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Collaborate to Escape: Purposeful Gaming Simulations for Clinical Skills Attainment

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Is it a good thing when students are looking at the clock? Educators typically would say no, however when students are cognizant of time and are competing to provide safe care, the answer might be yes! Using a computerized content review and practice game followed by an escape room to reinforce timely safe patient care is an innovative way to transfer didactic content to simulation and clinical.

In 2015, faculty conducted a major overhaul of our undergraduate pre-licensure curriculum. One measure typically used to evaluate the success of nursing curricula and ensure students have attained essential program outcomes is performance on the national licensure examination (NCLEX) for Registered Nurses. Each year, faculty members in our program review the results of the NCLEX to identify strengths and weaknesses in test scores of our graduates. Although NCLEX pass rates remained higher than state and national means after the curricular revision, faculty identified that pharmacology scores, specifically medication knowledge and skills content, trended downward. This suggested that additional revisions were needed to strengthen knowledge and skills related to pharmacology and patient safety.
Additionally, the Institute of Medicine's (IOM, 1999) To Err Is Human: Building a Safer Health System report stated medication-related errors were a significant cause of morbidity and mortality accounting for more than 7,000 deaths annually. The IOM has emphasized the importance of significantly reducing the number of medication errors and improving communication about medications with patients. Novice nursing students often express uncertainty with nursing skills including medication administration (Simones et al., 2014). Simulation is a well-documented pedagogy used to improve patient safety and decrease medication errors (Jarvill, Jenkins, Akman, Astroth, Pohl, & Jacobs, 2018; Eremita, 2018). Currently, our students participate in simulation experiences during every clinical course throughout the curriculum. Simulation is viewed favorably by both students and faculty who report positive collaborative learning outcomes from the small group experiential learning activities. To build on this success and address curricular concerns, a faculty team developed gaming and simulation escape room scenarios that supplement pharmacology content.
This project outlines the implementation of a university-based Faculty Innovator Grant awarded in 2017. The grant team created two game-based learning activities designed to connect didactic content to medication administration skills of nursing students in their first adult health clinical rotation. Both the computer gaming module and escape room are placed in the first pharmacology course, which is in the second semester of the five-semester nursing curriculum. Examples of gaming and escape rooms are found in the medical, pharmacology and, more

recently, nursing literature (Adams, Burger, Crawford, & Setter, 2018; Hermans 2018; Tan et al., 2017).

Educational escape rooms, a smart gaming approach building cooperative problem-solving skills, are an interactive learning experience in which a group solves a series of skill related puzzles using clues, hints and strategies to complete a quest. Participants must complete the task within a defined time limit and can ask for clues if they require assistance. Escape rooms provide a collaborative immersive educational platform that can be used to transfer didactic content to clinical practice. Similarly, computer gaming modules are interactive digital learning environments with built in consequences and rewards for performing designated tasks (Bauman, 2016). Novel approaches to learning, such as educational escape rooms and computer based gaming simulations, improve recall, reinforce muscle memory and cement knowledge.

Nursing faculty worked with an instructional technology design team to create a computerized module that reviews the rights of safe medication administration as students virtually practice this skill. Although students practice medication administration principles in their skills lab during semester one of the program, they don't pass medications in the clinical environment until semester two. This learning activity is placed in our curriculum just before students will be applying the skill with live patients. Successful completion of the required computerized module reinforces and refreshes the concepts of safe medication administration. After the content review, students watch an avatar deliver medications following the safety rights. Students are then required to direct the avatar to perform the steps. When the students successfully complete the task, they receive a computer generated “admission pass” for the simulation. A demonstration of the avatar delivering medications can be found at https://www.youtube.com/watch?v=qThHJlyVc6s&feature=youtu.be. This video illustrates a user navigating through medication administration in the virtual learning environment. It includes examples of both correct and incorrect decisions and the consequences of incorrect decisions.

