Original Publication

🔓 OPEN ACCESS

Simulation Clinical Scenario Design Workshop for Practicing Clinicians

Jamie M. Robertson, PhD*, Dorothy Bradley, MSN

*Corresponding author: jmrobertson@partners.org

Abstract

Introduction: Faculty development is important to developing skilled faculty members who are able to effectively design and deliver educational content. There has been an increase in courses designed to help faculty better teach at the bedside, but fewer options for those interested in developing their skills as simulation-based educators. Our goal was to create a workshop to train prospective simulation educators on the skills and knowledge necessary to design a clinical scenario. **Methods:** Learners participate in a 90-minute workshop utilizing short, didactic teaching and practical hands-on practice. Faculty guide learners through the process of developing targeted goals and learning outcomes, setting the scene for a clinical scenario, and storyboarding the main action. Learners work individually, but engage in peer-to-peer feedback, as well as instructor feedback, throughout the session. **Results:** We have run four iterations of this workshop at our institution in the past year, and developed a modified version for an international meeting. A total of 51 learners from our hospital have completed the workshop. Overall, learners agree that the workshop is informative and increases their knowledge. For each educational objective, more than 70% of participants indicated the workshop increased their competence in the area either "extremely" or "quite a bit." **Discussion:** This workshop provides learners hand-on practice in developing a scenario for simulation-based education. Learners leave with the tools and knowledge necessary to take the work developed in the session and create a complete scenario that can be used at our simulation center or at another facility.

Keywords

Simulation, Faculty Development, Clinical Scenario

Appendices

A. Simulation Clinical Scenario Design.pptx
B. Instructor Guide.docx
C. Goals and Learning Outcomes Worksheet.docx
D. Setting the Stage Worksheet.docx
E. Storyboarding Worksheet .doc
F. Course Evaluation.docx

All appendices are peer reviewed as integral parts of the Original Publication.

Educational Objectives

By the end of this session, learners will be able to:

1. Describe the three steps in Wiggins and McTighe's Backward Design Process for Curriculum Development.
2. Write specific and measurable learning outcomes for a clinical scenario.
3. Create an appropriate, realistic patient and background for their clinical scenario.
4. Develop a storyboard for a clinical scenario that includes the major decision points and options.

Introduction

As medical and nursing education at the undergraduate, graduate, and continuing education level continues to evolve, faculty development initiatives are essential to develop, coach, and refine the necessary skills to deliver effective education. Faculty development in medical education has largely focused on improving the teaching performance of faculty members. As teaching skills, curriculum design, and instructional strategies are not part of the standard medical curriculum, most faculty members learn these skills on the job and through ongoing educational lecture, seminars, workshops and peer observation.

Faculty development programs exist through medical schools, nursing schools, universities, and faculty development centers within institutions.[1] Much of the presented content focuses on clinical education and

AAMC

bedside teaching. Simulation has been widely adopted as a method of medical education; however, few faculty development programs have courses with an aim of developing simulation educators.[2] Indeed, at our institution, only one or two sessions per year focuses on simulation, and these sessions are largely focused on increasing interest in the use of simulation. Workshops on developing simulation-based curricula are available at many national and international simulation conferences. However, these courses require an investment in travel and registration fees, while also taking time away from practice, and are therefore not feasible for many faculty and staff members. Published articles[3] and other online resources can be helpful in developing a scenario, but identifying and vetting these resources may be difficult and time consuming. To our knowledge, no similar curricula for faculty development in simulation-based clinical scenario design has been published on *MedEdPORTAL*.

For those who were already engaged in simulation or who wanted to become engaged, there are many hurdles to clear in order to become a simulation educator. In discussion with our faculty and staff, a recurring need identified need was assistance in developing new scenarios to meet the needs of learners. As a result, we sought to develop a workshop that allowed participants to learn basic theory and guidelines for scenario development while also providing them with the opportunity to work on and receive feedback for a scenario they were interested in developing.

