Gamification in an Online Nursing Theory Course during the COVID-19 Pandemic

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Abstract

Background: In an attempt to minimize the risk of the transmission of the coronavirus (COVID-19), instructors and students had to rapidly shift from in-person to online delivery of classes. Educators had to adjust to this transition to keep students motivated and engaged. The integration of interactive online platforms in teaching nursing concepts enabled educators to implement a different pedagogical approach to engage students more effectively in their learning.

Purpose: This article highlights the use of online gamification to reinforce the learning of nursing concepts in an undergraduate nursing theory course during the fall semester of 2021.

Results: The students found the online games engaging and helpful in highlighting important nursing concepts in required readings. Moreover, students found benefits in participating in the games both synchronously and asynchronously.

Conclusion: Online gamification activities can engage nursing students while reinforcing relevant nursing concepts in remote nursing theory course.

Keywords: Gamification; Nursing education; online learning; Undergraduate

Introduction

The closure of educational facilities in 2020 to 2021 to mitigate the spread of COVID-19 disrupted the educational sector. This impacted 1.6 billion learners globally as educational institutions from preschools to universities had to rapidly pivot from the traditional face-to-face style of learning to remote learning as a safe teaching alternative during the COVID-19 crisis [1,2]. This transition might have hindered aspects of students' active class engagement and learning due to insufficient remote-teaching and remote-learning skills among instructors and students who were unprepared to adapt to the new situation [1,3,4]. Active learning includes strategies that involve students applying their knowledge and developing their thinking skills [5]. Gamification or Game-Based Learning (GBL) involves the integration of game elements (e.g., rules, a reward system, trial and error, failure, and eventual success with practice) into educational contexts [6]. GBL as a pedagogical approach allows students to actively participate in their learning instead of passively receiving knowledge from an instructor [7]. Compared to traditional learning methods, GBL elevates learning motivation and engagement, hence encouraging students to spend more time learning [5,6,8,9]. This promotes the long-term retention of information as students become engaged in developing their knowledge and skills [5,10].

Prior to the transition to online learning, most undergraduate schools used commercially available software programs such as Moodle, Kahoot, and Blackboard to facilitate the interaction of educators with students [11]. These software programs have been beneficial and engaging to provide effective learning. However, they were developed for traditional learning environments. The challenge is not in developing educational software that is richly interactive but in implementing available interactive websites into the post-secondary classrooms [11]. While the adoption of innovative GBL as an online teaching strategy increased substantially during the pandemic in elementary and secondary education, little is known about how post-secondary institutions used these activities to complement the delivery of course content, including how it impacted students' learning [10-12]. Educators from all disciplines began to modify their pedagogy and adopt innovative learning strategies like GBL into their programs by incorporating interactive websites into their lessons [10], yet little attention has been given to this approach in higher education, particularly in professional programs [7,13,14].

An example of the successful implementation of GBL in higher education can be found in an engineering program in Europe that used educational software [7]. This educational gaming software was developed to assist civil engineering students by using visualization and animation. Players were required to identify the right solution to a variety of problems to win. The game motivated players to learn indirectly by choosing and remembering the correct solution [7]. Although this study revealed that learners who played the game had equal learning outcomes to those who followed traditional learning methods, the learners enjoyed the game during the learning process and were able to correct their mistakes as they repeatedly played it [7]. The use of interactive web-based games has been further evaluated in the field of medicine. Studies show that medical students found educational games to be engaging and provided additional reinforcement in learning [15,16]. Moreover, an article by Martin-Somer, Moreira, and Casado [17] during the COVID-19 lockdown restrictions indicates that the use of regular online quizzes, such as Kahoot, increased the interest of students in studying academic subjects. Games are also an effective source of motivation since they produce higher levels of sustained interest in an activity while providing enhanced retention of course content in a supportive and safe environment [3].

Despite online learning being familiar to the current generation of learners, online education presents a plethora of technological and learning challenges, such as poor internet connection, login difficulties, screen fatigue, lack of guidance, and difficulties in collaborating with others [18,19]. Additionally, many faculty members are hesitant to deviate from traditional teaching methods due to limited class time, increased preparation time, and potential technical difficulties during class time [5,11].

The purpose of this article is to describe the positive implementation of supplemental online games in a nursing theory course designed to provide nursing students with additional opportunities to review nursing concepts and engage in learning during synchronous (real-time) and/or using asynchronous (flexible-time) online activities.

