Research

Mapping Information Literacy and Written Communication Outcomes in an Undergraduate Nursing Curriculum

A Case Study in Librarian-Faculty Collaboration

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A syllabi study was conducted by the health science librarian and nursing faculty members in a baccalaureate nursing program to map information literacy and communication learning outcomes. Nursing course syllabi and assignments were examined for particular evidence of information literacy and communication learning outcomes in relationship to three sets of standards from the American Association of Colleges of Nursing and the Association of College & Research Libraries, and the rubrics of the Association of American Colleges & Universities. A crosswalk was created between the standards to identify areas where the librarian and nursing faculty could better collaborate to assist students in their achievement of these standards. The resulting analysis led to a change in the librarian's practices with greater involvement with the nursing department. Information literacy skills are needed in a growing number of professions that value evidence-based practice, thus suggesting that similar curriculum mapping projects are useful for other academic disciplines.

Introduction

The importance of information literacy in health science professions is well established, and many disciplines recognize and incorporate information literacy concepts into their curriculum. Accredited Bachelor of Science in Nursing (BSN) programs use standards from *The Essentials of Baccalaureate Education for Professional Nursing Practice* (called *The Essentials* for short) from the Commission on Collegiate Nursing Education, an autonomous agency of the American Association of Colleges of Nursing (AACN, 2008). There is growing emphasis on evidence-based practice requiring that students locate, assess, and critically appraise research studies that have relevance to clinical problems (Adams, 2012).

Librarians and health science subject faculty, especially nursing, have a shared understanding of information literacy standards. Nonetheless, in order to recognize curricular redundancies and gaps, collaboration is helpful for outlining content that is associated with information literacy (IL) and written communication standards. Curriculum mapping is one approach used within academic departments to understand where and to what extent their curriculum addresses specific student learning outcomes (SLOs):

> Curriculum mapping is a procedure which promotes the creation of a visual representation of curriculum... Curriculum maps are aggregated first horizontally by course and then vertically across all courses in a sequence... Faculty members review the maps, identifying strengths, gaps, and overlaps... Faculty... add or eliminate content and/or strategies, which results in a more streamlined curriculum and integrated program. (Uchiyama & Radin, 2009, p. 272-273)

Librarians typically do not participate in departmental curriculum mapping although they may participate to some extent in general education curriculum development and also in analyzing course syllabi to better understand content that is being taught (VanScoy & Oakleaf, 2008).

The primary purpose of this curriculum mapping research was to create a map and crosswalk of information literacy and written communication SLOs for use by the health science librarian to improve instruction, and for use by nursing faculty for evaluating courses for general education learning outcomes. Accrediting bodies, such as Middle States Commission on Higher Education (2015), require specific core courses, often called general education courses, with measureable SLOs. The concept of general education is important in higher education, since these goals provide a foundation for achieving the skills needed for personal and professional success after graduation.

Interdisciplinary literature on information literacy and curriculum was reviewed, followed by the development and completion of a curriculum map. Appraisal of other syllabi studies on IL and written communication SLOs provides insight into content and teaching efficiencies, redundancies, and gaps. The design and results from this study have applicability to other disciplines too, as educators review their curriculum and plan better methods for preparing students for evidence-based practice and life-long information literacy skills.

Nursing majors worldwide, particularly students within accredited baccalaureate programs, must complete research and writing assignments. Nursing students often have access to multiple resources, including faculty assistance, online tutorials, classroom visits by a librarian, and ongoing librarian consultation.

Background

A review of the literature was conducted on curriculum mapping in higher education. Research results and themes focused on general education, levels of outcomes, and interdisciplinary collaboration. Information literacy was a common skill identified within academic standards.

Curriculum Mapping

Syllabi studies have been done in various programs and throughout other countries. In Canada for example, undergraduate writing assignments were analyzed by Graves, Hyland, and Samuels (2010). The frequency, range, and requirements of assignments were noted to be inconsistent when 179 syllabi were compared across college programs. The assignment objectives and method of feedback also varied. These findings are valuable for highlighting areas where curriculum and instruction can be improved.

The use of computer-assisted curriculum mapping was performed in medical schools in the United Kingdom and Canada (Willet, 2008). The number of teachers required, topics to be addressed, and expected student outcomes were part of this study. It is easy to lose track of content, as redundancies and gaps emerge. Curriculum studies and syllabi maps show what has been taught, where and when this content was offered, and by whom. Such data is helpful when planning practical improvements that take into consideration limited faculty time, program expenses, and other institutional resource factors.