Methods

This 90-minute workshop was designed to address a gap in the knowledge of current and prospective simulation-based educators regarding the creation or revision of clinical scenarios to fit the needs of their learners. A need for training regarding the process of creating a scenario that met and focused on learning outcomes was identified by the leadership of the simulation center based on meetings with faculty members, a user survey, and review of curricula submitted by faculty members. Though the institution offered a range of faculty development seminars and workshops focusing on medical education and bedside teaching, there were no focused training sessions for simulation or for scenario development available to staff and faculty at our institution.

A workshop-style session was chosen to allow participants to get as much hands-on practice as possible, and to encourage active development of products that could easily be taken from the workshop and, with only minor refinement, be utilized at the simulation center with learners. As time is incredibly valuable and sparse in the schedule of most clinicians, we replicated successful faculty development sessions held throughout the hospital that had tightly focused, 90-minute sessions. The workshops were hosted in a classroom at the simulation center to encourage participants to become more familiar and comfortable with our simulation space.

We encouraged all practicing clinicians and trainees with an interest in simulation to attend. As a hospital-based simulation center, this included residents, fellows, attending physicians, nurses, physician assistants, and researchers affiliated with the institution. There was no charge to attend the session, but participants had to preregister via an online form to ensure a seat in the workshop. The workshop was advertised using the institutional events calendar, various newsletters distributed to employees, and emails to current educators.

Registered participants received a reminder email approximately 24 hours prior to the scheduled session. The email included directions to the simulation center and a prompt to come with an idea of a training need and an identified group of learners they wanted to focus on for the session. Participants were encouraged to consider high-acuity, low-frequency events in their specialty, actual clinical events that had happened recently and highlighted a gap in knowledge, or training that new practitioners in their area needed in order to perform their job role.

The workshop relied on small, interspersed doses of didactic teaching immediately followed by an opportunity for learners to put the information into practice. As the session progressed, learners completed a series of worksheets that together formed the basis of a clinical scenario. Work was first

AAMC

done independently, followed by participants working with one or two peers to share their ideas and receive feedback on the process. The instructors circulated throughout the room to answer questions, provide feedback, and generate discussion. Before the next didactic section began, a few participants are asked to share their work with the group in order to create discussion around problems and solutions.

We had two instructors run the course. The didactic teaching portions were split prior to the course, allowing the instructors to switch back and forth between each section. As the atmosphere for this workshop was relatively informal, learners asked questions throughout. During the practical portions, both instructors circulated throughout the room and discussed the process with learners. Frequently, instructors switched which pairs they are working with during the hands-on sections in order to ensure that all participants are receiving a range of feedback, as we have found that participants appreciated the increased contact with both instructors. However, there was an advantage to touching base with the same group at each step to follow a set group of scenarios through from beginning to end.

In general, the workshop required very little set-up. A classroom or conference room space was utilized to run the session, depending on which was available. Attendees needed to be able to see the slides during the didactic component, so we ensured that the room was set-up so that no participant had their back to the screen. Participants also needed seats with a table or desk to write on as they worked through the activities. As the session required participants to work in pairs on multiple occasions, we arranged the classroom with this necessary partnering in mind to allow for minimal disruption during the course as participants moved from individual work to pairs to large group discussion.

The instructor only required the PowerPoint presentation (Appendix A), a computer, projector, and the instructor guide (Appendix B). Each participant was provided with a copy of each of the three worksheets referenced throughout the workshop (Appendix C, D, & E). We frequently provided hardcopies of the slides as a handout, as some participants preferred to take notes and reference the examples throughout the workshop. The course evaluation (Appendix F) was completed electronically via a link provided to the participants at the end of the course. No additional materials were required.

The course was divided into six sections: Course Introduction, Backward Curriculum Design Theory, Writing Goals and Learning Outcomes, Setting the Stage, Storyboarding, and Course Wrap-Up. Ech corresponded to a set of activities that led to completion of the three worksheets that participants received. Each of these sections is described in detail below with information on instructor roles, learning activities, and worksheet completion.

Course Introduction
Using the slide set and the instructor guide, the instructors walked through the step-by-step process of developing a scenario. We opened by allowing participants to go around the room and introduce themselves. We limited this section to quick introductions of name, job role, and course expectations in most circumstance to keep the course moving quickly. If the group was small and time allowed, we also asked about previous experiences with simulation, as either a learner or instructor, to get a better idea of the participant background.

