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Course Development: Nursing Informatics

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Abstract

In this information technology (IT) age, nurses need information literacy skills as part of their education to be able to evaluate and implement evidence-based practice. Technology advances have a profound effect on disease prevention and detection, and are a critical part of the healthcare delivery system. These changes drive healthcare and increased consumer demand for professional accountability in patient safety, quality and cost-effective service. Healthcare professionals should use IT in an efficient and effective manner to promote optimal outcomes for patients. Data suggest that most registered nurses felt that their classroom education did not prepare them to use IT required to provide patient care. Integration of informatics in nursing education continues to progress slowly in the United States. The purpose of this paper is to describe a course for implementing IT curriculum for novice nurses to create opportunities for competency before graduation.

Key words: Information Technology, Informatics, Nursing, Education, Curriculum





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Introduction

According to the Baccalaureate Essentials (AACN, 2008) baccalaureate graduates must possess “competence in using both patient care technologies and information management systems” (p. 18). Today’s advanced healthcare technology offers built-in safeguards that the bedside nurse must recognize and utilize. Additionally, health information available to patients may be overwhelming and, at times, confusing. This can delay or alter treatment plans. Healthcare consumers seek the services of nurses to obtain reliable information in matters of health and illness (AACN). Nurses must be able to assist their patients in understanding what has been presented. Frequently, this requires library and Internet searches on research-related information. Today’s Internet is saturated with both valid and misleading or incorrect information. In the value-driven and customer oriented healthcare world, the true test is to evaluate for reliable information.

In this age of ever-increasing information technology (IT), nurses must be savvy in their searches to locate sound information for their patients and the profession. All bedside nurses must be able to manage the specific technologies used in the healthcare setting to ensure best outcomes. According to the AACN (2008), the role of the beginning professional nurse should include (but is not limited to):





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- A solid base in liberal education.
- Knowledge and skills in leadership, quality improvement, and patient safety to provide high quality healthcare.
- Knowledge and skills in information management and patient care technology.

Moreover, the Pew Health Professions Commission (Commission, 1998) and the Institute of Medicine (IOM) (2003) regard the effective and appropriate communication use and technologies as necessary skills for all health care professional. Furthermore, the IOM Committee on Quality of Health Care in America (2003) identified the critical role of IT in designing safe and effective health care. When combined with *The Essentials of Baccalaureate Nursing Education*, Essential IV (AACN, 2008) specifies one should see the structured impetus for change within current nursing curriculums. The collective movement suggests the need to add a required nursing informatics component to the undergraduate nursing program at a local Southern California private university.

Background and Literature Review

As we live in dynamic times, the future is here today. Technology advances have a profound effect on disease prevention and detection, and have become more embedded within healthcare. These changes drive healthcare and have increased consumer demand for professional accountability for both quality and cost-effective service. Healthcare professionals should be able to utilize IT in both an efficient and effective manner to promote optimal outcomes for both





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inpatient and outpatient patient populations, as well as to meet nursing sensitive outcomes. The Joint Commission on Accreditation of Healthcare Organizations (JCAHO) (2002) suggested that IT could play a significant role in the prevention of medical errors. Bakken, Cimino and Hripesak (2004) and Desjardins, Cook, Jenkins and Bakken (2005) asserted that informatics competencies should be integrated into healthcare curricula within the context to promote patient safety while enabling evidence-based practice. Many healthcare professionals lack basic knowledge and technology skills as simple as familiarity with computers (Sweeney, Saarmann, Flagg, & Seidman, 2008). For these healthcare professionals to be able to mainstream with our fast-moving technology centered healthcare arena, basic skills must be taught, mastered and kept current.

According to the National Council of State Boards of Nursing (2006) only 62 % of graduates of 280 registered nurse programs surveyed felt that their classroom education adequately prepared them to use Internet technology to enhance patient care. Recent literature (Infoway, 2007; Nagle, 2007; Nagle & Clarke, 2004) suggests that few Canadian schools of nursing have tackled the challenge of integrating informatics throughout their nursing curricula; moreover, relatively few nurse educators incorporate information and communication technology (ICTs) within courses in Canadian Nursing Schools.

