., Alexander, M., Kardong-Edgren, S., & Jeffries, P. R. (2014). The NCSBN national simulation study: A longitudinal, randomized, controlled study replacing clinical hours with simulation in prelicensure nursing education. *Journal of Nursing Regulation*, 5(2), S3-S40. [https://doi.org/10.1016/S2155-8256\(15\)30062-4](https://doi.org/10.1016/S2155-8256(15)30062-4)

INACSL Standards Committee, Watts, P.I., McDermott, D.S., Alinier, G., Charnetski, M., & Nawathe, P.A. (2021, September). Healthcare Simulation Standards of Best Practice™ Simulation Design. *Clinical Simulation in Nursing*, 58, 14-21. <https://doi.org/10.1016/j.ecns.2021.08.009>.

Jeffries, P. R., Dreifuerst, K. T., Kardong-Edgren, S., & Hayden, J. (2015). Faculty development when initiating simulation programs: Lessons learned from the national simulation study. *Journal of Nursing Regulation*, 5(4), 17-23. [https://doi.org/10.1016/S2155-8256\(15\)30037-5](https://doi.org/10.1016/S2155-8256(15)30037-5)



#### 1.4. Team Members

Name	Title/Affiliation	Responsibilities/Roles
Carla Ferreira	Associate Professor of Teaching/ Nursing, Faculty of Applied Science	Principal Investigator
Geertje Boschma	Professor / Nursing, Faculty of Applied Science	A member of the Steering Committee for this project. Her roles include planning the research project, hiring research staff, and overseeing the execution of the project.
Bukola Ibitoye	Doctoral Candidate/ Nursing, Faculty of Applied Science	Worked with other team members to prepare and submit the ethics application, conduct literature review, data collection, analyses, manuscript writing, and knowledge translation strategies.
Alice Wong	Research Assistant, SSL Project / Nursing, Faculty of Applied Science	Curriculum mapping support
Kymerley Bontinen	Lecturer, Simulation and Lab Program Coordinator/ Nursing, Faculty of Applied Science	Simulation design and implementation/Faculty development
Krista Sferrazza	Project Analyst, SSL Project / Nursing, Faculty of Applied Science	Worked in collaboration with other team members to conduct the data analysis and reporting of data.
Adhami Nassim	Lecturer/ Nursing, Faculty of Applied Science	An advisory member on the project, offering expertise in qualitative research methodology
Elisabeth Bailey	Associate Professor of Teaching / Nursing, Faculty of Applied Science	An advisory member on the project, offering expertise in simulation learning and supporting simulation curriculum development.
Suzanne Campbell	Professor/ Nursing, Faculty of Applied Science	An advisory member on the project, offering expertise on research tools for simulation-based learning and research methodologies.
Bernie Garrett	Associate Professor / Nursing, Faculty of Applied Science	An advisory member on the project, offering expertise on educational research, curriculum development, and research methodologies.
Farinaz Havaei	Assistant Professor / Nursing, Faculty of Applied Science	An advisory member on the project, offering expertise in quantitative research methodology and analysis of large data sets and supporting data analysis.
Saima Hirani	Assistant Professor / Nursing, Faculty of Applied Science	An advisory member on the project, offering expertise in simulation learning and supporting simulation curriculum development.
Julie Anne Tipping	Lecturer / Nursing, Faculty of Applied Science	An advisory member on the project, offering expertise in simulation learning, undergraduate



		curriculum, and supporting simulation curriculum development.
Dalbir Mann	Lecturer / Nursing, Faculty of Applied Science	An advisory member on the project, offering expertise in simulation learning, undergraduate curriculum, and supporting simulation curriculum development.
Maura Macphee	Professor Emeritus/ Nursing, Faculty of Applied Science	A consultant on the project, offering expertise in teaching and learning, performance measurement, and supporting simulation curriculum development
Ashely Scott	Associate Professor of Teaching / Nursing, Faculty of Applied Science	An advisory member on the project, offering expertise in simulation learning and supporting simulation curriculum development.

### 1.5. Courses Reached

Course	Academic Year
NURS 321	2022 Winter 1 (Sept-Dec 2022)
NURS 322	2022 Winter 2 (Jan-Apr 2023)
NURS 323	2023 Spring/Summer (May-July 2023)
NURS 360	2022 Winter 1 (Sept-Dec 2022)
NURS 361	2022 Winter 2 (Jan-Apr 2023)
NURS 401	2023 Winter 1 (Sept-Dec 2023)
NURS 402	2023 Winter 2 (Jan-Apr 2024)



## 2. OUTPUTS AND/OR PRODUCTS

2.1. Please **list** project outputs and/or products (e.g., resources, infrastructure, new courses/programs). Indicate a URL, if applicable.

