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Curriculum-Integrated Information Literacy (CIIL) in a Community College Nursing Program: A Practical Model

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ABSTRACT

This article describes a strategy to integrate information literacy into the curriculum of a nursing program in a community college. The model is articulated in four explained phases: preparatory, planning, implementation, and evaluation. It describes a collaborative process encouraging librarians to work with nursing faculty, driving students to acquire information literacy competencies, to use information resources as part of their learning process, and to be lifelong learners. The literature reviews the evolution of the concept of informatics in nursing practice and the different blueprints organized to attain information literacy competencies. It also describes studies that have included these competencies into nursing curriculum.

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An information society in the 21st century requires an information-literate population (Argüelles, 2011). Information literacy (IL) is a learning process based on information resources to build a lifelong habit of information use. This process actively involve students, faculty, and librarians in the development of competencies to identify when they have an information need, determine the information needed to address a given problem, find and evaluate the needed information, and organize and use the information effectively to address the problem or issue at hand. The reorganizing of the learning process will enhance the student's critical thinking skills, empowering the student for lifelong learning and for an effective performance of professional and civic responsibilities. The Framework for Information Literacy for Higher Education (FRAMEWORK) using threshold concepts is part of this learning process to develop the necessary competencies. (Association of College & Research Libraries [ACRL], 2015).

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Argüelles's (2012) literature review concluded that nurses are not always prepared to use information and applied evidence-based care in their practice. This is why the technological priority is out of touch in an era when nurses (health care providers) need to be information literate to use evidence-based information and evidence-based care as vehicled to obtain higher standards of quality and better outcomes, and to attain outstanding scores or ratings for health care institutions.

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Nursing organizations such as the American Association of Colleges of Nursing (AACN), the American Nurses Association (ANA), and the Pew Health Professions Commission have started to establish guidelines for informatics. In 2001 (McNeil et al., 2005), ANA reviewed the Standards of Nursing Informatics Practice and included computer literacy skills, information literacy competencies, and other informatics competencies needed by nursing students and nurses. The information literacy competencies would give nurses the capacity to locate, access, and evaluate information.

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Being information literate will move students to the next step: using an evidence-based approach in nursing practice and promoting nurses' proficiency for lifelong learning (Arguelles, 2011). Nurses entering the professional workforce and the health care environment should be information literate, have a positive frame of mind or critical thinking, and have a good lifelong learning habit. Not having the necessary information competencies can be a complex and a difficult situation because nurses need to access and use evidence efficiently and effectively. Nursing as a profession must implement different IL programs at a national level and at nursing school level to mitigate this position. Librarians must take the initiative of structuring a systematic model that would address the lack of information competencies in nursing school students. Cobus (2008) stated that "IL must transcend disciplinary boundaries by underscoring a shared goal between librarians and faculty" (p. 31). Also necessary are curriculum-integrated IL programs to provide nursing students with the needed competencies and tools to have a competitive influence in the workforce, essential for proving high-standard health care.

It is difficult to implement a curriculum-integrated IL program in nursing schools because faculty alone takes an active role in guiding students through the research process, and librarians are not effectively using a collaborative model to work and overcome disciplinary boundaries.

The perspective of implementing a systematic model to integrate IL into the curriculum using FRAMEWORK as the driving force will move the collaborative process with faculty to a new level. It is important, however, to define roles in the collaborative model so that nursing students can obtain the necessary information literacy competencies.

Literature review

The process of integrating informatics into a nursing curriculum is the starting point to move IL into nursing academic programs. Graves and Corcoran's (1989) early definition was of "nursing informatics as a combination of computer science, information science and nursing science designed to assist in the management and processing of nursing data, information and knowledge to support the practice of nursing and the delivery of nursing care" (p.). This early definition influenced ANA to recognize in 1992 that managing information is part of nursing practice. This makes a great difference in the process of accepting informatics as a whole, but the concept is still not clearly defined. This position triggers an overall approval that informatics competencies should be part of the curriculum. Authors like Saba (2001) forecast computer technology as part of the nursing profession in the 21st century and believed informatics is needed in evidence-based nursing practice. The concept again is only a partial recognition of what nursing informatics represents. Arguelles (2012) in his article mentions that because of this difficulty there is no clear difference between information technology (IT) and information literacy (IL), both components of informatics.

