

# Adapting a Classroom Simulation Experience to an Online Escape Room in Nutrition Education

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## Abstract

Due to the COVID-19 emergency transition to remote learning, an undergraduate class in nutrition and dietetics modified a face-to-face experiential “escape room” assignment into a comparable online experience. The online assignment was structured so that students had to use knowledge and clues to move through each step of the Nutrition Care Process; students proceeded through the escape room individually until each successfully “escaped.” An important component of this assignment was the postactivity debriefing process, which took place via video conferencing in small groups. Students indicated that they were pleasantly surprised at the effectiveness of the online assignment. However, analytics showed that students progressed through most of the steps fairly quickly; thus, instructors plan to improve future deployments by using a variety of interactive assessments and adding more layered criteria and clues within each of the escape room steps.

*Keywords:* nutrition education, escape room, online education, simulation

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## Adapting a Classroom Simulation Experience to an Online Escape Room in Nutrition Education

The COVID-19 pandemic required academia to swiftly transition to online learning while maintaining the rigor of academic programs. This case study discusses how one undergraduate class in a nutrition and dietetics program at a public university in the southeast U.S. modified a face-to-face experiential “escape room” assignment to a comparable online experience. To date there are no outcome studies specific to the use of escape room assignments in nutrition and dietetics education. However, escape rooms have been used in other disciplines including nursing and pharmacy (e.g., Morrell, Eukel, & Santurri, 2020). In addition to improving student perceptions and knowledge development, educational escape rooms can also enhance soft skills such as teamwork and communication. These skills have implications for future professional practice due to the real-life nature of the activities involved in the educational escape room (Morrell, Eukel, & Santurri, 2020).

When escape rooms incorporate aspects of real-world clinical practice, they can fit into the larger framework of simulation-based learning (SBLE). In healthcare, SBLEs are typically in-person experiences that allow students to practice and enhance critical clinical skills with simulated patients (such as actors or mannequins) without risking patient safety. SBLEs are commonly used in nutrition and dietetics to improve student competence and communication (Buchholz at al., 2020; O’Shea, Palermo, Rogers, & Williams, 2020). While SBLEs are typically in-person, nursing education research has explored the nature and outcomes of online versions of these activities. Most online SBLEs incorporate authentic activities that include problem-solving, feedback, and reflection (Cant & Cooper, 2014). Typically, students observe a video that represents the simulation, and then work through a set of on-screen options/actions that are designed to engage them to actively participate and process the subject matter rather than to simply acquire new knowledge or facts. Research suggests that online simulation is highly acceptable to students and provides learning benefits similar to other models of simulation (Cant & Cooper 2014).

In this case study, we focus on an undergraduate class in a nutrition and dietetics program at a public university in the southeast U.S. The nutrition and dietetics program offers both on-campus and online courses, however, 67% of courses are only offered in a face-to-face format. The course, “Nutrition Assessment and Communication Laboratory (HUN4025L)” is a newly developed two hour and forty-five-minute face-to-face course that meets once weekly and is required for senior nutrition and dietetics students. The purpose of this course is to reinforce the skills necessary to provide accurate and effective nutrition intervention and communication strategies in various practice settings. This course embeds simulation-based activities such as performing a nutrition focused physical exam (NFPE) and effective communication; skills that students often struggle with. Upon completion of the course, students are expected to be able to: (a) Demonstrate nutrition assessment principles and techniques; (b) Apply medical nutrition therapy principles and techniques; (c) Use the nutrition care process in the development of nutrition care plans; (d) Demonstrate effective communication and counseling skills. This course was offered for the first time in the spring of 2020 with an enrollment of 53 students.

