

Enhancing RN-to-BSN Students' Information Literacy Skills Through the Use of Instructional Technology

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ABSTRACT

The American Association of Colleges of Nursing advocates that professional nurses have the information literacy skills essential for evidence-based practice. As nursing schools embrace evidence-based models to prepare students for nursing careers, faculty can collaborate with librarians to create engaging learning activities focused on the development of information literacy skills. Instructional technology tools such as course management systems, virtual classrooms, and online tutorials provide opportunities to reach students outside the traditional campus classroom. This article discusses the collaborative process between faculty and a library instruction coordinator and strategies used to create literacy learning activities focused on the development of basic database search skills for a Computers in Nursing course. The activities and an online tutorial were included in a library database module incorporated into WebCT®. In addition, synchronous classroom meeting software was used by the librarian to reach students in the distance learn-

ing environment. Recommendations for module modifications and faculty, librarian, and student evaluations are offered.

Nurse educators can use instructional technology to develop unique learning activities for promoting information literacy skills development. These skills, as defined by the Association of College and Research Libraries (2000), are:

a set of abilities requiring individuals to recognize when information is needed and...the ability to locate, evaluate, and use effectively the needed information. (§ 1)

The *Essentials of Baccalaureate Education for Professional Nursing Practice* (American Association of Colleges of Nursing, 1998) advocates that professional nurses have knowledge and skill regarding information literacy to include "traditional and developing methods of discovering, retrieving, and using information in nursing practice" (p. 13) to integrate evidence-based practice concepts with direct nursing care, health education, and health care management. As nursing schools embrace the evidence-based practice model, which emphasizes review and analysis of published research, multiple opportunities arise for cultivating students' information literacy skills through instructional technology. This article discusses the collaborative efforts of course faculty and the library instruction coordinator at Auburn University Montgomery to create information literacy learning activities for the development of basic database search tech-

niques. The successful integration of instructional technology tools, including course management systems, live synchronous classroom meetings, and online tutorials, to support student learning in the distance education classroom are also presented.

Nursing students and practicing nurses frequently lack the requisite information literacy skills to locate and evaluate information on which to base clinical decisions (Cole & Kelsey, 2003; Dee & Stanley, 2005; Dorner, Taylor, & Hodson-Carlton, 2001; Jacobs, Rosenfeld, & Haber, 2003; Pravikoff, 2006; Verhey, 1999). Pravikoff, Tanner, and Pierce (2005) concluded from a study of nurses that:

RNs in the United States aren't ready for evidence-based practice because of the gaps in their information literacy and computer skills, their limited access to high-quality information resources, and above all, the attitudes toward research. (p. 50)

To rectify this situation, they called for a paradigm shift:

so that information literacy, research use, and evidence-based practice are integrated into the curricula of all RN education programs. (p. 50)

Barnard, Nash, and O'Brien (2005):

argue that for information literacy to be enhanced, collaboration between teaching faculty and librarians must be fostered in meaningful ways. (p. 505)

As shown in the nursing and library literature, nursing faculty and librarians are working collaboratively to

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develop information literacy skills among their students (Anonymous, 2005; Dorner et al., 2001; Guillot, Stahr, & Plaisance, 2005; Jacobs et al., 2003; Shorten, Wallace, & Crookes, 2001).

Background

In addition to the traditional baccalaureate nursing degree and a master's degree in nursing education, Auburn University Montgomery offers an RN-to-BSN accelerated program. Annual enrollment in this Educational Advancement for Registered Nurses (EARN) program is 30 nontraditional students who have an average of 5 years of nursing experience. Because most students commute outside a 60-mile radius, the courses are heavily augmented with online course management systems (WebCT® and Blackboard®) and computer-based assignments.

Through learning assessments and informal audits of information source selections, nursing faculty recognized the need for further information literacy instruction across the curriculum. Librarian interactions with students additionally indicated the need to more fully integrate the library into the nursing curriculum. Students tended to gravitate to consumer information Web sites as opposed to research-based journal articles, perhaps because they are more accustomed to searching the Internet. Lack of knowledge regarding how to navigate library databases, anxiety concerning the technology involved with database searches, and the voluminous amount of information to be sorted through may also be contributing factors (Pravikoff, 2000). These concerns formed the impetus for the collaboration between the course faculty, the EARN curriculum coordinator, and the library instruction coordinator to create a library database module designed to foster student development of basic database search skills.