Definitions from the early 2000s denoted informatics as the use of computer technology in nursing endeavors: nursing services, education, and research. Other emphases are made on information technology integrated with clinical expertise and business applications. A proposed model in which all informatics activities interact to achieve a goal and to stimulate nursing research left out the information literacy component.

As informatics competencies for nursing students slowly evolved from entry to experience level, they are defined as a combination of knowledge, abilities, and attitudes. They should also include searching, retrieving, and using information as part of these competencies (Staggers & Thompson, 2002).

McNeil et al. (2005) conducted a national online survey of deans and directors of nursing programs in the United States. The study concluded that some programs were teaching computer skills to some extent, but very little instruction in IL, and the acquired competencies were not being linked to clinical practice. The deans and directors (80%) expected nursing graduates to have informatics competencies such as e-mail proficiency, word processing, bibliographic retrieval, and the Internet. Less than one-third reported teaching these competencies in their programs. Important findings of this study according to the authors were: (a) Current baccalaureate nursing programs

address computer skills, rather than information literacy competencies; (b) it is unclear the level of competencies faculty members in the United States possess; and (c) nurses must be knowledgeable and skillful in using information technology and it is necessary to include information literacy in the nursing curricula. This study also shows concern in relation to faculty's lack of a clear understanding of computer literacy or information literacy, and this ambiguity produces faculty's uncertainty on how to integrate this content into the nursing curriculum. 90

The problem of defining informatics persists because it is a moving target and as such every nursing program uses a different approach toward planning informatics in the curriculum. This is why this definition doesn't have any effect on the literature published, because it continues to denied/avoid including information literacy (McNeil et al., 2005). 95

The importance of establishing informatics competencies provides the foundation for determining the educational needs during a formal program and after graduation. These also describe nurses' preparation in roles within a field, assist in the development of nursing and health curricula, and determine job descriptions in line with the expectations of employers and health care consumers. This idea motivates the structuring of several programs nationwide to assist nurses in the development of competencies in informatics. 100

The Technology Informatics Guiding Education Reform (TIGER) focus on the use of informatics "tools, principles, theories and practices to make healthcare safer, effective, efficient, patient-centered, timely, and equitable" (TIGER, 2006). TIGER Informatics Competencies Collaborative (TICC) is one of the nine collaborative teams, and their recommendations for nursing practice form the TIGER Nursing Informatics Competencies Model. This model has three "parts: basic computer competencies, information literacy and information management" (TIGER, 2009). The TICC model includes IL and makes it fundamental to nursing and to evidence-based practice. 105 110

The Institute of Medicine (IOM) established five competencies as part of professional education for health care providers. Two of those competencies are the use evidence-based practice, and the use of informatics (IOM 2011). It is not clear what is included in informatics, but again these probably assume that all nurses are information literate, a paradigm we need to move away from in order to integrate information literacy into the curriculum. 115

The Quality and Safety Education for Nurses (QSEN) initiative intends to assist faculty in addressing the IOM recommendations, one of which is informatics. A QSEN competency for prelicensure included informatics, and was define as the "use of information and technology to communicate, manage knowledge, reduce errors, and support the process of decision-making in patient care" (QSEN, 2014, p. 2). 120

Another project designed to improve information literacy (IL) competencies of students and professional nurses is the Learning Information Seeking and Technology for Evidence-Based Nursing Practice (LISTEN). LISTEN woks with a series of online learning modules, Web-based resources, and interactive opportunities for nurses to acquire attitudes, knowledge, and skills of a five-step information process: needing, seeking, accessing, evaluating, and applying information. In this project it is easy to identify a close relation with the FRAMEWORK because of how it structures the information process. The initiative is based on the statement "50% of nurses haven't been taught search strategies? 50% of nurses don't value research evidence?" (The Listen Project, 2015, p. 2), and that information available to nurses and relevant to nursing practice doubles every 5 years (Yoder et al., 2014). Like most of the projects it considers IL to be the path to lifelong learning. 125 130

AACN promotes the development of information literacy competencies for nurses as an essential part of the process leading towards the use of evidence-based information in nursing practice. AACN also endorses evidence-based models in nursing schools to prepare students for nursing careers. 135

All the programs just described are a remedial process outside academic nursing programs. Accepting information literacy concepts and competencies as essential attributes of undergraduate nursing students across the board is the beginning of a collaboration between librarians and faculty and the origin of integrating IL into the nursing curriculum.