Once everyone introduced him/herself, the instructor went through the agenda for the session and the intended learning outcomes. We provided continuing education credits for attendees for several of the sessions and included a slide and discussion of the number of units, disclosures of potential conflicts of interest, and the process of obtaining the credits after the workshop.

Backward Curriculum Design Theory
The first section of the slides was devoted to a brief discussion of curriculum design theory. Our focus was on the Backward Curriculum Design theory developed and promoted by Wiggins and McTighe.[4] This particular method was chosen for its simplicity, focus on learner outcomes, and current use in our center. The instructor explained that the basic three-step process includes: (1) identifying the desired results, (2) determining acceptable evidence that the students have achieved the results, and (3) planning learning experiences and instruction.

The section was kept relatively short, but focused on the fact that this is the reverse process from how many educators plan their activities. In many cases, the content is built first, followed by the writing of learning outcomes and assessments to match. In this workshop, participants were asked to first describe the desired learning outcomes for their students, then to design an activity that achieved those outcomes.

Prior to moving on to the next section, the instructor asked participants to take 2 minutes to write down on the Goals and Learning Outcomes Worksheet (Appendix C) the learner population they intended to target with their clinical scenario.

Writing Goals and Learning Outcomes
The second section of slides was devoted to developing goals and learning outcomes. The instructor presented two small sets of slides and allowed for individual and peer work after each set so that participants could complete the goals and learning outcomes section of the worksheet. The discussion of goals and learning outcomes opened with a discussion of the main differences between goals and learning outcomes, then provided a more in-depth discussion of each.

In the section on goals, we asked participants to focus on the reasons why someone would want to attend their course. These broad, overarching statements about the purpose for a session are typically vague and general. It was stressed to participants that early development of a goal statement guided both the development of the learning outcomes and the rest of the scenario. Finally, we gave participants a few examples of well-developed goal statements from several simulation-based courses run at our simulation center. At the end of the slides, participants were asked to return to the Goals and Learning Outcomes Worksheet, and write a goal statement for their course.

Participants were given approximately 3 minutes to work on crafting their individual goal statement. When finished, we asked participants to pair up with another attendee and share their work. This opportunity allowed for the participants to receive peer feedback on their statement and practice critiquing the work of someone else. Instructors walked around the room, listened to conversations, answered questions, and provided feedback. At the end of this time, two or three attendees were asked to share what they wrote with the whole group. This process was repeated at each stage of the work and is commonly referred to as think-pair-share.[5]

Once finished, the instructor moved on to the slides on writing learning outcomes. We used the anatomy of a learning objective model published by the Society of Simulation in Healthcare[6] to demonstrate the components of a strong learning outcome. The three major components are the task, the conditions under which the task must be completed, and the criteria for the outcome to be successful. The participants were walked through these components using an example from one of our simulation courses. Before moving to the worksheets, we also covered some of the common pitfalls that we see in learning outcomes on submitted scenarios. Participants were then referred back to the Goals and Learning Outcomes Worksheet to complete the learning outcomes section. Participants were asked to develop two or three learning outcomes that they would like to see their learners achieve by the end of the session. They were given 5 minutes to work on writing learning outcomes on their own, followed by 5 minutes of sharing with their partner and providing feedback. The instructors typically solicited two or three examples from the group before moving to the next section.

Setting the Stage
In the next section, learners were asked to think about the setting for their scenario. The comparison was made to a stage performance where the setting, time period, and other elements are changed depending on the purpose of the scene. Participants were told that they were developing both the background and characters for their production. It was important that the details be thought through in order to develop a realistic case. The basic questions of who, what, where, when, why, and how were to be answered, assuming they are relevant and would otherwise be available to the participants in the clinical setting. These factors included relevant patient medical/surgical history, current complaint, current medications, drug allergies, family medical history, and social history. While many of these were left blank for scenarios, participants were asked to think through each one and consider whether it was applicable. Even when the

AAMC

information was not something that their learners would learn during the scenario, a rich background for the person serving as the voice of the patient during the scenario made answering questions easier. At the end of this section of slides, participants were asked to complete the Setting the Stage worksheet (Appendix D). Once people seemed to be finishing the individual task, participants were asked to pair up again and share what they had written.