A nursing education consortium compared different programs with the use of curriculum mapping (Landry, et al., 2011). The aim of this study was to improve the overall content for students moving from their associate's degree in nursing (ADN) through the completion of their BSN degree. In order to promote a more seamless progression, key concepts from the accrediting body's *Essentials*, such as communication, leadership, problem solving, and other skills, were charted and aligned for courses within the ADN to BSN curriculum (AACN, 2008). Communication and teamwork were addressed throughout the programs, but there were content gaps for problem solving, leadership, change theory, and quality improvement. Curriculum improvements were made based on the results, and a revised program of study was developed, as shown with a side-by-side listing of old program with new program course revisions. Research content and information literacy concepts were not identified in the curriculum map or the revised curriculum, although such content was implied within the courses dealing with communication, evaluation, and improvement of nursing care.

Information literacy is more than informatics and information technology; however, IL includes aspects of both. An Institute of Medicine (2003) report stressed the need for informatics or information technology in healthcare. Patient safety is contingent on providers using procedures and protocols that are supported by current research. Based on increased attention given to safer healthcare, nursing education in the United States readily incorporated information technology into the nursing curriculum (AACN, 2008; American Nurses Association, 2008; Flood, Gasiewicz, & Delpier, 2010). Multiple disciplines in higher education address the importance of scholarly communication and informatics, as depicted in general education programs using rubrics to assess oral and written communication skills and information literacy (Gaston & Gaff, 2009).

General Education

Information literacy is one aspect of general education, along with other core or foundational college courses. Higher education is expected to provide life skills, not just a diploma; hence, general education goals are adopted by many colleges and universities with the purpose of educating students beyond their careers or declared majors. The Association of American Colleges and Universities (AAC&U) developed "tips and tools" for improving student achievements in such areas as information literacy (Rhodes, 2010). The AAC&U's *Valid Assessment of Learning in Undergraduate Education (VALUE)* rubrics provide key elements to use when reviewing syllabi assignments and outcomes, such as the student's ability to conduct well-designed searches and to cite references appropriately (AAC&U, n.d.; Rhodes, 2010; Rhodes & Finley, 2013).

The Association of College & Research Libraries (ACRL) (2000) developed its *Information Literacy Competency Standards for Higher Education* to assist librarians and classroom faculty in teaching information literacy. The five

standards were to be embedded throughout the curriculum, and in fact, many of the competencies could only be taught and assessed by subject faculty. The standards have been adapted by other organizations over time. The AAC&U uses very similar language for the five elements in its *Information Literacy VALUE Rubric*. The ACRL's Health Sciences Interest Group modified the standards for use in nursing programs (Association of College & Research Libraries, 2013). The ACRL (2015) formally adopted the *Framework for Information Literacy for Higher Education* to provide more conceptual and foundational background for teaching information literacy, and to accommodate the increasing emphasis in the curriculum on content creation and the interdisciplinary nature of IL.

Gathering evidence and communicating up-to-date information is obviously important. Nonetheless, there are challenges related to the instruction and evaluation of information literacy skills. Elrod, Wallace and Sirigos (2012) conducted a review of 100 college information literacy syllabi that showed changes in teaching and grading over the last decade. Information literacy goes beyond the location and sharing of data to include the worldwide impact of technology and ethical issues, such as respecting intellectual property and avoiding plagiarism. Because of the complexity of information literacy, there is an increased need for interactive learning between students, faculty, and librarians that complements rather than complicates teaching and learning.

Badke (2014) makes the point that online search engines do not promote reflective thinking about the content. Resources may be found but not necessarily evaluated. Syllabi usually provide assignment directions, but the rationale for these assignments may be missing. Students learn how to find a peer-reviewed or refereed journal, yet the question remains as to whether or not students understand the process and value of critiquing findings. A syllabus or rubric does not typically state that information is gathered in order to solve a problem or to make something better because of research. The amount of summative and formative evaluations within a syllabus suggests how much guidance is provided to students in a course. If students are reaching milestones rather than expected capstones, then syllabi mapping provides data pertinent to cause and effect, especially if comparing feedback given for an assignment.

