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THE POWER OF PERIOPERATIVE ONLINE CLASSROOMS

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ABSTRACT

Distance (or online) learning and becoming accustomed to new technologies are two challenges educators and educational facilities are facing especially with the plentiful development of web-based technology. Technologically advanced nursing documentation encompasses electronic formats[1] and we must keep pace with our educational offerings for today's nurses. The internet has allowed for many opportunities in education without being physically present in a classroom.[2]

Perioperative practice environments continue to involve increasing complexity and patient acuity with evidence suggesting higher levels of nursing education have positive effects on nurses, patient care and mortality rate.[1]

This article presents a background of online perioperative education, an overview of online learning, and its advantages and disadvantages to nurse learners, and outlines significant program elements that should be included in perioperative training.

INTRODUCTION

Distance (or online) learning and becoming accustomed to new technologies are two challenges educators and educational facilities are facing – especially with the plentiful development of web-based technology. Online classrooms are decentralized, do not include a "real" physical location as traditional classrooms do, and are eliminating the scheduling barriers of time and space.[2] The trend towards online learning has influenced the landscape of education and educational programs. Nursing education has been quickly expanding into online classes and programs[3] but Gruendemann (2007) suggested perioperative nursing has been slower in moving toward online learning.[4] Perioperative programs, practice environments, and nursing in today's age of ever-growing technology is a very different landscape to that of the recent past.[5]

Few basic nursing undergraduate education programs include clinical placements in surgical suites.[6,7,8]

Few basic nursing undergraduate education programs include clinical placements in surgical suites.[6,7,8] What may occur is a day placement in an operating room setting or a follow through type of visit with a specific surgical patient to the operating room.[9] These practices produce a decreased awareness of the surgical suite environment and can result in fewer numbers of graduates seeking positions in surgical suites or choosing perioperative nursing careers.[9] The Operating Room Nurses Association of Canada, (ORNAC) supports clinical experience within a surgical suite and considers it a primary method of

Figure 1.

Behind the Closed Doors of the Operating Room Theatre.

increasing the knowledge and skills required to assist in the management of surgical patients as well as providing advantages for students, patients and employers.[10] Allowing students experience behind the closed doors of a surgical suite has proven successful at increasing recruitment.[9] This, in the current environment of limited access to and experience in the OR, for nursing undergraduate placements, supports a need for accessible perioperative education. This is an ongoing global issue.[1,6,7,8,11,12] The aging nursing population and the need for specialized nursing skills are contributing factors in the nursing shortage and, in particular, the shortage in the surgical suites/operating room theatres.[13] The expansion of online education, and advanced post basic education programs may assist in solving nursing shortages.

What is online education?

Online education can be defined as virtual education, e-learning, web-based training, computer assisted instruction and/or digital education, all terms which are used to reference electronic media and Internet and Communication Technology (ICT).[14] A second common description is the student and the faculty member are physically separated.[15]

Historical Perspective

Perioperative nursing settings are rich in a variety of technologies; these technologies will only continue to grow and create new demand on perioperative education programs.[16] The recent past has seen several new developments in the use of technology for perioperative nurses.

Dumchin (2010) states two concepts regarding online education the first is, "the expansion of nursing education programs into web-based environments" and, secondly "during the past last 5 years education has been revolutionized by the use of online technology"[16] (p 87). Dumchins reflection on education were for the years prior to 2010. Today the continuing advancement of information and communication technology makes online education popular, useful, suitable, convenient and accessible to adult learners.[16]

Using technology for electronic charting or e-documentation has provided nurses the skills necessary to expand how they access education in an online environment; in healthcare, and with nursing being the largest number of healthcare professionals using electronic documentation/charting,[17] it has increased the use of technology. The basics, principles of perioperative practices, and concepts are amenable to the online classroom.

Self-directed learning, via distance learning, has been present in various forms since the 1960s and has created new opportunities for teaching and learning.[14] Statistics Canada shows our population at 36,708,083 in 2018[18] with approximately 1.5 million students in a fully online credit course in a Canadian post-secondary institution and the surveyed institutions showed it was a 46% increase over the previous year and expected an increase in the coming year of 51%.[19] Canada has a lengthy history of online and/or distance education and

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is increasing in prevalence however until this study had not previously gathered this data.