The Computers in Nursing course is uniquely suited for the development of the module. This 1-hour course is taught in the first semester of the EARN curriculum and

is designed to foster attainment of knowledge, skills, and attitudes for beginning a successful career as a professional nurse in a computerized health care environment, with emphasis on the nursing application of information technology. The course provides the foundational computer technology and database searching skills to ensure successful completion of subsequent courses. All students were required to attend an initial course orientation and 5-hour computer training seminar on the first day of class. All remaining course work and communication used the online course management system (WebCT).

The Library Database Module

The module consisted of an assignment set of several learning activities designed to guide students through the database search process. Search topics were selected from other semester courses to ensure that information obtained would be deemed useful by students, thereby stimulating interactive learning. Students were required to bring copies of retrieved articles to the Transition to Professional Nursing I course for use in classroom learning activities and discussions.

A link to the library database module appeared on the course homepage in WebCT with a smaller version of the banner from the library's homepage as the identifier for the module. Once in the module, students could select from links to the library's Web site, a guide listing resources for research in nursing, a page describing CINAHL Plus with Full Text that linked to a database tutorial created by the librarian, the Alabama Virtual Library databases, and library database assignment instructions.

The librarian met with the students on the first day of class to familiarize them with library resources included in the module. The librarian introduced students to search techniques in the CINAHL Plus with Full Text database using Horizon Wimba® Live Classroom, a synchronous real-time voice and video classroom. Students easily accessed the program

and became familiar with live online classroom protocol.

To augment the live classroom presentation, the librarian created a tutorial linked from the module in WebCT to demonstrate a search in CINAHL. The tutorial included a PowerPoint® presentation and screen shots from the database search. The librarian narrated the tutorial, and text boxes briefly explaining the search appeared on the screen shots. The tutorial walked students through a search regarding a 25-year-old female patient recently diagnosed with chronic fatigue syndrome, with a focus on the psychosocial factors associated with it. The tutorial taught the students how to use subject headings, qualify subheadings, and gender, age, and publication (peer-reviewed articles) limits to narrow searches in the database.

One week after the initial instruction session, the librarian met with students on Horizon Wimba Live Classroom. The students divided into three smaller groups to make online discussions more manageable. The sessions were recorded and saved so students and the course faculty could later review the discussions. The librarian performed a search in CINAHL on Mezirow's perspective transformation theory (Mezirow, 1981) related to adult education. This topic coincided with discussions in the Transition into Professional Nursing I course. Few articles were found in CINAHL, a database focused on clinical disease, nursing theory, and nursing practice. This session demonstrated the need to select a database outside nursing for a more productive search on some topics.

The first library database assignment tested the students' ability to think critically about their topic to determine which database best fit their research needs. Because Mezirow's theory relates to adult learning, the students were expected to select an education database such as the Educational Resource Information Center (ERIC). Selecting an appropriate database proved difficult for the 22 students who completed the assignment. Only 13 of the students chose an

education database. The remainder opted for multidisciplinary ($n = 5$), nursing ($n = 3$), and psychology ($n = 1$) databases. Students were required to briefly describe their search strategies to encourage them to do a more critical examination of the process they used to retrieve articles.

The assignment also introduced students to the e-mail feature common in many library databases. E-mailing articles to the librarian and course faculty familiarized the students with a technique that could be used later in collaborative research projects. Following completion of the assignment, the librarian sent an e-mail through WebCT with an attached Microsoft Word® document explaining the correct search strategy. This method was followed for subsequent assignments as grading individual assignments would have been too time consuming.

The second database search assignment focused on using the multidisciplinary database Academic Search Premier accessible through the Alabama Virtual Library. The assignment directed students to visit their local public library to acquire an Alabama Virtual Library card. Alabama Virtual Library provides Alabama residents with access to library databases including a selection of health sciences and multidisciplinary databases at no charge. Given that students are no longer able to search CINAHL off campus following graduation, the Alabama Virtual Library databases offer alternative access to peer-reviewed articles.