Storyboarding

The final stage of the workshop allowed participants to begin storyboarding information for their scenario. We began with a brief overview and discussion of the purpose of storyboarding, then moved to some key tips for scenario development. These included beginning in the middle of the action, keeping the signal-to-noise ratio appropriate for the learner level, knowing the endpoint of the scenario, and avoiding trying to cram too much into one session. Participants were encouraged to refer back to the learning outcomes they wrote at the beginning of the workshop to ensure that they were building a scenario that targeted those specific outcomes.

Participants were then given about 10 minutes to work on the Storyboarding Worksheet (Appendix E). When done, they discussed in their pair groups and received peer feedback. Finally, depending on time, we asked for one or two participants to walk the whole group through his or her scenario.

Course Wrap-Up

By the end of the session, participants completed the majority of the work necessary to develop a simulation-based clinical teaching scenario. In the last few minutes, we reviewed the process for scheduling educational time at our simulation center and submitting a curriculum for approval. Before participants left, they were asked to complete a brief, anonymous course evaluation.

Results

A total of 51 individuals participated in this workshop over three different sessions. Six of the participants (11.8%) were attending physicians, 34 (66.7%) were practicing nurses, nine (17.6%) were medical residents or fellows, and two (3.9%) were therapists. We continue to offer this course on a quarterly basis, with most offerings reaching close to registration capacity.

At the end of the course, participants were asked to complete an anonymous course evaluation. A total of 32 individuals completed the online course evaluation. Twenty-two (68.8%) of the respondents were nurses, three (9.4%) were residents/fellows, and seven (21.9%) were attending physicians.

Among those who completed an evaluation, 100% said that they felt their knowledge increased as a result of the workshop. Participants were also asked to what extent their competence with each of the learning objectives had increased as a result of the course on a scale ranging from "not at all" to "extremely." With regard to increased competence in listing the steps involved in developing a curriculum, 12 (37.5%) respondents said their competence had improved "extremely," 11 (34.4%) said it had improved "quite a bit," eight (25.0%) said "to some extent," and one (3.1%) said "a little bit." In the ability to write specific and measurable learning outcomes, 12 (37.5%) said "extremely," 13 (40.6%) said "quite a bit," six (18.8%) said "to some extent," and one (3.1%) said "a little bit." Fourteen (43.8%) respondents said that the course increased their ability to develop a storyboard "extremely," 14 (43.8%) said "quite a bit," and three (9.4%) said "to some extent."

The most common piece of feedback from participants was that they wanted more time for the course or have it split into two sessions: the first focusing on writing goals and learning outcomes; the second on the storyboarding aspect.

In addition to the sessions at our institution, we ran this as a workshop at an international conference for 83 attendees. The conference used a separate evaluation form that was completed by 60 of the attendees. Overall, the course was highly rated with an average rating of 4.45 out of a maximum of 5.0 points. Participants felt that the learning objectives were addressed. The learning outcome of listing the

steps in the backward design process received an average rating 4.6/5; writing targeted learning outcomes received an average rating 4.53/5; and developing a storyboard received an average rating of 4.47/5.

Discussion

Faculty development for simulation-based education is an important part of creating expert simulation educators. In order to develop the resources and personnel necessary to capitalize on the innovative teaching experiences and rapidly advancing technology, institutions need to invest in educational programs for faculty who are interested in developing simulation programs, but who may have had little to no exposure to simulation-based education.

This workshop relies heavily on contact with the instructors throughout the development process to provide participant feedback and guidance. To do this properly requires a low instructor-to-participant ratio. In the first iteration of this course, we had 25 participants and two instructors. This made providing individual attention difficult given the limited time for the workshop. The time allotted for sharing and group feedback was also too short for the number of participants. In subsequent offerings, we have limited the number of participants to a maximum of 15 per session. This has reduced the demand on the instructors and ensured that each participant receives individualized feedback and support.

