

THE TECHNOLOGY OF ANESTHESIOLOGY ONLINE Convenience in Course Design

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This article examines the way the College of Nursing and Health Sciences at Barry University in Miami Shores, Florida, responded to the need to educate certified registered nurse anesthetists by incorporating educational technology into program delivery without compromising integrity and quality to meet market demand. The article discusses modalities used to deliver the master's in anesthesiology and the doctor of nurse practice. Emphasis is placed on how a blended format allows students to stay within their regions and neighborhoods and not have to relocate or lose job opportunities.

INTRODUCTION

This article examines the way the College of Nursing and Health Sciences at Barry University in Miami Shores, Florida, has responded to the need to educate and train certified registered nurse anesthetists by incorporating educational technology into program delivery without compromising integrity and quality to meet market demand.

Delivering education in the field of health care is challenging; however, nurse educators in particular have embraced new advances in educational technology and curriculum design and integrated them into course delivery. Bill-

ings and Halstead (2006) state that nursing curricula will need to move away from rigid requirements to flexible learning opportunities to prepare nurses who are capable of managing large amounts of data-rich knowledge in a technology-driven health care environment. Technology is prevalent throughout our culture and particularly in the field of healthcare; therefore it is only natural that nurse educators are incorporating educational technology to advance course design and enable greater access to the field. Osit (2008) stated that

Children and adolescents represent a rapidly growing sector of technology market. Inter-

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net subscriptions have increased 300% from 18 million subscribers in the mid-1990s to 66.2 million in 2007, with Internet access for almost 9 out of every 10 children living in a household with a computer and with 30% to 40% yearly increases in Internet subscribers....Vast amounts of valuable information can be found in seconds online, an unprecedented resource for developing minds. Teenagers can hone their social skills with casual peer interaction via e-mail, text messaging, and instant messaging.... Our culture breeds an "I want the latest and best, and I want it now" attitude, and our kids are at the front of the line, taking for granted that they will have access to a technologically sophisticated world with an excess of material goods and options. (pp. 6-7)

The article will discuss the various modalities used to deliver the master's in anesthesiology and the doctor of nurse practice program with a specialization in anesthesia across the State of Florida. It will begin with a description of the geographical challenges of having students in a master's program come to class every day when they are spread across a large geographical area. Next will be a description of how the learning management system plays an integral supporting role with delivering of a reverse classroom design modality. This will lead into a description of the high fidelity simulation laboratories that prepare students for their clinical practice. Finally, the article will describe the evolution of the doctor of nurse practice program and how it was designed to deliver a high quality blended experience.

NURSE ANESTHESIA

It is not well known, but nursing was one of the first professional groups to deliver anesthesia services in the United States. Early records show that Sister Mary Bernard assumed her duties in Erie, Pennsylvania in 1887 (Bankert, 1989).

This group of active health care professionals has been pushing back boundaries in nurse education for some time. As teaching and

learning modalities have evolved, nurse anesthetists have embraced innovative ways to further the development of nurse education, particularly in the area of distance education.

The College of Nursing and Health Sciences at Barry University offers two degree programs for nurses wishing to go into the field of anesthesiology. The original program is a successful master of science in anesthesiology. More recently, the school launched a doctor of nurse practice program with a specialization in anesthesiology. This program is flourishing today.

The original master's program at Barry has been in existence since 1994. Throughout its evolution it has taken on many formats and adapted to student needs and market forces. Situated in South Florida, the program and faculty have seen many changes and have had to adapt to rising costs of student accommodation and devastation from hurricanes. These outside factors have had an impact on the program, and one of the program professors recalled that changes were made to the program delivery because student accommodations became almost impossible to find after a major hurricane hit the area.

Advances in educational technology have offered administrators more flexibility in course design and delivery. They have embraced new innovations and are constantly improving and adapting both programs to meet student needs and market demands. Both programs are on regular review cycles. This promotes quality, continual improvement, and the adoption and evolution of educational technology as it supports pedagogy and impacts curriculum design.

MODES OF DELIVERY

As the program began to grow, administrators were faced with the problem of delivering curriculum content to 70 students spread across Florida who needed to come to class. The solution resulted in the effective use of academic

technology and some creative curriculum planning.

The program administrators established five satellite centers, all equipped with “smart” classrooms, where students come to class as prescribed. These centers, situated in Hollywood, West Palm Beach, Orlando, Ocala, and Tampa, are places where students come to mingle, exchange ideas, and form bonds. The program design is firmly rooted in the “blended” model in which students have an opportunity to meet in person and to meet live with their professors during the didactic delivery course content.