Active learning involves, engages, and focuses on the student in the educational process by performing or reflecting upon what was done or learned in the process which works well in an online classroom.[23] In other words, students participate in the learning process via discussions or games such as crossword, matching exercises; YouTube™ could be used within perioperative nursing education to facilitate learning. This method appeals to a larger group of today's nurses while assisting in critical thinking and/or decision making.[25] Mentors and/or preceptors can also be used to promote active learning by allowing online students to enter the practice setting to achieve competencies necessary via hands on learning.[4,27]

Standards for Technology in Nursing Education

The Canadian Association of Schools of Nursing (CASN), suggests using the Nursing Informatics entry to Practice Competencies for Registered Nurses, assists in preparing all basic undergraduate nursing students for the electronics used in the delivery of healthcare by introducing and using nursing informatics in a basic nursing program. CASN defines Nursing Informatics as:

> "a science and practice [which] integrates nursing, its information and knowledge, and their management, with information and communication technologies to promote the health of people, families and communities worldwide."[28] (p. 13)

A similar definition is found along with an outline of the need for informatics in nursing, are found in the joint position statement on Nursing Informatics from the Canadian Nurses Association (CNA) and the International Medical Informatics Association (IMIA).[29] Including informatics in nursing education would help prepare nurses choosing to enter perioperative practice settings and perioperative online classes or programs. Perioperative settings are rich with constantly changing technology used during surgeries and as well changing or advancing surgical procedures. Preparing students for perioperative settings via online classes fits well with the technology used in the practice environment.

What should an online classroom look like?

Designing an effective online perioperative instructional program and classroom(s) must include the specific knowledge modifications learners require to master the focused perioperative course content. The design must also include how each learner shall be assessed on the newly acquired knowledge using techniques such as surgical care plans or exams.[22] Mayer defines five types of core elements needed to acquire necessary knowledge:

- Facts: Previous factual knowledge means things like knowing the anatomy of the heart and that the right ventricle is part of the heart;
- Concepts: Conceptual knowledge describes or defines ideas, principles or values, such as the Principles of Asepsis;
- Procedures: Procedural knowledge includes step-by-step processes on how to complete a task or action such as self-gloving;
- Strategies: Strategic knowledge involves knowing common approaches or methods to resolve an issue; and
- Beliefs: Attitudinal knowledge which is a factor in how personal learning works or the ability to self-assess personal competence at a task.

Using the 5 elements needed to obtain the necessary knowledge in the classroom helps students complete course content and learn about the perioperative environment. Curriculum should focus on new information, expand on previous knowledge, and enhance concepts from basic nursing education.[2] An example is describing how to use and apply the Principles of

Asepsis when draping a surgical patient for a surgical procedure.

Consideration should also be given to curriculum in which learners participate and the opportunity for learners in the course to interact with one another.[30] An example is a dedicated discussion area in the classroom where students or faculty post questions, classmates respond or share personal contact information with faculty monitoring the discussions. Another is discussion postings in the form of questions to be answered and it may be a graded assignment. Some platforms have online workspaces for student groups to work together privately prior to submitting their assignments. Interaction between classmates and educators can also be via a "chat" session for discussion using a program such as SKYPE™.

There are a variety of platforms available for use as classrooms that enable facilities to create and present online curriculum in the web-based environment used for online education. Regardless of the platform the following elements are needed to build a strong and effective virtual classroom:

1. News/Announcements section usually found as soon as you log in to the classroom. This provides current important information such as when the faculty assigned has office hours, upcoming assignment deadlines, or important announcements such as when maintenance shall be performed on the classroom portal;
2. Establish a specific primary source of communication between faculty and students (often email);[21]
3. Most platforms used for online classes have a calendar within each noting due dates for assignments. It often contains an individual class pacing schedule showing what course content the student should be covering in the weeks allocated to the individual classes. This helps student keep up with the timeframe allocated for each class/course content. This is especially essential if a student is taking multiple classes concurrently and it helps with time management for exam writing and assignment submission;
4. The educational institution should offer some form of student orientation, which could be by phone or video chat with an instructor, to assist in navigating the classroom;[21]
5. Registration services must be made available with contact information for a program and/or individual classes;[21]
6. Access to online library services regarding nursing and perioperative focused nursing data and other healthcare related resources such as journals and textbooks;[21]
7. Assigned or available faculty for students to reach out to with any questions, challenges, issues, or for clarification.[21] This often includes designated faculty office hours for live conversations;
8. Technical support should be available to support students;[21]
9. Students should be made aware of the technology related requirements for the program and classroom;[21] and
10. Educators/programs/education facilities must use inventive teaching strategies to meet multigenerational student learning needs using newer technologies.

Program components

The format and/or required elements of a perioperative program can vary for each educational institution. A perioperative program may include;

- Didactic (theory) portion;
- Lab portion instruction for psychomotor skills;
- Instructor-led portion of a clinical placement;
- Preceptor led portion of a clinical placement;
- Simulation training; or
- A combination of some or all of the elements listed above.