Output(s)/Product(s):	URL (if applicable):
<b>Repository of simulation-based learning experiences in the undergraduate program</b>	
NURS 360 Standardized Simulation Learning (SSL) scenario 1 - Assisting clients with personal care	
NURS 360 SSL scenario 2 - Head-to-toe assessment	
NURS 360 SSL scenario 3 - Safe Medication administration	
NURS 360 SSL scenario 4 - Prioritizing care across multiple clients	
NURS 361 SSL scenario 1 - Preoperative and postoperative care	
NURS 361 SSL scenario 2 - Postoperative complications	
NURS 361 SSL scenario 3 - Communication in Nursing	
NURS 323 Motivational Interviewing simulation	
NURS 323 Mental Status Exam & Suicide Risk Assessment	
NURS 402 – Deteriorating Patient: Code Blue	
NURS 402 – Care of Patients with Delirium	
<b>Newly developed virtual products used to facilitate simulation-based learning experiences</b>	
NURS 366 – Matterport – Peds Home Environment Assessment	Apartment 1 – Studio: <a href="https://my.matterport.com/show/?m=ff4gdDJBiwE">https://my.matterport.com/show/?m=ff4gdDJBiwE</a> Apartment 2 – “2 Bedroom”: <a href="https://my.matterport.com/show/?m=3xBVv34euna">https://my.matterport.com/show/?m=3xBVv34euna</a> Password for both: nursing
<b>Trained Simulation Educators</b>	
6 faculty members have completed all 4 CASN Simulation Certificate Program	<a href="https://cnei-icie.casn.ca/our-programs/certification-programs/simulation-certification-program/">https://cnei-icie.casn.ca/our-programs/certification-programs/simulation-certification-program/</a>
2 faculty members successfully obtained their CCSNE (Canadian Certified Simulation Nurse Educator) designation	
3 faculty members have completed 1-2 modules (CASN Simulation Certificate Program)	



3 faculty members have completed the Essentials in Clinical Simulation Across the Health Professions course through Coursera	<a href="https://www.coursera.org/learn/clinicalsimulations">https://www.coursera.org/learn/clinicalsimulations</a>
14 School of Nursing faculty members/staff and 3 faculty/staff members from School of Midwifery, Social Work, and Centre for Instructional Support attended the PEARLS Debriefing workshop (delivered by The Debriefing Academy)	<a href="https://thedebriefingacademy.com/">https://thedebriefingacademy.com/</a> Pework completed by participants: <a href="https://www.sutori.com/en/story/pearls-debriefing-workshop-presented-by-the-debriefing-academy--PDEsTLJTQfk1hCNp96R2L7jM">https://www.sutori.com/en/story/pearls-debriefing-workshop-presented-by-the-debriefing-academy--PDEsTLJTQfk1hCNp96R2L7jM</a>

## 2.2. Item(s) Not Met – N/A

### 3. PROJECT IMPACT

#### 3.1. Project Impact Areas – Please select all the areas where your project made an impact.

- Student learning and knowledge
- Student engagement and attitudes
- Instructional team-satisfaction
- Teaching practices
- Student wellbeing, social inclusion
- Awareness and capacity around strategic areas (Indigenous, equity and diversity)
- Unit operations and processes
- Other: [please specify]



### 3.2. Please provide details on each of the impact areas you selected in 3.1.

#### **Student learning and knowledge**

The meaningful integration of standardized simulation learning (SSL) into the UBC School of Nursing's undergraduate curriculum means that nursing students can practice growing their competencies – that is, their nursing knowledge, skills, and attitudes (KSA), in a low-stakes practice environment. In a low-stakes environment, versus the high-stakes nature of actual clinical practice, learners can shift their focus on practicing their psychomotor skills, developing their clinical judgment and problem-solving skills, or refining their ability to establish a therapeutic relationship without the risk of harming patients/clients. Mistakes/errors are seen as puzzles to be solved and as opportunities to examine gaps that prevent individuals from practicing in a safe, competent, and ethical manner.

When taking part in SSL, students are asked to engage in self-reflection on their performance individually (or as a team) at the end of each simulation by a facilitator. Facilitators who have observed the SSL unfold facilitate a debrief where the goal is to identify practice gaps (or highlight positive performance) and promote reflective practice.

A strength of simulation-based learning experiences is that every UBC nursing student was exposed to the same clinical scenarios unlike in traditional clinical where students' experiences can vary. During this project, UBC students were exposed to high acuity but low frequency events (for example, care of a rapidly deteriorating patient leading to cardiopulmonary resuscitation in NURS 402) or low acuity but high frequency events like safe medication administration in NURS 360 regardless of their assigned practice placement.

#### **Teaching practices**

As facilitators, using SSLs to prepare learners for the demands of clinical practice requires specific training – training that nurse educators would not often receive when they take on an educator role as a clinical instructor. Simulation facilitators not only receive an orientation to the technology used during SSLs, but they are also expected to have knowledge of simulation pedagogy. Faculty development of facilitators of SSLs at the School of Nursing is an ongoing priority and focused on developing foundational knowledge around simulation pedagogy. Faculty development of SSL facilitators varied – from taking formal coursework through the [Canadian Association of Schools of Nursing \(CASN\)](#) or completing relevant [Massive Open Online Courses](#) on simulation.



### CASN Simulation Program and Coursera Course on Simulation

Name	Coursera	Module 1	Module 2	Module 3	Module 4	CCSNE certification
N. Adhami			X	X	X	
A. Askarzadeh	X	X				
K. Dhaliwal	X	X	X			
R. Dhari		X	X	X	X	
W. Konn	X					
J. Mahy		X	X	X	X	
D. Mann		X	X	X	X	
J. Misleng		X	X			
J. Neufeld		X	X	X	X	X
G. Parmar	X					
P. Rahmanian		X	X	X	X	
J. Tipping		X	X	X	X	X

This project also supported two nurse educators who completed and achieved their Certified Canadian Simulation Nurse Educator (CCSNE) designation (for a total of 5 faculty members at the School of Nursing). There is an opportunity to support 10 additional educators to obtain their CCSNE designation.

### 3.3. How do you know that the impacts listed in 3.1/3.2 occurred?

The project's impact was evaluated using both qualitative and quantitative methods and involved students who had undergone SSL in at least one course and faculty who implemented SSL.