Dorner, Taylor, and Hodson-Carlton (2001) discussed a collaborative plan in which communications 140
between librarians and faculty is an essential element during the planning and deciding phase. Part of the
discussion was “what topics would be taught, how topics would be integrated, and how the work would
be divided” (p. 133). Implementing this plan shows a high level of recognition of the students toward
having IL competencies and how the IL instruction is closely related to the content of the course.

The interactions as described by Ivey (2003, p. 101), “shared understood goals; mutual respect, 145
tolerance, and trust; competence for the task at hand by each of the partners; and ongoing
communication,” are essential to work collaboratively with nursing faculty.

Miller, Jones, Graves, and Sievert (2010) highlighted the need for a collaborative relationship to
address IL due to the fact that clinical practice is based on evidence-based information. They intend
to establish distinctions between the different roles and competencies of a collaborative group. 150
Librarians provide the expertise in searching principles and retrieving information, and faculty
members ask the clinical questions guiding the search process to obtain on-target evidence-based
information for patient care.

“Collaborative work should be the starting point to creating and co-teaching an IL course in a
nursing program” (Arguelles, 2012, p. 100). Because librarians are more “process based” and have 155
difficulty convincing faculty, more “content based,” of the educational power of IL. (Mounce, 2010),
it is essential to gain faculty support and assure that faculty members understand the importance of
IL to students. A new era of collaboration is on the way with the implementation of the
FRAMEWORK.

College libraries, in an attempt to promote collaboration between librarians and faculty, 160
established the figure of departmental liaisons. Liaisons are defined as subject-specialist
librarians who can make contact with faculty and develop relationships that will lead to
opportunities for information literacy instruction. “The overall goal is to bring faculty and
librarians together to improve student learning through curriculum-integrated IL instruction.
This collaboration may result in single, well-timed instruction sessions related to class assign- 165
ments” (Lindstrom & Shonrock, 2006, p. 20), or the start of teams integrating IL into an
academic program.

The clinical practice based on evidence from the best research literature is a standard in health
care today. Nurses today are challenged to use information literacy competencies in their practice,
which means to be able to locate, evaluate, and use information for decision making. IL compe- 170
tencies are inextricably tied to computer technology skills, and both must be present in a nursing-
school curriculum. Some authors suggest analyzing formal IL sessions to determine how useful they
are for nursing students and recommend these sessions be incorporated into the curriculum to
ensure students have motivation toward learning the necessary competencies to complete classroom
assignments and future research needs. They propose that the best IL instruction method involves 175
both nursing faculty and librarians working in a collaborative model as a team.

Flood, Gasiewicz, and Delpier (2010) explained how they integrate IL into the nursing curricu-
lum. The methodology increases the degree of difficulty and the design of assignments to boost
students’ awareness to IL. The process establishes a novice-level focus on the access and evaluation of
information, an intermediate-level focus on the use of information for teaching patients and for 180
clinical purposes, and an advanced-level focus on plan of care and clinical and organizational
decision making. This effort has the sole intention of providing nursing faculty with examples on
how to integrate IL assignments into a curriculum.

Jacobs, Rosenfeld, and Haber (2003) integrated IL in core courses using a modular approach
instead of a tiered one and started with a general orientation session. The IL competencies and 185
evidence-based practice were then matched with class content and integrated into five core courses.
An assignment for each course was developed to assess the IL competencies. This IL model proved to
be successful from the point of view of faculty and students. Faculty observed improvements in
outcomes of assignments as students’ competencies increased because of their familiarity with the
information process and sources. 190

A curriculum-integrated approach is recommended to develop an undergraduate program containing information literacy activities. This structural rationale is based on four key issues: motivation, relevance, integration, and assessment. Motivation teaches competencies incrementally building on previous sessions, makes them transferable to academic and professional life, and rewards students for learning, integrating, and assessing tasks. Librarians must become members of subject specific teams regardless of the curriculum or the courses. A next step toward developing IL competencies in a collaborative and curriculum integrated model is the design of pre- and post-program questionnaires to obtain evidence on how effectively students are developing these competencies. 195