### **Switch to Remote Learning**

A face-to-face nutrition assessment escape room experience was originally developed as the culminating final project for HUN4025L. The escape room was to take place in a nursing simulation lab with the use of mannequins and medical equipment (beds, medical devices, etc.) to mimic an actual hospital setting. The assignment required students to use knowledge and clues to move through each step of the Nutrition Care Process (NCP), a systematic approach to providing high-quality nutrition care that emphasizes critical thinking, problem-solving, and decision-making (Academy of Nutrition and Dietetics, 2020). Students would enter the lab in small groups and begin in the dietitian’s office where they would look through the inbox at patient charts to determine priority for assessing patients. After reviewing the chart, students would proceed to the patient’s bed and continue with the NCP. Throughout the process, the students would need to unlock clues and choose the correct application to move on and eventually “escape” from the room. An essential component of this exercise is the small group debriefing after students successfully “escape.”

Due to the COVID-19 pandemic and the abrupt transition of all university courses to online delivery, the instructors (i.e., authors of this paper) were faced with the challenge of adjusting the escape room assignment from an in-person experience to fully online. No applicable online

software or virtual nutrition simulations were available to use in the development of the new online format of the escape room.

### Components of the Online Escape Room

The online escape room was organized into nine modules within the learning management system (LMS) (Table 1). Detailed instructions for the assignment were provided to students in the first module and students proceeded through the escape room individually. After entering, each module contained pertinent information for each step and students were required to score 100% on a quiz to unlock the next step. The quizzes were embedded in the LMS and were the same for each student. Students had unlimited and untimed attempts for each quiz. Although the quizzes were multiple-choice, the questions and answers were at the “analysis” and “evaluation” levels of the cognitive domain.

To illustrate the escape room activities, we provide examples from steps 2 and 7. In step 2, students were provided with multiple nutrition screening forms of recently admitted patients and they had to prioritize the patient who needed a complete nutritional assessment to advance to the next step. Step 7 included a video of a swallow study being performed (Figure 1) to help students identify the appropriate intervention based on the patient’s progress. In all steps, if the student chose the wrong intervention, diagnosis, or progress, cues were provided to assist with self-correction. See Table 1 for the resources provided, evaluation method, and criteria to advance for each module of the online escape room assignment.

#### Figure 1.

*Video of a Swallow Study that was Provided to Students to Help Identify the Appropriate Intervention.*



**Table 1**

*Module/NCP Step, Resources, Evaluation Method, and Advancement Criteria for Online Escape Room Assignment*

<b>Module/NCP Step</b>	<b>Resources/Information Provided</b>	<b>Evaluation Method</b>	<b>Criteria to Advance</b>
Step 1: Nutrition Escape Room Entrance	Assignment instructions	Short Answer Quiz	Students must correctly identify the 4 steps of the NCP
Step 2: Determining Workload/Prioritizing	Video clip demonstrating an RD reviewing and prioritizing consults; screening results for 3 mock patients	Multiple-choice Quiz	Students must correctly identify which patient to prioritize
Step 3: Chart Review	Image of the patient; medical admission notes; bedside swallow evaluation	None	Module contains information to assist with the NFPE video
Step 4: NFPE	Video of RD demonstrating a NFPE on a mannequin	Matching Quiz	Students must correctly match the body area with the NFPE clinical characteristic indicated.
Step 5: Writing a Problem, Etiology, Signs, & Symptoms (PES) Statement	Students use previous information provided	Multiple-choice Quiz	Students must identify the correct PES statement for the mock patient
Step 6: Intervention #1	Image of a tube feeding pump with feed rate, flush, and duration visible; images of different tube feeding products; formulary guide	Multiple-choice Quiz	Students must recommend the appropriate nutrition prescription
Step 7: Progress	RD progress note; video of a swallow study being performed	None	Information provided is needed to determine the next step, intervention #2
Step 8: Intervention #2	Students use previous information provided	Multiple-choice Quiz	Students must determine the appropriate intervention for discharge
Step 9: Monitoring & Evaluation	Students use previous information provided	Multiple-choice Quiz	Students must identify the appropriate measures to monitor and evaluate

## Data Collection

An important component of this assignment was the debriefing process that took place after the students “escaped.” This took place via video conferencing (Zoom) in groups of eight to nine students; all students were required to attend. Due to unforeseen circumstances, three students did not attend a video conferencing session and instead submitted their debriefing responses via a typed document. The questions asked in the debriefing were aimed at not only assessing the overall process of the escape room, but also to help students reflect critically on how this assignment can be applied to future practice. Questions 1 and 2 of the debriefing asked students about their first impressions of the online escape room and if they had the knowledge and skills to meet the objectives; Question 3 asked students in which ways they thought the scenario was challenging; Question 4 dug deeper into application and asked students to identify what factors were significant enough to apply to practice; and Questions 5 through 7 asked students to identify what they might do differently in real life, what went well, and what could have been changed.