Next, teams of 3-4 students participate in an escape room designed to reinforce and practice safe medication administration. For this scenario, the university mascot has been admitted to the hospital with a diagnosis of heart failure after an exciting football game. Students are tasked with giving his stat medications. During the escape room, students are required to collaborate to demonstrate medication calculation and safe medication administration principles. The escape room requires students to communicate and work cooperatively to unlock clues, administer medications, and escape. Students are allowed 25 minutes to complete the task and can ask for up to 2 clues as needed to progress in the simulation.

Finally, students participate in a facilitated debriefing where they critique their individual and team performance and group dynamics. Faculty and students explore whether the team collaborated to safely administer medications or whether forward progress was hindered by safety violations.

Evaluation occurs through multiple methods. First, groups are evaluated on “escape” time and number of hints given. Second, the group is scored using the safety and communications subsections of the Creighton Competency Evaluation Instrument (CCEI) (Hayden, Keegan, Kardong-Edgren, & Smiley, 2014). This nationally recognized evaluation tool has subsections that measure safety and medication competency. HESI exit exam scores and aggregate NCLEX results will be monitored for improved patient safety, communication and pharmacology scores. Additionally, students provide feedback evaluating the efficacy of the gaming module and escape room as they relate to learning, collaboration, communication, teamwork and

competency. Faculty developed separate gaming and escape room surveys to gauge student reactions to this learning style. Student feedback has been positive. They found the escape room to be a fun and interactive way to collaborate on a task and work on team building and communication skills. They felt using a familiar mascot and story line made the activity fun, and searching for clues decreased the stress associated with medication administration. To date, all groups have completed the task within the time limit and felt the escape room improved their medication administration skills. These experiences should translate to improved patient care in the hospital and simulation settings as well as improved NCLEX results.

Our educational innovation allows students to engage in immersive learning via a computerized gaming module and interactive escape room format. This learning approach can be translated to a variety of clinical scenarios. For example, our next project is the development of an escape room designed for the senior year capstone course in which several teams of students will collaborate to assist a COPD patient to "escape" from the emergency department to an inpatient unit and ultimately escape to telehealth assisted home care. The escape room concept requires students to use high levels of critical thinking and clinical decision making to unlock clues that further the scenario. The gaming format encourages students to work cooperatively to escape successfully. Critical thinking, clinical decision-making and cooperative teamwork are essential to deliver safe patient care and improved outcomes.

Title:

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Keywords:

Computerized Gaming, Escape Room Simulation and Medication Administration

References:

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Abstract Summary:

Implementing a computer gaming module coupled with an escape room simulation to reinforce timely safe patient care is an innovative way to transfer didactic content to hands-on learning. This presentation outlines the application of two types of gaming as learning pedagogies to reinforce safe medication administration for novice nursing students.

Content Outline:

I. Introduction to Purposeful Gaming Teaching Innovation

A. Review of Simulation Strategies
1. Gaming as a teaching pedagogy
2. Escape Rooms as a teaching pedagogy
B. Review of Medication Administration Safety
1. IOM Report
2. Nursing student competence with medication administration
3. Programmatic curricular review and revision for continuous improvement
II. Medication Administration Gaming Computer Module
A. Partnership with instructional designers to develop teaching content
B. Avatar demonstration and student return demonstration modules
III. Medication Administration Escape Room Simulation
A. Development of the escape room / clues
B. Concept testing prior to course implementation

C. "Admission Pass" activities
D. Debriefing
IV. Learning Activity Assessment
A. Student competence with medication administration
B. Student Perspectives of gaming and escape room as a learning pedagogy
V. Future Plans
A. Multi- room escape room scenario in capstone course
B. Open discussion for other potential applications

First Primary Presenting Author

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Author Summary: Ms. Tremblay has given presentations at a graduate symposium. She had a presentation accepted at the Sigma Leadership convention, but due to weather was not able to attend.