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Innovations in virtual education for clinical and simulation learning

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ABSTRACT

The global impact of COVID-19 forced nursing education to provide an alternative for scheduled clinical experiences during the Spring and Fall of 2020. Many programs selected the pre-packaged, web-based solutions at the onset of the pandemic due to the uncertainty and recommendation of social distancing. Clinical and simulation faculty began to look for educational alternatives to provide meaningful learning experiences that more closely replicated clinical learning because students expressed displeasure with the asynchronous web-based options. This article outlines how an innovative partnership between clinical faculty, simulation faculty, and the Theatre Department modified an in-person simulation activity designed for groups of two students into a web-based "clinical" experience that included the assigned clinical faculty, eight nursing students, and one simulated patient. This active learning strategy was able to meet the course objectives, required little additional resources, and most importantly, underwent positive evaluation by the weary, screen-based learners.

Introduction

From the onset of the pandemic, academic institutions preparing the next frontline healthcare workers struggled to provide traditional clinical training required for their students. Most health professions programs encountered extreme restrictions as their students (and upcoming graduates) were unable to access the medical facilities (Alexander, 2020; National Council of State Boards of Nursing, 2020). The disruption of traditional teaching practices challenged faculty to rapidly reinvent their teaching and learning strategies. These innovative educational opportunities needed to provide meaningful learning that replicated clinical learning experiences to meet established curricular objectives. Interestingly, these rapid pivots revealed valuable insights on the impact of synchronous screen-based simulation education with small groups and a simulated patient.

Background

High fidelity simulation learning with simulated patients

The term high fidelity in healthcare simulation often evokes thoughts of a sophisticated manikin that possesses technology to provide typical and atypical patient presentations. For example, a facilitator or simulation technician can modify the software in a control room to change heart rhythms of the manikin. The simulation learners can then feel the pulse of the manikin to confirm the rhythm change and work together to determine the best course of action. However, the Healthcare Simulation Dictionary (Lioce et al., 2020) defines high fidelity simulation as "experiences that are extremely realistic and provide a high level of interactivity and realism for the learner" (pg. 21). The addition of a trained simulated patient heightens the authenticity and interactivity of the simulation which closely replicates clinical learning experiences.

The terms standardized and simulated patient (SP) are typically used synonymously in the literature (Lewis et al., 2017); whereas an SP is defined as an individual trained to portray a specific patient archetype so realistically that an experienced clinician cannot identify a difference (Lioce et al., 2020). SPs can also provide objective patient-centered feedback on learner performance during the debriefing process, which has shown to be a significant advantage for learners (Lewis et al., 2017). Medical education first began integrating SPs in their curriculum in the 1950’s whereas today, SPs are fully integrated into healthcare educational curriculum (Errichetti, 2015). SPs have gained significant popularity in undergraduate nursing programs in the last 10 years as administrators and educators have sought opportunities to replace or augment manikin-based learning with simulation-based education that more closely mimics the actual clinical environment. For the purposes of
this article, learners are defined as health professions students, specifically upper-level undergraduate nursing students.

Simulation learning with SPs has shown to be an acceptable alternative to direct patient care learning in psychiatric mental health nursing in order to meet clinical objectives (Treloar et al., 2019). These experiences can be beneficial in a variety of ways, including development of therapeutic communication skills and performing mental health assessments (Witt et al., 2018), enhancing learning experiences in psychiatric mental health nursing (Treloar et al., 2019; Witt et al., 2018; Yong-Shian et al., 2016), and creating a safe environment which tests essential knowledge, skills, and attitudes needed in the clinical setting (Jacobs & Venter, 2017). Simulated experiences with SPs closely replicate the psychiatric mental health clinical environment and provide a controlled, safe learning environment for clinical nursing students. This article outlines how an innovative partnership between psychiatric clinical faculty, simulation faculty, and the Theatre Department modified an in-person small group learning activity to a web-based learning platform that met course objectives, provided opportunity for engagement, and was evaluated positively by the learners.