Canada is not alone in this dilemma. Integrating informatics continues to progress slowly in the United States (Staggers, Gassert, & Curran, 2001). Professional health associations and



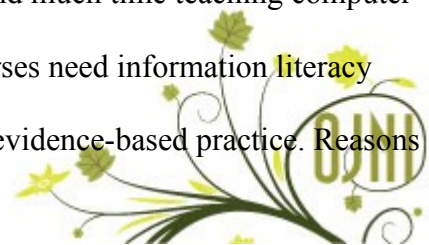


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societies formulate scope and practice guidelines to develop criteria and competencies for clinicians (ANA, 2008). The growing mandate for electronic health information systems and the escalating complexity of healthcare services and practice have raised the bar for the nursing professional (ANA). While Nursing Informatics has exploded along with information technology advances, this article is more geared to the developing competency of a beginning nurse at a generalist level. In landmark nursing informatics research, Staggers and colleagues (2001) formulated four levels of practice competencies for nursing practice and informatics ranging from beginning nurse, experienced nurse, informatics nurse specialist, and informatics innovator. Recently numerous authors have contributed to the ANA *Nursing Informatics: Scope and Standards* resulting in an updated table of informatics competencies by nursing informatics functional areas. The current authors have adapted the table to show beginning nurse computer and information literacy competencies as shown in Table 1.

Therefore, the purpose of this paper is to describe a computer literacy course, i.e., computer informatics, for beginning nurses at a local private school in Southern California. We see a significant need for such a course, and we are in the process of putting many of our core master's courses online. Student feedback from pilot courses indicates that this teaching methodology is welcomed and that more courses are desired. However faculty spend much time teaching computer literacy before students feel comfortable with this technology. Nurses need information literacy skills as part of their education to be able evaluate and implement evidence-based practice. Reasons





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for acquiring such skills are apparent as evident by the increased emphasis on computerized medical records and search for best practice models by the health policy makers to decrease escalating health care costs. We believe one way to help decrease healthcare costs is better use of available information technology in providing better patient care. This course provides nurses with some of the basic computer informatics skills required to deliver evidence-based nursing care.

Theoretical Foundation

Bandura's (1986) Social Cognitive Theory (SCT) emphasizes that an individual's actions and cognitive functions affect future behavior. The SCT demonstrates that reciprocal determinism (cause and effect) is dynamic. Although learning and adopting computer literacy is not necessarily that simple. Instead, the adoption of the effective learned activity can be based on the interacting triad of the person, environment, and the resulting behavior. Once an individual learns successful approaches to computer literacy, literature searches, online classroom activities and electronic mail practices, he or she is more likely to continue to apply the learned strategies throughout his or her educational and professional career.

According to Bandura (1986), outcome expectations are anticipatory aspects, called antecedent determinants of behavior. The individual must foresee a prospective benefit to the proposed activity. Outcome expectancies are incentives and are different from expectations. The individual must feel an intrinsic reward before adopting the behavior. The proposed web-enhanced





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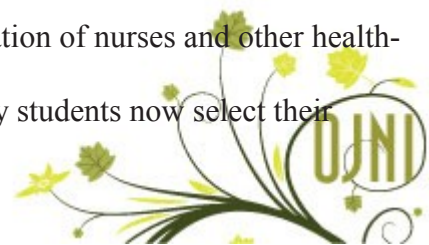
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nursing informatics course may present extrinsic forces through online class formats and face-to-face settings to provide knowledge as information and support for the student. The student discovers through intrinsic processes that prescribed activities provide the needed skill acquisition that promotes successful electronic interactions, as well as increasing the student's knowledge base and competency that result in positive subjective experiences.

Based on Bandura's principles, it can be theorized that once a student successfully learns basic computer literacy competencies, the student should continue to use the learned behavior based on intrinsic rewards. Repetition over time builds self-efficacy thereby leading to enhanced self-efficacy and individual practices to facilitate technology practices. Using principles from the SCT, the proposed nursing informatics course educator facilitates and optimizes the learning and self-efficacy of the healthcare professional students within a technological-driven environment by focusing on the intrinsic reward of increased individual satisfaction.

