

INFORMATION LITERACY

COURSE CODE: 9204

UNITS: 1-9

STUDY GUIDE

BS-LIBRARY AND INFORMATION SCIENCES

AIOU website: <https://aiou.edu.pk>

LIS Department website: <https://lis.aiou.edu.pk/>

LIS Facebook page: LIS@AIOU official



**Department of Library and Information Sciences
ALLAMA IQBAL OPEN UNIVERSITY**

2019

Compiled by: Dr. Amjid Khan
Reviewed by: Dr. Sajjad Ullah Jan

Program Coordinator
Muhammad Jawwad

Course Coordinator
Dr. Amjid Khan

Table of Contents

Sr#	Content / Title	Page#
1	Course organization	4
2	Course study plan	4
3	Assessment/evaluation criteria	5
4	Course introduction	5
5	Objectives of the course	5
Unit 1	The importance of standards and assessment	7
Unit 2	Integrating the ACRL standards	11
Unit 3	Developing a topic and identifying sources of information	25
Unit 4	Accessing information effectively and efficiently	31
Unit 5	Evaluating information	41
Unit 6	Using information effectively	50
Unit 7	Information, social context, and ethical and legal issues	58
Unit 8	Beyond the standards: what now?	64
Unit 9	Developing and automating information literacy assessment instruments	71

Course Organization

This course has been organized in a way to help you in completing your required course work. There are nine units in this course. Each unit starts with an introduction, which provides an overall overview of that particular unit. The introduction part is followed by objectives in each unit that shows the basic learning purposes. Similarly, the rationale behind these objectives is that after reading unit a student should be able to explain, discuss, compare, and analyze the concepts studied in that particular unit. Hence, this study guide is intended to be a concise appetizer and learning tool in which the course contents are briefly introduced.

This study guide is based on prescribed reading materials. For each unit, these prescribed reading materials have been classified as compulsory readings and suggested readings. Students are bound for studying these materials so as to have successful completion of the course. After the section of 'suggested readings' few self-assessment questions and activities have been put forth for the students. These questions are meant to facilitate students/you in understanding that how much student/you have learned.

For this course, a workshop and tutorial support will be provided as per AIOU policy. So, before going to attend a class, prepare yourself to discuss course contents with your tutor. There will be 70% compulsory attendance in every workshop. After completing the study of first 5 units the 'Assignment No. 1' is due. The second assignment that is 'Assignment No. 2' is due after the completion of next 4 units. These two assignments are to be assessed by the relevant tutor/resource person. Students should be very careful while preparing the assignments because these may also be checked with Turnitin for plagiarism.

Course Study Plan

As you know the course is offered through distance education so it is organized in a manner to evolve a self-learning process in absence of formal classroom teaching. Although the students can choose their own way of studying the required reading material, but advised to follow the following steps:

Step 1: Thoroughly read description of the course for clear identification of reading material.

Step 2: Read carefully the way the reading material is to be used.

Step 3: Complete the first quick reading of your required study materials.

Step 4: Carefully make the second reading and note down some of the points in notebook, which are not clear and needs fully understanding.

Step 5: Carry out the self-assessment questions with the help of study material and tutor guidance.

Step 6: Revise notes. It is quite possible that many of those points, which are not clear and understandable, previously become clearer during the process of carrying out self-assessment questions.

Step 7: Make a third and final reading of study material. At this stage, it is advised to keep in view the homework (assignments). These are compulsory for the successful completion of course.

Assessment/Evaluation of Students' Coursework

Multiple criteria have been adopted to assess students' work for each course, except Research Project/Project, as under.

- (a). Written examination to be assessed by the Examination Department, AIOU at the end of each semester = 70% marks (pass marks 50%). AIOU examination rules apply in this regard.
- (b). Two assignments and/or equivalent to be assessed by the relevant tutor/resource person = 30% marks (pass marks 50% collectively).

All the matters relating to Research Project/Project will be dealt with as per AIOU rules. However, the pass marks for Research Thesis is 50% both in evaluation of research report and viva voce examination separately.

Course Introduction

This course is of three credit hours and contains nine units. The introduction provided at the start of each unit, which summarizes contents within that unit. Students should study this carefully so as to have idea of the syllabi and prepare themselves for the solution of assignments, assessment questions, activities, and final examination. A brief introduction of the whole course is provided in the following paragraphs.

Information literacy has been a topic of much interest both nationally and internationally during the past two decades. Information literacy has been an important factor in the development of librarian-academia partnerships to improve students' learning outcomes. Librarians and academia have worked more closely together in recent times to integrate the teaching of information and technology skills into the entire curriculum. This has been especially significant since the rise of the Internet. As students rely more and more on the electronic environment, they need appropriate information and technology expertise, and librarians together with academician are providing this important instruction.

This study guide provides a much needed resource for assessing the learning outcomes of teaching information skills to students in higher education. There is a real need within the education community to obtain information regarding the assessment of information skills instruction and related learning outcomes.

This study guide also provides a good understanding and basis for information literacy testing based on the ACRL Standards. It provides appropriate background information on information literacy, supplies many valuable references to additional information on assessing the information skills of students, and also provides examples of questions from existing testing instruments. This guide is indeed a much needed publication for the library and education community and a major printed guide to assist librarians and faculty in assessing students' information and technology skills.

Thus, this course has been particularly designed for library and information sciences students with the purpose to prepare them for their future role in electronic environment. The expected learning outcomes of this course include a combination of knowledge, values, attitudes and skills with a particular emphasis on its use in professional as well as daily activities.

Objectives of the Course

After studying this course, the students will be able to understand:

- The importance of standards and assessment integrating the ACRL standards.
- Developing a topic and identifying sources of information.
- Accessing information effectively and efficiently.
- Using information effectively.

- Evaluating information, social context, and ethical and legal issues.
- Beyond the Standards: What now?
- Developing information literacy assessment instruments& automating assessment instruments.

Recommended Readings

1. Neely, T. Y. (2006). *Information literacy assessment: Standards-based tools and assignments*. Chicago: American Library Association. Available at <https://www.pdfdrive.com/information-literacy-assessment-standards-based-tools-and-assignments-d161378855.html>

2. Association of College and Research Libraries. (2000). *Information literacy standards for higher education*. Washington, DC: Author. Available at <https://alair.ala.org/handle/11213/7668>

UNIT NO. 1

INFORMATION LITERACY: WHAT AND WHY

1.1. Introduction

The amount of information available today is increasing rapidly. Information doubles in months rather than years or decades. The wide spread use of the Internet has increased access to information to an extent that was unheard of ago. Certainly, there is more and more information available to students and teachers, and that information is valuable. Teachers must realize and communicate to students an understanding that in today's society, information is viewed as a commodity and, as such, it is bought and sold, like the product of any other business. Educating students to achieve information literacy competence is a goal that must become the heart of the library media program. All students need information literacy skills. To neglect teaching students these skills only widens the gap between the haves and the have-nots.

Ultimately, information literate people are those who have learned how to learn. They know how to learn because they know how knowledge is organized, how to find information in such a way that others can learn from them. They are people who are prepared for lifelong learning, because they can always find the information needed for any task or decision at hand.

Information Literacy is vital to all disciplines and to effective teaching and learning in any institution. The Association of College and Research Libraries (ACRL) which is a division of American Library Association has defined the information literacy that "Information literacy is 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."

1.2. History of Information Literacy

The concept of information literacy has been around for about 30 years but has evolved over time. In 1974 Paul Zurkowski, president of the Information Industry Association, introduced the concept of information literacy and defined it as people trained in the application of information resources to their work. In other words, people use a variety of information tools to mold information solution to problems.

In order to be information literate people needed a new set of skills, including how to locate and use information efficiently and effectively to solve problems and make decisions. Another early definition of information literacy was that it includes all the facts and ideas that one wants at different times for any part of one's life. With this definition, the idea that information literacy contains more than needed facts, and she expanded the definition to include the idea that facts could be used in the areas of work, leisure, and personal interest.

A basic objective of education is for each student to learn how to identify needed information, locate and organize it, and present it in a clear and persuasive manner. Since 1959 the Association of College and Research Libraries (ACRL) has taken the lead in developing standards and guidelines for academic libraries. Nowhere else are standards more critical than during the accreditation process.

In 1988 the American Association of Institute Librarians and the Association for Educational Communications and Technology published *Information Power: Guidelines for Institute Library Media Programs*. Included was a mission statement that defined the role of the library media program in terms of information needs: The mission of the library media program is to ensure that students and staff are effective users of ideas and information. Based on this mission statement, the definition of information literacy as the ability to find and use information was developed.

Ten years later *Information Power: Building Partnerships for Learning* stated a set of information standards for student learning. Those standards outline levels of proficiency, provide examples of where information literacy skills might be needed, and offer content area standards with which information literacy might be integrated.

