The Use of Simulation and Cases to Teach Real World Decision Making: Applied Example for Health Care Management Graduate Programs

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ABSTRACT

Many pedagogy experts suggest the use of real world scenarios and simulations as a means of teaching students to apply decision analysis concepts to their field of study. These methods allow students an opportunity to synthesize knowledge, skills, and abilities by presenting a field-based dilemma. The use of real world scenarios and simulations has also proven to be an effective method for training healthcare professionals not only in the classroom, but also in the workplace (Galloway, 2009). The article examines the use of real world scenarios and simulations in graduate learning to enhance students' decision-making and leadership skills. The article will present two case examples involving the use of a real world scenario and a simulation to facilitate higher learning at the graduate level for healthcare management students.

In the first case example, students in a graduate healthcare management course, Healthcare Operations Management, participated in a simulation presented by the quality team of a local hospital system. Students were asked to evaluate a given scenario and make decisions about how to best improve patient flow and efficiency, while ensuring healthcare quality and safety. In the second case example, graduate students in Strategic Planning and Marketing in Healthcare, participated in consulting projects involving two different real world clients: a national non-for-profit healthcare service organization and a local non-for-profit healthcare clinic. The students in this class conducted research, analyzed data, and ultimately developed marketing and strategy recommendations that may be implemented by the clients.

BACKGROUND

According to Bloom's taxonomy of educational objectives, a common tool for assessing and defining learning outcomes, there are six higher learning knowledge-based goals. The goals are presented in order of expertise: 1.) knowledge, 2.) comprehension, 3.) application, 4.) analysis, 5.) synthesis, and 6.) evaluation (University of North Carolina at Charlotte, Center of Teaching and Learning, 2015). In the hierarchy of the taxonomy, these six components appear in order of difficulty to master. Thus, of the six, knowledge and comprehension are considered to be lower level learning objectives. For any graduate student to be well prepared for success in his/her field of study, higher levels of learning must be achieved. As professors of higher education, we strive to facilitate this type of learning by utilizing the four remaining knowledge-based objectives that are more difficult to master. Bloom's defines these objectives as follows:

- Application–Apply abstractions, general principles, or methods to specific concrete situation.

- Analysis –Separation of a complex idea into its constituent parts and an understanding of organization and relationships between parts

- Synthesis – Creative, mental construction of ideas and concepts from multiple sources to form complex ideas into a new integrated, and meaningful pattern subject given constraints.

- Evaluation- To make a judgment of ideas or methods using external evidence or self-selected

criteria substantiated by observations or informed rationalizations. (University of North Carolina at Charlotte, 2015, Benefits to Students).

Although, there are several pedagogical methods that are employed to facilitate the achievement of application, analysis, synthesis, and evaluation, real world scenario and the use simulation are extremely effective. These methods are categorized as problem-based learning.

PROBLEM BASED CASE LEARNING

Problem based learning (PBL) is defined as "an instructional (and curricular) learner-centered approach that empowers learners to conduct research, integrate theory and practice, and apply knowledge and skills to develop a viable solution to a defined problem" (Savery, 2006, p.9). It is an active learning approach in which students, working in small groups, try to solve a problem. (University of Delaware, Institute for Transforming Undergraduate Education, n.d.). This active approach engages and motivates students not, only to solve a problem, but also to find and apply the knowledge. (University of Delaware, n.d.).

The role of the instructor in problem-based learning is "to facilitate group process and learning—not to provide easy answers" (University of Delaware, Faculty, n.d.). The challenge facing instructors who use a PBL model is ensuring the development of strong problems that can be resolved by students. (University of Delaware, n.d.). These problems "must be ill-structured and allow for free inquiry. Problems in the real world are ill-structured (or they would not be problems)." (Savery, 2006, p.13).