Each semester, students begin to bond through daily meetings and develop real-time and online learning communities. It is suggested that blended learning can promote more student engagement and, consequently, deeper learning if it is well implemented and assessed (Glazer, 2011). Additionally, motivation, course design, and accessibility are key aspects to students’ success (Shivetts, 2011).

The blended format is popular with students as it builds in a convenience factor that allows them to stay within their regions and neighborhoods and not have to relocate or lose job opportunities. Blended learning incorporates the best of both worlds; it brings together aspects of traditional face-to-face modalities with many elements of online delivery techniques. Distance education courses requiring a physical on-site presence for any reason, including the taking of examinations, are considered to be a hybrid or blended course or program (Rashid & Elahi, 2012).

The program faculty has embraced this format even though they have realized that the “online” portion of a blended course requires placing a greater emphasis on course preparation (Simonson, Smaldino, Albright, & Zvacek, 2012). As the program has evolved, faculty have met the challenges and changes in the style of teaching (Durrington, Berryhill, & Swafford, 2006). The complexity in delivery of the program has brought about many issues that have been addressed.

TECHNICAL SUPPORT

During the first week of the program an orientation is scheduled for all students in the master’s program who are brought together at the Hollywood campus where they have a chance to meet and bond as a group. During this time, the administration and faculty will look for students who would be good candidates for the position of Florida Association of Nurse Anesthetists (FASNA) representatives. The FASNA representative is responsible for preparing the satellite center classrooms, ensuring that the technology equipment is working and ready for class. As a reward for taking on these extra duties, the program directors offer each FASNA representative free accommodation when the students attend the Florida Association of Nurse Anesthetists conferences. This incentive is very popular and students enjoy the extra responsibility.

In addition, the university supports all the satellite sites by providing a designated technology support person who works for the university technology department out of the Hollywood technology campus office. If equipment does not work, instead of calling the faculty member, the FASNA representatives can call the designated technology support person. Most issues can now be resolved using remote access tools.

Throughout the program, students come into the satellite centers and attend a traditional face-to-face style lecture. The course faculty member will be broadcasting live from any one of the satellite sites, as all sites have broadcasting ability. Faculty use an Adobe Connect room, which is broadcast to each satellite center. Adobe Connect provides synchronous streaming to the students at each site. The software offers a series of pods, each with specific functions, from which the presenter can create a custom screen. The most commonly used and largest pod gives the participants a share screen controlled by the presenter (Riddle, 2010).

The virtual classroom allows the presenter to open a PowerPoint presentation or demon-

strate multiple Internet sites. A second pod allows a Web camera and voice options so that students can see and hear the presenter.

The program has evolved using this technology and has reached a comfort point, but there have been some problems along the way. Originally the program used a Polycom system, which had its own challenges and was very expensive to administer. Faculty are now finessing delivery and the program is considering adding lavalier microphones to assist with movement in the classroom.

UTILIZING A LEARNING MANAGEMENT SYSTEM

Barry University uses Blackboard as its central learning management system. Having access to Blackboard has allowed the faculty to deliver the didactic parts of the curriculum in an online format. It has allowed the faculty to take advantage of the “reverse classroom” approach in which students are given course content in advance so they are prepared to act upon that content during the face-to-face sessions. This reverse classroom content delivery design has been very successful. It has been suggested by Strayer (2012) that students in an inverted classroom become more aware of their own learning process than students in more traditional settings. Thus, students in inverted classrooms need to have more space to reflect on their learning activities so they can make necessary connections to course content. Therefore, students are given access to the learning management system on their first day along with an orientation session.

SIMULATION

In addition to attending class and accessing course content through Blackboard, students attend simulation laboratories for practical hands-on sessions and to play out real case scenarios. Billings and Halstead (2006) state that clinical simulations in nursing education can be used for many purposes (e.g., a teaching

strategy or for assessments and evaluation). They go on to say that simulation can be one of the most important reasons to provide experiential learning. Anesthesia education is based upon a blend of didactic and clinical applications in advanced pathophysiology, pharmacology, and principles of anesthesia sciences. In the past, traditional anesthesia students would attend a classroom setting to gain their didactic education and subsequently immerse themselves in the clinical setting without any type of simulation previews. Today’s anesthesia student has the benefit of practice immersion through high fidelity simulation lab and technologies with the use of high fidelity mannequins lending a paradigm shift to the pedagogic process of anesthesia education.

Barry University has incorporated high fidelity mannequins and simulation scenarios for its anesthesiology program. Endsley and Jones (2014) state that current trends in anesthesia training support their model of situation awareness. Universities throughout the country are incorporating simulation training to better prepare students for the rigorous, dynamic environments of operating rooms. Simulation scenarios are essentially a method of building working memories of crisis management and standard procedures in anesthesia practice. Students become familiar with skill sets and operating room scenarios to provide better care for their patients and increase situation awareness.