Background

The benefits of gamification for student engagement and the application of learning content [5-9] inspired the development of remote gaming activities during the COVID-19 pandemic as an adjunct teaching activity in an undergraduate nursing theory course at a Southern Ontario university in the fall of 2021. The nursing theory course at this institution uses Problem-Based Learning (PBL) as part of its teaching methodology alongside other teaching and learning modalities (e.g., self-directed learning) that require learners to complete weekly prereadings to support their understanding of the learning outcomes of the nursing course. The online activities were meant to highlight concepts from the prereadings and learning outcomes. Feedback on this course during the first year of remote online learning in the fall of 2020 indicated that students enjoyed faculty tutors' efforts to incorporate online games that tested their knowledge and understanding of nursing concepts. Because of this feedback, in collaboration with a faculty tutor and course coordinator of the nursing theory course (MP), a student partner (HH) created and compiled free online games from May to August 2021 for faculty tutors to administer to students (n = 125) during the course. The course was delivered as a synchronous online class for four hours once a week. The students in the course were divided into six sections of approximately 20 students per section, with a different faculty tutor assigned to each group.

Tutors were provided an opportunity to use the gaming activities at their own discretion to prompt students' engagement, either at the beginning or at the end of the online synchronous class. Links to online activities were provided for students to use outside of class. Free online activities, such as Kahoot, Quizlet, a matching game, bingo, an escape room scenario, and virtual case simulation, were adopted to provide an opportunity for students to engage in course content and test their knowledge and understanding of the required learning materials during class or, as desired, after class. The games lasted 15 to 20 minutes. Free online multiple-choice quizzes, a format similar to the midterm quiz and final exam of the course, were also available. The aim of the supplemental activities was to support students' learning, to serve as a break from the more traditional large group discussions, and to help enhance the students' interest in their learning [5,7,10]. To ease faculty tutors' preparation time and ameliorate potential reluctance to use the gaming technology, guidelines were created and provided, which included answer keys to the questions in the games. Additionally, the student partner (HH) was available via e-mail or Zoom to all faculty and students for any technical issues experienced with the games.

Methods

Students enrolled in their first nursing theory course from September 2021 to December 2021 were invited to provide feedback at midterm on the suggested online activities and again at the end of the course by responding to a self-reporting questionnaire via their course learning management system. This consisted of a 5-point Likert scale (1 = poor, 2 = fair, 3 = satisfactory, 4 = very good, and 5 = excellent) and short-answer questions, as follows:

On a scale of 1 (poor) to 5 (excellent), how engaging were the activities?
On a scale of 1 to 5, to what extent did the activities help highlight the nursing concepts and required readings?
What aspects of the activities were most valuable or useful?
Would you please provide suggestions on how the learning activities could be improved?
Would you have preferred to have completed the activities as a large group (synchronously) as opposed to independently (asynchronously)?

Students were informed that their participation was voluntary and that their feedback was anonymous. This project received an exemption from the Research Ethics Board review, as it fell under the category of "program evaluation." At midterm, 32% of the students participated in the questionnaire, and 10% of the students filled out the questionnaire at the end of the term. Data were analyzed using descriptive statistics for the first two questions and content analyzes for the latter three questions.

Results

In the midterm and final questionnaires, the students (n = 40 and n = 12, respectively) reported that each activity was engaging (midterm: mean = 3.8 [SD = 0.78], median = 4; final: mean = 2.67 [SD = 1.37], median = 2.5) and helpful in highlighting the learning concepts and required readings (midterm: mean = 3.8 [SD = 0.95], median = 4; final: mean = 2.42 [SD = 1.38], median = 2). Students found that the midterm activities were more engaging and helpful than the final activities.

We evaluated the students' subjective responses to the open-ended questions using a qualitative thematic analysis, and three major themes emerged: 1) facilitation of the learning process, 2) benefits of the activities, and 3) areas for improvement.

Facilitation of the Learning Process

Students found that online games such as Kahoot, bingo, and Quizlet flash cards were engaging and helpful in highlighting important concepts from the prereadings. Several students noted that "there were a lot of readings," so they appreciated the activities with sample questions they could expect to see on an exam, as this somewhat decreased their anxiety about taking the online exams. While students valued the online practice questions, they also found the activities helped enhance and solidify their understanding of the course concepts and reinforced concepts they needed to review. As such, these activities served as good tools and guides for supplementing the students' learning.

Benefits of the Activities

Students found that completing the activities was beneficial both during online classes and outside of class time. Students who preferred completing the activities synchronously found "discussing answers and hearing [their classmates'] viewpoints" and "getting immediate feedback from the tutor" when they selected an incorrect answer to a question extremely helpful. One participant explained that "activities like Kahoot are always more fun to do with other students," and another suggested that "incorporating even 10 minutes of Kahoot-type questions into every class" may increase class engagement. Kahoot boosts target memory retention and recall, as it helps to focus a student's attention [5,10]. These students found that completing the activities with others encouraged them to have constructive discussions with other learners as they chose their answers. This enabled them to collaborate with their peers rather than complete the online task individually. One student recounted that completing the activities in groups took "some pressure and anxiety off."

Conversely, students who preferred to work on their own reported that having the option to "complete [the activities] independently" allowed them to review content they may not have understood. One student reported frustration in doing the activities in a large group when they still had not completely grasped the concepts from the readings. Importantly, completing the activities asynchronously allowed them to learn and review the content at their own pace with no outside pressure.