The purpose of the project evaluation was to evaluate student learning outcomes and experience, and faculty teaching experience with the implementation of the simulation-based learning curriculum in the BSN program at the SoN. The project objectives are as follows:

1) Evaluate students' perceptions of the effectiveness of simulation and the clinical learning environments – traditional clinical learning environment, face-to-face simulation environment, and virtual online learning environment.

2) Evaluate faculty development needs and their experiences of using simulation as a pedagogical method.



## Methods

### Objective 1: Students' perceived impact of SSL learning outcomes and their experience.

For this objective, we employed a mixed methods approach. We recruited Bachelor of Science in Nursing (BSN) students who participated in at least one SSL in the 2022 – 2024 academic years. We conducted surveys using previously validated clinical simulation evaluation tools and focus group discussions.

### Surveys

We conducted a formative evaluation using The Simulation Effectiveness Tool- Modified (SET-M). After each SSL activity, students were invited to complete the survey. From October 2022 – February 2024, we conducted four SET-M surveys. Using the SET-M survey we asked students to reflect on how aspects of their simulation experience (pre-brief, scenario, debrief) impacted 19 factors using a 3-point Likert Scale (1= do not agree, 2= somewhat agree, 3 = strongly agree).

#### Simulation Effectiveness Tool - Modified (SET-M)

After completing a simulated clinical experience, please respond to the following statements by circling your response.

PREBRIEFING:	Strongly Agree	Somewhat Agree	Do Not Agree
Prebriefing increased my confidence	3	2	1
Prebriefing was beneficial to my learning.	3	2	1
SCENARIO:			
I am better prepared to respond to changes in my patient's condition.	3	2	1
I developed a better understanding of the pathophysiology.	3	2	1
I am more confident of my nursing assessment skills.	3	2	1
I felt empowered to make clinical decisions.	3	2	1
I developed a better understanding of medications. (Leave blank if no medications in scenario)	3	2	1
I had the opportunity to practice my clinical decision making skills.	3	2	1
I am more confident in my ability to prioritize care and interventions	3	2	1
I am more confident in communicating with my patient.	3	2	1
I am more confident in my ability to teach patients about their illness and interventions.	3	2	1
I am more confident in my ability to report information to health care team.	3	2	1
I am more confident in providing interventions that foster patient safety.	3	2	1
I am more confident in using evidence-based practice to provide nursing care.	3	2	1
DEBRIEFING:			
Debriefing contributed to my learning.	3	2	1
Debriefing allowed me to verbalize my feelings before focusing on the scenario	3	2	1
Debriefing was valuable in helping me improve my clinical judgment.	3	2	1
Debriefing provided opportunities to self-reflect on my performance during simulation.	3	2	1
Debriefing was a constructive evaluation of the simulation.	3	2	1
What else would you like to say about today's simulated clinical experience?			

Leighton, K., Ravert, P., Mudra, V., & Macintosh, C. (2015). Update the Simulation Effectiveness Tool: Item modifications and reevaluation of psychometric properties. *Nursing Education Perspectives*, 36(5), 317-323. Doi: 10.5480/15-1671.



Unfortunately, the number of respondents for the SET-M surveys was not consistent and varied from term to term. The number of responses are as follows:

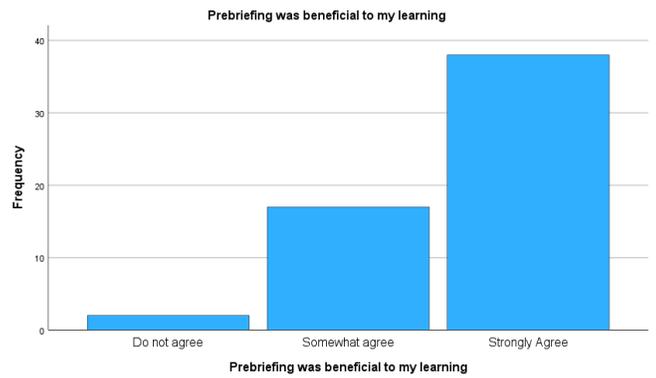
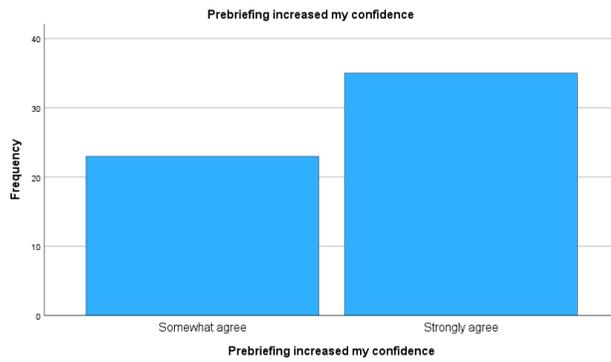
Course number/Date of survey collection	Simulation-based learning experience	SET-M survey responses
NURS 360 October 2022	SSL 2 – Head-to-toe assessment	54
NURS 361 February 2023	SSL 2 – Postoperative complications	23
NURS 323 June 2023	Motivational interviewing	7
NURS 401 October 2023	Motivational Interviewing	5

Frequency and descriptive statistics were performed in SPSS. **Most responses across the four SET-M surveys showed an average score between 2 (somewhat agree) and 3 (strongly agree) indicating that students agreed that their simulation experience (prebrief, scenario, and debrief) was effective. The following bar graphs have been provided in the next few pages to show examples of student responses from NURS 360, NURS 361, and NURS 366.**