The International Literacy Year in 1990 defined literacy as the ability to read and use written information, write appropriately in a range of contexts, and recognize numbers and basic mathematical signs and symbols. The *Policy* also widened the definition to include the integration of speaking, listening, and critical thinking (skills) in reading and writing as well as the idea that literacy develops throughout a person's life.

1.3. What Is Information Literacy?

Mention the word literacy, and most people will automatically think "reading," but there are a variety of types of literacy that people must have. Among these are reading, visual literacy, computer literacy, numeracy, media literacy, digital literacy, and information literacy.

The term *information literacy* can mean different things to different people. Lenox and Walker (1993) define information literacy as a person's ability to access and understand a variety of information sources. Loertscher (1996) says that an information literate student is one who is an avid reader, a critical thinker, a creative thinker, an interested learner, an organized investigator, an effective communicator, a responsible information user, and a skilled user of technology tools. Information literacy defined as the ability to find information, translate it into meaning and understanding, and create good new ideas. Thompson and Henley (2000) state that information literacy can be defined as knowing how to learn, or the ability to derive meaning from information.

The Association of Supervision and Curriculum Development (ASCD) defines an information literate student as one who can successfully complete a complex problem solving process that requires him or her to define the need for information, determine a search strategy, locate the needed resources, assess and understand the information found, interpret the information, communicate the information, and evaluate his or her conclusions in view of the original problem.

Doyle's (1994) definition of information literacy focuses on the attributes of an information literate person. She says that an information literate person is one who;

- recognizes that accurate and complete information is the basis for intelligent decision-making;
- recognizes the need for information;
- formulates questions based on information needs;
- identifies potential sources of information;
- develops successful search strategies;
- accesses sources of information, including computer-based and other technologies;
- evaluates information;
- organizes information for practical application;
- integrates new information into an existing body of knowledge; and
- uses information in critical thinking and problem solving.

Librarians in Maryland defined IL that in order for students at all levels to succeed academically, they; "must be able to access, retrieve, evaluate, manage, and use information effectively and efficiently from a variety of print and non-print sources. Information resources are multiplying exponentially, and becoming more diverse, more complex, and more interdisciplinary. Successful students must be information literate, as well as technologically proficient, in order to complete basic coursework and degree requirements".

Many of these definitions have common themes: accessing, locating, evaluating, and using information. Some definitions go further, mentioning the ability to recognize a need for information. Information literate people are those who have learned how to learn. They know:

- How knowledge is organized;
- How to find information;
- How to use information in such a way that others can learn from them.

1.4. Why Information Literacy?

Computer literacy, digital literacy, media literacy, and other types of literacy are all important skills to use in learning. However, the terms should not be used as synonyms for information literacy. Information literacy is the ability to recognize a need, then access, find, evaluate, use, and communicate in formation. This definition has evolved over the years and will continue to change as in formation needs change.

Information by itself is of little value. It is not equal to knowledge. With the adoption of state standards, the ability to think critically and reason has become increasingly important. Unlike library skills, thinking and reasoning are exactly what information literacy instruction ensures. Information literacy is not a program or a technique, but rather a goal that reflects students' abilities to use information. It is mainly about developing understanding and in sight. Information literacy instruction goes beyond memorizing facts to promoting research and understanding, understanding that is demonstrated through projects or products. Students must be involved with the information they find and must connect new information with what they already know. Information literacy skills help students convert information into understanding.

Literacy is about interpretations of information to guide decisions, solve problems, and steer through uncertain, complex futures. Information literacy skills help students filter out information that is not needed. Information literacy can be thought of as combining the familiar library skills (location and access) with the process of learning from in formation (evaluating, using, synthesizing, and communicating). More access to information is not sufficient; students need the critical skills of sorting, evaluating, and using the information available. Instruction that helps students develop a realistic perception of an information system prepares them to be more successful searchers. To achieve proficiency in information literacy, instruction in a research process is needed.

Because literacy depends on information, and because information is expanding at an exponential rate, the mere ability to read and write must be being translated into the ability to read, write, and develop the capacities to understand, absorb, assimilate, and digest images being transmitted electronically, with the added capacity to communicate these images electrographically.

Not only is information expanding rapidly; with the advent of the Internet and the ease of creating Webpages, the accuracy of the information must be questioned. Unlike books and magazines, in which editorial constraints help to ensure the accuracy of the information being presented, anyone can publish a Website. There is no assurance that a Website has accurate information, or that the author knows anything about the subject. Consequently, students must be taught how to determine the value, accuracy, and bias of information.

In order to lead productive, interesting, and stimulating lives, students will need the skills to find, access, evaluate, and communicate information. Information literacy is a set of competencies that will remain with students throughout their lives. Regardless of the definition used, the literature is clear that all students must become information literate to become life-long learners.

1.5. Objectives

After reading this unit you will be able to explain:

- Information Literacy
- Information Literacy Standards
- Information Literacy
- Information Literacy Assessments & Accreditations

1.6. Self-Assessment Questions

Q1. What is Information Literacy? Discuss.

Q2. Define the terms 'standard' and 'accreditations' with justification.

Q3. Information Literacy Assessments is critical for evaluating students' skills. Discuss with relevant examples.

1.7. Activities

- Information Literacy is vital to all disciplines including library and information science professionals, discuss your role as a librarian in the development of *Information Literacy Skills* of graduate students.
- Discuss the role of LIS association in the development of *Information Literacy Models* for academic libraries.

UNIT NO. 2

INFORMATION LITERACY STANDARDS AND ASSESSMENTS

2.1. Introduction

Standards tell educators what the essential learning skills are. Indicators are used to show teachers and library media specialists what to observe or what students should be able to do in order to meet the standards. Some information literacy skills are listed as standards students need in addition to specific subject area knowledge. Information literacy standards include identifying and organizing what is known and not known in a problem; the ability to find information from a variety of sources and be able to assess the quality and reliability of that information; and knowing a variety of notetaking methods for both research and class lectures.

2.2. ACRL Standards

The library profession has long recognized the importance of standards in all aspects of library work. The development and widespread acceptance and use of standards is critical in the assessment of student outcomes, especially for information literacy. Since 1959 the Association of College and Research Libraries (ACRL) has taken the lead in developing standards and guidelines for academic libraries.

It follows that once standards for student learning have been established, the focus logically turns to assessment. Ilene Rockmannotes that “assessment is a process for quality improvement. As such, since libraries are both administrative and academic units, they have an important role to play in the continuous quality improvement goals of their parent organizations. “Assessment for libraries is not a new invention, but for some it may require re-envisioning the library’s role in assessing student outcomes at the institutional level. Libraries involved with student assessment will have to rethink who, what, how, and in many cases where they are assessing in order to satisfy institutional or external requirements.

Ensuring that students are information literate and prepared for lifelong learning is and has long been a key priority for the profession of librarianship. Academic accrediting associations and national discipline specific organizations have begun to lend their weight to the implementation of the ACRL Information Literacy Competency Standards for Higher Education by including information literacy in accreditation guidelines.

The Middle States Association of Colleges and Institutes has taken a leadership role in this regard, stating that “Information Literacy is vital to all disciplines and to effective teaching and learning in any institution. Institutions of higher education need to provide students and instructors with the knowledge, skills and tools to obtain information in many formats and media.”

Currently, there are at least two known large-scale efforts under way to develop and implement objective, standardized survey instruments that will produce results that are comparable across campuses, but their initial findings have not yet been publicly disseminated. Additionally, although a significant amount of information literacy assessment is taking place in library and information science education (for dissertations and theses) and in practice, very few of the survey instruments are based on any one set of standards. In January 2000 the ACRL approved the final version of the standards, which were developed by the ACRL Task Force on Information Literacy Competency Standards. The goal of the task force was to provide a framework to assist and guide the development of information literate individuals. The final product included 5 standards, 22 performance indicators, and more than 100 outcomes intended to provide some insight into the skill set needed during the research process.

The five ACRL Standards are as follows:

1. The information literate student determines the nature and extent of information needed.
2. The information literate student accesses needed information effectively and efficiently.
3. The information literate student evaluates information and its sources critically and incorporates selected information into his or her knowledge base and value system.
4. The information literate student, individually or as a member of a group, uses information effectively to accomplish a specific purpose.
5. The information literate student understands the economic, legal, and social issues surrounding the use of information and accesses and uses information ethically and legally.

2.3. The American Library Association Standards

The American Library Association has expanded the definition of information literacy by explaining the nine standards of information literacy as under:

- accesses information efficiently and effectively;
- evaluates information critically and competently;
- uses information accurately and creatively;
- pursues information related to personal interests;
- appreciates literature and other creative expressions of information;
- strives for excellence in information seeking and knowledge generation;
- recognizes the importance of information to a democratic society;
- practices ethical behavior in regard to information and information technology;

2.4. AASL & AECT Information Literacy Standards

The American Association of Institute Librarians (AASL) and the Association of Educational Communications Technology (AECT) have developed the following nine standards. These standards are categorized under three headings: Information Literacy, Independent Learning, and Social Responsibility. Each heading contains three standards:

- Information literacy Standards.
- The student who is information literate accesses information efficiently and effectively.
 - The student who is information literate evaluates information critically and competently.
 - The student who is information literate uses information accurately and creatively.