The didactic, or theory, portion of an online perioperative programs is well suited to adult learners and to the online classroom format. Students today want to choose how, when, and where they learn and are greatly influenced by the value and merit of a program.[5] The number of required theory classes and the length of each class is determined by the facility offering the program and the requirements and time required to complete each component should always be defined clearly. Successful completion of the theory portion of a program allows the student to progress to the next segment of a program as outlined in the program requirements.

The psychomotor skills lab where students participate in hands-on learning of specific designated skills such as self-gown and glove or learning to apply an antiseptic skin cleansing solution. This portion of a program is in person and facilitated by an instructor. The class varies in length depending on the individual program. This should include time for in person return demonstration of skills and the assessment of each student for the required skills prior to completing the lab and/or advancing to the next component.

Clinical practice placements allow a student to convert theory into practice and to gain knowledge and skill in the perioperative setting. This component will vary, from program to program, in length and structure. A program may provide an instructor-led portion that has a limited number of students per instructor for a defined period of time and allows for dedicated learning experiences with an instructor. Evaluation and assessment of skills is performed prior to successful completion of this component.

Alternately programs may include a preceptor-led clinical placement, arranged by the program or by, a facility/employer for a defined period of time. Students are paired one-on-one for with an experienced preceptor to allow the student to gain experience, knowledge, and skills alongside the preceptor in the practice setting.

Assessment and evaluation of each student occurs prior to the successful

Students should investigate perioperative programs and assess which program would meet their personal needs.

completion of each component of a program.

Simulation training, a teaching method duplicating hands-on interactive training may be used by a perioperative program as an educational tool. Simulation training provides an opportunity to learn such things as how to perform a skill, practice a skill, and improve on it without doing so in the practice environment.[31,32] This form of educational teaching is used extensively in medicine, nursing and for other health professionals needing to learn and practice technical skills. Simulation lab training has been proven to provide a safe learning environment, enhance learning in specific situations while mirroring real circumstances.[33] This type of training enhance skills, and knowledge.[34] This type of interactive learning/training can be used within the skills lab portion of a program or whilst in the instructor-led or preceptor-led portions of clinical placements. A research project out of Edmonton demonstrated simulation training is a beneficial tool used for perioperative learning.[34]

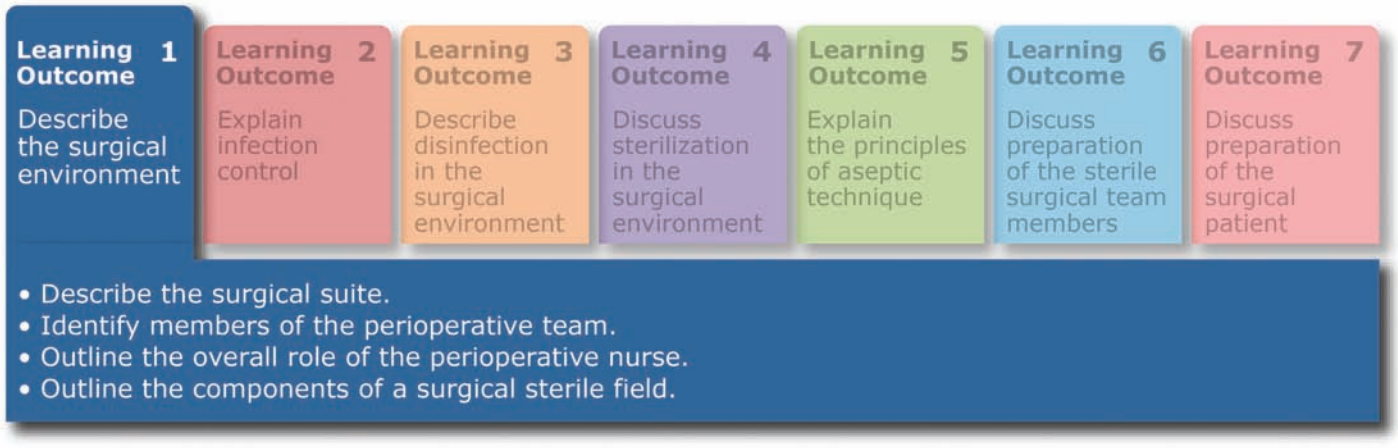
Students should investigate perioperative programs and assess which program would meet their personal needs. Healthcare facilities and/or employers may offer a perioperative program, or partner with a specific program, that meets the needs of the facility.

Learning structures in online courses

Chunking is a term used to describe presenting information in smaller portions, or chunks, to better help a student remember the information. A common example of chunking in life is retaining a phone number by remembering it in 3 and then 4 digits rather than all 7 together.[35] In a classroom an example may be a page dedicated to a short definition of what a Surgical Conscience is rather than a full detailed explanation to start with. The use of chunking is a way to have new information placed into a student's short-term memory to gradually build on the knowledge level of students.