Discussion

Computers are an instructional resource in which once the basics are mastered one can move forward more confidently to searching for information needed on the Internet, navigating an online classroom, or corresponding via email effectively. In the future, the role of computer enhanced learning will increasingly play a pivotal role in the education of nurses and other healthcare professionals at both the beginning and advanced levels. Many students now select their





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program of study based on the availability of on-line classes offered by a school. With an increased demand for and development of distance education, health professionals must be prepared to participate successfully. The changing nature of traditional nursing education coupled with the addition of fully online or enhanced classrooms requires nursing students to have basic computer literacy skills. To ensure that all students are able to use available tools, as well as participate optimally in the online classroom setting, a foundational computer course should be offered. For some individuals the most significant obstacle to using the Internet and technology is an irrational anxiety about the unknown, what these authors like to term “afraid of pushing the buttons syndrome” and the best solution is to have someone coach or navigate that person through the basics.

Proposed Nursing Informatics Course

Based on the preliminary discussion, the authors propose an introductory course in Nursing Informatics, i.e., “Computer Competency for the Beginning Nurse.” The proposed course is a two unit web-enhanced course and would be placed in the first semester slate of coursework.

The nursing profession must be prepared for the demands associated with the rapid advancement of IT in healthcare settings. This may be facilitated by identifying minimum competency skills in information technology for nursing students in preparation for the future role as a





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registered nurse; and by developing standards for nursing curriculum that integrate content and application of information technology skills from admission through graduation. Course specifics are shown in Table 2. Course objectives are based on Baccalaureate Essential IV: Information Management and Application of Patient Care Technology (AACN, 2008) as listed in Table 3.

Additionally, ethics will be a thread of this course especially related to accessing of private and personal information via technology. Students will be expected to integrate the Health Insurance Portability and Accountability Act (HIPAA) regulations throughout their student and professional careers. Furthermore, students will be expected to apply a professional nursing code of ethics and professional guidelines to clinical practices (ANA, 2001a; Essentials, 2008).

Specific computer skills critical for nurses include (but are not limited to): word-processing, accessing and using the various hospital information systems, clinical information systems and applications, navigating the net, and e-mailing. Additionally, nurses must also be aware of system security issues. The aforementioned and other current and relevant topics would be explored and cultivated within the proposed course. Detailed objectives have been formulated and are shown in Appendix A. Finally, examples of potential classroom and online-enhanced activities are shown in Appendix B.





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Conclusion

The influence of technology on the organization, access, and rate of information exchange requires a health professional to be proficient at information management within an electronic environment. The pressure to adapt to the ever-increasing technological environment coupled with an individual drive for success based on Bandura's SCT will enhance student success within the proposed course. Efficient use of IT requires a basic understanding of applications. Providing safe and effective patient care is a driving force to develop and include an introductory informatics course at the undergraduate nursing curriculum level. The purpose of the proposed Nursing Informatics course NI-101 is four-fold and includes the following: 1) to provide a sound basis of fundamental knowledge in relation to navigating an online course, 2) searching sensibly on the World Wide Web, 3) participating proficiently and knowledgably within an online course community, and 4) understanding the importance and purpose of built-in safeguards within patient care technologies. Ultimately, this course will serve as a bridge to healthcare courses or programs in the student's future and enhance the drive for lifelong learning.





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Appendix A

NI-101 Course Objectives

A. Utilize information and communication technologies to document and evaluate patient care, advance patient education, and enhance the accessibility of care.

1. Complete HIPAA training at your clinical facility as mandated. Supply verification.
2. Utilize facility documentation practices for required documentation and evaluation of patient care, patient teaching and coordination of patient care.

a. While in Fundamentals Nursing Course, be able to document vital signs, basic care as given utilizing clinical facility documentation methods (clinical information systems, electronic, paper)

B. Utilize information technologies to enhance one's own knowledge base.

1. Complete a literature search as per assignment guidelines.
 - a. Demonstrate ability to perform search successfully.
2. Identify ways to supplement a mail message with additional information.
 - a. Demonstrate ability to send an email with an attachment or multiple attachments.
3. Participate in organizational, collegial and professional electronic communication.
 - a. Demonstrate ability to reply to an individual, a group, send a blind carbon copy email.
 - b. Demonstrate ability to request a "read receipt" and respond to a "read receipt request".
 - c. Participate substantially in online chat forum as scheduled.





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C. Critical thinking skills will be enhanced along with writing skills to prepare thoughts, ideas, insights, discoveries and assignments effectively in oral and written form.