Independent Learning Standards

- The student who is an independent learner is information literate and pursues information related to personal interests.
- The student who is an independent learner is information literate and appreciates literature and other creative expressions of information.
- The student who is an independent learner is information literate and strives for excellence in information seeking and knowledge creation.

Social Responsibility Standards

- The student who contributes positively to the learning community and to society is information literate and recognizes the importance of information to a democratic society.
- The student who contributes positively to the learning community and to society is information literate and practices ethical behavior in regard to information and information technology.
- The student who contributes positively to the learning community and to society is information literate and participates effectively in groups to pursue and generate information.

2.5. ACRL Psychology Information Literacy Standards

The Education and Behavioral Sciences Section of ACRL has charged the Psychology Information Literacy Working Group to create standards for undergraduate psychology students. As a result, the following standards, henceforth referred to as the *ACRL Psychology Information Literacy Standards*, map the ACRL general *Information Literacy Competency Standards for Higher Education* into the domain of Psychology. The standards will be useful for psychology liaison librarians as a tool to organize information literacy skills instruction and as a foundation for library/faculty collaboration.

The main purposes of the *ACRL Psychology Information Literacy Standards* are to:

- Help psychology liaison librarians and psychology faculty design the content of information literacy instruction for students in psychology.
- Make possible an evaluation of the information literacy skills of psychology students by delineating competencies that should be assessed.
- Encourage psychology liaison librarian and psychology faculty collaboration in the teaching of information literacy as a component of research methods in psychology.

Standard One

The information literate psychology student determines the nature and extent of the information needed.

Performance Indicators:

- Defines and articulates the need for information.
- Identifies and articulates a topic of interest.
- Determines with psychology faculty whether research, diagnostics, practice guidelines, statistics, or other types of information are needed.
- Understands basic research methods and scholarly communication patterns in psychology necessary to select relevant resources.
- Understands the traditional production flow of scholarly communication in psychology from primary to secondary sources.
- Understands basic research methods in psychology research, including research design, data analysis, and interpretation. Example: Distinguishes between an empirical study and a literature review.
- Understands the role of peer review in journal articles. Example: Understands the difference between a peer reviewed article and an article selected by an editor.
- Understands the expanding role of the Web in scholarly communication for selecting appropriate Web sources.
- Understands the principles of privacy, confidentiality, and other ethical issues related to research methodology in psychology.
- Recognizes the difference between scholarly research and popular sources of information.
- Understands the costs and benefits of acquiring the needed information.
- Understands that scholarly material can be obtained beyond local library holdings. Example: Uses interlibrary loan.
- Defines a realistic overall plan and timeline to acquire and analyze the needed information.
- Consults with librarians before paying for information and recognizes that different institutions throughout the world offer different sources for fee-based information.

Standard Two

The information literate psychology student accesses needed information effectively and efficiently.

Performance Indicators:

- Selects the most appropriate sources for accessing the needed information. Identifies and selects appropriate sources for locating relevant books.
- Identifies and selects appropriate article databases. Recognizes the difference between discipline-specific databases and aggregate databases when using library resources. Example: Identifies databases with significant content for psychology, such as PsycINFO™ and MEDLINE™.
- Incorporates relevant Web search engines and government sources into scholarly research. Examples: Uses Google Scholar™ and PubMed™.
- Knows and complies with local, state/provincial, and federal laws and institutional rules on access to information resources.
- Consults additional resources with cross-cultural, international, or interdisciplinary content when appropriate.
- Constructs and implements effectively-designed search strategies.
- Uses appropriate psychological terminology for searching databases, recognizing the different effects of using keywords, synonyms, and controlled vocabulary from the database. Example: Uses online thesaurus in PsycINFO™.
- Creates and uses effective search strategies in relevant databases using advanced search features, such as Boolean operators, truncation, and proximity searches. Example: Uses (adolescen* OR teen) AND episodic memory.
- Retrieves scholarly journals, books, and sources appropriate to the inquiry. Example:
- Understands how to retrieve online journal articles and how to locate journals in the periodical stacks.
- Seeks out knowledgeable individuals in the library and academic department as part of the search plan. Example: Makes appointment with the library psychology subject specialist.
- Assesses results to ascertain if there are information gaps and revises or expands search strategy as necessary.
- Effectively organizes and credits information sources.
- Identifies and systematically records all relevant citation information for future use. Examples: Utilizes vendor storage space on MyEBSCOhost™; Exports to RefWorks™ bibliographic manager.
- Produces accurate citations and reference lists using the most current documentation style of the American Psychological Association.
- Demonstrates respect for intellectual property rights by accurately giving credit to the words and ideas of others.

Standard Three

The information literate psychology student evaluates information and its sources critically and incorporates selected information into her or his knowledge base.

Performance Indicators:

- Summarizes the main ideas to be extracted from the information gathered and synthesizes to construct new ideas.
- Selects the main ideas from resources and paraphrases or identifies verbatim material to be quoted.
- Recognizes interrelationships between research results and psychological theories and combines information to produce new ideas with supporting evidence. Example: Indicates that research supports or contradicts a psychological theory.
- Recognizes that existing information can be combined with original thought, and/or analysis to produce new information and insights into behavior and mental processing.

- Combines critical and creative thinking, implementing the scientific approach to solve problems related to behavior and mental processes.
- Examines and compares information from various sources in order to evaluate reliability, validity, accuracy, authority, timeliness, and point of view or bias. Example: Compares results from a traditional literature review and a meta-analysis.
- Recognizes the strengths and weaknesses of different research methods. Example: Understands the difference between quantitative and qualitative research.
- Understands the need to weigh the evidence and tolerate ambiguity.
- Understands what constitutes valid evidence and recognizes prejudice, deception, bias, or manipulation. Example: Understands how to recognize or apply the correct statistical tools for a problem.
- Recognizes, understands, and respects the complexity of socio-cultural and international diversity. Example: Compares the concept of intelligence cross-culturally.
- Understands the political and social issues of censorship and freedom of speech as they relate to psychological research. Example: Understands the political implications of research examining gender, ethnic, or racial differences.
- Compares new information with prior knowledge to determine its value, contradictions, or other unique characteristics.
- Demonstrates familiarity with the relevant concepts, theoretical perspectives, empirical findings, and historic trends in psychology.
- Documents the information seeking process to explain and evaluate the new information gathered.
- Evaluates the information collected by comparing it with other sources and current theoretical knowledge; considering such things as the limitations of the research instruments and samples available for study. Example: Student interested in rural mental health care notices that most articles deal with urban mental health care.
- Draws conclusions based upon information gathered and integrates new information with previous information. Seeks expert opinion from instructor or other subject specialist to validate the research results and interpretation of the information.
- Extends information query based on new information when necessary. Example: Student expands search on therapeutic tools to include virtual reality therapy after finding a citation discussing this new area.
- Outlines future research suggested by new information.

Standard Four

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

Performance Indicators:

- Applies new and prior information to the planning and creation of a particular project, paper, or presentation.
- Organizes the content in a manner that supports the purposes and format of the product. Example: Creates a draft or an outline on new treatments for Asperger Syndrome.
- Integrates the new and prior information, including quotations and paraphrasing with relevant citations to authors of original ideas and information; includes reference section. Example: Correctly cites sources using APA format.
- Accurately represents team member contributions in collaborative projects.
- Communicates the product effectively to others.

- Chooses a communication medium and format that best supports the purposes of the product or presentation and the intended audience. Example: Prepares a poster on effects of ethics on classroom behavior for a regional conference.
- Uses appropriate information technology applications in creating the product or presentation. Example: Creates PowerPoint™ presentation on attention deficit disorder with hyperactivity (ADHD) in adults for class assignment.
- Demonstrates an understanding of intellectual property, copyright, and fair use of copyrighted material and posts permission granted notices as needed.

2.6. The National Forum on Information Literacy (NFIL)

The National Forum on Information Literacy (NFIL) has developed Information and Communication Technology Literacy Maps (ICTLM) to show how literacy intersects with core academic subjects. These are skills students need to enter the workplace:

1. Information and Communication Skills:

- Information and Media Literacy: Analyzing, accessing, managing, integrating, evaluating and creating information in a variety of forms and media. Understanding the role of media in society.
- Communication Skills: Understanding, managing and creating effective oral, written and multimedia communication in a variety of forms and contexts.

2. Thinking and Problem solving Skills:

- Critical Thinking and Systems Thinking:
- Exercising sound reasoning in understanding and making complex choices, understanding the interconnections among systems.
- Problem identification, formulation and solution: Ability to frame, analyze and solve problems.
- Creativity and intellectual curiosity: Developing, implementing and communicating new ideas to others, staying open and responsive to new and diverse perspectives.