Learning Outcomes (LO) must be set for each class. Each Learning Outcome specifies what you will cover in a specific portion of the classroom. The process usually builds on previous knowledge and expands from simple to more complex information. through a series of Learning Steps (LS) within each LO. Each LS covers valuable required information/knowledge in a LO. Building on previous knowledge provides students with a solid foundational knowledge about perioperative practices.[36] Learning Activities (LA) are found within the Learning Steps and are methods by which students build and retain acquired knowledge. This may include, but is not limited to, elements such as:

Figure 2.



Courtesy Saskatchewan Polytechnic

Learning Outcomes

- Videos;
- Course content;
- Articles;
- Perioperative textbook readings; and
- Inter-active review exercises such as matching, crossword puzzles, or multiple-choice questions.

Required discussions and assignments within a course should always be planned to build on related or previous classes/knowledge in a program.[36]

Advantages of online educational programs

Nursing in general seeks self-motivated individuals who don't need constant supervision to complete work or organize their time. Those personality types often achieve better results through distance education rather than through an in-class environment.[21] Online education allows students the ability to choose an online program or class that suits their personal needs.[21,37] Online courses appeal to potential students facing geographical barriers, such as travel nurses or those living in a rural or remote community, and the convenience of access in times suitable to their needs.[21,38,39]

Classroom content and exam questions may be removed, reviewed, revised, updated, and/or expanded quickly to reflect current practices, evidence-based research, emerging trends, new standards, and relevant student and stakeholder feedback in an online classroom. New technology such as virtual reality videos on a specific surgical procedure can be easily added to enhance learning and course content.

The online classroom has the potential for increased communication with faculty and/or peers via school-based email or discussion boards to meet student needs.[38]

Online programs may have the ability to monitor online learner progress and participation[30] and more easily able to offer both full and part time access to students.

Online education also allows for an increased focus on Canadian content that might not be as readily available on the mass market and to adapt quickly to updates in key documents such as the ORNAC Standards for Perioperative Nursing Practice[10] as a source of information, Canadian evidence-based research, updates from regulatory bodies, and other relevant publications such as this Journal.

Other Factors to Consider

Access to faculty for questions and/or immediate assistance may be limited to specific designated office hours and has student and teacher physically separate. This may result in delayed feedback being provided.[4] Writing exams for the program may be limited to specific acceptable test centres rather than via your personal computer which may include an additional cost. Programs may offer limited access to hands-on-learning through a psychomotor skills lab, simulation training, and/or clinical and preceptorship placements in a practice setting.

Learners must be self-directed and internally motivated to cover and complete course content.[20] Students may feel isolated or insecure about the use of technology.[4] A need for different software may challenge students and their personal computer skills.[38] Alternately faculty may face challenges with new technology or be lacking in the appropriate training.[40]

Traditional visual communication cues are not available in the online classroom, for example body language,[40] and a visual or tactile learner may have more challenges in the online classroom.[38]

Depending on student geographic location access to the classroom may be limited due to lack of and/or limited internet access.

The financial cost of obtaining perioperative education or the cost per class may inhibit participation in an online perioperative program. Facilities offering programs should include

financial assistance options for students. This is an important factor when a portion of the program is fulltime which would not facilitate a work/study format.

Areas for Discussion

If we can convert to electronic documentation in healthcare,[4] and learn new technologies, we can also learn perioperative knowledge in the online classroom and use this format for other educational endeavours.

The online classroom helps train nurses for the perioperative environment but this will not necessarily lead to a full solution if our undergraduate programs do not include the surgical suites as regular placement options.

The roles of students and instructors/faculty have changed with online classrooms, students, rather than teachers, are now in charge of their pace to learn the content.[45] How will this alter the types of nurses we are producing in the future?

CONCLUSIONS

We have the ability to use present and advancing technology to innovate, inspire, and educate nurses about the perioperative focused practice settings. Teaching and learning has been transformed.[41,42]

Perioperative online learning is appropriate and successful with technology applying an increased focus on education via distance and is very appealing to the nursing work force with the varied work schedules in healthcare settings.[36]

Perioperative programs are an excellent example of the amount of new knowledge students are expected to know. This includes, but is not limited to, such things as learning and applying the Principles of Asepsis, instrument recognition, principles of draping, surgical positioning, and the application of surgical antiseptic skin preparations.[43]

We must continue to transform current teaching and learning styles to be successful with online education programs[40] and continue to make continuing education and competence achievable, helping to open the doors of the surgical suites and operating room theatres to new perioperative nurses.

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