The pandemics impact on simulation learning

Each semester simulation centers have a set rhythm and schedule to meet established curricular goals, but COVID-19 intensified pressure on established simulation programs in several ways. The first hurdle Simulationists faced was how to provide the same or slightly modified learning experiences already planned for the semester while adhering to the new social distancing guidelines and regimented cleaning protocols. Many simulation centers established evening and weekend hours to accommodate these needed modifications. To compound this pressure, academic leadership asked Simulationists to identify alternative active learning experiences for clinical placements that had been severely restricted. This was done in an effort to develop students within the curriculum and meet established regulatory guidelines for their graduates. Creatively doing more with less is a common theme in the simulation literature, but the added regulations of COVID-19 and a short time frame were unusual constraints and required a collaborative “thinking outside the box” mentality.

Healthcare Theatre

For one university in the Northeastern United States, the Department of Theatre and College of Health Sciences have a long-standing, sustainable partnership to provide a cost effective, mutually beneficial SP program for simulation-based experiences within the college. (Cowperthwait et al., 2015) The partnership, called Healthcare Theatre, offers two unconventional university courses co-taught by a health sciences faculty liaison with expertise in simulation andragogy and theatre faculty with expertise in applied theatre and improvisation.

In the first three weeks of the beginner course, enrolled students from any major are taught theatre techniques and simulation standards of best practices to ensure each SP case is standardized to the others. Additionally, students are taught techniques to provide objective, character centric feedback to the healthcare learners during the debriefing process of the simulations. The patient centric feedback style is focused on incorporation of the “sandwich technique”; providing one positive, one or two constructive, and an additional positive comment about how the SP felt at specific moments in time during the simulation.

The second, more advanced, three credit course provides instruction and active learning assignments to objectively coach the performance of the students in the first course and provide patient centered feedback, which also provides quality control and sustainability for Healthcare Theatre.

When the pandemic forced these two courses to be moved to a virtual format in Spring of 2020, Healthcare Theatre faculty had to develop creative screen-based solutions that would allow enrolled students to meet the course requirements of both courses. Students in the advanced course who had portrayed at least 2 different archetypes in the previous semester were given an assignment to modify one of the SP archetypes into a patient presentation that would be appropriate for web-based simulated learning. This modification required several adjustments and faculty were available for remote assistance. Students in the advanced course were also taught to select patient presentations that did not require significant physical assessments and would be effective in communicating emotion and personality through a digital box, while also ensuring that the emotional safety of the SP would be protected.

After the simulations were written (see Table 1) in Spring of 2020, the students enrolled in the beginner course were assigned to one of the archetypes and scheduled virtually for performances throughout the semester based on their availability. Though nursing faculty were busy restructuring the simulation learning for the nursing program, they were able to create an interview form for each of the developed simulations so Healthcare Theatre staff and Faculty could effectively portray the healthcare learners in these simulation experiences. In order to meet course objectives, the students in the advanced course observed the web-based pilots in three aspects: to ensure the archetype was authentically portrayed, to coach and analyze performance, and to assist with feedback. The work done in the Spring of 2020 unknowingly served as the pilot for the Fall 2020 semester when the Healthcare Theatre partnership would fill a need for senior nursing students enrolled in their psychiatric mental health clinical experiences.

Freezeframe

The unique opportunity of this partnership allowed the faculty to adapt the educational strategies from the respective departments to learning objectives of each program within the constraints of time, budget, and/or space. The Freezeframe technique, a good example of this concept, was developed by Theatre Faculty for improvisational training, while providing a safe, interactive, and authentic learning environment for small groups of 20 to 30 healthcare learners. Historically, these experiences began in a live, performative format, where the “audience” would watch two SPs model a challenging clinical encounter unfold between a healthcare provider and a patient. The course instructor would pause, or “Freeze,” the interaction several times to reflect on what transpired, discuss assessment findings, and then ask the audience for input on next steps. During the “Freeze” the SPs sit quietly as if frozen during these reflective pauses. The ability to pause or “Freeze” at any point during these live, high-fidelity scenarios allows the audience to ask questions, receive answers, and immediately practice essential communications techniques, including: “reflecting in action” vs. the traditional form of simulation debriefing, “reflecting on action” at the conclusion of the simulation (Clapper & Leighton, 2020; McMullen et al., 2016).