3. Interpersonal and Self-Directional Skills:

- Interpersonal and collaborative skills: Demonstrating teamwork and leadership; adapting to varied roles and responsibilities; working productively with others; exercising empathy; respecting diverse perspective.
- Self-Direction: Monitoring one's own understanding and learning needs, locating appropriate resources, transferring learning from one domain to another.
- Accountability and Adaptability: Exercising personal responsibility and flexibility in personal, workplace and community contexts; setting and meeting high standards and goals for one's self and others; tolerating ambiguity.
- Social Responsibility: Acting responsibly with the interest of the larger community in mind; demonstrating ethical behavior in personal, work place and community contexts.

2.7. Information Literacy Standards for Anthropology and Sociology/Social Science and Humanities Students

The ANSS Instruction and Information Literacy Committee's Task Force on IL Standards and the members of the American Sociological Association (ASA) and American Anthropological Association (AAA) prepared the following IL standard. It has been approved by ACRL. The main purposes of the ANSS IL standards are to:

- provide a common ground for faculty to work with librarians in helping students become more critical researchers and to offer faculty a basis for integrating the outcomes into their courses.

- help librarians design the content of instruction for students and plan information literacy initiatives in anthropology and sociology.
- make possible an evaluation of the information literacy skills of anthropology and sociology students by providing standards and competencies to assess.

I. Standard One – Know what kind of information is needed

What the student needs to do: Define and articulate the information need.

II. Standard Two – Access needed information effectively, efficiently, and ethically

What the student needs to do: Select the most appropriate sources and databases for accessing and obtaining the needed information.

III. Standard Three – Evaluate information and its sources critically; Incorporate selected information into knowledge base and value system

What the student needs to do: Summarize the main ideas to be extracted from the information gathered and synthesize main ideas to construct new concepts.

IV. Standard Four – Use information effectively and ethically to accomplish a specific purpose

What the student needs to do: Apply new information and research results to the planning, creation, and revision of a particular project, paper, or presentation.

2.8. Information Literacy Standards for Science and Engineering/Technology

Information literacy in science, engineering, and technology disciplines is defined as a set of abilities to identify the need for information, procure the information, evaluate the information and subsequently revise the strategy for obtaining the information, to use the information and to use it in an ethical and legal manner, and to engage in lifelong learning. Information literacy competency is highly important for students in science and engineering/technology disciplines who must access a wide variety of information sources and formats that carry the body of knowledge in their fields. These disciplines are rapidly changing and it is vital to the practicing scientist and engineer that they know how to keep up with new developments and new sources of experimental/research data.

Science, engineering, and technology disciplines require that students demonstrate competency not only in written assignments and research papers but also in unique areas such as experimentation, laboratory research, and mechanical drawing. The field of mathematics is not included in the standards.

Based on the ACRL Information Literacy Competency Standards for Higher Education with the association of *ALA/ACRL/STS Task Force on Information Literacy for Science and Technology*, five standards and twenty-five performance indicators were developed for information literacy in Science & Engineering/Technology. Each performance indicator is accompanied by one or more outcomes for assessing the progress toward information literacy of students of science and engineering or technology at all levels of higher education.

I. Standard One

The information literate student determines the nature and extent of the information needed.

Performance Indicators

The information literate student:

- Defines and articulates the need for information.
- Identifies and/or paraphrases a research topic, or other information need such as that resulting from an assigned lab exercise or project.
- Consults with instructor/advisor for appropriateness of topic, research project, or laboratory exercise question.
- Develops a hypothesis or thesis statement and formulates questions based on the information need.

- Explores general information sources to increase familiarity with current knowledge of the topic.
- Defines or modifies the information need to achieve a manageable focus.
- Identifies key concepts and terms that describe the information need.
- Identifies a variety of types and formats of potential sources for information.
- Identifies the purpose and audience of potential resources (e.g. popular vs. scholarly, current vs. historical, external vs. internal, primary vs. secondary vs. tertiary).
- Considers experts or other researchers as potential information resources.
- Identifies the value and differences of potential resources in a variety of formats (e.g., multimedia, database, website, data set, patent, Geographic Information Systems, 3-D technology, open file report, audio/visual, book, graph, map).
- Realizes that information may need to be constructed with raw data from primary sources or by experimentation.
- Recognizes that potentially useful information or data in a variety of formats may be proprietary, have limited access, or may be freely available online.
- Recognizes that potentially useful information may require specific data management expertise and that an understanding of the structure of organizations involved in producing the information aids in the identification of that information.
- Has a working knowledge of the literature of the field and how it is produced.
- Knows how scientific, technical, and related information is formally and informally produced, organized, and disseminated.
- Recognizes that primary, secondary, and tertiary sources vary in importance and use with each discipline.
- Is aware of the professional associations of the field and their literature.
- Is knowledgeable of sources that are specific to the field, e.g. manuals, handbooks, patents, standards, material/equipment specifications, current rules and regulations, reference material routinely used in industry, manuals of industrial processes and practices, and product literature.
- Recognizes that knowledge can be organized into disciplines and combinations of disciplines (multidisciplinary) that influence the way information is accessed and considers the possibility that the literature of other disciplines may be relevant to the information need.
- Recognizes the value of archival information, recognizes how its use and importance may vary with each discipline, and recognizes the importance of preservation of information.
- Considers the costs and benefits of acquiring the needed information.
- Determines the availability of needed information and makes decisions on broadening the information seeking process beyond locally held resources. Some examples would be consulting with colleagues, independent information brokers, experts, and consultants in the field in addition to using interlibrary loan, nearby libraries, and information centers.
- Recognizes that there may be a trade-off between the value of the information and the time and cost to obtain it.
- Formulates a realistic overall plan and timeline to acquire the needed information.
- Recognizes the importance of a variety of information research areas that can be used to gain competitive advantage, track new products, improve processes, and monitor competitors and their marketing strategies. Some examples would be consulting with experts and consultants in a field, research into licensing opportunities, and patent and intellectual property research.
- Recognizes that information needed may be in a foreign language and that translation may be necessary.

II. Standard Two

The information literate student acquires needed information effectively and efficiently.

Performance Indicators

The information literate student:

- Selects the most appropriate investigative methods or information retrieval systems for accessing the needed information.
- Identifies appropriate investigative methods (e.g., literature search, laboratory experiment, simulation, fieldwork).
- Investigates the scope, content, and organization of information retrieval systems.
- Selects efficient and effective approaches for accessing the information needed from the investigative method or information retrieval system.
- Constructs and implements effectively designed search strategies.
- Develops a research plan appropriate to the investigative method.
- Identifies keywords, synonyms and related terms for the information needed and selects an appropriate controlled vocabulary specific to the discipline or information retrieval system.
- Uses other methods of search term input such as structure searching and image searching, specific to the discipline or information retrieval system.
- Constructs a search strategy using appropriate commands for the information retrieval system selected (e.g., Boolean operators, truncation, and proximity for search engines; internal organizers such as indexes for books).
- Implements the search strategy in various information retrieval systems using different user interfaces and search engines, with different command languages, protocols, and search parameters, while recognizing similar search features across the systems (such as: e-mail alerts and save search options, search fields, and controlled vocabulary).
- Follows citations and cited references to identify additional, pertinent articles.
- Retrieves information using a variety of methods.
- Uses various relevant search systems to retrieve information in a variety of formats.
- Uses various classification schemes and other systems (e.g., call number systems or indexes) to locate information resources within the library or to identify specific sites for physical exploration.
- Uses specialized online or in person services as needed to retrieve information and whenever unable to identify or locate appropriate materials (e.g., interlibrary loan/document delivery, librarians, library staff, professional associations, institutional research offices, community resources, subject experts, and practitioners).
- Uses surveys, letters, interviews, experiments, and other forms of inquiry to retrieve information or data, as appropriate for the research area or discipline.
- Refines the search strategy if necessary.
- Assesses the quantity, quality, accuracy, currency, and relevance of the search results and the limitations of the information retrieval systems or investigative methods to determine whether alternatives should be sought and used.
- Identifies gaps in the information retrieved and determines if the search strategy should be revised.
- Repeats the search using the revised strategy or new systems or methods as necessary.
- Extracts, records, transfers, and manages the information and its sources.
- Selects the most appropriate technology for the task of extracting the needed information (e.g., copy/paste software functions, photocopier, scanner, audio/visual equipment, exploratory instruments, export of the information or record, or note taking). Examples of

technologies to export information would be bibliographic management software, text conversion software, and spreadsheet software.

- Creates a system for organizing the information including tracking results of laboratory experiments, fieldwork, etc.
- Differentiates between the types of sources cited and understands the elements and correct syntax of a citation for a wide range of resources.
- Records all pertinent citation information for future reference by downloading, printing, emailing, or manual notation. Uses various technologies to manage the information selected and organized, e.g., bibliographic management software.

III. Standard Three

The information literate student critically evaluates the procured information and its sources, and as a result, decides whether to modify the initial query and/or seek additional sources and whether to develop a new research process.