Student Progression

In 2008, VanScoy and Oakleaf used syllabi studies to suggest a different plan for teaching information literacy, since the tiered approach was not producing the desired student outcomes. "Tiered," in this study, meant that basic content was introduced during the first year and mastered by the senior year of college. Instead of learning literature searches and scholarly writing in segments, it was suggested that more sophisticated IL strategies be taught before the junior and senior years. In a later article, Oakleaf and VanScoy (2010) discussed teachable moments that occur at the library reference desk. Students were asked to show their research steps or to talk out loud while searching. Higher-level instruction occurred sooner, as students demonstrate their readiness for additional skills.

Flood, Gasiewicz and Delpier (2010) integrated information literacy in stages from novice to intermediate, and then to advanced. Assignments reflected an initial exposure to library database searches followed by teamwork to analyze and write a brief article synopsis. The intermediate stage resulted in a teaching plan based on literature that documented current evidence-based practice. At the advanced level, students concentrated on complex issues that were well-researched.

Although there are academic levels of students as well as variations of information literacy mastery, a key element of student success may relate to "point of need." McCulley and Jones (2014) suggested that the timing and type of feedback makes a difference. Student outcomes were seen to improve when there was collaboration between the faculty member and the librarian as students worked on their assignments. A collaborative approach combined with good timing seems like a simple idea, but improving assignment logistics requires innovative planning and a good roadmap of the curriculum.

Interdisciplinary Collaboration

Uchiyama and Radin (2009), although not specifically addressing information literacy, made a good argument for using curriculum mapping in higher education as a vehicle for better collaboration and collegiality. Teamwork is facilitated when curriculum is better understood and aligned with the stakeholders.

Interdisciplinary collaboration was recommended by VanderPol and Swanson (2013) as the combined efforts of librarians and faculty members were appraised. The *Information Literacy Competency Standards for Higher Education* were used as a conceptual framework for the teamwork done to obtain better IL student outcomes (Association of College & Research Libraries, 2000). These standards were described as packaged artifacts, and "it is unreasonable to think that one librarian can teach every outcome standard" (VanderPol and Swanson, 2013, p. 146). The new *Framework for Information Literacy for Higher Education* further emphasizes the need for collaboration between disciplinary faculty and librarians (Association of College & Research Libraries, 2015).

Cramarenco, Moraru, Balazsi, and Aluas (2015) compared a meta-analysis with systematic reviews as they looked at different strategies for improving academic writing. The authors did not directly address information literacy, but critical thinking and evidence-based decisions were reviewed in the context of reading and writing. Published materials were studied in relationship to database searches, data extraction, and analysis of findings. Academic writing competencies were assessed, and a major theme emerged that related to the need for an improved community of learning. Librarians provide expertise and guidance to students as they learn advanced skills with meta-analyses and the critical use of data.

The reviewed literature supports the use of syllabi studies and suggests that a more collaborative approach is needed for teaching communication, information literacy, and problem-solving skills. Therefore, this curriculum mapping project used standards from three different fields, general education, librarianship, and nursing, to identify areas of interdisciplinary collaboration to promote better SLOs.

Methodology

This project occurred in a comprehensive public Pennsylvania university with 55 bachelor's degree programs and over 9,000 students. Approximately 500 of these students are nursing majors. The undergraduate and graduate nursing programs are accredited by the Commission on Collegiate Nursing.

Initially, the health science librarian proposed a study with members of the nursing faculty to examine the nursing curriculum for student learning outcomes in information literacy and written communication. Exempt approval was received from the Institutional Review Board. Funding for this project was obtained from an internal grant from the Teaching and Learning Enhancement Center.

A descriptive study using syllabi was designed to answer questions about the effectiveness of the timing and content of the librarian's classroom instruction and to aid nursing faculty with the ongoing review of their curriculum. Undergraduate courses for all years were examined for content and assignments that required information research and writing. Courses were compared and analyzed for variations, similarities, and incremental learning in relationship to information literacy. Although nursing topics were part of the assignment guidelines and rubrics, nursing content was not analyzed in this study. The focus centered on information literacy, written communication, and general education or lifelong skills for locating, analyzing, and applying scholarly resources and published research.