Another group of students stated that they would have preferred a mixture of synchronous and asynchronous activities, as certain activities (e.g., virtual simulation) were better suited for a large group and ensured the activity's implementation in a timely manner. One student suggested using some of the activities at the start of class and then completing others (e.g., Quizlet) as self-directed activities. Nonetheless, having the activities available to all students made it easier to incorporate them into their studies.

Areas for Improvement

Overall, the students called for more questions on a wider range of topics in the course. Some students reported that some questions were not comprehensive enough to impart a better understanding of the course content. In other words, they felt the questions should reflect the style and depth of knowledge that would be expected for the exam. Additionally, knowing which of the readings the content for each of the questions had been obtained from would have been helpful in better informing their knowledge when a question was incorrectly answered. Some students also expressed less enthusiasm for the interactive games (e.g., the virtual escape room and virtual simulation), as these activities did not provide sample practice questions for the exam. Nonetheless, the gamification content helped highlight the nursing course concepts for some.

Discussion

In this article, we report the creation of supplemental educational activities to enhance the collaborative engagement of students online and provide opportunities for them to review the learning outcomes and concepts in an online nursing theory course during the fall semester of 2021. Most of the students were satisfied with having the option to complete the learning activities synchronously and asynchronously. Completing activities like Kahoot synchronously encouraged group engagement and interest in the course and helped to solidify students' cognitive retention and understanding of the prereadings [5,10]. Additionally, the activities generated group discussion. Collaborative learning not only increased engagement but also had a positive impact on student satisfaction, their problem-solving skills, and their social interaction as they worked with their peers to meet the objectives of the games [3,20]. The asynchronous activities served as a study guide to review the course content and sample questions from the activities at each student's own pace. As also reported in Hu et al's study [19], the learners in the current study reported that the accessibility of online links to the games allowed them the flexibility to review the practice questions at any time, location, and pace convenient to them. The online games were made accessible to all students, and the students and tutors did not have to purchase licenses to use the games. Furthermore, the game developers ensured that the games could be used in future in-person classes.

In response to the COVID-19 pandemic and the switch to remote synchronous learning, efforts to enhance student engagement and opportunities for students to connect with their peers became necessities [4]. The nursing students in this study used a PBL learning approach, wherein student participation and collaboration in discussion were essential to understanding the case studies in the nursing course. While students typically learned in their small virtual breakout groups, the faculty tutors played a role in facilitating the students' overall learning and understanding of the case studies and concepts. Thus, supplemental online learning activities were created to assist tutors in providing additional activities to engage the entire class during synchronous virtual classes. Since these activities were not required to be delivered by the tutors, links to the online activities were shared with all students in the course learning management system at midterm and during the final week of the term. This ensured that every student was provided an opportunity to access the same course study and testing materials prior to the midterm quiz and the final exam, which was favorable to the students who responded to the survey.

Strengths and Limitations

The use of supplemental online activities during the period of remote learning caused by the pandemic was appreciated by the students in this online nursing theory course, and they all received the same examples of practice test questions. The partnership between a senior student and a faculty course coordinator in the creation and implementation of the activities was another strength of the study. The support provided by the senior student and faculty coordinator during the implementation of the activities allowed faculty tutors to increase their engagement in their classrooms by using the activities without feeling the burden of learning the online games or facing technical difficulties without support. The games and online quizzes remained relevant and accessible as the course transitioned back to in-person classes in the fall of 2022. The use of games like Kahoot was helpful as the course's midterm quiz and final exam were also carried out online, and the collaborative delivery of the activities helped encourage students to work together and review concepts highlighted in the games at their own pace.

Despite the usefulness of the activities, the outcome of this study was limited to one nursing program at one institution and thus provided a relatively narrow perspective. Not all the tutors delivering the activities synchronously and promoting the use of the activities asynchronously might explain the low number of students (n = 12) who completed the questionnaire at the end of the term. As mentioned earlier, all online links were posted in the course management system at the end of the term, three weeks prior to the students' final exam. To strengthen this study, the effectiveness of the games on the students' comprehension could have been measured by comparing the students' scores on some of the online activities with their marks on the midterm quiz and final exam.

Conclusion

The demand for hybrid models (synchronous and asynchronous) of learning will likely continue to grow even with the reopening of universities [4]. This shift requires educators to continue thinking of innovative teaching methods that will increase engagement with and comprehension of learning materials outside the traditional classroom. The extensive opportunities to learn from the use of supplemental activities discussed in this paper demonstrated effective ways to engage nursing students in their remote nursing theory course, both synchronously and asynchronously, during the pandemic. Having a student work with a faculty course coordinator in creating learning activities for the online curriculum was critical in leveraging student leadership and acting as a partner in teaching and learning.

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