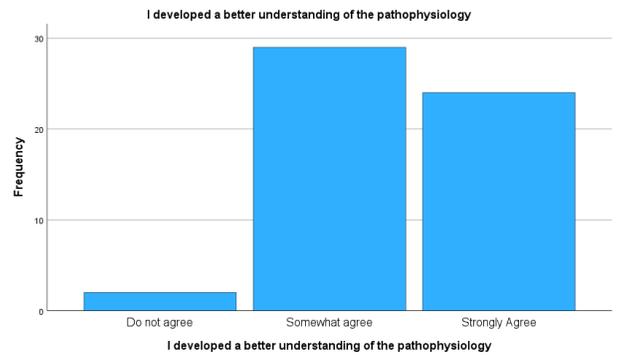
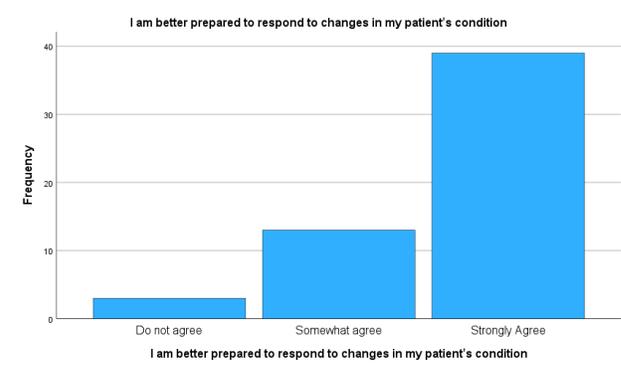


**NURS 360 – SSL 2 – Head-to-Toe Assessment**

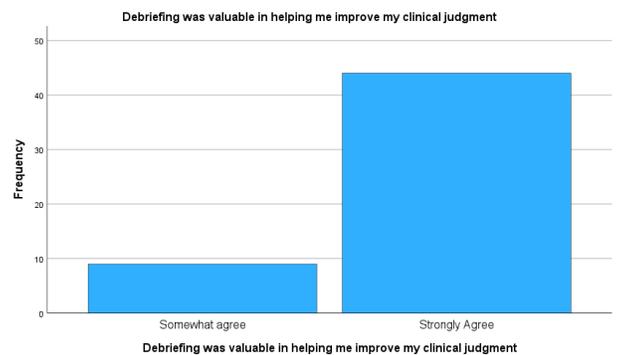
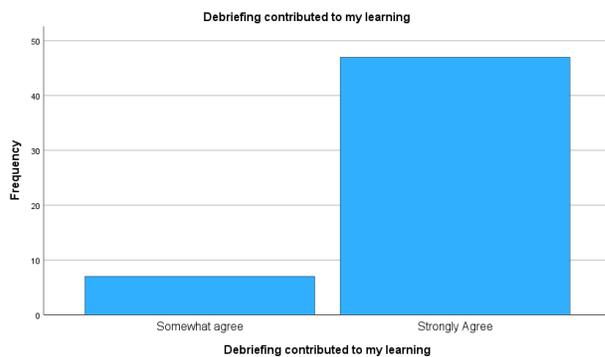
**Prebriefing**



**Scenario**



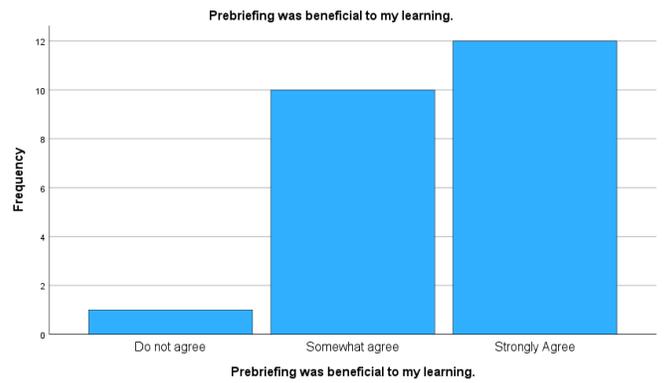
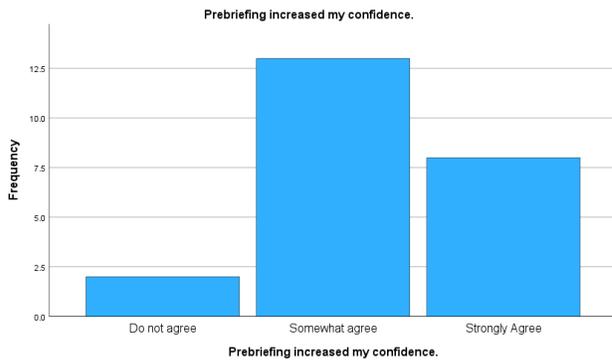
**Debriefing**



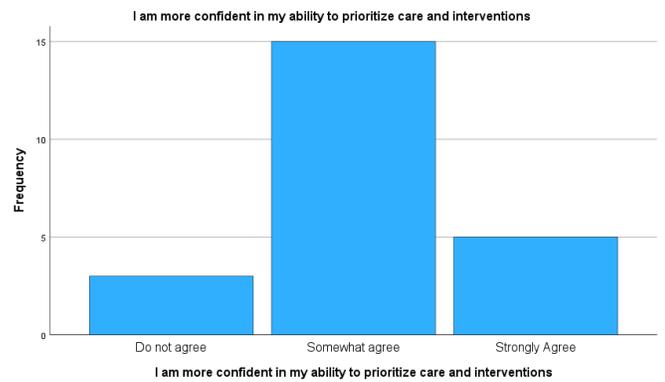
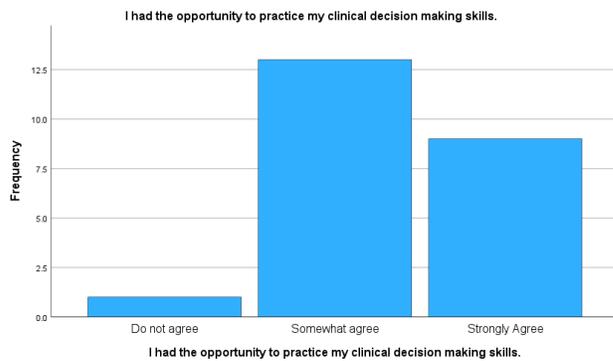


