Integrating Information Literacy into Your Curriculum
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Today I am here to talk with you about how to integrate information literacy into your curriculum. What I plan to do in this short course is to:

- define information literacy (IL)
- discuss information-seeking behaviors of millennials and practicing clinicians
- relate IL to accreditation and speech-language pathology (SLP) standards
- describe the connection between IL and evidence-based practice (EBP)
- describe how to promote IL in the curriculum

Defining Information Literacy

Let's start with a definition. The American Library Association (ALA) defines information literacy (IL) as "a set of abilities requiring individuals to *recognize* when information is needed and have the ability to *locate*, *evaluate*, and *use* effectively the needed information" (American Library Association, 1989). Note the emphasized words (here in italics) are to *recognize*, *locate*, *evaluate*, and *use* information. As we will soon see, the skill of evaluating information is a particularly important focus.

Many people tend to confuse IL with computer literacy, thinking that there are one and the same. They are related, but there are a number of components and skills that comprise information literacy (UMUC, 2005). **Library literacy** involves being knowledgeable about what resources may be found in the library in print, microfilm, or other formats as well as the electronic resources found online and within databases. **Computer literacy** is also a component of IL in that as information and resources increasingly become electronically available, basic knowledge and skill of how to use a computer are essential. An essential but often overlooked area of IL that is getting increasing attention of late is **critical thinking skills**. Information-seekers must be able to determine which resources are the best for their information need, not just those that are the most convenient (e.g., full-text articles online through a database or the open Internet). The search for information should also be in response to solving a problem or answering a question rather than just trying to gather whatever information can be found on a topic. Finally, IL focuses on acquiring **lifelong learning skills**. There is a need to find information for a wide variety of purposes throughout one's life whether for personal needs, health or medical needs, research, or practical job-based needs. In health-related fields (among others), the application of IL to evidence-based practice (EBP) is receiving emphasis for performing one's job effectively. Regardless of the purpose, the need for information continues throughout a person's lifetime.

In preparing students and practicing clinicians to be information literate, it's helpful to have some understanding about the abilities and needs of the people we are

teaching or training. The following sections will shed some light on our current students and provide a snapshot of the practicing clinicians in the field.

The Millennial Generation

The students we currently have in our university programs have been termed the Millennial Generation. What distinguishes the students of this generation from those past? According to Holliday and Li (2004), they were born after 1982 (or some say between 1980 and 2000). They grew up with computers and tend to have extensive experience using the World Wide Web as a primary source of information. However, their way of accessing information is often through a search engine (e.g., Google, Alta Vista) that combs the open Internet. With this familiarity, they expect all search engines to be like Google. So, while they may be savvy in terms of computer literacy and navigating the Web, they tend to have little knowledge about how information is produced, organized, and disseminated. This is where specific training in IL becomes valuable.

Dan Ream, a librarian at the Virginia Commonwealth University, developed an informative and humorous video where he asked a series of questions about information literacy to students and to a sampling of other library users (Ream, 2002). To get a feel for what undergraduate students said, I have extracted some sample quotes. When asked, "Are you information literate?, some responses were:

- "It depends on the topic…it's usually easier for me to get on the Internet and find what I need to find by using Google, Alta Vista, and AOL."
- "…some sources are very hard to tell whether it's good information or not…"
- "I know where information is. I don't always choose to use some of those sources."

These quotes illustrate the points made by Holiday and Li that general Internet search engines tend to be their primary information source and that they know much less about how information is produced, organized, and disseminated, making it very difficult for them to evaluate what they are finding.

A second question was, "Where did you get the IL skills you have? (Ream, 2002). Some responses were:

- "Trial and error, just playing with the computer, surfing the Internet."
- "My parents…they were overachievers."
- "Usually I go to my professors or teachers and they tell me where to go."
- "Some from my freshman year in my 101 class."
- "I always use librarians. They are the best way to get information the quickest."

From these responses, you get a feel for the range of ways in which students learn about information. Given what we know about the millennial generation, I'd be willing to bet that the majority of them turn to the trial and error form of searching the open Internet or ask someone they know.

Research Behaviors of Millennials

In order to better learn the information-seeking behavior of undergraduates, Holliday and Li (2004), conducted a literature review of undergraduate attitudes and information behavior and did a qualitative study of 35 undergraduates. The study was designed to replicate Kuhlthau's classic study on the information search process (ISP) which was developed in the 1980's and 1990's. The study involved having the students in introductory and intermediate English classes to write three short statements describing their information seeking process at the beginning, middle, and end of their research process. Preliminary and suggestive findings were:

- Finding a topic caused the most confusion, uncertainty, and anxiety at the onset of doing research.
- The first information found often determined their direction without further exploration or thought.
- Few students conducted a comprehensive search using many kinds of information sources.
- Students did not seem to have a good sense of closure.
- Many students started writing their papers the night before it was due, motivated by assignment requirements.
- Few students asked librarians for help.