Integrating information literacy into a community college nursing curriculum 200

The acceptance of information literacy concepts and abilities as essential attributes of undergraduates nursing students across the board should be the starting point of the integration. Students being able to conceptualize, locate, retrieve, assess, and use information has been an important part of learning in an academic environment. Education should provide students with the abilities necessary to be able to navigate the information pathways both online and in other media (Hossain, Perrin, & Cumming, 2012). A wide review of nursing education determined “that for future nursing professionals to be effective in the current climate of technological change it is crucial that they are able to maintain their competence through lifelong learning” (p. 1). 205

Information literacy is concepts and competencies building and should not be separate from other learning activities. This is why it must be associated and enforced with other instruction in order to be useful to students. Including IL in the curriculum could be challenging because faculty teaching a particular course may not want to include an IL component. This means that librarians must gain support and insist that faculty understands the importance of IL in the learning process. Once IL is integrated into the curriculum it is necessary to incorporate methods of assessment. Studies revealed that nursing students are not proficient in IL and also point out that nurses have challenges working with EBP, because they don’t have the competencies to locate and critically analyze information. The conclusion is that changes have to be made in the way IL is taught and a closer collaboration with faculty is recommended as a way to systematically integrate IL into the nursing program and associate IL with course requirements and assignments. 215

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Traditionally IL training has focused on a series of competencies with little long-term learning and not addressing students’ information literacy needs. Research suggests that these competencies should be taught continually with reinforcement and repetition. 220

A phenomenographic study was designed to expose variation in students’ experience of a phenomenon and to map that variation into a set of logically related categories. The fundamental principle of phenomenography is to see the connection between a student and the phenomenon, and investigate this relationship. Studies done by Bruce (1997), Maybee (2006), and recently by Diehm and Lupton (2012) identified students’ approach to learning information literacy and established the categories explained in Table 1. These categories are closely related with the frames of the FRAMEWORK (ACRL, 2015). Strategies like learning by doing, trial and error, and interacting with other people suggest a close collaborative partnership between librarians and faculty to create an environment for learning. 225 230

Learning by doing is an active approach and has a direct relation with learning how to do things proficiently. In this case the IL learning was done individually or in a group, and was guided by librarians. This collaborative partnership needs to create opportunities for a more active learning assisted by practice. Workshop-based classes in this case were more effective compared to lecture-based classes because students acquired concepts, practiced, and used their capabilities and processes. Among other activities identified were “hands-on exercise, trying things out, practicing, gaining experience by working one’s way through the resources” (Diehm & Lupton, 2012, p. 219). 235

Table 1. Intention of learning (Diehm & Lupton, 2012).

Category 1: Learning to find information—Students' intention is to find the best and most relevant information in the most effective and efficient way
Category 2: Learning a process to use information—Students' intention is to develop an effective and efficient process that suits both the student and the task
Category 3: Learning to use information to create a product—Students' intention is to report learning about their subject as well as learning to use information
Category 4: Learning to use information to build a personal knowledge base—Students' intention is to understand subject content (rather than simply recalling)
Category 5: Learning to use information to advance disciplinary knowledge—Students' intention is to answer a research question or address a research problem
Category 6: Learning to use information to grow as a person and to contribute to others—Students' intention is to use information in a socially responsible way

Trial and error is a mode of learning by doing and it is describe by (a) an uncoordinated approach to different processes (use of keywords, information tools and sources), and (b) a planned experiment that includes analysis and reorganizing processes. Librarians in this strategy must teach nursing students how to deal with possible events of frustration and to overcome barriers when exposed to searching and using information. The experimentation encourages nursing students to try different searching strategies and ways of working with information, opening up new possibilities.

Interaction is another strategy for learning IL, and is based on the nature and intention to support an environment of collaboration and cooperation among peers, faculty, and librarians.

Seeking assistance, observing others, and requesting feedback from who they interact with are some of the learning strategies students can use. Faculty and librarians must create a classroom practice that values participation and the sharing of knowledge and must promote experiences to expedite learning participation.

A practical model

The model is a system approach to integrate IL framework into course curricula. The focus is on the student's conceptualization of information. This conceptualization, explain in Table 2, relied on the experience nursing students have when using information sources (Maybee, 2006). "This will allow the creation of a user-centered IL pedagogy designed to strengthen student learning. Being a formative process, it is interactive and flexible. It is also self-regulatory because it has a feedback dynamic through continued evaluation and change" (Arguelles, 2012, p. 105).