The success of the Freezeframe format for small groups has been adapted and refined over the last six years, expanding its reach to a multitude of skill levels both in and out of the health professions. In 2014, Freezeframe was expanded to include asking the next member of the audience to replace the previous healthcare provider in the scene and integrate the results of the “group think” discussed during the “Freeze”. Feedback from this adaptation was that the learners in the audience appreciated the opportunity to “take the reins” for short periods of time, increasing engagement. Additional feedback was that the learners appreciated watching their peers interact with the same patient, offering a unique perspective and approach to patient care.

Collaboration is key

Amid a curricular change during Fall 2020, psychiatric mental health clinical placements were tenuous, and many local facilities were closed to outside visitors once COVID-19 cases were identified within the institution. The last senior practicum course requirements from the retiring curriculum included 84 h of face-to-face clinical experiences in a
variety of mental health settings. No simulation-based learning was integrated or planned for this clinical course originally. However, due to COVID-19, these clinical hours were restricted, and development of innovative solutions was required to ensure 10 clinical cohorts of 8 senior nursing students (approximately 80 students total) had meaningful and experiential components of the course to meet established clinical objectives.

**Modifying the simulations**

In Fall 2020, psychiatric mental health nursing faculty began collaborating with the Healthcare Theatre team to develop a powerful solution that would work within the constraints of remote, web-based learning for groups of 8 learners in each clinical cohort. The team agreed that web-based Freezeframe learning was the most feasible option for the small groups, as in person simulation planning for the semester was already complete and limited additional SPs would be available if web-based learning was an option. The group decided to utilize two of the archetypes created from the previous semester: motivational interviewing and depression assessment. Clinical faculty and the health sciences faculty liaison wrote the additional portions of the simulations utilizing the National League for Nurses Simulation Template (National League for Nurses, 2019) including learner objectives, pre-briefing information, essentials of the Freezeframe format, and debriefing notes. More details on the simulations are provided in Table 1.

**Essentials to execution**

For the web based Freezeframe, the simulations required additional administrative support to ensure a smooth transition and operationalization. The SP Program Coordinator, whose responsibility is to schedule the simulated patients for in-person simulations, agreed to take on this additional responsibility. The two simulated patient encounters were planned during the scheduled times of the nursing student’s clinical course to accommodate the availability of the facilitator (assigned clinical instructor) and healthcare learners. The program coordinator scheduled the Zoom meeting and disseminated to the SP, facilitator, and healthcare learners. The first SP and facilitator were scheduled to join 15 min before the simulation began so the SP could change their screen name, turn off their camera, mute their microphone and be moved to a breakout room. The facilitator admitted students from the web-based “waiting room” to the theatre, there is no set start and stop and a decision was made to pause

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**Table 1** Synopsis of web-based simulations.

| Applicable course objectives* | Freezeframe simulation objectives* | Pre-briefing reminders* | Suggested questions for mini team debriefs |
|--------------------------------|-----------------------------------|------------------------|------------------------------------------|
| Incorporate critical thinking into the care of adults with common acute and/or chronic mental illnesses. | Analyze subjective and objective data to formulate and test hypotheses during the patient interaction. | Introduce yourself/Ensure safety | What went well during this portion of the interaction? What could be improved? |
| Provide safe, competent, and appropriate nursing care to individuals experiencing mental illness. | Articulates the validation and acknowledgment of the patient feelings during interaction. | Discuss simulation flow | What therapeutic communication choices were made during the interaction? How did the patient respond? |
| Demonstrate professional role behaviors in clinical practice. | Demonstrate professional demeanor throughout patient interaction. | Ensure simulation confidentiality | Describe the subjective and objective data you gathered? How does that better inform your assessment? |
| Demonstrate effective oral and written communication and technology skills. | Implement at least 1 therapeutic communication technique during interaction. | Review the above objectives and answer any questions | What would be your next question/approach with this patient? |