The Good, the Bad, and the Ugly of Information Use

In summary, we could say that given this preliminary knowledge about the information-seeking behaviors of undergraduate students, the good news is that students are skilled with using technology. The bad is that students are less skilled with critical thinking or questioning as part of the research process. The downright ugly is that electronic access may promote copying and pasting – plagiarism!!!

I will address a little later how we can deal with the problems of IL. Before we do, let's take a look at some preliminary data on the information-seeking behaviors of practicing clinicians.

The Practicing Clinician

Nail-Chiwetalu and Ratner (2005) are currently conducting a research study on the information-seeking behaviors of practicing speech-language pathologists through a grant obtained by the University of Maryland Libraries, College Park. A survey was sent to 1000 ASHA members chosen at random from across the United States. From the current return rate of approximately 30%, some preliminary analysis of this initial data indicates that:

- For professional information, most SLPs consult their personal library, the Internet, and personal contacts.

- 36% searched MEDLINE; most other proprietary databases were not used
- 68% have consulted a Web site for clinical case; 40% consult the Web regularly
- 51% said lack of time to search and read the literature was the greatest barrier to EBP

These findings are not surprising and are quite consistent with the literature that describes information-seeking behavior of physicians, occupational therapists, and other health professionals. We hope to present the study in its entirety at the ASHA conference in San Diego in November 2005. So, stay tuned for more complete findings to come.

What Can We Do?

Now that we are aware of some of the challenges that are before us in the training and implementation of EBP, what can we do? I say it's time that we collaborate and integrate!! As Gandhi (2003) stressed that "…faculty-librarian collaboration is absolutely the most effective way to integrate information literacy into the curriculum"(p. 409)

Next, let's take a look at some reasons why we should be concerned about giving more attention to IL in the curriculum, some models for how professors and librarians may collaborate in this process, and specific strategies we can use to integrate IL into the curriculum.

Accreditation, SLP Standards, and Information Literacy

Accreditation agencies are now including language in their standards to stress the importance of information literacy skills being taught in colleges and universities. For specific language regarding the teaching of information literacy from the Middle States Association of Colleges and Schools (MACS), the Northwest Association of Schools and Colleges (NASC), the North Central Association of Colleges and Schools (NCACS), the New England Association of Schools and Colleges (NEASC), the Southern Association of Colleges and Schools (SACS), and the Western Association of Schools and Colleges (WASC), see the American Library Association (ALA) Web site at: http://www.ala.org/ala/acrl/acrlissues/acrlinfolit/infolitstandards/infolitaccred/accreditation.htm

As one example, taking a look at the language in the documentation from MACS (noted on the ALA Web site) which examines the whole institution rather than specific programs, they stress:

- "collaboration between professional library staff and faculty in teaching and fostering information literacy skills in the curriculum" (Characteristics…, p. 34)
- "evidence of information literacy incorporated into the curriculum with syllabi, or other materials…describing expectations of students' demonstration of information literacy skills" (Characteristics…, p. 35)

- "assessment of IL outcomes, including assessment of related learner abilities" (Characteristics…, p. 35)
- "programs that support student use of information and learning resources" (Characteristics…, p. 35)
- "the institution's curricula are designed so that students acquire and demonstrate college-level proficiency in…critical analysis and reasoning, technological competency, and information literacy" (Characteristics…, p. 37)

Clearly, IL is becoming an important and recognized area in higher education in terms of collaboration between librarians and faculty, integrating IL into the curriculum, assessing IL outcomes, and ensuring that critical analysis is a component of IL competency. There is evidence as well for the need to incorporate IL in the field of communication disorders.

Starting on January 1, 2005, the standards for clinical competence in speech-language pathology brought a new focus to the importance of evidence-based practice (EBP) (ASHA, 2004). Specifically, Standard IIIF states that students "… must demonstrate knowledge of processes used in research and the integration of research principles into evidence-based practice" (p. 6). In its implementation, this means that students must know how to "access sources of research information and have experience relating research to clinical practice" (p. 7). Information literacy is inherent in EBP. Let's take a closer look at how the two relate.

IL and Evidence-Based Practice

First, it's important to be mindful of the rapidly changing landscape of technology in general, which strongly impacts how we are and will be accessing information in the future. Along with the rapid changes in information technology, the availability of information is exploding. I frequently hear from professors that it has become difficult for them to keep up with their own specialized area within a field because the availability of information is so voluminous.