Problem based case learning (PBCL) is similar to PBL since both approaches are learner centered and problem based. However, PBCL "enables educators to design scenario-based learning situations based on current and authentic problematic situations encountered at local businesses." (Nashville State Technical Community College, & WGBH Educational Foundation, (What is PBCL?, 2009-2011). PBCL benefits not only the students but also the instructors and the business community. (Nashville State Technical Community College, 2009-2011).

According to the University of Delaware, Nashville State Technical Community College and the WGBH Educational Foundation, for students, PBCL

- Improves problem solving, research, and social skills
- Increases motivation to learn
- Develops critical thinking, communication and team working skills

- Enhances retention
- Develops true sense of the challenges facing real world in chosen field
- Able to apply new competencies to real situations
- Increases professional networking
- Better transfer knowledge, skills, and attitudes to new environments and situations (University of Delaware, Students, n.d.); Nashville State Technical Community College, Benefits to Students, 2009-2011).

Problem based learning facilitates the group process and brings students into the real world and allows them to re-act and resolve issues that are presented beyond the limitations of the classroom (University of Delaware, n.d.). In addition, the instructors:

- Are better able to create and manage a highly effective classroom environment, regardless of their experience level
- Are better able to prepare their students for subsequent STEM education and for the workplace
- Find their work more enjoyable and stimulating (Nashville State Technical Community College, Benefits to Instructors, 2009-2011).

Through PBCL, the business partner, with little or no additional costs, gains an opportunity to:

- recruit talent
- acquire research and exploration of new ideas,
- market the organization
- assist in developing future workforce (Nashville State Technical Community College, 2011).

A reciprocal relationship exists among all parties. See Figure 1.

APPLIED EXAMPLES

Types of problem based learning models include: the use of scenarios, simulations (live or computer-based), case studies, consulting projects and community based research. Many of the models may incorporate an interdisciplinary approach. This article presents and examines the use of an in-class simulation as well as the use of real world consulting projects in graduate learning to effectively teach appropriate decision-making and evaluation. In one graduate level course, students participated in an in-class simulation presented by a local hospital quality team. In another course, two different scenario-based learning situations were used to allow students to apply

core competencies and enhance learning outcomes. The students worked closely with local healthcare organizations to solve strategy and marketing issues. The applied use of the simulation and the real world consulting projects are evaluated and discussed in detail throughout the proceeding pages.

FIRST EXAMPLE:
OPERATIONS SIMULATION EXPLORED

Students enrolled in a graduate level healthcare operations course participated in a simulation presented by the quality team of a local hospital system. Students were asked to evaluate the scenario and make decisions about improving patient flow, patient quality and wait times. At the time the scenario took place, students in this class had completed several readings and assignments pertaining to the following related topics including: wait-times, delays, medical errors, and process flow within a variety of healthcare settings. The purpose of the in-class simulation was to track the time and error rates in order to determine if the process could be streamlined. Students accomplished this task successfully. The scenario was played out in several steps, as outlined and discussed below.

Step One

The quality team from a local hospital system provided an in-class lecture concerning patient flow, errors rates, and quality in the hospital setting. The team presented a scenario discussion involving a current/typical process of patient throughput (the total time through the system/process).

Step Two

The classroom was arranged using separate tables for the following hospital process points: Registration, Emergency Department (ED) waiting room, Radiology, Lab, Vital Signs Room, and Exam Room. Students were assigned to specific roles (i.e., doctor, nurse, medical technician, registration clerk, etc.) and specific tables/departments to conduct an assigned medical task pertaining to that department. The other assigned student roles were patients and observers. There were a total of thirteen (13) students participating in this class. The students, as a group, were asked to determine the most efficient ED set-up and process. Based on their judgments they assigned staff to particular departments. (Note: the students were given a specific number of doctors, nurses, and clerical staff to assign).