The model is also a collaborative process between librarians and nursing faculty; it should be encapsulated in the curriculum analysis nursing departments perform each year because the model is visualized as a process within the context of an existing curriculum. Faculty and librarians must work together using the FRAMEWORK (ACRL, 2015) as a guide because it is a critical step to a successful implementation of this model in any nursing program. It requires nursing faculty to have the knowledge and competencies to apply the FRAMEWORK's concepts to the process of integrating information literacy into the curriculum.

Because this is a new framework concept in IL, the literature is barely expanding and little is being published to guide faculty and librarians in developing strategies to teach the IL process. Competencies associated with the FRAMEWORK are critical to the success of implementing an

Table 2. Experience of information use—Undergraduate students (Maybee, 2006).

Sources—Information use is seen as finding information located in information sources.
Processes—Information use is seen as initiating a process.
Knowledge base—Information use is seen as building a personal knowledge base for various purposes.

integrated IL program in a nursing school. Faculty's understanding of the dynamics of each frame is important to effectively apply the process in a learning environment. 270

The following is an interpretation of the knowledge and the competencies needed to comprehend the frames:

Frame 1: Research as inquiry—Nursing faculty members should be aware that when they have an information need or a simple or complex question, they should be competent to identify the type of information needed. The creation of learning opportunities on different nursing practice themes stimulates critical thinking and increases the awareness of problem solving and leads to the use of different research methods. An open mind and a critical position toward solving an information need should be the main discussion. This framework will switch the paradigm: nurses learning and using research as part of a lifelong learning process, instead of only learning from the experience of their peers. 275 280

Frame 2: Searching as strategic exploration—Librarians design education strategies to develop faculty's competencies to use the different information resources and to have a critical approach when using them. Searching is considered a creative and flexible process in which different strategies can be used to obtain contrasting results. This framework considers a novice-to-expert continuum; the novice has less experience in searching and this limits the resources the novice can have access to. The expert can search broadly and accessed more information sources obtaining on target results. Nursing faculty members should develop their searching abilities in order to build confidence in implementing a curriculum-integrated IL program. 285

Frame 3: Scholarship as conversation—This frame should be understood and embrace as a functional process that makes a difference for faculty when formulating ideas, debating, and confronting, critiquing, and synthesizing the contribution of a particular author or information source to a discipline. Learning activities should focus on integrating findings into nursing practice and evaluating the effects of a practice change. 290

Frame 4: Information has a value—Identify ways to increase the awareness that information has a value in different dimensions and that having access to information sources demands an ethical and responsible behavior. Faculty members must understand how they are involved in the production cycle not only as users but as potential creators of information. 295

Frame 5: Information creation as a process—Identify the creation process of information and the different range of formats and modes of distribution. Faculty should identify the different dynamics of the information world in nursing, where information is created, and the different formats in which it is packaged. 300

The collaborative model should be conceptualized in four sequential phases: preparatory, planning, implementation, and evaluation. Figure 1 is a schematic diagram representation of the model within the context of an existing nursing curriculum. The different phases are sequential and the model is based on the partnership between librarians and faculty. It represents an interactive process that is flexible and self-regulatory because of sequential phases that generate feedback and the continuing evaluation of change. The idea is that the process should diminish as the integration occurs and only increase when change is needed due to external factors. 305

Preparatory Phase

This phase, according to Arguelles (2012), includes identifying the needs, developing a program philosophy, and selecting the framework for information literacy. The first part of the process is the design of an assessment to identify and establish opportunities for students to acquire information literacy concepts and competencies. These data are important for curriculum design, for determining 310

Figure 1. Information literacy model.

the specific concepts and abilities needed by the students, and for establishing points of integration with the curriculum through learning activities that will facilitate the required competencies.

Considering the FRAMEWORK, the process should be laid out as a novice-to-expert continuum in which the curriculum, the assessment, and the instruction should interconnect and function as a permanent cycle interacting with students in a two-way communication channel. The FRAMEWORK is the foundation of the model, and we recommend collecting evidence with a performance assessment rather than the traditional survey or fixed-choice questions. Oakleaf (2015) considering the FRAMEWORK suggested research logs, reflective writing, “think alouds,” self or peer evaluations, research drafts or papers, open-ended question responses, bibliographies, presentations, posters, performances, portfolios, worksheets, and concept maps. These assessments can be formative or summative: formative when they give feedback to librarians and faculty on their teaching methods, and summative when they establish what students learned during a period of time.