Academic Search Premier, although not specific to nursing, was chosen to encourage students to consider a database with a broader scope of coverage. The students executed a search for articles about carpal tunnel syndrome and exercise published between 2000 and 2006 and selected one article suitable for patients and a second article appropriate for health care professionals. All 21 students who completed the assignment distinguished correctly between articles intended for the specified audiences; however, their individual article choices indicated that more explicit assignment in-

structions regarding the search and evaluation of articles for content was needed. The librarian assumed that students would select an article from the *Harvard Women's Health Watch* that illustrated exercises to relieve the discomfort of carpal tunnel syndrome. Instead, 11 of the students chose shorter articles (with no illustrations of exercises) from either *New York Amsterdam News*, a newspaper for African American individuals in New York, or *Natural Health* magazine. Those students who chose the most appropriate patient article made better choices of relevant journal articles suitable for health care professionals.

The students cited the articles using American Psychological Association (APA) style and submitted these citations as a Word document via WebCT to course faculty. Proficiency with APA style was extremely low. Individual student submissions were edited with a comment feature available in Word. In addition, a review of APA format with example references compiled from student submissions was e-mailed to the class.

For the third database assignment, the students searched CINAHL Plus with Full Text and Academic Search Premier for peer-reviewed articles to indicate the value of searching more than one database. To coincide with discussions in the Transition into Professional Nursing I course, students searched the databases to find articles discussing Lewin's (1951) change theory. This was the most complex of the three assignments as students were expected to think critically about their search terms, use truncation appropriately, and select the correct Boolean connectors. Initial questions from students indicated that they continued to have difficulty with these concepts and were spending several hours on the assignment. To shortcut student frustration, the librarian sent more detailed instructions for the search. Despite the additional help, most students continued to have difficulty formulating search strategies. Selection of appropriate search terms to describe Lewin's theory proved the

most difficult aspect of the search. Of the 22 students completing the assignment, only 6 determined the correct method for conducting the search. Following completion of the assignment, the librarian met with the students through Horizon Wimba Live Classroom to discuss the assignment and to provide an opportunity for student questions regarding library resources covered during the semester.

Problems Encountered

This approach to instructing students required significant additional time over that spent on the former single library instruction sessions taught by the librarian. Consultation with course faculty and creation of the CINAHL tutorial and database assignments increased preparation time by approximately 45 hours. Interpreting students' descriptions of database searches also added to the amount of librarian time. Because of the complexity of work, school, and family schedules, students could not always time questions to coincide with the librarian's business hours. The librarian and course faculty monitored students' e-mail messages in WebCT during regular working hours, evenings, and weekends to ensure prompt responses to student questions.

Because WebCT allows only one course designer to have an e-mail address, students could not e-mail the librarian directly with database questions. Consequently, the course faculty and librarian found it necessary to review multiple e-mails to meet student instructional support needs. For future collaborations, the librarian will be listed as a student in WebCT so that direct e-mail will be available.

Evaluation

Nursing faculty gained a tremendous amount from this collaborative effort. The course faculty's information literacy skills strengthened during the library database module development. In addition, exposure

TABLE
Library Database Survey Responses Voluntarily Completed by 20 of 23 Students

| Survey Statement | Strongly Agree | Agree | Total |
|---|----------------|----------|----------|
| The tutorial on CINAHL Plus with Full Text that is linked from the library module in WebCT® helped me understand how to search this database. | 5 (25%) | 8 (40%) | 13 (65%) |
| Meetings with the librarian on Horizon Wimba® Live Classroom helped me understand data searching. | 7 (35%) | 9 (45%) | 16 (80%) |
| Contact with the librarian by phone, e-mail, or in person helped me understand database searching. | 4 (20%) | 5 (25%) | 9 (45%) |
| The three library database assignments helped me understand database searching. | 6 (30%) | 9 (45%) | 15 (75%) |
| The librarian's comments sent by e-mail in WebCT following completion of each library assignment helped me understand database searching. | 5 (25%) | 12 (60%) | 17 (85%) |
| I feel more comfortable using library databases. | 7 (35%) | 10 (50%) | 17 (85%) |
| I think library databases will be useful in my current job. | 5 (25%) | 9 (45%) | 14 (70%) |
| I will use library databases to find information for my current job. | 3 (15%) | 10 (50%) | 13 (65%) |
| The written comments concerning American Psychological Association referencing helped me better understand how to properly reference. | 6 (30%) | 10 (50%) | 16 (80%) |
| Overall, I would rate this as a positive learning experience. | 6 (30%) | 11 (55%) | 17 (85%) |

to the librarian's communications with students proved beneficial. Review of student submissions supported course faculty's decision to integrate this content into the course as the students' lack of information literacy skills became more apparent during the semester. The use of instructional technology assisted course faculty in the delivery of learning guidance and feedback. Horizon Wimba Live Classroom and WebCT communication was invaluable in ensuring positive student learning outcomes.