1. Substantive participation in online chat forums, threaded discussions, and collegial email formats.
2. Demonstrate ability to retrieve and utilize research-based information to support best practice decisions.

D. Apply clinical and theoretical expertise to the review of interactive health communication resources.

1. Critically analyze web-based health content for literacy level and accuracy of information for clinical populations.
2. Select appropriate materials for a target population's health information and education needs related to a specific topic.





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Appendix B

Course Assignments

Assignment #1: Create biographical sketch and save on your computer for later use.

Assignment #2: Attend Library In-service as scheduled.

- a. Library assignment: Complete Literature Search utilizing CINAHL or PUBMED on topic of your choice (topic to be related to nursing practice)
 - b. Save search on your computer, Print out hard copy for your records.
- c. Submit your saved search in Assignment #4.

Assignment #3: Create patient education material.

- a. Locate appropriate and suitable patient education materials related to your topic from Assignment #2 from the internet.
 - b. Post your creation (handout, document, brochure, PowerPoint) in online course in assigned thread.
- c. Print out hard copy for your records; make sure to cite your sources as per APA format.

Assignment #4: Access online portion of this course and complete online assignments as instructed.

- a. Post your biographical sketch (from assignment #1) in assigned area.
 - b. Participate in online threaded discussion as required.
- i. Occurs with three subtopics.
- c. Submit your Literature Search from Assignment #2 in the “drop box” as indicated in online class.
 - d. Participate in online chat as instructed.





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i. Occurs with three different assigned chat times.

Assignment #5: Access online portion of this course and send group email with an attachment as instructed.

- a. Group email must be exchanged twice a week at a minimum.
- b. Weekly with a relevant attachment (journal article, resource)

Table 1.

Beginning Level Nurse Competencies *

- Computer skills - Administration
- Computer skills - Communication
- Computer skills - Data access
- Computer skills - Documentation
- Computer skills - Education
- Computer skills - Monitoring
- Computer skills – Basic Desktop Software
- Informatics Knowledge – Impact
- Informatics Knowledge – Privacy/Security
- Informatics Knowledge – Systems
- Standards for Privacy & Security
- Adapting information technology as a primary means of patient safety

*American Nurses Association. (2008). Nursing Informatics: Scope and Standards. Washington DC: Author. (Adapted from Informatics Competencies by Nursing Informatics Functional Areas, pp. 39-40)





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Table 2.

Nursing Informatics 101: Computer Competency for the Beginning Nurse

Course Credit and Clock Hours: 2 units

- An additional (minimum) expected 1 hour per week online participation.
- Format: Lecture and discussion
- Placement in Curriculum: Sophomore Year
- Prerequisite course for Nursing Major

Course goals:

- To introduce the nursing major to the basic concepts of IT applicable to personal and professional use.
 - To use IT to locate nursing research and relate to patient care.
 - To continue socialization into the professional role of the nurse.
 - To introduce student to online classroom netiquette.
 - To increase and diversify the forms of communication between instructors and students.
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Table 3

Baccalaureate Essential IV: Information Management and Application of Patient Care Technology*

1. Demonstrate skills in using patient care technologies, information systems, and communication devices that support safe nursing practice.
2. Use telecommunication technologies to assist in effective communication in a variety of healthcare settings.
3. Apply safeguards and decision making support tools embedded in patient care technologies and information systems to support a safe practice environment for both patients and healthcare workers.
4. Understand the use of CIS systems to document interventions related to achieving nurse sensitive outcomes.
5. Use standardized terminology in a care environment that reflects nursing's unique contribution to patient outcomes.
6. Evaluate data from all relevant sources, including technology, to inform the delivery of care.
7. Recognize the role of information technology in improving patient care outcomes and creating a safe care environment.
8. Uphold ethical standards related to data security, regulatory requirements, confidentiality, and clients' right to privacy.
9. Apply patient-care technologies as appropriate to address the needs of a diverse patient population.
 1. Advocate for the use of new patient care technologies for safe, quality care.
 2. Recognize that redesign of workflow and care processes should precede implementation of care technology to facilitate nursing practice.
 3. Participate in evaluation of information systems in practice settings through policy and procedure development.

* American Association of Colleges of Nursing (2008). The Essentials of Baccalaureate Education for Professional Nursing Practice. Author.





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