While the technological advances overall help to make our ability to access information easier, we are now having to become informed about and navigate free resources (e.g., Google Scholar, http://scholar.google.com/) that compete with fee-based resources (e.g., proprietary databases such as ERIC or PsycInfo). Effective search skills are necessary to navigate this range of electronic resources.

Probably the most neglected area of skill development in IL and a critical piece to EBP is the need to know how to evaluate the evidence once found. Evaluation is essential to effective information use. With the preponderance of online resources, it becomes even more essential for students and clinicians to have the skills to carefully evaluate what they are finding.

How Can IL Be Promoted?

So, what can we do to incorporate IL into our curricula? The following discussion will stress four main areas, which include:

- cultivating collaboration between professors and librarian subject-specialists
- using the *Information Literacy Competency Standards for Higher Education* in conjunction with the SLP Standards
- integrating information literacy standards into activities, assignments, courses, and curriculum
- assessing skills learned.

Collaboration between Professors and Subject-Specialist Librarians

Collaboration needs to be based on shared goals and carefully defined roles. Professors spend much more time with students and understand their strengths and weaknesses. They also are experts in the content to be taught. What librarians bring to the mix is the knowledge of information skills, methods to integrate IL into courses, pedagogical knowledge for teaching these skills, and knowledge of student's frustrations with the research process. Librarians see students when they are in the research process and when they are having trouble. Librarians gain valuable insight into what the students *are* learning and what they *are not* fully comprehending from classroom instruction.

Professors may wonder how to best include librarians in their instructional process. Grim, Scott, Gustafson, Vaughan, & Comer (2003) suggest three different models of librarian involvement that may be seen as lying along a continuum. These are consultant, consultant/instructor, and team teacher. Each of these will be described briefly.

Librarian as consultant. A librarian may be consulted for things such as syllabus planning, assignment design, assessment design, and creating Web sites. Web sites created by librarians may include, for example, course-related Web pages (e.g., http://www.lib.umd.edu/MCK/hesp407.html) which list and link resources to support assignments in a particular course and provide an online tutorial for the research process. Typically, these course pages are used in conjunction with one or more library instruction sessions for a particular course and then are posted on the libraries' Web site for access by students while they complete the assignments. However, they may also be created to support assignments without direct instruction. Another example of Web page support is what we call at the University of Maryland Libraries, Guides to Information Resources (e.g., http://www.lib.umd.edu/MCK/GUIDES/health_statistics.html). These are guides to electronic and non-electronic resources on a specific topic, which in this example is health and medical statistics on the Internet. Topics that are particularly salient or difficult to navigate on one's one are often chosen to be guides that are free-standing on the libraries' Web site. Such a guide could be created for an academic department to support, for example, grant-writing and be used in multiple classes.

Librarian as consultant/instructor. A librarian may be considered as a consultant and an instructor, incorporating any or all of the tasks above as well as teaching up to

several class sessions, using pre-existing Web sites, or creating assignments, assessment instruments, Web sites, or tutorials to accompany teaching.

Librarian as team teacher. A librarian may be incorporated even more fully into a course by doing any of the above tasks in either of the two models outlined above and performing additional in-class observation (e.g., when students are giving presentations based on research conducted), having more opportunities to participate in the teaching of the course (not just a one-shot library instruction session), and being more involved in the design, implementation, and reviewing of course assignments. Their range of activity might include teaching three or more classes to observing or participating in half or all of the class sessions. This level of involvement is not always necessary or practical given the multitude of tasks and activities that comprise a librarian's job. However, it does offer some options to consider when applicable and deemed helpful.

Some initial steps you may take in collaborating with your librarian may be to:

- ask a librarian to review an assignment for potential barriers to students.
- check the library's Web site for research guides developed by librarians.
- ask the librarian to teach IL skills in a course with a significant research component.
- invite the librarian to join the curriculum committee in the department.

Use the Information Literacy Competency Standards for Higher Education in Conjunction with the SLP Standards

The *Information Literacy Competency Standards for Higher Education* were developed by the Association for College and Research Libraries (ACRL) in 2000. They contain standards, performance indicators, and outcomes for teaching information literacy. Nan Bernstein Ratner and I talked about the five standards in detail in our presentation at CAPCSD a couple of years ago. For further information see Nail-Chiwetalu & Ratner (2003). Also, a copy of the complete standards may be found at the ACRL Web site at http://www.ala.org/acrl/ilcomstan.html . For those who were unable to attend the presentation, following is a very brief overview of the standards to serve as a foundation for the discussion that follows on implementation.