The FRAMEWORK is used to structure a guidepost with themes on which questions of the assessment are based. Table 3 shows an example of the themes and essential competencies for the information research process. The assessment should also include the student’s research context needs for course-related assignments: (a) “big picture”: identifying the background for defining and selecting a topic; (b) language: determining the meaning of words and terms associated with a topic; (c) situational: gauging how far to go with research, based on the surrounding circumstances; and (d) information-gathering: locating, accessing, and securing relevant research resources (Head & Eisenberg, 2010, p. 6).

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Table 3. Essential competencies (43).

Themes	Information research process
Formulating questions	Questions based on the process of formulating problems or questions in a discipline
Search strategy	Questions on the structuring of a search strategy (selection of keywords, the Boolean operators “AND” and “OR,” search indexes, and controlled vocabulary)
Information formats	Questions on formats and modes of delivery of information
Search resources	Questions on the evaluation of information sources (library catalogues, databases, search engines and metasearch engines)
Use of results	Questions on assessing content and recognizing authoritative content (reading a bibliographic reference/citation, bibliographies, evaluating the information found on the Internet, and the ethical use of information. Use of information in problem solving and decision making)

Table 4. Relation between the FRAMEWORK for information literacy and the nursing process.

Curriculum	Phase 1	Phase 2	Phase 3	Phase 4	Phase 5
Information literacy FRAMEWORK	Research as inquiry	Searching as strategic exploration	Scholarship as conversation	Information has a value	Information creation as a process
Nursing process	Assessment	Planning	Intervention	Implementation	Evaluation

The philosophy of IL as a benchmark for decision making with specific components and learning experiences is more useful for the students if these components and experiences are curriculum integrated. 335

The program flows along a novice-to-expert continuum and starts with basic competencies and transitions, moving toward an increasing level of proficiency in the use of information to support clinical decision-making. Table 4 illustrates the different information phases and their relation to how nursing students perceive the nursing process. This table will help librarians and faculty to divide in phases the information literacy model that is a result of the preparatory phase. 340

IL is directly correlated to the philosophy adopted and should be clear and systematized in order to explain the “what, how, where, and why” of curriculum strategies and learning activities.

Pierce (2005) explained several elements to consider when structuring the plan. These elements are:

- Organization of the plan gives the order and structure that guide its development. It is designed in such a way that concepts and operational definitions are added as they relate to the philosophy and implementation of the IL program. 345
- Comprehensiveness of the plan is toward the IL program and the provision of guidelines for implementing IL.
- Applicability relates to the convenience of the plan in the education environment of the nursing school. 350

Planning Phase

The first part of this phase identifies the knowledge, abilities, and competencies that the FRAMEWORK describes as characteristics of an information literate nursing student. Competencies originate in the philosophy of IL and are assumed from the plan adopted in the previous phase. The document “Nursing Informatics: Scope and Standards of Practice” (American Nurses Association, 2015) recognizes information literacy as a competency expected when nurses enter nursing practice. The document that guides the associate programs entitled “Educational Competencies for Graduates of Associate Degree Programs” (National League of Nursing, 2000) doesn’t require courses that would facilitate nurses in becoming information literate, but as we know, nurses at a baccalaureate or associate degree level have similar responsibilities for the delivery of services and for the use of evidence-based decisions for patient care. Therefore, this model must incorporate IL into the curriculum, assuring that all the competencies needed are defined. 355 360

Evaluation of the success of IL is based on the understanding of the expected faculty competencies, student competencies at graduation, and the data from the initial assessment.

Librarians and faculty must establish learning outcomes because they are working with threshold concepts in the FRAMEWORK. These learning outcomes would have different instructional options, for example: assignment-focused sessions, orientations, online tutorials, research consultations, collaborative course, assignment design, and course-integrated instruction (ACRL, 2015). This would lead to conceptualization in determining when information is needed, when and where to search and locate and how to evaluate and use information, and evidence-based resources in nursing practice. 365 370

It is imperative to start IL concept building at a preclinical level and continue improving throughout the curriculum using evidence-based methodology. This is a paradigm shift from building skills, moving toward the use of threshold concepts to build instructional design activities based on learning outcomes.

Table 5. Information literacy matrix (example): Research as inquiry.

