

Integrating Game-based Learning into Undergraduate Nursing Education

Keywords:

Nursing, Education, Game-Based Learning, Innovation, Evidence Based Education, Research, Undergraduate

Abstract:

The undergraduate nursing research course is intended to help students explore ways research can inform nursing practice. Unfortunately, nursing students often report that this course, in its traditional format is tedious and does not clearly connect research content and the reality of nursing practice. In response to this critique, the course was redesigned using a Game-based learning (GBL) platform. Game-based learning aligns with principles of effective adult education and leverages technology in a pedagogically sound manner. This study evaluates the level of engagement, achievement of course learning outcomes and satisfaction of undergraduate nursing students who are enrolled in the nursing research course. We will also compare the experiences of students between two redesigned sections of this course. One section will be delivered completely online over 13 weeks and the other section will use a blended approach (face to face and online) over six weeks.

Description:

“Through the creation of novel digital learning experiences inside and outside of the classroom, [The University of Alberta] can appeal to traditional and non-traditional learners.” (p. 1)¹³ In the 2013 report from the University of Alberta’s Online Visioning Committee, it is recommended that faculty broaden the integration of appropriate technologies in the classroom to enhance the quality of teaching and learning.¹³ This project directly supports that recommendation and will develop foundational evidence to guide the future integration of technology in a manner that will enhance the learning experiences of students. The purpose of this project is to assess and compare the experiences of students engaged in a game-based learning approach in a fully online class delivered over 13 weeks and a blended (mix of face to face and on-line) class delivered over six weeks. The course that will be used in this study is the undergraduate nursing research course (NURS 301) taught in the Faculty of Nursing at the University of Alberta. This study will also leverage opportunities to collaborate with faculty (both within the UofA and beyond) in order to build capacity around Game-based learning (GBL) course design and teaching. All of these activities will contribute to our emerging knowledge base about how best to use GBL approaches in effective and sustainable ways.

Game-based learning (GBL) is being used increasingly in K-12 education. However, adoption in post-secondary education has lagged, despite its close alignment to student-centered learning. GBL complements the principles of adult learning, making it a promising new tool for undergraduate course development. GBL principles, and the 3D Gamelab® platform specifically, were used by the primary investigator to adapt and deliver an online section of the undergraduate nursing research course that was piloted in the winter 2014 term. The students gave the course very favorable course ratings and many completed optional assignments provided for interested

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students. The proposed study builds upon that pilot project and the positive results from a larger study using 3D Gamelab® in a pre-service teacher training program at Boise State University.⁷

The nursing research course (NUR 301) has traditionally been a course that has received low student satisfaction ratings, and narrative comments from students on end of course evaluations describe the course “boring” and “dull”. Students also seem to struggle to connect course content to their clinical practice as beginning nurses. These sentiments about the undergraduate research experience are also reflected in the nursing literature.^{2, 3, 5} This less than ideal learning experience may impact newly registered nurses’ ability to access and utilize evidence and thereby affect their development into critically thinking and confident professionals; this is reflected in the fact that many new nurses enter practice lacking the knowledge, skills and attitudes that foster evidence-based practice.¹¹ The context described above, created an opportunity to implement game-based learning with the critical goal of improving student satisfaction and engagement in this course.

Innovation: Acknowledging and responding to student values and learning preferences are crucial to creating effective learning environments.^{4, 7-9} Game-based learning is an innovative and promising approach in teaching, learning and instructional design. Several studies suggest that this approach can improve student satisfaction and engagement in undergraduate courses.^{1, 7-9} GBL is grounded in the pedagogy of mastery learning, in which choice, flow and engagement are paramount.⁶ Active learning is facilitated by leveraging student engagement and by providing an array of learning challenges that allows students choice in how they “master” course learning objectives.¹⁰ 3D GameLab® is a game-based content creation and student tracking platform where educators can design and share quests and badges to create personalized learning for their students.¹ Students “level up” through a course, choose quests they want to play, and earn experience points, badges, and awards in the process. Class is literally turned into a game, providing the opportunity for mastery learning.¹ In the 3D Gamelab® platform that is used in this course, students earn experience points (XP) by completing specifically developed and leveled learning “quests”. The XP are used as markers of progress and mastery through the course, rather than letter grades or marks. This platform also requires students to become competent in the use of information and communication technologies (ICT) while at the same time providing a context rich milieu for learning to engage critically in course material. The development of technological competencies has become a necessary component of undergraduate education in the 21st century.^{4, 14}

Collaboration: The potential for collaboration in this project is a significant and intentional component of its design. An integral component of the original pilot project completed by the PI was the feedback and collaboration with students who took the course. This iterative feedback will continue, as it is essential to develop and implement a research course that is engaging and relevant to these undergraduate students. Collaboration will also occur with students at a graduate level. In the winter 2014 pilot of this course, a master’s student completed her teaching practicum with the PI in this course. In this winter 2015 offering of the course, two master’s level students will act as teaching assistants (TA) during the implementation of the course. Their

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participation in this course will allow them to acquire knowledge and skill in the application of GBL, student-centered learning and both online and blended course delivery.

There is great potential for collaboration with other faculty members within the University of Alberta. As the use of game-based learning is still an emerging practice, particularly in higher education and health sciences, the PI has been a leader in convening a special interest group (SIG) in game-based learning facilitated via the Centre for Teaching and Learning. This SIG creates a university wide community of faculty in a variety of teaching positions who can share their expertise, vet questions and collaborate together on the use of game-based learning. Within the Faculty of Nursing, the PI has already collaborated with another faculty member to integrate GBL elements into the Anatomy & Physiology, and Pathophysiology courses. The co-investigator for this project (Dr. Karin Olson) was intrigued by the pilot GBL course taught last year, and approached Dr. Davidson about extending the use of GBL within the nursing research course to include the section she is teaching this winter (this will be the blended delivery section).