Horizon Wimba Live Classroom allowed the librarian to go beyond the single traditional library instruction session. Although more students could have requested additional librarian assistance, those who sought help benefited from the experience by gaining a clearer understanding of database searching. The librarian ended this experience recognizing that the learning process was mutual and gained insight into the students' thought processes as they approached database searches.

The objective of the library database module was to assist students

in developing basic database search skills. Based on feedback from the 20 students who voluntarily completed the Library Database Survey, a teaching assessment survey designed to determine student perception of the module's learning effectiveness, success was achieved. Student feedback was overwhelmingly positive (**Table**). Seventeen considered the library database module to be a positive learning experience. The same number of students indicated increased comfort using library databases. Fifteen students reported that library assignments supported understanding of database search techniques, whereas 13 noted that the tutorial on CINAHL Plus with Full Text supported learning of proper search techniques for this database. Seventeen found the written comments provided by the librarian following completion of each library assignment helpful. Sixteen observed that written comments on APA referencing were helpful. Online meetings with the librarian via Horizon Wimba Live Classroom guided understanding of search techniques for 16 of the students. Only 9 students responded fa-

vorably regarding contacts with the librarian via phone, e-mail, and in person. This is not surprising given that many students did not contact the librarian. The percentage of students who considered library databases an asset for their current jobs was lower than anticipated. Only 14 considered the library databases useful, and 13 reported that they would use the library databases. Limited Internet and database access in the workplace may account for this (Pravikoff, Pierce, & Tanner, 2003).

Course evaluations voluntarily completed at the end of the semester by 17 of 23 students further supported the student survey results. Thirteen (76%) indicated that the quality of the course learning activities was good or excellent, and 14 (82%) reported that the library database assignments supported student learning of database searching. Sixteen (94%) found the course to be a positive learning experience. One student noted the value of the learning experiences in this course:

I believe the skills I have learned will help me in the EARN program and the rest of my career.

Recommendations

As with any introductory attempt to integrate new content, it is imperative to review the learning outcomes and student responses to determine areas of improvement. Course faculty and the instructional librarian determined that several changes would further strengthen student learning. First, development of a short student learning assessment following the CINAHL Plus with Full Text tutorial, either a mini-quiz or instructor-led group discussion using Horizon Wimba Live Classroom, would be beneficial to verify student comprehension of the content. Second, integration of a database information literacy quiz at the end of the module as a substantial part of the module grade may increase student effort. Finally, grading criteria should be changed to require students to evaluate articles selected during the module and provide rationale for why the selected article was chosen for a particular audience. This would convey the importance of selecting top quality articles as opposed to the most recently published or most popular article.

Conclusion

Information literacy empowers nursing students to positively effect change and to transition to an evidence-based practice health care environment. Nurse educators must recognize the significance of information literacy development and seek the support of library professionals to identify ways to integrate it into the nursing curriculum. Nursing faculty and librarians can take advantage of instructional technology to create engaging learning activities focused on students' information literacy development.

To support this development among students in the Computers in Nursing course at Auburn University Montgomery, nursing faculty and the library instruction coordinator used the instruction technologies of Horizon Wimba Live Classroom, WebCT, and an online tutorial. Students responded positively to the experience by reporting increased understanding of database searching, a higher level of comfort with using library databases, and an awareness of the value of database use in the workplace. A high percentage of students considered the library database module a positive learning experience. The database searching and citation skills the students gained from this course form the basis for further development of information literacy skills in future courses. Based on instructor and librarian experience, modifications were identified to improve the module, and traditional baccalaureate nursing faculty have integrated the online database tutorial into other courses. Overall, this experience proved beneficial to students, the course instructor, and the librarian.

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