Performance Indicators

The information literate student:

- Summarizes the main ideas to be extracted from the information gathered.
- Applies an understanding of the structure of a scientific paper and uses sections, such as the abstract or conclusion, to summarize the main ideas.
- Selects main ideas from the text.
- Identifies verbatim material that can then be appropriately quoted.
- Selects information by articulating and applying criteria for evaluating both the information and its sources.
- Distinguishes between primary, secondary, and tertiary sources, and recognizes how location of the information source in the cycle of scientific information relates to the credibility of the information.
- Distinguishes among facts, points of view, and opinion.
- Examines and compares information from various sources in order to evaluate reliability, validity, accuracy, authority, timeliness, and point of view or bias.
- Analyzes the structure and logic of supporting arguments or methods.
- Understands and uses statistical treatment of data as evaluative criteria.
- Recognizes prejudice, deception, or manipulation in the information or its use.
- Recognizes the cultural, physical, or other context within which the information was created, and understands the impact of context on interpreting the information.
- Synthesizes main ideas to construct new concepts.
- Recognizes interrelationships among concepts and combines them into potentially useful primary statements and/or summary of findings with supporting evidence.
- Extends initial synthesis, when possible, at a higher level of abstraction to construct new hypotheses that may require additional information.
- Utilizes computer and other technologies (e.g. spreadsheets, databases, multimedia, and audio or visual equipment) for studying the interaction of ideas and other phenomena.
- Compares new knowledge with prior knowledge to determine the value added, contradictions, or other unique characteristics of the information.
- Determines whether information satisfies the research or other information need.
- Uses consciously selected criteria to determine whether the information contradicts or verifies information used from other sources.
- Draws conclusions based upon information gathered.
- Tests theories with discipline-appropriate techniques (e.g., simulators, experiments).

- Determines probable accuracy by questioning the source of the information, limitations of the information gathering tools or strategies, and the reasonableness of the conclusions.
- Integrates new information with previous information or knowledge.
- Determines whether information provides evidence relevant to the information need or research question.
- Includes information that is pertinent even when it contradicts the individual's value system, and includes it without skewing it.
- Validates understanding and interpretation of the information through discourse with other individuals, small groups or teams, subject-area experts, and/or practitioners.
- Participates in classroom and virtual/electronic discussions (e.g., email, bulletin boards, chat rooms) and uses discussions for validating understanding and interpretation of the information.
- Works effectively in small groups or teams.
- Seeks expert opinion through a variety of mechanisms (e.g., interviews, email, electronic discussion lists, etc.).
- Determines whether the initial query should be revised.
- Determines if original information need has been satisfied or if additional information is needed.
- Reviews search strategy and incorporates additional concepts as necessary.
- Reviews information retrieval sources used and expands to include others as needed.
- Evaluates the procured information and the entire process.
- Reviews and assesses the procured information and determines possible improvements in the information seeking process.
- Applies the improvements to subsequent projects.

IV. Standard Four

The information literate student understands the economic, ethical, legal, and social issues surrounding the use of information and its technologies and either as an individual or as a member of a group, uses information effectively, ethically, and legally to accomplish a specific purpose.

Performance Indicators

The information literate student:

- Understands many of the ethical, legal and socio-economic issues surrounding information and information technology.
- Identifies and discusses issues related to privacy and security in both the print and electronic environments.
- Identifies and discusses issues related to free vs. fee-based access to information.
- Identifies and discusses issues related to censorship and freedom of speech.
- Demonstrates an understanding of intellectual property, copyright, and fair use of copyrighted material and research data.
- Follows laws, regulations, institutional policies, and etiquette related to the access and use of information resources.
- Participates in electronic discussions following accepted practices (e.g. "Netiquette").
- Uses approved passwords and other forms of ID for access to information resources ethically.
- Complies with institutional policies on access to and distribution of information resources.
- Preserves the integrity of information resources, equipment, systems and facilities.
- Legally obtains, stores, and disseminates text, data, images, or sounds.

- Demonstrates an understanding of what constitutes plagiarism and does not represent work attributable to others as his/her own. This includes the work of other members of research teams.
- Demonstrates an understanding of federal, state, and institutional policies related to the use of human and animal subjects in research.
- Acknowledges the use of information sources in communicating the product or performance.
- Selects an appropriate documentation style for each research project and uses it consistently to cite sources.
- Posts permission granted notices, as needed, for copyrighted material.
- Acknowledges all contributors, funding sources, grants, etc. Complies with reporting and other requirements related to grants.
- Applies creativity in use of the information for a particular product or performance.
- Selects, analyzes, organizes, summarizes, and/or synthesizes information from a variety of resources.
- Explores the use of advanced information technologies, such as data mining and visualization to move beyond retrieval and identify trends and patterns within large sets of complex research data.
- Evaluates the final product or performance and revises the development process used as necessary.
- Maintains a journal or log of activities related to the information seeking, evaluating, and communicating process.
- Reflects on past successes, failures, and alternative strategies.
- Applies devised improvements to subsequent projects.
- Communicates the product or performance effectively to others.
- Chooses a communication medium and format that best supports the purposes of the product or performance and the intended audience.
- Uses a range of information technology applications in creating the product or performance.
- Incorporates principles of design in the product or performance.
- Communicates clearly and succinctly, if appropriate, with a style that supports the purposes of the intended audience.

V. Standard Five

The information literate student understands that information literacy is an ongoing process and an important component of lifelong learning and recognizes the need to keep current regarding new developments in his or her field.

Performance Indicators

The information literate student:

- Recognizes the value of ongoing assimilation and preservation of knowledge in the field.
- Recognizes that, for a professional, it is necessary to keep up with new developments that are published in the literature of the field.
- Recognizes that learning about information gathering is an ongoing process as the source, format, software requirements, and delivery method of needed information changes and evolves with time.
- Is able to apply information access skills learned in one subject area to another.
- Understands the importance of archiving information so that it will survive company mergers, outdated access technologies, personnel departures, etc.
- Uses a variety of methods and emerging technologies for keeping current in the field.

- Establishes current awareness services and follows citation and cited references for pertinent articles.
- Uses online table of contents scanning, review journals, and other forms of rapid communication literature.
- Manages files of citations of articles read or accessed (such as through use of bibliographic management software).
- Uses bibliometric analysis tools to update knowledge of changing technology and product life cycles (such as by analyzing a company's published papers and/or patent portfolio).
- Recognizes emerging forms and methods of scholarly publishing in the field. Recent examples are: the use of blogs, RSS feeds, open access journals, and freely available online research data.

2.9. Canadian and International Information Literacy Standards

The information literacy standards presented here is based on learning outcomes drawn from multiple subject areas and current Canadian and international information literacy documents. These are:

- Uses Information with Aesthetic Appreciation: Students will demonstrate an appreciation of the creative arts, literature, various media formats and other aesthetic representation, and of the value lifelong learning.
- Uses Information Responsibly: Students will use information responsibly and ethically for individual and collaborative learning activities.
- Uses Information Respectfully: Students will use information from diverse perspectives and values with respect.
- Uses Information Critically: Students will use information critically to evaluate the relevance, authenticity, and validity of information and its source.
- Uses Information Strategically: Students will use information strategically to process, organize, and select information to meet an individual or collaborative learning need.
- Uses Information for Decision-Making: Students will consciously use information for making personal and group learning decisions.
- Uses Information Expressively: Students will use information expressively to modify, revise, and transform information and to communicate their newly created information with an intended audience.

2.9. Objectives

After reading this unit, you will be able to explain:

- ACRL IL standards
- American Library Association IL Standards
- AASL & AECT IL Standards
- ACRL Psychology IL Standards
- The National Forum on Information Literacy (NFIL) Standards
- IL Standards for Anthropology & Sociology/Social Science & Humanities Students
- IL Standards for Science and Engineering/Technology
- Canadian and International IL Standards

2.10. Self-Assessment Questions

- Q1. Explain the ACRL IL standards in details.
- Q2. Write a comparative note on 'ACRL' and 'ALA' IL standards.
- Q3. What kinds of Information Literacy Standards does require for Science and Engineering/Technology students? Discuss.

Q4. Write short notes on each of the following:

- IL Standards for Anthropology & Sociology/Social Science & Humanities Students
- ACRL Psychology IL Standards
- The National Forum on Information Literacy (NFIL)
- Canadian and International Information Literacy Standards

2.11. Activities

- Write a summary of the main Information Literacy standards.
- Suppose you are the convener of IL assessment committee in university library to form an IL assessment tool. What type of list/standards will you follow?

UNIT NO. 3

INTEGRATING THE STANDARDS

The integration of the standards, like the integration of most library research skills, is most effective when done in the context of student learning. Most student learning occurs in the classroom; however, there are instances of student learning where librarians are involved.