1. **The student determines the nature and extent of information needed.**

   - ✓ defines and articulates the need for information
   - ✓ identifies the types and formats of potential sources of information
   - ✓ determines the costs and benefits of acquiring needed information

2. **The student accesses needed information effectively and efficiently.**

   - ✓ selects the most appropriate investigative methods or information retrieval systems

- ✓ appreciates what types of information are available through chosen databases
- ✓ appreciates what search language or parameters will be required in the search command
- ✓ identifies key words, synonyms, and related terms appropriate to the discipline and question

3. The student evaluates information and its sources critically and incorporates selected information into his/her knowledge base and value system.

- ✓ critically evaluates information and sources
- ✓ incorporates only selected information into final product

4. The student individually, or as a member of a group, uses information effectively to accomplish a specific purpose.

- ✓ synthesizes information and compares it with prior knowledge

5. The student understands many of the economic, legal, and social issues surrounding the use of information and accesses and uses information ethically and legally.

- ✓ plagiarism

Integrate Information Literacy Standards into Assignments, Activities, Courses, and Curriculum

Students. In thinking about how to go about integrating the IL standards into activities within the curriculum, it may be helpful to consider our students' learning preferences. In the workplace, millennial learning preferences include: teamwork, use of technology, structure, entertainment and excitement, and experiential activities (http://www.generationsatwork.com/millennials.htm) . These preferences may be incorporated into the design of assignments and activities.

Principles of developing IL skills. In thinking more specifically about the *IL behavior* of students, Cheney (2004) reported on some additional characteristics that are helpful to keep in mind when preparing activities or assignments that incorporate IL.

- Students tend to fall back on prior knowledge when not instructed to use specific methods or tools.
- Students need specific and detailed feedback about which sources are appropriate or inappropriate and why.
- Students need to practice information gathering over and over with gradual stages of complexity.

From these characteristics, it is clear that there is a need for explicit IL instruction. These principles may be applied to the integration of IL into activities, assignments, courses, or the entire curriculum. Next, I will talk about some specific ideas on how to do this for each of the levels.

How to integrate IL into an activity. The ACRL Web site lists three simple steps for integrating IL into a classroom activity (ACRL, 2004). First, you need to review the objectives of the activity. Next, review the learning outcomes for each of the IL Standards. Finally, select the Standards that match the objectives. An example of this process is as follows.

- **Activity Objective:** Students will investigate options before selecting a topic for their research paper.
- **IL Standard One:** KNOW; Outcome 1C: Explores general information sources to increase familiarity with the topic.
- **Activity:** In collaboration with a librarian, the instructor develops a set of "quests" to allow students to break down broad topic and explore subtopics in groups of 2-3 students. Under the guidance of the librarian in searching general sources, the groups search for information about their subtopics and then report back to larger group about the sources they used and what they learned about them.

How to integrate IL into assignments. Creating effective library assignments is critical in the learning process. It is not uncommon for professors to develop assignments that have the good intention of requiring the students to get into the library and use library resources. However, the creation of assignments requires a lot of thought and attention to detail in order to make research a meaningful learning experience and not an exercise in frustration for the students. Some pitfalls to avoid include (UMUC, 2005):

- **"Mob Scene"** – requiring the entire class to use the same information, book, or article
- **"Shot in the Dark"** – giving incorrect or incomplete information to students
- **"Scavenger Hunt"** – asking student to find obscure bits of information
- **"Old Curiosity Shop"** – assigning outdated resources
- **"Elusive Topic"** – assuming students will be able to select their own topics without assistance from faculty or librarians
- **"Lost in Space"** – sending students off on their own to use online resources without providing some instruction and hands-on time with the instructor or librarian present for consultation

In order to avoid common pitfalls, a helpful guide is available on the Internet to facilitate the research experience. See *Creating Effective Library Assignments* (http://www.lib.umd.edu/UES/assignment.html). Stilling (2003) also outlines six steps in designing effective information literacy assignments, which are to:

1. break large assignments into steps or stages.

2. have assignment make use of real-life problems, situations, theory, or practice.
3. specify an audience other than the professor.
4. have students respond to a thesis to develop critical thinking skills.
5. require use of several different sources.
6. provide means for students to learn library skills needed for the assignment.

How to integrate standards into a course. The backward design process is helpful in incorporating specific IL standards into a course (ACRL, 2004). The steps are to first identify what you want the desired results to be. From those results, determine the acceptable evidence. Then you want to plan learning experiences that will result in the desired proficiencies. As mentioned above in the activities section, you then pair course objectives with applicable IL outcomes from the standards. Finally, you design the syllabus and assignments.