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**Motivational interviewing summary of patient archetype**

Jesse Rogers is a 21-year-old college student who has recently received an underage drinking citation. Jesse was a week away from turning 21 at the time of the citation. Jesse was mandated community service, fines, and proof of counseling, which is the reason for this appointment. At the beginning of the simulation experience, Jesse has no interest in participating in this counseling session and shows distraction through being on their phone and not listening to the provider. As the provider builds rapport with the patient, we find out that Jesse has strained relationships with friends because of their drinking habits and has an aunt with a substance use disorder. Jesse had a strong relationship with the aunt and at first does not see the relationship between drinking habits and the now strained relationship the family has with the aunt.

**Depression assessment summary of patient archetype**

Mel Munser is a 20-year-old college student who recently drove their car into a brick building late at night. The patient suffered a left femur fracture and a minor left shoulder injury. They are also experiencing strained relationships with family members. Mel’s parents recently got divorced, father moved to Texas with his new girlfriend, and Mel’s mother has extreme academic expectations. After receiving a B on a midterm exam, Mel drove a car into the building in a suicide attempt. Mel feels like a screw up and does not know how to handle life situations anymore.

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**Synopsis of web-based simulations.**

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**Incorporate critical thinking into the care of adults with common acute and/or chronic mental illnesses.**

**Provide safe, competent, and appropriate nursing care to individuals experiencing mental illness.**

**Demonstrate professional role behaviors in clinical practice.**

**Demonstrate effective oral and written communication and technology skills.**

**Analyze subjective and objective data to formulate and test hypotheses during the patient interaction.**

**Articulates the validation and acknowledgment of the patient feelings during interaction.**

**Demonstrate professional demeanor throughout patient interaction.**

**Implement at least 1 therapeutic communication technique during interaction.**

**Introduce yourself/Ensure safety**

**Discuss simulation flow**

**Ensure simulation confidentiality**

**Review the above objectives and answer any questions**

**What therapeutic communication choices were made during the interaction? How did the patient respond?**

**Describe the subjective and objective data you gathered? How does that better inform your assessment?**

**What would be your next question/approach with this patient?**
the simulation and call “Freeze” after approximately 5 min of interaction had occurred (Clapper & Leighton, 2020). During the “Freeze”, the SP turned off video and sound, while the learners and facilitator completed a reflective pause, or mini-debrief, where all learners turned on video and sound and actively participated in the discussion. The SP was directed to take notes for the patient-centered feedback portion of the simulation at the end of the experience. Each facilitator was provided a list of suggested reflective questions to help facilitate the interaction, but they were free to develop their own reflective questions that applied specifically to the observed interaction. At the conclusion of the reflective pause, the group would discuss next steps for the new “provider,” and the next volunteer continued where the previous provider left off as if the pause never happened. Each learner had about 5 min to participate as the provider with 3–4 min of group discussion between. This process then repeated until all learners had participated as the provider.

Once the final provider participated with the first SP, the SP turned off their video and sound while preparing patient-centered feedback for the group. The simulation facilitator led a final debrief for that patient interaction with the healthcare learners to review the objectives and discuss any outstanding questions from the learners. When the SP was prepared to give feedback, the SP turned video and sound on to indicate to the facilitator they were ready when the time was appropriate. Once directed by the facilitator, the SP would verbally give feedback to the learners from the perspective of the patient and answer any questions posed by the learners or facilitator. After all questions were addressed and the facilitator felt as though all debriefing points were covered, the first simulation experience was concluded, and both the learners and facilitator briefly discussed the reason for the second patient’s appointment before being transferred into a second breakout room.

After being admitted to the platform by the program manager 15 min before their scheduled simulation, the second SP was placed in a different breakout room after completing the same preliminary process. For this experience, the learners completed both of the patient interactions outlined previously within a 4-hour block of time.