Students were provided a spreadsheet to calculate the total throughput time, error rates, rates per step in the pro-

FIGURE 1
NASHVILLE STATE
TECHNICAL COMMUNITY COLLEGE,
PBCL BASICS, 2009-2011
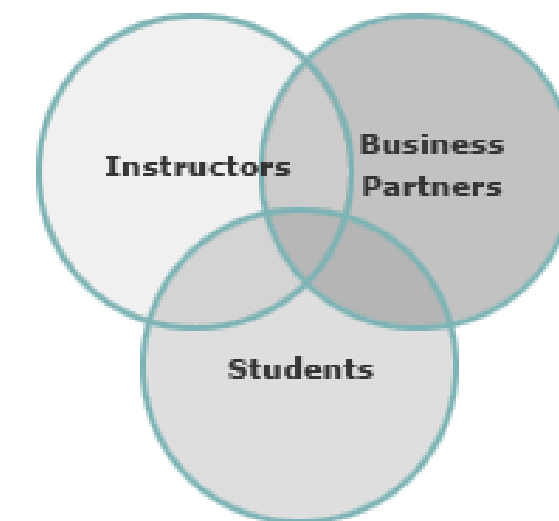
Problem-Based Case Learning transpires in the overlapping concerns of students, instructors, and business partners.

cess, and wait times. Students were also provided a Lego® board. The premise for the simulation was to begin with a "patient" at the start of the process, which was symbolized as blank Lego® board, and then add to the board as the "patient" went through the process of an ED visit. Each department was assigned a certain Lego® color-shaped piece (red block rectangle for ER, blue square for registration, etc.), a Lego® board, and a sticker, to be initialed. As the "patient" went through the process, the Lego® pieces were each attached accordingly. An error was tallied if the students skipped a step in the process, did not attach the Lego® piece correctly, did not place the sticker correctly or at all, or did not sign/initial the sticker piece.

Step Three:

Once the "patient" was through the entire process, students then analyzed their error rates, rates per process step, wait times, and total throughput time. Students were given an opportunity to make changes to the staffing, set-up of the ED simulation, and overall adjustments to the process to minimize steps and potentially minimize errors.

Step Four:

Students ran through the simulation a total of four times. Prior to each time, they analyzed their outcomes, made changes accordingly, and discussed the impact of their changes. Based on the analysis of outcomes, the students ultimately chose the best ED set-up and staffing assignments out of the four simulations. Students based their choice on the most efficient and quality outcomes with the least amount of error.

Outcomes

The above-described simulation is based on a very common problem encountered by hospital emergency departments. In fact, the local hospital, which partnered to implement this classroom simulation, actually uses the same simulation to train its hospital staff about efficiency and flow. Students were able to work together as a team to streamline an ED patient flow and adequately assign resources, as well as ensure proper patient safety. Students collectively achieved learning outcomes, which were based on real world healthcare operations.

In addition to making appropriate decisions to improve patient flow, the ED simulation was focused on two other learning objectives. First, the students were to gain competencies in operations planning and efficiency to include all major resources: staffing, equipment and scheduling. Secondly, students were to apply operations management and process improvement skills to ensure the most efficient and safe patient outcome through patient throughput (total time through the system or process) exercise / simulation. All students in this course reported an increase in their ability to evaluate and choose appropriate process improvement techniques in a variety of healthcare settings. Thus, learning objectives were successfully accomplished in a creative and real world simulation!

Furthermore, students were later given a team based assignment to prepare a process improvement project based on their analysis of a case study. The participation of this simulation positioned students to accomplish the case study analysis successfully. It is the belief of the professor that the simulation also provided a solid foundation in decision making analysis and evaluation, such that when presented with similar scenarios in the field, graduates of the program will rely on what they have learned in the classroom and be able to apply it to multiple situations that they may face as practitioners in the field.

SECOND EXAMPLE:
STRATEGIC PLANNING &
MARKETING CONSULTING PROJECT

Graduate students enrolled in *Strategic Planning and Marketing in Healthcare,* participated in consulting projects involving real world clients seeking to overcome current strategic challenges. The clients were both non-profit healthcare organizations: one national and one local. The students, working in teams, conducted research, analyzed data and developed marketing and strategy recommendations, which were presented to the clients for consideration and use.