**NURS 361 – SSL 2 – Postoperative complications**

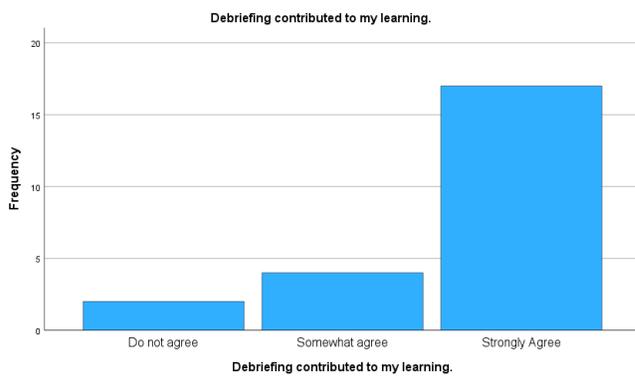
**Prebriefing**



**Scenario**



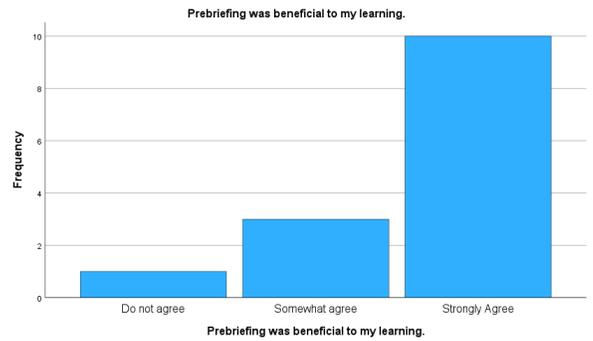
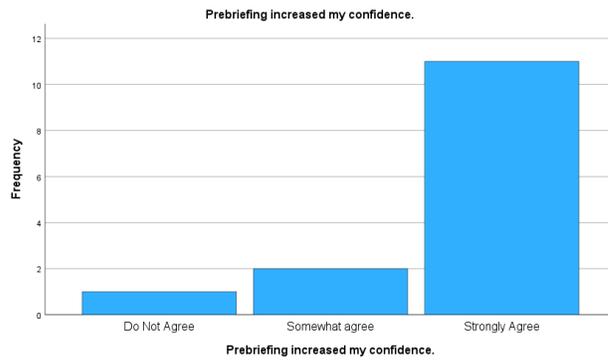
**Debriefing**



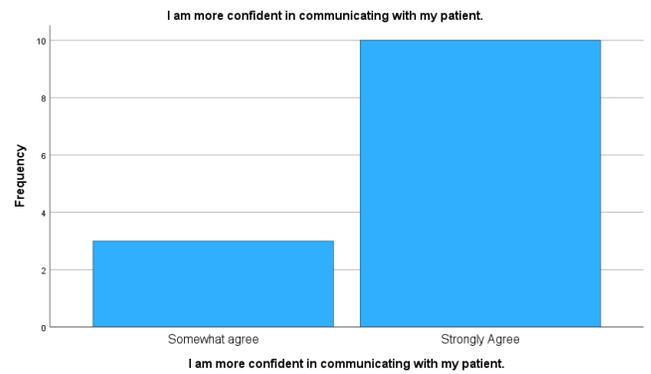
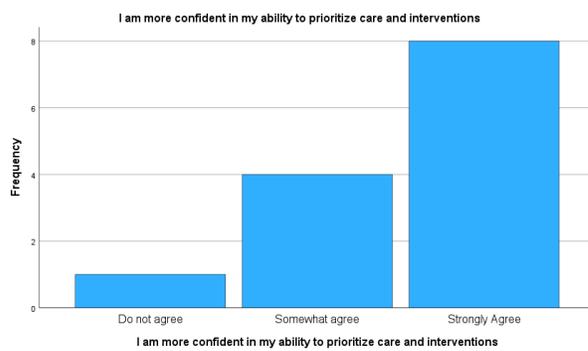


**NURS 323 and NURS 401 Motivational Interviewing**

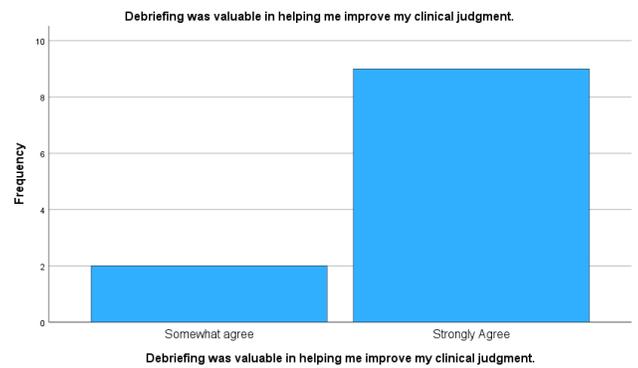
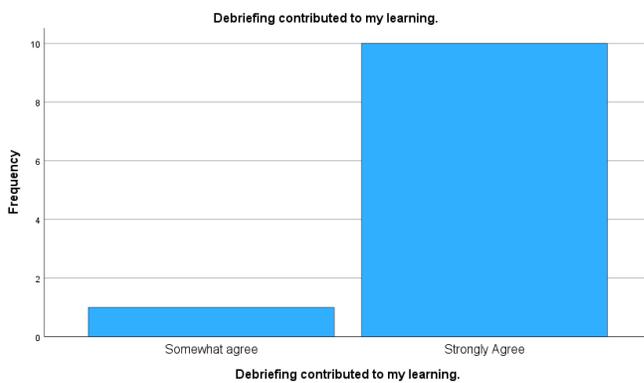
**Prebriefing**