To gauge student progress through the escape room, we also examined the analytics for the quizzes, which were produced automatically by the LMS. Analytics included the average time for students to answer the question, and the proportion who answered correctly on the first attempt.

## Results

### Student Experience

All students reported a positive first impression of the assignment, and having the knowledge and skills needed to complete it. Students also noted that they were initially a bit nervous and unsure of what to expect, but once they entered the assignment, they were pleasantly surprised at how effective it was. Students felt the experience flowed well; for example, one student documented, “I think the flow of the assignment was really good. I liked that we worked chronologically through the NCP, like we would in an actual clinical setting.” Students particularly appreciated the videos, which helped the process feel “more immersive.” For example, one student said that it was “cool seeing the video of the RD introducing the patients, felt like I was in an escape room; watching swallow study was emotional, seeing the person and seeing what they’ve been through and puts it into perspective.” In addition, they appreciated the sense of real-life exposure to medical records; as one student said, it was valuable “being able to analyze the medical records, seeing the intervention and monitoring by looking at the chart.”

In terms of challenges, a few students mentioned technology challenges: Three students said the process of downloading documents and having several internet browser tabs open at the same time was slightly challenging. However, most students focused on clinical challenges, particularly calculating tube feeding needs and choosing the correct formula. Overall, students felt the escape room helped them learn how to prioritize their caseload, apply the steps of the nutrition care process, and practice and build confidence in their clinical judgment. For example, one student remarked that they “didn’t realize how well I was able to apply it, made me feel better going into the internship; being able to apply it helped confidence/self-efficacy.”

Several students stated that this type of assignment could be deployed more times throughout the semester and there could be more steps and calculations involved.

## **Student Analytics**

The analytics for the quizzes revealed that students progressed rather quickly through the online escape room. In step 2, prioritizing care, the average time for students to answer the question was 54 seconds with 67% of students answering correctly on the first attempt. Most of the quizzes were similar in terms of time to answer and the percentage of students answering correctly, except for the final question (to “escape”) where the average time was only 15 seconds with 86% of students answering correctly on the first attempt. Students’ speedy progress through the escape room assessments suggest that future deployments can include more layered and complicated criteria and varied assessments to challenge the students to think critically.

## **Conclusion**

The concept of using an escape room format is a novel approach in nutrition and dietetics and adapting this concept to an online format in a relatively quick time proved to be an innovative and effective learning strategy. Since this course was offered for the first time in spring 2020, it was not possible to compare the online version of the escape room assignment to the in-person version. However, feedback from students was overwhelmingly positive. Many students indicated that they were unsure of what to expect from the online format, but once they entered the assignment, they were pleasantly surprised at how effective it was. They also reported that the step-by-step progression through the escape room—including review of electronic medical records, diagnostic videos, and nutrition-intervention images—helped them learn how to prioritize their caseload, apply the steps of the nutrition care process, and practice and build confidence in their clinical judgment.

Considering how quickly students completed each step of the online escape room, we plan on improving this virtual assignment by creating and adding more videos from the simulation lab, challenging clues, and layered criteria to advance through each step. Adding interactive quizzes such as matching using images rather than text, sorting/classification, and games such as a crossword puzzle, or trivia will enhance the student experience. To reestablish the collaborative nature of the escape room, we will also explore the use of Zoom to enable students to complete this assignment in groups. Additionally, it would be helpful to add a few escape room assignments throughout the course to build up to the final, culminating assignment. Lastly, future studies regarding the efficacy of online escape rooms in nutrition and dietetics should incorporate in-depth qualitative measurements and use control groups to better assess the overall impact of this type of learning activity.

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