3.1. Course-Integrated Instruction

This type of bibliographic instruction is the most common in academic libraries. Typically, the faculty member arranges to bring the class to the library to receive instruction in one or more areas, such as locating scholarly journal articles, finding biographical information, or evaluating web pages. In other cases, the librarian may visit the classroom to provide instruction. Regardless of whether the students visit the library or the librarian visits the classroom, integration of the standards depends primarily on the intended outcomes for that session—that is, what the faculty member expects the librarian to teach the students.

In developing the library session for this course, standard integration, based on the assignment and the course needs, can be accomplished as outlined below. First, we describe the stage, citing the outcome that will be integrated, and then we identify the librarian's role, if any, at that stage.

1. Identify a health-related issue for African-Americans. (*Outcome 1.1.a. Confers with instructors and participates in class discussions, peer workgroups, and electronic discussions to identify a research topic, or other information need*)

Librarian's role: None; student/course-initiated.

2. Develop research questions based on topic. (*Outcome 1.1.b. Develops a thesis statement and formulates questions based on the information need*)

Librarian's role: None; student/course-initiated.

3. Identify and review general resources to become familiar with topic. (*Outcome 1.1.c. Explores general information sources to increase familiarity with the topic*)

Librarian's role: Introduce students to the concept of using general information resources such as subject encyclopedias, dictionaries, and handbooks to become familiar with their topic.

4. Identify key words and concepts to describe topic. (*Outcome 1.1.e. Identifies key concepts and terms that describe the information need*)

Librarian's role: Brainstorm with students to identify key concepts that help to describe topic: for example, high blood pressure versus hypertension; AIDS versus acquired immune deficiency syndrome; sugar versus diabetes.

5. Identify a variety of types, formats, and sources of information. (*Outcome 1.2.a. Knows how information is formally and informally produced, organized, and disseminated*)

Librarian's role: A brief lecture on how information is produced, organized, and disseminated; how the major academic disciplines influence the production, organization and dissemination of information; the variety of types and formats of information (e.g., multimedia, database, website, data set, audiovisual, book); the variety of sources of information; the purpose and audience of potential resources (e.g., popular vs. scholarly, current vs. historical). Brain-storm with students about the types and formats of resources that would be most appropriate for their particular health issue (e.g., journal articles, websites).

6. (*Outcomes 2.1.a–*

d. Select the most appropriate investigativemethodsorinformationretrievalsystemsforaccessingthe needed information).

Librarian's role (may be limited by faculty members' expectations and course goals and objectives): A brief lecture on identifying and selecting an appropriate database for health-related issues. Introduce and do sample searching in the library's catalog; general databases such as *Academic Search Premier* or *Masterfile Premier*; and subject specific databases such as *Medline* and *PsycINFO*. Also, include a discussion on Internet resources including professional associations (American Medical Association, Association of Black Psychologists), government (Centers for Disease Control and Prevention, National Institutes of Health), education (Joslin Diabetes Center affiliated with Harvard Medical Institute), and commercial websites (WebMD.com). Provide opportunity for hands-on searching. Student's role: inclass assignment: Select the library's catalog or a subject database and/or websites for the particular health issue and focus of the assignment.

7. (*Outcomes 2.2.a–f. Constructsandimplementseffectivelydesignedsearch strategies)*

Librarian's role: A brief lecture on developing successful search strategies, including controlled vocabulary and subject headings, Boolean logic, and other search strategies. Student's role: Participate in identifying appropriate keywords/subject headings for their topics using various resources (library catalogs, databases, descriptors, thesauri, subject headings). Practice searching using these terms in the database(s) selected in step 6.

8. (*Outcomes 2.3.a–c. Retrievesinformationonlineorinpersonusingavarietyof methods)*

Librarian's role: A brief lecture on retrieving located information, including using the local online catalog and/or serials database to determine ownership and journal subscription information and to determine call numbers and locations in the stacks, e.g., Library of Congress call number classification, Superintendent of Documents call numbers, local call number schema, etc.; retrieving full-text and print based materials; interlibrary loan (ILL), resource-sharing agreements, and document delivery services. Student's role: After identifying journal articles and books, determine whether the library owns the items and describe how to go about obtaining the items.

9. (*Outcome 3.2.a. Articulates and applies initial criteria for evaluating both the information and its sources)*

Librarian's role: A brief lecture on evaluating information, including websites and information found in databases, e.g., journal articles. Student's role: Apply evaluative criteria to the items they have identified and participate in a discussion of the usefulness and appropriateness of the resources for completing the assignment.

This particular instruction session lasted about two and a half hours; however, most lectures average about fifty minutes, and you will not be able to cover this much ground. Additionally, the instructor may only allow part of the total course time for library instruction. It is important to acknowledge that you may not be able to cover all the topics you want to as comprehensively as you might like. You may need to provide detailed handouts or develop a web page so that students have something to refer to, as well as to provide the information that you are unable to cover.

The development of individual web pages for individual courses or sessions can be time-consuming and difficult to manage over time, given the potential number of bibliographic sessions taught in a typical semester. It may be more appropriate to develop a template for subject or research guides that lends itself to instructional purposes.

When integrating the standards into bibliographic instruction sessions, it is important to keep in mind the faculty members' priorities and make sure they are addressed. This will ensure that the students have the information needed to adequately complete their assignment. In addition, you should always provide your e-mail address and phone number so that students may contact you after the session in case they need additional assistance.

3.2. Librarian-Developed Courses

A host of these courses are widely available, ranging from one-credit partial semester to three-credit semester-long courses. Integrating the standards into these courses may require an overhaul and revision of the syllabus, much like the revision of a course offered in a particular academic discipline. It cannot be assumed that the average library research methods course will be in compliance with the standards, so all aspects of the course and syllabus must be reviewed and revised, if necessary.

Librarians at the University of Maryland, Baltimore County, revised two course syllabi to incorporate the standards: one for a three-credit course developed and taught by librarians for the Honors College—Honors 201 and one for an eight-week librarian-taught lab offered in conjunction with a three-credit course for the Ronald E. McNair Scholars program—Research Proposal Fundamentals. The following is a description of the syllabus revision process for the eight-week lab course. Prior to integrating the standards into this eight-week lab, it was determined that the management of the course needed to be addressed. At that time, each reference librarian in the department was teaching a different session. To streamline the process and make more productive use of the librarians' time, two librarians volunteered to teach the course. The course syllabus previously had been organized around resources and functions as is shown below. After integration, the course syllabus flowed from and built upon the standards and their performance indicators.

Prior to Standards Integration

Week 1. Introduction to staff, course objectives, library services; the nature of research

Week 2. Evaluating material identified; organizing information

Week 3. Online catalogs/electronic sources

Week 4. Printed/online reference sources

Week 5. Online/printed indexes and abstracts

Week 6. Statistics and government documents

Week 7. World Wide Web and critical thinking

Week 8. Capstone session

After Standards Integration

Week 1. Introduction, course overview, and discussion of information literacy as a concept (viewed *E-literate?* video), discussion of research topics

Week 2. Performance Indicator 1.1, Indicator 1.2

- How knowledge is organized
- Types of resources and formats available
- Defining and articulating research needs

Week 3. Indicator 2.1, Indicator 2.2, Indicator 2.4, Indicator 2.5, Indicator 3.2

- Select the most appropriate resources
- Catalogusmai (local catalog) and *WorldCat* Subject databases for journal articles Serial search (local serials database)
- Access information efficiently and effectively. Retrieve information in a variety of ways
- Criteria for evaluation
- Refine search strategy

Week 4. Indicator 2.1, Indicator 2.2, Indicator 2.3, Indicator 2.5, Indicator 3.2

- Controlled vocabulary
- Implementing and refining search strategy
- Using keywords and descriptors Boolean searching Proximity/phrase searching
- Evaluating materials, you find Author, Publisher/publication, Bias, currency, References to other sources Reliability
- E-mailing/saving/printing

Week 5. Indicator 3.1, Indicator 3.2, Indicator 3.3, Indicator 3.4, Indicator 3.7, Indicator 5.1

- Evaluating and incorporating information
- Rewriting of original thesis
- Academic integrity and plagiarism
- Citation style guides

Week 6. Indicator 4.1, Indicator 4.2, Indicator 4.3

- Presentation techniques
- Information use and issues in using information

Week 7. Indicator 5.1, Indicator 5.2, Indicator 5.3

- Information use and issues in using information • Course presentations

Week 8. Indicator 5.2, Indicator 5.3

- Information use and issues in using information Course presentations

Course wrap-up/course evaluations

For this course, the instructors felt it was important to introduce the concept of information literacy to the students and to facilitate a discussion on the students' perceptions of and knowledge about information literacy.

The instructors found that in some cases they were unable to spend a great deal of time on all of the topics; however, a brief lecture along with some structured hands on exercises proved to be just as effective as a twenty-minute lecture on an individual topic. The instructors found that flexibility was key in the management of the course. For example, if after a lecture and discussion, students were unable to adequately complete an assignment, it was necessary to revisit that topic. This sometimes meant that topics were occasionally bumped to the next session.