All nursing course syllabi within the program were collected. Twenty-five syllabi were identified as approved courses within the undergraduate nursing program and were reviewed for written assignments relevant to information literacy and communication. Every semester, beginning the sophomore year, at least one, and often two, scholarly papers are required. Once the syllabi and assignments were gathered, a student assistant helped compile data into

spreadsheet tables, using keywords from catalog descriptions, course objectives, and assignments related to writing and research, details about the assignments, and percentage of the grade for each outcome. The course data were then examined to identify which student learning outcomes related to the *VALUE* rubrics for Information Literacy and Written Communication (AAC&U, n.d.) and the ACRL (2000; 2013) five information literacy standards, which correspond directly to the five AAC&U IL rubric elements. To aid in the analysis, a crosswalk was begun to visualize connections between the AACN *Essentials* (2008) and the ACRL standards for nursing (2013) and the AAC&U rubrics (n.d.). In short, this curriculum mapping project compared the AACN *Essentials* in order to create a crosswalk with the ACRL and AAC&U standards. Interestingly, all three organizations' standards reflect general education (lifelong) skills needed in written communication and information literacy.

Ideally, curriculum mapping labels student learning outcomes in courses as "introduced," "reinforced and opportunity to practice," "mastery at the senior or exit level," or "assessment evidence collected" to convey the level of student progress through the curriculum (University of Hawaii at Manoa, 2013). If the same learning outcome is introduced in multiple concurrent or successive courses, then this is redundant. Likewise, if students are expected to master an outcome after being introduced to it, without having practiced the skills required for the outcome, then there is a gap. This information is often obtained from faculty discussions because it is not usually apparent from syllabi. For this study, only syllabi and supporting documents were examined. Therefore, for the purpose of research rigor, 'explicit' was used to note what was clearly described within the syllabus and 'implicit' to record what was not spelled out within the syllabus yet was necessary in order to complete the assignment. For example, the syllabus and assignments for a sophomore course explicitly stated that students would access information in online library databases. Syllabi for two junior level courses did not specifically list database activities, but these IL skills were necessary for completing the assignments. The most likely reason for this omission relates to students being expected to have already mastered this outcome, and so the outcome was coded as 'implicit' for those courses. 'Implicit' therefore is used in place of either 'reinforced' or 'mastered.'

Findings

Required courses for typical four-year nursing students were examined for written assignments requiring explicit and implicit IL student outcomes from the AAC&U IL Rubric and the ACRL IL Standards, shown in Table 1. The written assignment and its percent of the grade were listed for each course, too. Written assignments for these courses typically counted for 10 to 25% percent of the total course grade, with an average of 14.2%. Although not in the syllabi, librarian assistance was available to nursing students in every year of their four-year baccalaureate program, either through guest in-class instruction or during individual consultations. The courses for which the librarian provided in-class instruction or significant instruction outside of the classroom are noted with a and b superscripts within Table 1.

During freshman year, students took University Seminar that introduced first-year students to the library and its resources. This course was not included in the table because it was not a required course with written assignments. However virtually all freshman nursing students have taken the course in a cohort, and were required to complete an online library research tutorial. Instruction in researching the literature occurred primarily in the second year (sophomore), and some instruction occurred in the third-year research course (junior year). At the time of the study, information literacy instruction was not provided in any senior nursing class although the librarian did provide individual instruction to a large number of senior nursing students.

Table 1

Required Nursing Courses with Information Literacy Student Learning Outcomes

Year & Course Taken	Identify Research Question	Access Info	Evaluate Sources & Data Critically	Use Info For a Specific Purpose	Use Info Ethically & Legally
2nd year: Professional Nursing[a,b]	Explicit	Explicit	Explicit	Explicit	Explicit
2nd year: Foundations of Nursing Practice	Explicit	Implicit	Implicit	Explicit	Explicit
3rd year: Intro to Nursing Research[Error! Bookmark not defined.,Error! Bookmark not defined.]	Explicit	Implicit	Explicit	Explicit	Explicit
3rd year: Family Nursing	Explicit	Explicit	Explicit	Explicit	Implicit
3rd year: Adult Health Nursing I	Explicit	Explicit	Explicit	Explicit	Explicit
3rd year: Maternal-Child Health Nursing	Explicit	Explicit	Explicit	Explicit	Implicit
4th year: Adult Health Nursing II[Error! Bookmark not defined.]	Explicit	Explicit	Explicit	Explicit	Explicit
4th year: Leadership & Management in Nursing	Explicit	Implicit	Explicit	Explicit	Explicit
4th year: Public Health Nursing	Explicit	Implicit	Explicit	Explicit	Explicit
4th year: Psychiatric/ Mental Health Nursing	Explicit	Implicit	Explicit	Explicit	Explicit

a Librarian provides in-class instruction at invitation of instructor
b Librarian provides moderate to high level of instruction outside of class