A total of twenty-three (23) students were assigned in teams. The team assumed the role of a consulting group and prepared an analysis report for the chosen organization. The initial team assignments were based on group interviews conducted by the course professors, which assessed the student's individual strengths and weakness, along with interests and experiences. Teams were assigned according to the information provided during the interview phase. Four teams were assigned to one of the two clients, who each presented two critical strategy issues.

The national non-profit healthcare service organization projects involved the following: 1.) an organizational culture shift/change management scenario, and 2.) reducing the physical footprint while maintaining and building upon the current community presence. The other client, a local non-profit healthcare clinic, presented the following issues: 1.) the exploration of marketing methods to reach donors and other key stakeholders, and 2.) the development of a functional website as a marketing and social media tool.

The student consulting teams were asked to work with the clients throughout the semester. The teams were responsible for ongoing communication with the clients and professors, resolving team conflict issues, and providing work-plan reports periodically. Each team chose a team leader. The role of the leader was to facilitate key meetings and keep the on target for meeting key milestones.

In general, the teams prepared an in-depth assessment of the outlook, potential, and strategic viability as it pertained to each of the assigned projects. Each team presented a final presentation outlining their recommendations to the clients. Each client along with the course professors evaluated the student projects based on the application and synthesis of marketing and strategic planning knowledge and skills. Students were also evaluated on the ability to demonstrate critical analysis skills, business communication, and professional organizational recommendations.

Outcomes and Results

Each team presented to an audience consisting of: classmates, the clients, and the professors. The teams fielded questions from the entire audience. Both professors and clients judged the projects. The results were as follows: 1.) All teams scored a satisfactory or above on the ability to create an original analysis throughout the project by going beyond merely summarizing or paraphrasing key points. 2.) All teams scored above a satisfactory on the ability to show insight into the meaning of the content discussed and explored. 3.) All teams scored above a satisfactory on the ability to tie together disparate parties of the analysis (synthesis) to make a strong case for their position taken.

Throughout the semester, students had an opportunity to develop an ongoing relationship with their client. Students were responsible for developing and implementing an approved work plan that would meet the client's needs and monitor major project milestones. All teams had at least one client site visit as well as a minimum of two conference calls. These activities and responsibilities, not only ensured that the students were meeting the course deliverables and objectives as well as the client's demands, but also helped to create a real-world professional relationship between the students, as consultants, and the organizations, as real clients.

Students working with the larger non-profit client on the project involving the premise of organizational change, made several appropriate strategy recommendations. Their ideas included: developing lead volunteer positions, developing a volunteer liaison position, recruiting interns from local universities, and conducting a team building workshop for volunteers and employees. The strategies presented by the students working on the project involved lessening the physical footprint of the organization while maintaining/expanding the target market included: enhancing community partnerships, implementing a digital campaign, and adding annual events. Students working with the non-profit clinic made strategy recommendations for: methods to reach donors and other stakeholders, website engineering, the use of social media, and the implementation of a crowd-sourcing website.

Both clients were able to use the students' analysis and research to the benefit of the organization. Furthermore, several of the strategy recommendations made by the student teams were implemented by the organizations. Students received initial feedback during the presentation session and were able to hear directly from the clients about the viability of the strategies presented and whether or not these would be implemented.

Real world projects and simulations are highly beneficial to promote higher learning objectives. In addition to ac-

complishing the learning objectives, as discussed, the use of the real world scenarios and simulation described in this article offered students and professors many additional unforeseen benefits. To name a few, the professors were able to: develop and enhance professional relationships with community partners, expand their students' professional network, allow students a field based forum to demonstrate project management skills, and allow students an intimate view of client's changing needs. Student feedback supported the need to keep the real world scenarios as part of both the Operations course, as well as the Strategic Planning and Marketing course in the future.

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