**Scenario**



**Debriefing**





In addition to the formative evaluation, we conducted a summative assessment to compare three clinical learning environments namely the traditional clinical learning environment, face-to-face simulation based clinical learning environment, and screen based simulated clinical learning environment. The Clinical Learning Environment Comparison Survey (CLECS) 2.0 was used. Using a 4-point Likert scale (1=Not Met, 2=Partially Met, 3=Met, 4=Well Met, with additional Not Applicable Option) learners scored how well each type of clinical learning environment met 28 of their learning needs. These learning needs encompassed subscales including communication, nursing process, holism, critical thinking, self-efficacy, and the teaching-learning dyad. From October 2022 – February 2024, we conducted three CLECS surveys. The first two CLECS surveys at the end of Term 1 and Term 2, both had a low response rate, with 3 and 13 responses, respectively. Due to the low response rate, we were unable to perform an analysis that could be generalizable to the larger group of students.

However, the third CLECS survey distributed in February 2024 yielded 145 responses (out of a total of 147). With these survey results we performed frequency and descriptive statistical analysis on SPSS. Friedman tests with Post Hoc Comparisons were performed to more closely analyze if there were statistically significant differences between the three clinical learning environments (see Table below). Analysis showed that the **traditional clinical learning environment consistently ranked the highest in meeting learner’s needs, followed by face-to-face simulation-based learning environment, and lastly, screen based simulated clinical learning environment was ranked the lowest.**

#### CLECS 2.0 Items Across 3 Clinical Learning Environments with Post Hoc Comparisons (February 2024)

Subscale	Item	Mean (SD)			Friedman Test <sup>a</sup>	Significant Post Hoc Comparisons
		Trad	Sim	Screen	$\chi^2$ (df=2)	
Communication	1. Preparing to care for patient	3.34(0.76)	2.77(0.75)	1.77(0.96)	155.59 <sup>b</sup>	A, B, C
	2. Communicating with interdisciplinary team	3.10(0.93)	2.37(0.92)	1.61(0.99)	114.24 <sup>b</sup>	A, B, C
	3. Interacting with patient	3.46(0.83)	2.61(0.88)	1.71(1.01)	139.41 <sup>b</sup>	A, B, C
	4. Providing information and support to patient’s family	3.19(0.85)	2.45(0.95)	1.64(0.97)	131.55 <sup>b</sup>	A, B, C
Nursing Process	5. Understanding rationale for patient’s treatment plan	3.28(0.79)	2.96(0.83)	2.02(1.00)	116.65 <sup>b</sup>	B, C
	6. Understanding patient’s pathophysiology	3.20(0.79)	2.85(0.79)	1.97(1.02)	111.12 <sup>b</sup>	A, B, C
	7. Identifying patient’s problems	3.32(0.76)	3.10(0.74)	2.16(1.02)	101.26 <sup>b</sup>	B, C
	8. Implementing patient’s care plan	3.28(0.79)	2.75(0.79)	1.79(0.99)	146.78 <sup>b</sup>	A, B, C
	9. Prioritizing patient’s care	3.38(0.77)	3.00(0.83)	1.95(1.01)	136.94 <sup>b</sup>	A, B, C
	10. Performing appropriate patient assessment	3.46(0.74)	3.08(0.79)	1.90(0.99)	153.83 <sup>b</sup>	A, B, C
Holism	12. Assessing outcomes of care provided to the patient	3.34(0.80)	2.82(0.87)	1.80(0.99)	139.15 <sup>b</sup>	A, B, C
	13. Identifying short and long-term nursing goals	3.15(0.87)	2.75(0.88)	1.99(1.01)	88.52 <sup>b</sup>	A, B, C
	14. Discussing patient’s psychosocial needs	3.20(0.89)	2.42(0.94)	1.81(1.05)	99.83 <sup>b</sup>	A, B, C