Preparation of the simulated participants

The transition to web-based simulation learning presents different challenges and considerations especially when including SPs, primarily because of additional logistical considerations and new technology, which can be overwhelming, particularly for students who were new to the concept of improvisational performance. The two simulations: motivational interviewing and depression assessment, had been completed by the Healthcare Theatre team in person in the past and the content was modified for web-based learning with a single learner. In the Spring, a pilot was again necessary to follow best practice standards. Since the structure of the simulation was changed to a Freezeframe format; all stakeholders, Healthcare Theatre, clinical, and simulation faculty could analyze how the change in simulation flow would affect the simulation outcomes. With all stakeholders present on the web-based pilot, one designated SP from the Spring 2020 class and two volunteers from the accelerated nursing class who had already completed the psychiatric mental health nursing course ran through the simulations utilizing the modified archetypes from Fall 2020. After the “performance” portion of the pilots the key stakeholders discussed the SP character portrayal and made any necessary modifications in order to meet the simulation objectives, along with analysis of the pre-briefing notes for clarity. Once the pilots had been completed and all stakeholders were satisfied with the essential logistics, performance notes, and learning opportunity, the simulation templates were modified, and a second dry run of the web-based simulations were completed a second time with just the health sciences faculty liaison present to ensure the changes were sufficient. The completed simulations were disseminated to the Fall 2020 SPs at least one week before the scheduled dress rehearsal. During dress rehearsal students were given coaching on their patient presentation along with necessary practice on the video conferencing platform, including the correct timing for turning microphones and cameras on and off.

Domain 3 of Association Standardized Patient Educators Standards of Best Practice (Lewis et al., 2017) highlights the importance of completing the dress rehearsal (SP training) in the same setting that the actual simulation will take place and including all of the SPs who will be portraying that particular patient present at the same time. This best practice is especially important in a web-based format to be sure the SPs are comfortable with needed technology and associated software. Conducting the dress rehearsal virtually and utilizing the same simulation flow provides SPs with both confidence and competence for their first simulation. Dress rehearsals were scheduled the week prior to the first simulation experience. Ideally, the SP Program Coordinator, content experts, and all facilitators observe the web-based dress rehearsal. The addition of the content experts and facilitators to the dress rehearsal was to clarify any potential misunderstandings not made clear in the dry run. For these dress rehearsals, all of the SPs “casted” for the identified role, lead clinical faculty, and SP Program Coordinator joined the video conference. During the dress rehearsal, the SP Program Coordinator started by providing a brief synopsis of the flow of the simulation and overview of the “patient” as well as having the SPs practice turning on and off their camera and muting themselves at the appropriate time.

During the “performance” portion of the dress rehearsal, all observing SP’s turned off their camera and muted their microphones except for the SP that was selected to be the first one to perform. The SP Program Coordinator role-played as the learner using the interview guides created in the Fall 2020. After about 5 min of the dress rehearsal transpired, the dress rehearsal was paused, feedback on performance was given to the entire SP group to ensure that the SPs heard the same feedback. Once the coaching notes had been provided and all questions were addressed, the scene continued with the next SP where the last SP had been paused. This round robin approach in the dress rehearsal allowed each SP to see their peer’s performance, refine the performances of each “patient” playing the same role, and standardize the patient

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**Fig. 1. Freezeframe flow.**
interactions for each group of learners.

Nursing student evaluations/feedback

The authors asked all 80 of the senior nursing students that participated in the Freeze frame simulation experiences to evaluate the simulation experience utilizing the Simulation Effectiveness Tool-Modeled (Leighton et al., 2015). Evaluations were received from 46 of the 80 learners. Several interesting themes emerged from the free text comments of the survey (see Table 2). The first theme was that learners valued the reflective pause in the middle of the simulation experience. Most simulation experiences are debriefed at the end (reflection-on-action), in this case, advanced pre-licensure learners value a reflective pause in simulation (Clapper & Leighton, 2020) to group think and get feedback from clinical instructors before reengaging the SP. Second, learners valued the ability to observe classmates therapeutically interacting with the same patient. The learners reported that they learned valuable insight by watching other students interact with the same patient. The third theme, the ability to discuss next responses or important lines of questioning as a team, kept the learners engaged throughout the simulation experiences even though they were not interacting with the “patient” throughout the entire simulation. Fourth, feedback from the learners was provided which stated that they would have preferred a short break between the 2 patient interactions in order to process the experience and decompress. Fifth, under early comments about the pre-brief in Table 2, the early evaluations revealed that the learners needed more detail regarding the flow and expectations of the simulation. This information highlighted the need for the health care faculty liaison and lead clinical faculty to provide additional information on the pre-briefing to the three clinical faculty facilitating the simulation. To address this oversight, the health care faculty liaison created a facilitators guide for clinical faculty to alleviate the concern (see Table 3).