When integrating the standards into your instruction sessions, remember to focus on the standard, not the resources. You will find that you are still teaching the same concepts, but your focus has shifted to ensuring that students understand how to identify a database for their appropriate topic, rather than you picking one and demonstrating it. If you focus on the standards, the resources will logically follow, as is seen in the revision of AFST 495 above. Students will understand the process of identifying a topic, learning more about the topic, and identifying the most appropriate investigative method, information retrieval system (e.g., selecting a database), and so on. Once the students have been introduced to and understand this process, and their skills have been reinforced, they can transfer those skills to other courses, libraries, and information-literate environments in the pursuit of graduate and other degrees and into the workforce.

3.3. Assignment Development

Some assignments are appropriate for more than one area of the standards. In the process of identifying assignments, the task force found that most websites and published literature focused on and offered tips for creating good assignments as opposed to actual library assignments. The tips, usually aimed at faculty, consist of the advice librarians have been attempting to share with faculty for decades.

Evidence shows that when instructors clearly state assignment requirements in writing, the chances of students completing the assignments successfully increase greatly. In developing successful creative assignments, it is a good idea to remember what motivates students:

- a need to know (curiosity about the subject matter)
- relevance of the assignment to the course content and other assignments
- perceived value in knowing the material
- lively modeling of the process by the professor or librarian
- an expected level of success with the assignment

Some other areas to consider are the following.

- *Provide assignment objectives.* Inform students of the learning objectives of the assignment. Tell students why they are doing the assignment and the purpose it serves.
- *Clarify the assignment requirements and expectations.* State the requirements in writing as well as verbally.
- *Describe the specific assignment.* Do you want the students to cite in a specific style, such as APA (American Psychological Association) or MLA (Modern Language Association)? Make sure to convey this to students in writing and provide examples if possible.
- *Distinguish between resources.* When describing the requirements of an assignment, distinguish between different types of sources: popular and scholarly, primary and secondary, and so on. If possible, show examples.
- *Check for feasibility.* Make sure the library's resources are adequate for the assignment. If you expect the students to use resources from other libraries, make sure they are aware of it and know how to access these resources.
- *Check the assignment beforehand.* Ideally, it is best to test the assignment yourself. Try to approach it from your students' perspectives and experiences.
- *Do not assume students already know the basics.* Many students have little (if any) experience completing assignments and course work using a college or university library. Assume minimal knowledge of library resources, procedures, and jargon.
- *Allow variety in topic selection.* Allowing your students to research a variety of topics prevents a "mob scene" in the library. If the whole class must depend on one or a few sources, those sources may be mutilated or eventually disappear.
- *Foster critical thinking.* Encourage a critical approach to doing research.
- *Allow for incremental improvement.* Allow students to begin working on the project early in the semester and to work on small assignments (such as turning in an initial bibliography of resources) throughout the semester. Give feedback.
- *Keep your assignments current.* Library resources are constantly in flux check your assignments each semester so that your students are not asked to use outdated resources or methods of research.
- *Get to know your reference and instruction librarians.* Many academic libraries assign librarians as liaisons to academic departments. Librarians can assist you in identifying resources, developing assignments, and introducing students to library resources and services.

3.4. Objectives

After reading this unit, you will be able to explain:

- Integrating the IL standards.
- Course-integrated instruction.
- Librarian-developed courses.
- Assignment development.

3.5. Self-Assessment Questions

Q1. Explain the factors that could motivate students while developing a successful creative assignment.

3.6. Activities

Let us assume that students are supposed to research a topic relating to the health science issues. The faculty member acknowledges that students previously had relied heavily on Internet resources to complete this assignment. They want them to be introduced to reputable Internet sites, as well as the scholarly journal literature. As a librarian what sources will you suggest and how to guide them? Discuss with examples.

UNIT NO. 4

DEVELOPING A TOPIC AND IDENTIFYING SOURCES OF INFORMATION

4.1. Standard 1: The information literate student determines the nature and extent of the information needed.

Standard 1 addresses two major areas of information literacy: the ability to recognize and define an information need and the ability to identify a variety of types and formats of potential sources of information. These abilities are crucial in the early stages of the research process, of which many aspects are overlooked by college-level students. These early stages are essential for successful research, and students should be encouraged to develop their skills in these areas.

Although this standard has four performance indicators and seventeen accompanying outcomes, the primary concepts for college students are the ability to recognize and define an information need (1.1) and the ability to understand and identify a variety of types and formats of potential information sources (1.2). This standard includes both higher-order skills, such as constructing information with raw data from primary sources (1.1.f), and lower-order skills, such as developing a thesis statement and formulating questions based on information needs (1.1.b).

4.2. Assessing the Ability to Define Informational Needs

Performance Indicator

1.1. The information literate student defines and articulates the need for information.

Outcome 1.1.a. Confers with instructors and participates in class discussions, peer workgroups, and electronic discussions to identify a research topic, or other information need

Outcome 1.1.b. Develops a thesis statement and formulates questions based on the information need

Outcome 1.1.c. Explores general information sources to increase familiarity with the topic

Outcome 1.1.d. Defines or modifies the information need to achieve a manageable focus

Outcome 1.1.e. Identifies key concepts and terms that describe the information need

Outcome 1.1.f. Recognizes that existing information can be combined with original thought, experimentation, and/or analysis to produce new information

Faculty and librarians can assist students at this stage by discussing topic ideas, talking about reference sources, and providing assignments that encourage students to examine their ideas and potential sources of information.

Assessment Queries

One way to broadly assess the first indicator for Standard 1 is to introduce students to hypothetical situations and inquire whether or not those situations require the use of information.

We need information when we want to:

- a. discusses current issues
- b. plan a vacation
- c. write a report
- d. revise our diet
- e. answers a, b, c, and d

Another query that broadly assesses 1.1 was developed by Claudia J. Morner 'Test of Library Research Skills' (*Morner Test*).

What is the most important first step in library research?

- a. identify key authors on research problem

- b. know research problem
- c. locate key articles on research problem
- d. locate key books on research problem

Depending on the number of students you are assessing, this short answer format may not be the best approach, but it is an excellent way to find out exactly how students are approaching their topics and what keywords they are using.

Forming a research question from a broad topic. Let's say that you wanted to research the topic "computer and Internet crimes." Given that broad area of interest, what might be a research question to investigate—for example, "Should governments get involved in regulating the use of the Internet?"

Identifying keywords. Using the research question you drafted above, what keywords might be good to use in the first stages of research? (If you didn't write your own research question, use the question given in the example.). With the exception of a vague reference in performance indicator 3.6, Standard 1 is the only one that addresses students' relationships with faculty and instructors (1.1.a). The following query, investigates a student's comfort level in asking his or her professor for assistance.

To what extent do you feel comfortable asking your professors for assistance in locating resources to support your research? Please select all that apply.

- a. I feel comfortable setting up an appointment with a professor for in-depth consultation regarding resources.
- b. I feel comfortable asking my professors for a few recommended titles/authors in the field.
- c. I don't feel comfortable asking professors for assistance in this area.
- d. I have never needed a professor's assistance in locating resources.

Successful researchers develop research questions based on their need for information (1.1.b), and they know how to refine a broad topic into a narrow, manageable one (1.1.d). Standard 1 also addresses the use of reference sources during the research process (1.1.c). If used, reference sources prove to be excellent tools for providing an overview of a topic and explanations of key concepts. The question below was taken from the Florida Gulf Coast University Library's *Search for the SkunkApe (Information Literacy Tutorial)*, or *FGC SkunkApe Tutorial*, and addresses outcome 1.1.c.

You have gotten an assignment on a topic about which you know very little. What's the first thing you should do to get started?

- a. Browse the library shelves for books on your topic.
- b. Ask the professor if you can change topics.
- c. Find out some basics on your topic from a reference source such as an encyclopedia.
- d. Ask your friends if any of them know about your topic. The following query also addresses outcome 1.1.c.

You are writing a paper for your ecology class. You first need information defining the term "watershed." What is your best choice for getting some brief background information?

- a. Search for "watershed" in the library's online catalog.
- b. Find journal articles about "watershed."
- c. Look up "watershed" in a general reference source like an encyclopedia.
- d. Type "watershed" in a web search engine for a complete list of references on the topic.³

The following is an assessment query taken from the *Neely Test of Relevance, Evaluation, and Information Literacy Attitudes (Neely Test)* that asks students about the use of sources when researching a particular topic. Not only does a query of this type ascertain whether or not students use reference sources, but it can determine whether or not they are using them at the right time during the research process (in the beginning). The options for this question can be changed to other activities, such as "discuss your topic with your professor," to suit the needs of your institution. This query also assesses outcomes 1.1.d and 1.1.e.