The Faculty of Nursing has numerous partnerships via the undergraduate nursing program that is delivered with partner schools including Keyano College, Grande Prairie Regional College and Red Deer College. More than one of these institutions has already identified their interest in learning more about our methods, experiences, and results. The University of British Columbia has also expressed interest, particularly in receiving a Webinar from Dr. Davidson on her expertise with GBL. There is international interest in collaboration, from Aga Khan University (AKU) in East Africa. A multi-year capacity building project is currently being developed between the Faculty of Nursing at the University of Alberta and AKU School of Nursing & Midwifery to adapt and implement the GBL nursing research course in their advanced nursing program. This work is being supported in part by funds available from a memorandum of understanding for academic and scientific collaboration between the two Universities. Finally, the Dean of Academic Affairs from Bellin College in Green Bay, Wisconsin has contacted Dr. Davidson about undertaking a collaborative research project that will enable Bellin nursing faculty to integrate GBL into their nursing research courses at both the undergraduate and graduate levels.

Evaluation: This TLEF project will have two main foci, and will be conducted over one and a half years. One focus will be to support on-going capacity building and partnership with both internal and external collaborators. This TLEF proposal (and specifically the RA support included in this grant) will be leveraged to obtain additional external research funding (with collaborative partners) to further explore and evaluate the use of GBL in higher education. Specific grants we are targeting are: The Sigma Theta Tau International/Chamberlain College of Nursing Education Research Grant and a Social Sciences and Humanities Research Council Partnership Development Grant.

The second focus of this project is to continue to refine and develop best practices for the use of game-based courses at the University of Alberta. This study will use a convenience sample of students from two sections of NURS 301 being taught in the winter 2015 and 2016. Primary outcomes of interest include student satisfaction with the learning experience, achievement of

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course objectives, and level of student engagement in the course. Specifically, we will compare game-based learning delivered in a blended format versus a fully online asynchronous format.

This study will utilize the Evidence-based Practice Competence Questionnaire (EBP-COQ) tool (pre-test/post-test) along with descriptive statistics from the final course grade reports to assess the characteristics of student learning related to the course outcomes. The EBP-COQ is a well validated self-report questionnaire that measures student's knowledge, skills and attitudes about evidence-based practice.¹² The end of course grades and the EBP-COQ (pre-test/post-test) scores for both sections will be reviewed and compared.

Student satisfaction will be evaluated using the University of Alberta end of course Instructor Designed Questionnaire (IDQ) scores as indicators of satisfaction. Specifically, the IDQ questions "Overall, the quality of the course content was excellent" and the question "Overall, this instructor was excellent" will be used as key indicators of satisfaction. Descriptive statistics will be used to analyze the IDQ results. Content analysis will also be completed on the narrative comments provided by students in the IDQ's. These comments will be important in gaining insight into any differences in experiences between the online (13 week) and blended course (6 week) course sections.

Student engagement will be assessed using the analytic reporting tools in 3D Gamelab®. Specifically, we will generate and review reports on: the number of learning quests completed by users and the number of optional learning quests completed by users. We regard the completion of optional learning quests completed to be an indicator of student engagement. This indicator of engagement was also used in the study completed by Haskell with pre-service teacher students.⁷ Descriptive statistics will also be calculated from the 3DGamelab® analytic reports (quest completion times and quest user ratings). These indicators will be used to refine/improve the game experience from year 1 to year 2; and to inform best practices in game-based course design. Finally, narrative comments provided by students regarding their level of engagement (from within the 3DGamelab® and on IDQ's) will be used to add context to the descriptive statistical data.

Sustainability: As the long term intention of this pilot project will be to provide undergraduate students with excellent and transformative learning experiences, it is of the utmost importance to ensure sustainability of the GBL undergraduate nursing research course, and indeed any higher education application of GBL. An integral part of this project will be capacity building for faculty and graduate students to ensure that GBL is supported and well taken up. It is by design that this project is not requesting funds for additional teaching support, but rather research support. Short term (grant-driven) teaching support is often not sustainable and the eventual loss of this support can result in waning interest and viability of a project. Our goal is to use this TLEF grant to develop grass roots capacity for GBL, and support the sustainability of the GBL approach by generating and disseminating evidence about what works and what doesn't in a realistic teaching environment.

Impact on Students: In the previously completed online pilot of the GBL course, student feedback was positive. As an example of this, the Instructor Designed Questionnaire (IDQ)

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results for the key question “Overall, the quality of the course content was excellent” yielded a score of 4.9 out of 5. Likewise, the response to the question “Overall, this instructor was excellent.” was also a score 4.9 out of 5 (10 out of 30 students completed the course IDQ). Improvements in student engagement and satisfaction with their undergraduate research course experience will also have long-term benefits to both the nursing students themselves and to the future patients they will care for. These students will be more confident and skillful in their ability to integrate evidence into their nursing practice.

Dissemination: We will complete and submit 2-3 manuscripts for publication on the results and findings of this project. Journals that we seek to publish in include: *Worldviews on Evidence-Based Nursing*; *Nursing Education*; and the *International Journal of Game-Based Learning*. Presentations at key conferences, both national and international will also be an integral part of our dissemination process. Specifically, we plan to submit abstracts to The National League for Nursing Education Summit and the International Society for Technology in Education Conference.

In addition, we will encourage uptake of GBL strategies with our aforementioned collaborative partners; we have established relationship with partners both nationally and internationally as described above. Dissemination of evidence and best practices related to GBL will be more efficient through these relationships and further dissemination will be enabled via the successful attainment of additional external research funding.

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