The qualitative feedback from the evaluations of the Freeze frame format will inform future iterations of the Freeze frame web-based learning experience. First, learners requested that the group size be reduced for future semesters because at times, it felt as though the line of questioning during the patient interaction with the SP became repetitive with eight learners. Because this experience was meant to replace a clinical day in a psychiatric mental health unit, no preparatory work was assigned in advance of the simulations. In the evaluations, some of the learners requested more information on their patients in advance to better prepare (see Table 2). This insight will be evaluated by the course coordinator and simulation faculty to determine if this could improve learning outcomes. As simulation centers are stretched for space and availability of clinical sites is shrinking, research is needed to explore the viability of web-based learning options such as this to replace a portion oflost clinical hours.

Freeze frame essentials for success

The team sought to ground these simulation learning experiences in best practices established by the International Nursing Association for Clinical Simulation and Learning (INACSL Standards Committee, 2016) and the Association for Standardized Patient Educators (Lewis et al., 2017). One of the standards highlights the importance of having a facilitator who possesses knowledge and skill specific to simulation. This standard was a challenge as a strategy for rapid implementation was created with clinical faculty who were untrained in simulation best practices. One benefit was that the clinical faculty in charge of the simulation experiences were Master’s-prepared psychiatric mental nurses with extensive training in the reflective practice needed for effective debriefing. This style of reflective questioning, though applied in a different way, translated well during the reflective pauses; however, clinical faculty should have been better prepared for the pre-briefing and general understanding of psychological safety of the learners as well as

| Question | Excerpts |
|-----------|----------|
| What did you like about the simulation? | Peer assisted learning |
| • “I liked seeing how other people in my clinical group approach talking to patients.” | |
| • “It gave us an opportunity to learn from each other, provide advice, and strategize on ways to therapeutically communicate.” | |
| • “I liked being able to collaborate with other students throughout the interaction and during the debriefing.” | |
| Reflective Pause | |
| • “I think the actors did a very good job simulating what it could be like to talk to different types of patients with mental health needs.” | |
| • “I liked how different each patient was and how unpredictable their responses were to our questions.” | |
| • “It was very real life and the actors did well. Both of them were really into character.” | |
| Immediate Feedback | |
| • “I liked the instant feedback and how comfortable the experience was.” | |
| • “I liked how we were able to practice therapeutic communication with our instructor there and get feedback right away.” | |
| • “I like how we got feedback after our turn speaking with the patient. It really improved my confidence.” | |
| Safety | |
| • “It was a very safe and engaging experience.” | |
| • “I liked how it was an environment where I can practice freely and get feedback afterwards.” | |
| • “I liked that it was ok to make mistakes and feel part of a community of learners.” | |
| Table 2 Excerpts from the learner evaluations of the freezeframe web-based simulation | |
| How can we improve the simulation? | |
| • “We were not prebriefed so I had no idea what to expect.” | |
| • “Reinforce that we are one nurse not a bunch of different nurses prior to the experience.” | |
| Preparation | |
| • “Helping prepare students more for the education/intervention aspect of the therapeutic communication.” | |
| • “Be given a DSM5 criteria sheet including the main mental health disorders prior to the assessment.” | |
| • “I think having very basic background on the patient before meeting so we can formulate important questions would be helpful.” | |
| Less Students | |
| • “Maybe have a group of 4 instead of 8 for the group.” | |
| • “By the end of the 8 people, it seemed like our conversations were getting slightly repetitive. I think the simulation could be improved if less people potentially talked to each patient with a few more simulations to spread it out.” | |