	15. Discussing patient's developmental needs	2.94(0.99)	2.28(0.97)	1.79(1.01)	91.50 <sup>b</sup>	A, B, C
	16. Discussing patient's spiritual needs	2.48(1.10)	1.88(1.03)	1.59(0.96)	64.63 <sup>b</sup>	A, B, C
	17. Discussing patient's cultural needs	2.67(1.05)	2.06(1.03)	1.69(0.99)	68.60 <sup>b</sup>	A, B, C
Critical Thinking	18. Anticipating and recognizing changes in patient condition	3.32(0.78)	3.06(0.88)	1.90(1.07)	125.20 <sup>b</sup>	B, C
	19. Taking appropriate action when patient's condition changes	3.36(0.75)	3.10(0.80)	1.88(1.05)	140.36 <sup>b</sup>	B, C
Self-efficacy	20. Reacting calmly to changes in my patient's condition	3.18(0.86)	2.98(0.77)	1.88(1.21)	95.33 <sup>b</sup>	B, C
	21. Knowing what to do if I make an error in my patient care	2.97(0.87)	2.72(0.93)	1.68(1.07)	112.74 <sup>b</sup>	B, C
	22. Being confident in my decisions	2.94(0.87)	2.74(0.82)	1.83(1.01)	92.43 <sup>b</sup>	B, C
	26. Feeling confident in abilities	2.88(0.91)	2.73(0.81)	1.83(1.03)	89.23 <sup>b</sup>	B, C
Teaching-learning dyad	23. Having instructor available to me	3.21(0.85)	3.41(0.76)	1.66(1.19)	140.41 <sup>b</sup>	B, C
	24. Feeling challenged and stimulated	3.47(0.76)	3.12(0.86)	1.66(1.04)	157.64 <sup>b</sup>	A, B, C
	25. Receiving immediate feedback on performance	3.17(0.89)	3.36(0.83)	2.10(1.24)	90.25 <sup>b</sup>	B, C
	27. Feeling supported by instructor and peers when making care-related decisions	3.33(0.79)	3.23(0.83)	1.70(1.24)	120.64 <sup>b</sup>	B, C
	28. Improving my critical thinking skills	3.37(0.79)	3.13(0.79)	1.85(1.07)	150.86 <sup>b</sup>	B, C
Unassigned to subscale	11. Evaluating the effects of medications administered to the patient	3.41(0.77)	2.70(0.85)	1.76(1.05)	138.99 <sup>b</sup>	A, B, C
N=145						
Abbreviations: CLECS, Clinical Learning Environment Comparison Survey; Trad, Traditional clinical learning environment; Sim, Face-to-face simulated learning environment; Screen, screen-based simulated learning environment.						
A= statistically significant difference between traditional clinical learning environment and face-to-face simulated learning environment; B= statistically significant difference between traditional clinical learning environment and screen-based simulated learning environment; C= statistically significant difference between face-to-face simulated learning environment and screen-based simulated learning environment						
<sup>a</sup> Each Friedman test had 2 degrees of freedom (df)						
<sup>b</sup> p ≤ 0.05						

### ***Focus group discussion***

We conducted two focus group discussions and two individual interviews with students. The purpose of these interviews was to understand their experience and perceptions regarding the effectiveness of SSL as a clinical teaching approach. Two research team members conducted the semi-structured interview via Zoom using an interview guide. Audio recordings were transcribed verbatim with an online transcription service, Temi. Transcribed data is being analysed by two research team members using thematic analysis by Braun and Clarke (2006). Data analysis is still ongoing. The preliminary overarching themes are as follows:

#### **Improved skills**

Some students reported that SSL improved their clinical skills, interprofessional communication skills, confidence and team working skills. One participant said:



*“I think confidence wise SSL just taught me to not be afraid to ask questions even in front [of] like a larger audience, like the group of people just because, um, like the healthcare is such a team environment, there's no dumb questions. So I think definitely in clinical practice, I so just build up that confidence for me.”*

### **Unnatural environment**

Some students pointed out that, despite the SSL team’s efforts to simulate real life scenarios, there are aspects of the clinical environment that could not be replicated. For instance: the natural flow of conversation between nurses and patients and nurse providing nursing care alone instead sharing responsibilities in a group.

One student said:

*“..... the biggest thing that stuck out to me is just how unnatural a lot of it felt. I think like it, because we were working with a mannequin, there was certain things that we would get off the mannequin, certain things that we would ask the instructor for as far as like actual assessments and vitals.”*

Another student said:

*“So for example, if I am the nurse caring for a patient, I'm not [going to] have two of my classmates dividing up that same care [because] it quickly becomes very uh, overcomplicated to do simple tasks in SSL if you're sharing it amongst, you know, two or three other people when you normally don't do that and you're like [the] decision maker.”*

### **Rare Learning opportunities**

Some students recognized that SSLs help prepare them for rarely seen/experienced events due to their practice placement.

A student said:

*“.....but one positive thing that uh, I did find about the SSLs is there are some experiences in clinical practice that are really rare to come across. Um, especially when they're high stress, um, extreme cases, rare cases or things we're just not seeing as students. Those are the situations I think that are good to go through in SSL because just as you would like practice CPR or emergency first aid in a course going over it, you [want to] be prepared once you get into that situation in clinical and not panicking.”*



## **Objective 2: Faculty experience and development needs**

We conducted two individual interviews with faculty members who facilitated SSL in 2022 – 2024 academic years. The purpose of the interviews was to understand their experiences facilitating standardized simulated-based learning activities. A research team member conducted the semi-structured interview via Zoom using an interview guide. Audio recordings were transcribed verbatim with an online transcription service, Temi. Transcribed data is being analysed by two research team members using the thematic analysis by Braun and Clarke (2006). Data analysis is still going. The preliminary overarching themes are as follows:

### **Effective orientation**

The participants reported that they were adequately oriented, trained and supported to facilitate SSL hence they felt prepared to implement SSL at the School of Nursing. A participant said:

*“She's [Simulation Co-ordinator] so great. It's, it's[Orientation] so thorough and she makes the time, she does the recording, like she answers any questions. She even has us all like, you know, be there in person and she de like we, she demos and she's involved, and other facilitators are involved, and if we have any questions we can ask them in the moment and then we can make some tweaks here and there that may be needed.”*

### **Technological difficulties**

When technology fails, simulation educators need to be able to pivot to keep the learning going.