When we have run this on a larger scale at a conference, alterations have been made to allow for groups of up to 100 to participate. First, we had five instructors available and moving around the room. Second, since working independently would be difficult, we provided needs assessment vignettes with cross-disciplinary situations to groups of participants around the room to allow for each group to have a unified theme at the start. Finally, instructors walking around the room asked specific groups to volunteer to share when someone had an idea, process, or answer that the instructor thought would be useful to the larger group. Each instructor was asked to find one group item share, greatly limiting the amount of time necessary for sharing and feedback. This version of the course utilized the same slides and worksheets, but removed the individual work and peer-sharing component in exchange for larger group work. While this model works well for a large group, there are several caveats. First, individuals do not get to work on a project that they would actually like to implement, and although they are learning the process, they do not leave with a nearly completed scenario for use in a simulation center. Second, groups do not always work well together in designing the scenario, as they frequently come from different types of institutions, professions, and disciplines. It may work better at a single discipline conference where the individuals are able to approach the scenario with the same lens and learner needs.

It is important to discuss several limitations of this course. While the described workshop provided participants with the opportunity to develop the bulk of a simulation scenario, there are additional components that were not completed during the workshop and that we were not able to describe. For example, selecting appropriate technology and equipment is essential to the scenario. In addition, running a scenario and working closely with a simulation specialist to ensure that the scenario runs as planned is a separate skill that requires coaching and practice. These topics were beyond the scope of the current workshop. The workshop was designed around the scenario template used at our simulation center, which is required of all faculty who wish to run a course. Many simulation centers have similar worksheets. However, this workshop may not cover all of the important aspects that are required by those centers. Finally, developing high-quality simulation scenarios for learners requires iterative work and development as well as input from a variety of sources. While participants leave the session with a good start, it is important for them to realize that further thought, refinement, feedback, and testing are necessary.

Despite these limitations, the workshop has been well received by participants. Our course has been highly rated and participants report that the training achieves its aims and provides them with a foundation for developing a clinical scenario. There are a number of possible improvements or changes that may be useful for different population or for developing a similar workshop. Often participants attend from the same clinical areas or divisions and have similar plans for a simulation-based training session they would like to run. In some cases, it has been beneficial to have these individuals work together to develop a

single scenario. One of the major benefits of this is that we see these scenarios often develop into interprofessional programs that meet a number of institutional needs. On the other hand, often one person's original intent can be lost in the process. In addition, the conversation between the groups working together can be distracting for the other participants who are working independently. In the future, we hope to run this course with a focus on interprofessionalism, with teams coming together to develop a scenario that meets the needs of the various professions in a specific unit or setting.

Jamie M. Robertson, PhD: Instructor in Emergency Medicine, Harvard Medical School; Assistant Director of Simulation-Based Learning, STRATUS Center for Medical Simulation, Brigham and Women's Hospital

Dorothy Bradley, MSN: Director of Nursing Simulation, Brigham and Women's Hospital; Assistant Director for Nursing, STRATUS Center for Medical Simulation, Brigham and Women's Hospital

References

1. Steinert Y, Mann K, Anderson B, et al. A systematic review of faculty development initiatives designed to enhance teaching effectiveness: a 10-year update: BEME guide no. 40. *Med Teach.* 2016;38(8):769-786. https://doi.org/10.1080/0142159X.2016.1181851

2. Acton RD, Chipman JG, Lunden M, Schmitz CC. Unanticipated teaching demands rise with simulation training: strategies for managing faculty workload. *J Surg Educ.* 2015;72(3):522-529. https://doi.org/10.1016/j.jsurg.2014.10.013

3. O'Regan N, Coombs-Thorne H. Physiologic storyboarding for scenario development in high-fidelity simulation. *Med Sci Educ.* 2017;27(2):385-390. https://doi.org/10.1007/s40670-017-0397-1

4. Wiggins GP, McTighe J. *Understanding by Design.* 2nd ed. Alexandria, VA: Association for Supervision and Curriculum Development; 2005.

5. Lyman FT. The responsive classroom discussion: the inclusion of all students. In: Anderson A ed. *Mainstreaming Digest.* College Park, MD: University of Maryland Press; 1998:109-113.

6. Society for Simulation in Healthcare. Writing effective learning objectives. http://www.ssih.org/Portals/48/IMSH%202016/Abstracts/Resource_LearningObjectives.pdf?timestamp=1427901864257. Retrieved July 1, 2017.

AAMC