Results	Instruction outline	Learning activities
Construction of a research questions exploring general and specific information sources	Formulating a search questions Reviewing search strategies Searching databases	Locating and analyzing public policy and accepted practices Treatments and/or patient education sources most relevant to a particular condition or disease. Clinical research paper Completion of a search strategy outline

Implementation phase

The way this phase is approached by faculty and librarians is critical. The strategies implemented are those related to identifying needs in information literacy and research appraisal. In this phase, faculty and librarians build a level of competence and certainty that solidifies the effectiveness of a curriculum-integrated information literacy program. The next major decision is to implement learning strategies in the subsequent semesters with a single class or to implement learning strategies at all levels at the same time for preclinical students. It is necessary to establish a novice-to-expert continuum that will address IL and research appraisal competencies, and guide librarians and nursing faculty in designing learning activities.

Librarians and faculty using the plan, the course content outline, and the competencies continuum can design a creative learning experience to build IL competencies and promote nursing practice. Implementation is a formative process, and as a strategy it is integrated into the curriculum, giving rise to other approaches and building an information literacy teaching strategies bank.

Librarians and faculty in the implementation phase draw together an information literacy matrix or outline to meet the core concepts of the FRAMEWORK (ACRL, 2015). An example of the matrix is presented in Table 5. An additional column can be added to include the corresponding nursing course and other learning activities.

Evaluation phase

This curriculum-integrated initiative should be appropriately evaluated in terms of program outcomes. The preparatory phase defines the needs assessment that measures and describes student's knowledge and competencies to identify and make the necessary adjustments. It would be ideal to have pre- and posttesting as a reliable tool to identify the gaps in information literacy and research appraisal competencies. Students are surveyed at the beginning of the program, and the data are compared with evaluative measures of seniors and/or graduates maybe 6 months after graduation. These valuable data will guide future program development and assure the success of the IL program. Because this is a collaborative initiative, focus groups offer excellent qualitative data to adjust the program. Feedback from faculty members is essential because they monitor the changes in students' behavior toward the use of information and their own progress in IL.

As a result of being involved in clinical practice, students can motivate change in concordance with how research is utilized in the clinical environment. It is vital to acknowledge that students who do research on a regular basis will master critical thinking and clinical reasoning. The data obtain in this phase are used to improve the learning cycle and obtain better outcomes. The target is to achieve students who are information literate and lifelong learners.

Conclusion

The acceptance of information literacy competencies as an essential attribute of undergraduates is widely recognized. Adopting the FRAMEWORK gives librarians the opportunity to have a greater and more active role as instructors in IL education. Librarians' identity as instructors will inspire the

use of a collaborative model to encourage and support faculty in setting up learning experience to achieve learning outcomes. These outcomes will have a positive impact in securing that nursing students obtain the necessary competencies to become effective lifelong learners.

Collaboration is an essential part of the success of the model and will contextualize instruction to promote learning and avoid the fragmentation of IL. The integration of IL into the curriculum should empower nursing students to learn competencies and understand the threshold concepts of the FRAMEWORK. Students will be able to include evidence-based information in the learning process to become critical thinkers and have their decision-making process boosted by the adequate use of information.

According to Rockman (2004, p 66) "Information literacy is no longer just a library issue, an institution issue, or an American issue," it has become a world issue. All around the world an information-literate professional can contribute more to economic productivity and societal well-being. This is also a new instructional pedagogy and a change agent for learning. Only by working with educational stakeholders can librarians, faculty, and administrators achieve information literacy goals. This instruction requires a paradigm shift from teaching one-time courses to a pedagogy in which IL and evidence-based information are reinforced, requiring students to build their knowledge and competencies along a novice-to-expert continuum throughout their educational process.

Information literacy programs in libraries can't be limited to an instructional process and must be more involved in the research process across the curriculum. It is no secret that IL programs in libraries are not enough and do not put students on the track to become lifelong learners. This is particularly true in nursing, where students should be able to adjust, update, and learn a new body of knowledge constantly to improve patient outcomes.

Overall, students must be information literate to use information effectively. If students can use information, they can function effectively in their academic activities. Regardless of the model used, the integration of IL into a nursing curriculum depends on the level of partnership librarians and faculties have to teach students IL competencies. When students have mastery over IL, librarians and faculty have accomplished their goal as educators. The challenge then is to teach IL competencies to nursing students, giving them strategic advantage in the use of information. Building lifelong learners and forming highly productive professionals with a knowledgeable understanding and utilization of information should be the ultimate goal.

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