The course-by-course map of nursing curriculum sought to determine whether information literacy and written communication outcomes were sequentially introduced, reinforced, and mastered in courses. However, a weakness in this study surfaced when sequential learning could not be determined by the librarian. Course content may have built on previously acquired knowledge, but this is not evident from the syllabi alone. Of note, there were few 'implicit' outcomes (16%) found in the assignments; most outcomes were 'explicit' (84%). An analysis was done to create a crosswalk between the AACN *Essentials* (2008), the conflated IL standards of the ACRL (2013) and AAC&U (n.d.), and the AAC&U rubric for Written Communication, shown in Table 2. This table illustrates that information literacy and written communication outcomes are widespread within the nursing curriculum.

Table 2

Standards Crosswalk: AAC&U and ACRL IL Standards Compared to AACN Essentials

The Essentials of Baccalaureate Education for Professional Nursing Practice (AACN, 2008)	IL 1: Determine Info Needed [c]	IL 2: Access the Needed Info [c]	IL 3: Evaluate Info [c]	IL 4: Use Info Effectively [c]	5: Accessing and Using Info [d]	WC 1: Context of and Purpose for Writing [e]	WC 2: Content Development [Error! Bookmark not defined]	WC 3: Genre and Disciplinary Conventions [Error!]	WC 4: Sources and [Error!]	WC 5: Control of Syntax and Mechanics [Error!]
I. Liberal Ed for Baccalaureate Generalist Nursing Practice	X	X	X	X	X	X	X	X	X	X
II. Basic Org & Systems Leadership for Quality Care & Patient Safety	X			X						
III. Scholarship for Evidence Based Practice	X	X	X	X	X	X	X	X	X	X
IV. Info. Mgt. & Application of Patient Care Technology			X	X	X				X	
V. Healthcare Policy, Finance, & Regulatory Environments			X	X					X	
VI. Inter-professional Communication & Collaboration for Improving Patient Health Outcomes				X					X	
VII. Clinical Prevention and Population Health	X	X		X			X		X	
VIII. Professionalism & Professional Values	X	X			X				X	
IX. Baccalaureate Generalist Nursing Practice			X		X					

[d] VALUE Information Literacy Rubric (AAC&U, n.d.)

[e] IL Competency Standards for Nursing (ACRL, 2013)

[f] VALUE Written Communication Rubric (AAC&U, n.d.)

A concept map, which is really a hybrid crosswalk, was used to take a closer look at the written assignments for all required courses compared to the standards. This juxtaposition of the curriculum mapping findings with the standards of the AACN, ACRL, and AAC&U becomes clearer when visualizing the concept map in Figure 1. Figure 1 summarizes the course assignments associated with these three sets of standards to better show the information literacy skills embedded and implied within course assignments.
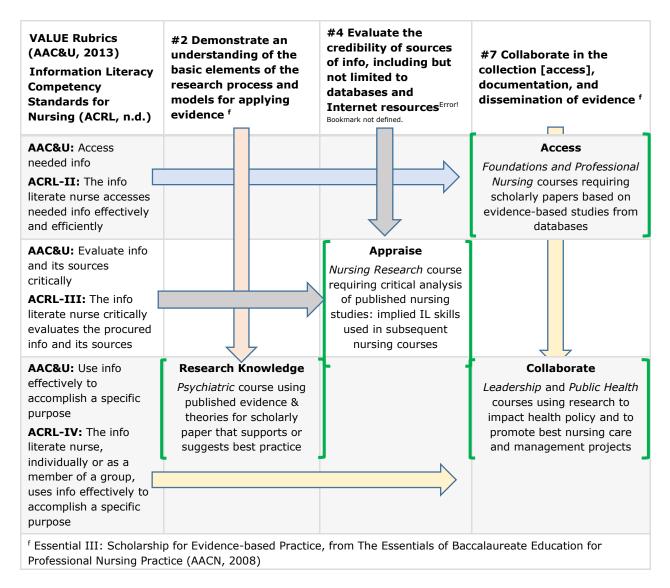
VALUE Rubrics (AAC&U, 2013) Information Literacy Competency Standards for Nursing (ACRL, n.d.)	#2 Demonstrate an understanding of the basic elements of the research process and models for applying evidence [f]	#4 Evaluate the credibility of sources of info, including but not limited to databases and Internet resources[Error! Bookmark not defined.]	#7 Collaborate in the collection [access], documentation, and dissemination of evidence [f]
AAC&U: Access needed info **ACRL-II:** The info literate nurse accesses needed info effectively and efficiently			**Access** *Foundations and Professional Nursing* courses requiring scholarly papers based on evidence-based studies from databases
AAC&U: Evaluate info and its sources critically **ACRL-III:** The info literate nurse critically evaluates the procured info and its sources		**Appraise** *Nursing Research* course requiring critical analysis of published nursing studies: implied IL skills used in subsequent nursing courses	
AAC&U: Use info effectively to accomplish a specific purpose **ACRL-IV:** The info literate nurse, individually or as a member of a group, uses info effectively to accomplish a specific purpose	**Research Knowledge** *Psychiatric* course using published evidence & theories for scholarly paper that supports or suggests best practice		**Collaborate** *Leadership* and *Public Health* courses using research to impact health policy and to promote best nursing care and management projects