the SP before the simulations began. Because the simulation team was closely monitoring the simulation evaluations, these issues were addressed at the end of week one by the lead clinical faculty in one-to-one meetings with the facilitators as well as the facilitators guide for
based learning, training standards will need to be established for clinical
evaluate the impact on clinical competence. For future iterations of web-
take into consideration the variability of each clinical instructor's ca
regarding strengths and opportunities for the screen based Freezeframe
the students have provided the team with an evaluation and thoughts
Limitations
they are completed online, the administrative demands to run web-
simulations may appear to require less administrative support because
Institutions planning to integrate web-
simulations were monitored by the clinical
liaison as a reference for the clinical instructors facilitating these sim
Table 3
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5 min. Pre-briefing* See script
below
5 min. Learner reflection
5–10 min SP feedback Q & A

Freezeframe simulation (Table 3) developed by the healthcare faculty
liaison as a reference for the clinical instructors facilitating these sim-
Additionally, simulation learning was monitored by the clinical
coordinator who had experience with simulation and debriefing.

Limitations
The biggest limitation for this type of learning experience is that it is
difficult to quantify the impact of learning at the bedside. Qualitatively,
the students have provided the team with an evaluation and thoughts
regarding strengths and opportunities for the screen based Freezeframe
approach. However, more research needs to be completed to establish
true best practice standards for this type of learning experience and
evaluate the impact on clinical competence. For future iterations of web-
based learning, training standards will need to be established for clinical
faculty leading this type of simulation learning. It is also important to
take into consideration the variability of each clinical instructor's ca-
pabilities and workload. As simulations like these are developed, it is
important to factor in the need for administrative support. Though these
simulations may appear to require less administrative support because
they are completed online, the administrative demands to run web-
based simulations are the same. Institutions planning to integrate web-

Freezeframe simulation (Table 3) developed by the healthcare faculty
liaison as a reference for the clinical instructors facilitating these sim-
ulations. Additionally, simulation learning was monitored by the clinical
coordinator who had experience with simulation and debriefing.

Conclusion
Because the feedback on the evaluations demonstrated positive
outcomes and thought-provoking qualitative comments, the team will
continue this practice to manage the clinical limitations throughout the
pandemic. Many list-serves and conference discussions center on how to
keep an entire clinical group engaged in the simulation experience. The
reflective pause and group think opportunities maintained engagement
throughout each of the ninety-minute simulations experiences. Not only
were the learners asked to actively engage with the patient for a portion
of the experience, but they were also asked to engage with each other
during the reflective pause. Because each of these experiences were
created to be one complete simulated encounter, learners were able to
collect subjective and objective data from the patient, then pause and
critically think about that data to formulate a hypothesis and create a
plan for how the next learner could test or refine the hypothesis. This continued for several iterations which resulted in a team approach to the nursing process.

The versatility of Freezeframe appears to adapt well to a web-based platform and can easily include multiple professions. Up to 30 learners can participate in this active learning technique in a face-to-face forum. On a web-based platform, it is easier to limit the learner size to 14 or less, allowing facilitators to see all the learners during the reflective pauses, which allows the facilitator to refocus or reengage any learners that are distracted. The merit of this educational strategy for clinical groups needs to be explored further to uncover its impact and uncover more information on how it translates to competence and confidence in clinical practice. Though the impact of COVID-19 is waning, many institutions reported difficulty with finding suitable clinical sites for their students before the pandemic, especially in the specialty areas of the curriculum. This creative teaching and learning strategy can allow faculty to target specific clinical learning objectives of their course, takes no additional space in the simulation room, and if the proper professional development is provided, the clinical faculty assigned to the course can lead the Freezeframe simulation experiences for their cohorts.

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Declaration of competing interest

Amy Cowperthwait (corresponding author) is a stock owner and CEO of a company that sells simulation education equipment to colleges and universities. This partial ownership is not identified as a commercial interest by the ANCC because Avkin does not sell products for patient use or products to be used for patients. However, since it is a company that sells into simulation spaces, I felt it important to disclose this interest.

All other authors have nothing to disclose.

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