A variety of simulation scenarios have been developed for the anesthesia students with input from the students and faculty. There are two simulation labs with high fidelity simulation mannequins and fiber-optic equipment located in Orlando and Hollywood. The students attend simulation labs at least twice a semester with clinical rotations as needed to improve the technical skills of anesthesia. Studies have shown that computer and simulation scenarios have improved anesthesia training (Lampotang, 2008). Barry has adopted the utility of simulation and has made it an integral part of the anesthesiology program since 2011.

DOCTOR OF NURSE PRACTICE ONLINE

The doctor of nursing practice (DNP) with a specialization in anesthesiology program is a practice-focused doctoral program for certified registered nurse anesthetists (CRNAs) holding a master's degree or higher. This program focuses specifically on nurse anesthesia and consists of web-mediated courses that provide opportunities for synchronous and asynchronous learning. The DNP with a specialization in anesthesiology degree prepares CRNAs to acquire the clinical, organizational, financial, and leadership knowledge to design and implement programs of care delivery that significantly impact health care outcomes. The curriculum builds upon the scientific, management, and leadership knowledge and skills gained during the master's degree in nurse anesthesia education as well as the professional practice experience gained as a CRNA.

This program was designed according to the university's policies and procedures regarding online and blended program development. The university has designed a course delivery template combining two rubrics to ensure quality. The Barry Online template references the Blackboard "Exemplary Course Rubric" that focuses on course design, interaction and collaboration, assessment, and learner support and ensures courses are delivered at the highest level. The template also references the "Quality Matters rubric" (QM). QM is a national benchmark for online course design. The QM process is a collegial, faculty-driven, research-based peer review process based on a rubric consisting of eight general standards and 40 specific standards that are nationally recognized as reflecting a shared understanding of quality in online and hybrid course design (<https://www.qualitymatters.org/>). Barry University is part of the Quality Matters initiative and all courses are aligned accordingly.

Courses are built using a modular/unit approach, and student feedback has been consistently positive. All courses are reviewed on a regular cycle to ensure quality and consis-

tency. Qualitative and quantitative data are collected every term to use as a basis for course improvement.

At the beginning of course development, faculty meet with an instructional designer who will work with them to develop their content and provide guidelines for blended and online course development. Curriculum mapping ensures objectives are clear and aligned with the module/unit level outcomes and that no repetition occurs throughout the program delivery. It has been noted that best practices in clear course design and curriculum mapping influences how students learn and how well the course influences time on task and the productive use of students' time (Pallof & Pratt, 2003). Billings and Halstead (2006) also suggest that faculty or subject matter experts have access to course designers, graphic artists, and web technicians during course development.

For many faculty, moving to an online environment may not be an easy transition. Additionally, professors are not experts on instructional design, nor do they have the time to learn an entirely different career path. It has been noted by Piskurich (2006) that teaming with instructional designers is a necessary ingredient to building an effective program. Instructional designers understand the theories, concepts, and tools unique to online education, and learners do not appreciate it when instructors present them with ineffective designs, experiences, and learning objects (Vasser, 2010).

It is important to acknowledge the trepidation traditional faculty members experience when first encountering a design team. Faculty often operate independently, and revealing their work may make them feel vulnerable and defensive. It is essential to listen to their reservations and gain their input throughout the transition (Vasser, 2010).

Working with an instructional designer has helped faculty adhere to online processes and procedures, ensuring students are always clear about the learning path within each course. This reduces anxiety, and faculty get very few questions about content or where to find items

within the course. Finally, the instructional designer will work with the faculty with e-packs/course cartridges, learning objects, and graphics.

At Barry University, faculty are supported with a number of resources including the College of Nursing and Health Sciences instructional designer and the university's Division of Information Technology (DoIT). DoIT is the central computing, network, communications, and library services organization. DoIT is charged with directing, managing, and supporting the information systems, library needs, and computing infrastructure of Barry University. It also provides additional support for faculty in all aspects of curriculum design and course development.

CONCLUSION

Health professionals have been among the first to embrace the use of technology in the way they deliver their academic and didactic programs. Nursing in particular has been at the forefront of technological innovation through online course delivery and simulations. Today's health care educators, in addition to being a subject matter experts, require technology skills and need to be comfortable using an learning management system and working with an instructional designer. They need to be up to date and feel comfortable using a high fidelity simulation laboratory. The College of Nursing and Health Science at Barry University, which includes the anesthesiology programs, is dedicated to delivering high quality programs to health care professionals thru the use of these innovative technologies.

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