[f] Essential III: Scholarship for Evidence-based Practice, from The Essentials of Baccalaureate Education for Professional Nursing Practice (AACN, 2008)

Figure 1

Concept Map showing IL Standards with Selected Syllabi Content

It is noteworthy that very few SLOs were implicit, and this concept map helps determine whether these scant syllabi assignment descriptions indicate connections with the IL standards. Indeed, the concept map from Figure 1 is encouraging, although more evidence of assignment rubrics would be helpful to assess and document SLOs. The figure depicted progression from locating data (sophomore-level courses) to utilizing evidence (senior-level courses). Such outlining of IL assignments within the curriculum is also helpful for planning librarian and faculty collaboration and for showing students the development of their information literacy skills.

Discussion

This qualitative study describes an intensive collaboration between a librarian and nursing faculty to identify areas of possible change in the nursing curriculum to improve students' information research competencies. The results of this syllabi study found information literacy and written communication outcomes embedded throughout the undergraduate nursing curriculum. Graduate students were not part of this research, and syllabi studies on this group could prove insightful to sequential learning and lifelong general education related to information literacy.

From the librarian point of view, the project provided a much better understanding of the nursing curriculum and lent more credibility to librarian suggestions to nursing faculty for specific changes or revisions in assignments or in the timing of IL instruction. These suggestions to faculty included providing nursing students with the opportunity to incrementally develop, practice, and master their IL competencies across the entire curriculum; tapping the librarian, who has an education and health science background, to assist in the design or revision of research and writing assignments; scheduling the librarian's instruction at the point of need rather than far in advance of the due date for an assignment; collaborating with the librarian to seek alternative strategies when IL instruction was not feasible, such as providing feedback on online research guides; enrolling the librarian in the course management system so that students could easily seek assistance and find the research guide; and inviting the librarian to the nursing department computer lab to provide one-on-one research assistance.

Due to additional contact with the nursing faculty, the librarian developed more interaction with students during all four years of their curriculum. The librarian collaborated with nursing faculty members teaching freshman University Seminar, and an in-class library assignment was developed to familiarize students with the library's resources and services and the basics of finding books and scholarly articles using the library website. This assignment continues to be reviewed and revised.

Also as a result of this study, the "point of need" was improved in the sophomore Professional Nursing course. The faculty member teaching the course scheduled the librarian's instruction at a time closer to the assignment deadline, when the students began their actual library research. The faculty member and the librarian also collaborated to revise the assignment rubric by instructing students to print their best search strategy from a library database showing their keywords or subject terms rather than a list of articles. This modification provided the justification for teaching database use and features, including thesauri and limiters, as part of a search strategy. Without the curriculum mapping appraisal by both the librarian and nursing faculty, these educational strategies would not have occurred.

As a further outgrowth of this collaboration, the librarian began offering an open consultation in the nursing department computer lab. This session that spanned a six-week period included both fall and spring semesters. Other nursing faculty members beyond the sophomore level advertised this assistance to their students, and some faculty actually attended the sessions for help with their own scholarly endeavors. This open consultation continues.