A participant commented:

*“Yeah. But I think, um, it was a little bit of a glitch...one of the examples I can give is that the manikin, there's a little lever on it that would actually make it sit up, but it wasn't working for that manikin. So I was the one that was going in and when the students were, you know, wanting to listen to the patient's posterior lungs, I went up and held the patient So it's just like when things aren't working, we just have to, you know, be creative and continue on with the simulation, but just, we might just need to tweak a few things in the moment.”*



#### 4. TEACHING PRACTICES

Over the project period, SSL facilitators have engaged in faculty development opportunities to grow their knowledge of simulation pedagogy. As noted in the SET-M survey findings, students consistently perceived the debriefing phase of each SSL as something that contributed to their learning. This is a critical finding because the debriefing phase of any simulation-based learning experience is an essential component of this pedagogical approach. To continue to do this well, simulation facilitators ought to engage in sustained faculty development. When the project began, debriefing practices varied. As a result of this project, and the School of Nursing's commitment to the standards of best practice in simulation education, facilitators were introduced to the PEARLS debriefing tool as the preferred debriefing approach when engaging in simulation-based learning within the curriculum.

#### 5. PROJECT SUSTAINMENT

##### **Meaningful integration of simulation-based learning experiences in the undergraduate curriculum**

In this project, we used a variety of simulation-based learning experiences using various modalities to support the education of nursing students at UBC. With each SSL offering, we debriefed as a team to discuss what worked well and what needed to be improved for future sessions to ensure conceptual fidelity. This project has supported the integration of SSL in a permanent way and continues to benefit the BSN program and those who teach and learn within this program. As a result, we continue to evaluate the students' experience with the incorporation of the SET-M tool with the new cohort of nursing students (BSN 2023 cohort and beyond) to evaluate the efficacy of the various simulations.

We also started curriculum mapping to determine how well the various SSLs map to BCCNM's Entry-level practice competencies. By engaging in this work, we can identify which competencies are well addressed through the SSLs and which areas we could improve. This work is important to continue so that we, as a School of Nursing, can learn the extent to which the various learning experiences students are exposed to contribute to their achievement of the competencies expected of them upon graduation.

##### **Ongoing professional development needs**

We are working toward establishing an in-house simulation training program that new faculty will be asked to participate in using Canvas. We have grown the simulation program and require skilled facilitators. Several faculty members are enrolled in certificate courses that take between 1-2 years to complete; therefore, we require additional strategies to prepare educators to facilitate simulations before completing their certificate. Presently, new facilitators are asked to work through a free open access simulation foundations course that introduces them to the basics of simulation. The faculty have found this course to provide a good foundation in simulation, and we plan to continue encouraging new facilitators to complete it. The Canvas course will provide application activities and videos of best practices in simulation education,



to provide faculty with feedback on their learning, as well as offer a resource hub for research articles, simulation scenarios, updates from the field, simulation webinars and conference opportunities. There will be three modules in this Canvas course for simulation educators to complete; the novice module is in the early stages of development with at least two additional modules for intermediate and advanced simulation educators in the planning phases to continue to build and hone facilitator skills. Included in this program is mentoring new simulation educators by more experienced simulation educators. In addition, there is a goal to create a community of practice for our simulation educators as well as an outward facing hub where all faculty can learn about the simulation program. A TLEF grant would be of benefit to this faculty development initiative to work with UBC studios to film scenarios and support faculty with some release time to focus in on this project. The quality of facilitation and skill of the facilitator in simulation directly impacts student learning outcomes and supports the need for ongoing faculty development in simulation pedagogy.

## 6. DISSEMINATION

For this project, we were able to share our work in several local and international venues through poster (1) and oral presentations (4) at various relevant conferences. Future plans for dissemination include a manuscript describing the work we have done, and lessons learned along the way to support the growing literature on the science of simulation within nursing education.

Scholarly Activity	Presentation Forum	Presentation Title	Authors	Date
<a href="#">Poster</a>	TLEF and ALT-20240 Virtual Showcase	Breaking free from tradition: An expansion of simulation-based learning in an undergraduate nursing program	Carla Ferreira, Bukola Mary Ibitoye, Dr. Geertje Boschma, Dr. Elisabeth Bailey, Kymberley Bontinen, Dr. Suzanne Campbell, Dr. Bernie Garrett, Dr. Farinaz Havaei, Dr. Saima Hirani, Dr. Maura MacPhee, Debbie Mann, Ashley Scott, Krista Sferrazza, Julie Tipping	May 2023 UBC
Oral	BC Simulation Network Conference (Local)	Simulation-based learning experiences to the rescue: Lessons learned from an undergraduate nursing program	Carla Ferreira Kymberley Bontinen Bukola Mary Ibitoye Krista Sferrazza	August 16-17, 2023 Kamloops
Oral	Western Canada Collaborative of Health Sciences Educators	Excel-ing in Education: Harnessing the Power of Spreadsheets for Objectives Mapping	Carla Ferreira Alice Wong Kymberley Bontinen Carrie Hunter	May 16-17, 2024 Burnaby



	(WCCHSE) conference (Local)	in Simulation Learning Experiences		
Oral	WCCHSE conference (Local)	Putting virtual simulation games into action: Considerations for curricular integration	Kymberley Bontinen Carla Ferreira	May 16-17, 2024 Burnaby
Oral	Association of Standardized Patient Educators Conference (International)	Redesigning a learning experience with simulated participants: Using a motivational interviewing lab as a case study	Carla Ferreira Kymberley Bontinen	June 23-26, 2024 Vancouver