In teaching courses, problem-based learning (PBL) has received a lot of recent attention. The principles on which PBL are based are (Maklin, 2001) to:

- construct new knowledge on what is already known (Boud & Feletti, 1991)
- develop meaningful learning experiences generated by contemporary, real-life problems
- provide an environment that allows for freedom of thought in creative problem solving
- use open-ended problems but with structure
- use peer mentoring while building individual skills.

The principles of PBL may be incorporated into the teaching of IL skills as well (Maklin, 2001; Carder, Willingham, & Bibb, 2003). First, the facilitator introduces a question to the class. The students analyze the problem for information, both individually and collaboratively. They determine the information need and propose possible solutions for finding the needed information. The facilitator (the librarian) then introduces the students to various information sources through instruction. The students complete the activity by investigating the various information sources to locate information to support their hypothesis. This is one way that librarians can team teach a class with a professor as well.

How to integrate standards into a curriculum / program. Moving now to the curriculum or program level, there are some suggested principles to follow (ACRL, 2004). It is important to invite a librarian to join the curriculum committee to provide input into where in the curriculum and how IL skills may best be incorporated into the curriculum. First, all committee members need to review the entire curriculum. From that review, courses may be identified that lend themselves to teaching IL outcomes. (More on this point will be discussed below.) Attention should be given to seeing where outcomes taught in one course may be reinforced or further developed in courses that follow in a sequence. Another component of the integration is the mesh the IL standards with, for example, the SLP standards (Standard IIIF).

In identifying which courses might be best suited to the integration of IL, consider a/an (Junn, Cox, Szeszulski, & Reisman, 2003):

- early entry core course
- senior level capstone course
- part of an incremental course sequence
- course required for graduation
- course that is frequently offered
- assignment components can be framed in terms of specific skill-building tasks
- course containing transferable skills (generic or discipline-specific skills).

Assess Skills Learned

The IL Standards may be used not only for determining what to teach but are also helpful for assessing skills learned. Each standard has a performance indicator and an outcome. The outcomes may be assessed by any of a variety of methods, of which you are probably already familiar. For example, a **worksheet** may be used to teach keyword selection, Boolean connectors, or limiters. **Tutorials and Web-based software** are also becoming more popular, although they require quite a bit more work to develop. An outcomes-based assessment using a **pre- and post-test** is another option. An **annotated bibliography** may be applied to the answering of specific questions. When writing a paper, a **one-page analysis of searching** may be included for credit as part of the paper. One increasingly popular assessment method with librarians is having the students complete a **research journal** accompanying a paper. Details about what resources they used (e.g., databases, Google, reference book, catalog), search terms used or procedure followed, and an evaluation of what resulted (e.g. number of "hits" in a database search, evaluation of usefulness, adjustments for next search), can provide some rich information in determining what skills have been acquired and specifically where the students are having trouble. In this way, skills may be built over the course of a program.

Tackling Plagiarism

As searching for information becomes increasingly "convenient" with, for example, full-text articles available at the touch of a button, Google Scholar finding scholarly papers, and increased posting of information on professional Web sites, students increasingly need to become proficient in deciphering the origin and quality of what it is they are finding in online searches. Plagiarism, whether intentional or unintentional, becomes all too convenient as well with the easy access to material that can be copied and pasted into word processing document.

Lampert (2004) suggests some ways in which plagiarism may be prevented. First, it is important to educate students directly about what constitutes academic dishonesty (not just including a statement in the syllabus). Students think that they know what plagiarism is but may not be fully clear on the concept. They also tend not to read the syllabus very carefully. Another idea is to develop process-based assignments. Students can be asked to turn in research papers in stages in order to obtain feedback on the research process and

correct problems before the paper is due. (This also prevents students completing the papers at the last minute.) Finally, ask the librarian to infuse a discussion of plagiarism into the IL instruction. This will help to reinforce the importance in understanding what plagiarism is and help in preventing it rather than catching it later. See Nail-Chiwetalu & Ratner (2003) for more specific tools for preventing and catching (e.g., Turnitin.com) plagiarism.

Conclusion

This presentation provided some background information to facilitate awareness of the relationship between IL and EBP. Some tools for integrating IL into all levels of the curriculum were also provided. Emphasis was placed on the need to involve the librarian directly in the process of teaching and truly integrating IL into the content being taught in order to ensure that the students develop the skills useful for successful completion of their degrees, EBP as clinicians, and lifelong learning. As you walk away from this short course today, above all, remember to…collaborate and integrate!!

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