The librarian's guest instruction in the junior Introduction to Nursing Research class has become more intensive, due to the librarian's greater visibility following the syllabi study. During this class session, the librarian used a course research guide to teach students how to identify and to locate specific types of research articles using library databases. Previously students received instruction for a poster assignment for the University's Health Science Symposium, but students did not receive coaching for the research literature critique assignment. This outgrowth of additional librarian involvement is directly related to the student need for expanded skills in applying evidence based research. This extra librarian instruction specifically relates to the general education rubrics (Association of American Colleges & Universities, n.d.), accreditation standards (American Association of Colleges of Nursing, 2008), and library standards (Association of Colleges & Research Libraries (ACRL), 2000; ACRL, 2013; ACRL, 2015) on IL and evidence based practice.

Following the curriculum study, the librarian was invited for the first time to provide instruction to senior students in the Adult Health II class. Due to curricular requirements, the timing and setting for the librarian's

instruction was less than ideal, occurring during the first or second week of the semester in a room where no computers were available; however, communication continued between the librarian and the course professor. To offset the timing and setting, the librarian implemented active learning strategies to develop an effective research question and introduced the use of graphic organizers to analyze and synthesize research articles for a literature review.

Finally, the librarian was invited to attend the nursing department curriculum committee meeting to discuss possible librarian roles within the nursing program. The librarian's goals include more involvement as a stakeholder, participant, and collaborative educator within the department. Specifically, this would unfold as having a greater responsibility in developing written communication and information literacy student outcomes for courses and assignments, as well as serving more as a resource within the department, for example, to better match library collection development with curriculum.

From the nursing faculty point of view, the study demonstrated the need to specify the level at which student information literacy learning outcomes should be demonstrated in specific courses. While clinical nursing skills are carefully sequenced and developed in the nursing curriculum, general education competencies such as information literacy and critical thinking have not been as carefully sequenced, although the new university-wide General Education (GE) program and assessment criteria is articulated elsewhere. This curriculum study results showed areas where GE SLOs need to be better written within the syllabi. The focus of general education throughout the U.S. is expanding, so the need for improved outcome criteria for departments beyond nursing is being addressed in most institutions of higher education. Therefore, curriculum mapping of student GE learning outcomes using course syllabi and assignments is a strategy that is beneficial to other programs besides nursing. The similarities between the AACN (2008), ACRL (2000; 2013), and AAC&U (n.d.) standards demonstrate that there is a consistent and credible framework for analyzing student information literacy outcomes. The *Framework for Information Literacy for Higher Education* (Association of College & Research Libraries, 2015) adds further richness to the discussion of general education goals related to information literacy and critical thinking.

The librarian and nursing faculty members, particularly at the sophomore level, collaborated to review other possible recommendations based on the curriculum map. Since information literacy cannot be developed in a single class or semester, the librarian's role is crucial for helping students segue into higher level skills. Another factor for improving SLOs involves the opportunity for students to revise assignments based on feedback. The chance for refinement was not apparent in the syllabi, with little formative assessment processes noted. Multiple strategies to support information literacy skills could be developed, including the use of instructional materials and online research guides and tutorials. Syllabi could list remedial resources, faculty and librarian consultation availability, and other unique course methods to improve information literacy, such as consistently soliciting more librarian feedback during the writing process.

Summary

The significance of this descriptive syllabi study is the mapping of curriculum with the published information literacy standards of the AACN, ACRL, and AAC&U. Researchers compared course assignments with outcome standards in a baccalaureate nursing program. The results showed a consistent requirement for scholarly papers for students throughout. To improve faculty efficiency and the librarian's efforts, more collaborative teaching approaches involving nursing faculty and the health science librarian were recommended. Also as a result of this study, some changes in the frequency and timing of the librarian's classroom instruction were made. Additional open lab and consultation sessions between the librarian and students were scheduled, and more interaction between the librarian and nursing faculty occurred. The importance of information literacy in healthcare is well documented, and graduates of nursing schools must locate, critique, and apply evidence to achieve best practice. Syllabi mapping is recommended

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for other academic programs beyond nursing, in order to identify unique curriculum trends that can be improved with logistical changes. Information literacy is imperative to evidence based practice for any professional field, and these skills continue to be of value to lifelong learners. Using general education goals with other educational standards is a topic for further research.

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