“Violence in American high institutes” is a popular topic because it is a growing problem. Given this topic as the subject of a research project, in what order would you perform these steps? (1—the first step; 2—the second step, etc.; use 0 if you would not take a particular step)

- a. Browse a current printed magazine index.
- b. Browse the most recent issue of an education journal.
- c. Search the Internet using the keywords “violence” and “high institutes.”
- d. Look at reference material that provides an overview of “violence and teenagers.”
- e. Brainstorm the concept, using the terms in the topic.
- f. Formulate questions based on the information needed to begin the research.
- g. Search subject-based and other related databases.

One element of the first performance indicator is an understanding of the importance of identifying key concepts and terms that describe an information need (1.1.e). These concepts can be used for online searching on the Web and in databases, among other things. The *Neely Test* adapted the following question from the *Morner Test* as well.

Before searching for information on a topic, such as “adolescent drug use in urban institutes,” you would first

- a. decide which databases or indexes are appropriate for the search
- b. divide the topic into concepts or terms
- c. know which aspects of the topic are most important
- d. revise the topic to be more specific
- e. I do not know

One of the first steps in the research process is to determine the major concepts or terms related to a topic. It is essential for students to perform this step before they begin searching in order to have useful keywords. Once they begin searching, it may be necessary to revise the topic to be more specific if it is determined the topic is too broad (3.7).

Assignments

As stated before, one of the major components of Standard 1 is the process of determining useful keywords. Students consistently struggle with this step, frequently skipping it entirely. Anecdotal evidence gathered from reference librarians reveals that many students do not know how to focus and develop their topics into something that would lend itself to enough, but not too much, research. Carol Kuhlthau found that of the users she studied, “half of the users in academic, public and secondary school libraries studied did not show evidence of reaching a focused perspective of their topic at any time during the search process.” Although it may come as a surprise to some, many students complete an entire research paper without ever going through the process of refining their topic and determining major search concepts. How can this skill be developed and encouraged? On a very casual level, a student can discuss his or her topic with professors and classmates, which can help to identify other viewpoints and ideas (1.1.a). Exploring reference sources for background information is also helpful (1.1.c). Instructors can assist students in tackling these steps by assigning an exercise that requires them to formulate research questions based on their given topics and to define keywords, concepts, and synonyms related to their topics.

One such exercise/assignment has been used by the California Polytechnic State University System. The assignment includes an online tutorial that takes students through the early stages of the research process. Students are asked to first state their topic as a research question in order to clarify their thoughts. Second, students are asked to identify the main concepts in the questions. For example, a topic such as drinking and driving would lend itself to research questions such as “How does drinking affect driving?” and “What are the laws regulating drinking and driving?” Key concepts taken from these questions are drinking, driving, affect, and laws. Students can then create lists of synonyms and related words for

each of the concepts. The concept of drinking has synonyms and related words that include alcoholism, intoxication, inebriation, and substance abuse. Finally, students are asked to look critically at their research questions and determine if they need to broaden or narrow their topic. Students may need to refine their topic by adding concrete or specific terms to their questions. This last step may require them to determine a new list of concepts, synonyms, and related terms. In small classes, instructors can use this as an opportunity to encourage classroom discussion by having students discuss their topics in class (1.1.a), work together to formulate research questions (1.1.b), and determine key concepts (1.1.e). Larger classes can be assigned this exercise as a take-home assignment with follow-up written feedback from the instructor or in-class peer review. This exercise can also be used to address Standard 2 by having students develop search statements using search strategies (2.2), for example, by inserting Boolean operators between the concepts.

Another way to assist students in defining and articulating an information need is to have them develop a concept map. Concept mapping is a technique used for a variety of purposes, including generating new ideas, designing complex structures, communicating complex ideas, and assessing understanding or diagnosing misunderstanding.

When developing a concept map, the first step is to determine the central word, concept, or research question around which to build the map. From there, students can add associated concepts, items, descriptive words, and even questions. A concept map can be developed using a top down approach, working from general to specific, or with more of a brainstorming approach, using free association. Students can use different colors and shapes to identify different types of information. Figure 4.1 is an example of a concept map developed by the author for the topic of vegetarianism. There are many benefits to doing such an exercise. It requires a student to think about his or her topic and any issues that surround that topic. Developing a concept map is a great way for students to determine key concepts and terms that describe their information needs.

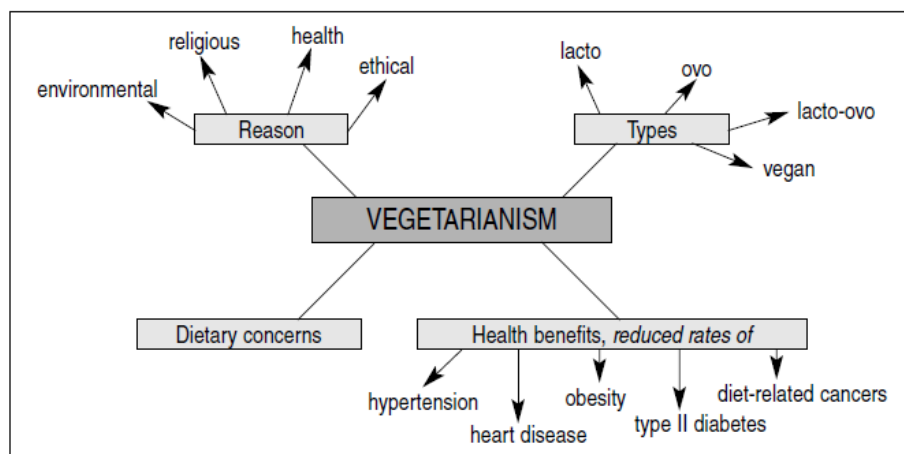


Figure 4.1. Concept map for vegetarianism

4.3. Assessing the Ability to Identify Types of Information Sources

Performance Indicator 1.2. The information literate student identifies a variety of types and formats of potential sources for information.

Outcome 1.2.a. Knows how information is formally and informally produced, organized, and disseminated

Outcome 1.2.b. Recognizes that knowledge can be organized into disciplines that influence the way information is accessed.

Assessment Queries

The *Morner Test* produced the following two assessment queries for outcomes 1.2.

a. The first place most research in education appears is a. in books published by university presses

b. in education encyclopedia articles

c. in newsletters of professional organizations

d. at professional conferences and journal articles

This assignment requires students to investigate the publishing cycle. Students must identify an experimental article from a journal and then attempt to answer the following:

- The earliest date of the author's interest in this research
- The first date the author gathered experimental data for the paper
- Whether or not a scholarship or grant was awarded for the research
- If an earlier version of the paper was presented or published, and when
- When the paper was first received at the journal
- When the revisions were received at the journal
- When the final version was received at the journal
- When the final version was published
- How much time elapsed between the time data were gathered and the final version was published, and if this is significant

Another assignment is to ask students to search a particular topic in two related (but discipline-specific) indexes, such as *Sociological Abstracts* (sociology) and *PsycINFO* (psychology), and compare their findings on how two different disciplines approach a given topic and how it is treated in the scholarly research of each particular field.

Outcome 1.2.c. Identifies the value and differences of potential resources in a variety of formats (e.g., multimedia, database, website, data set, audio/visual, book)

Outcome 1.2.d. Identifies the purpose and audience of potential resources (e.g., popular vs. scholarly, current vs. historical)

Outcome 1.2.e. Differentiates between primary and secondary sources, recognizing how their use and importance vary with each discipline

Outcome 1.2.f. Realizes that information may need to be constructed with raw data from primary sources

Assessment Queries

There is an abundance of available assessment queries that address outcomes 1.2.c–f. The following question developed for the *UMBC Survey* broadly addresses outcomes 1.2.c through 1.2.e and targets a student's familiarity with a variety of information sources beyond books and journals. The following list can be customized to fit the needs of individual institutions.

Other than "books" and "journals," what other types of information are you familiar with or might you use for a research project/paper? Please select all that apply.

a. dissertations/theses

b. magazines

c. newspapers

d. websites

e. diaries/letters

f. manuscripts

g. images/pictures

h. conference proceedings

i. interviews

j. television/radio transcripts

- k. videos/movies/DVDs
- l. music
- m. television shows/broadcasts
- n. radio shows/broadcasts
- o. speeches
- p. none of the above
- q. other: _____

The following question tangentially addresses outcome 1.2.c: “an information-literate student identifies the value and differences of potential resources in a variety of formats.” Typically, a library’s online catalog contains;

- a. information about books, videos, and other non-print items in the library
- b. the complete text of all the journal articles in the library
- c. information about the college’s courses
- d. answers *a* and *b*

You want to help your father understand a medical diagnosis. Look at the database descriptions in the box and then select the best source to search for this information need.

- a. *News Bank News File*
- b. *Health Reference Center–Academic*
- c. *Bio Medical Reference Collections: Basic*
- d. Answers *a*, *b*, and *c*

Health Reference Center–Academic, the correct answer, follows the question with the description:

Health Reference Center–Academic

COVERAGE: Articles from a variety of consumer-oriented and professional health periodicals, plus excerpts from health-related reference books. Material includes a medical dictionary; medical directories and reference books; and pamphlets issued by leading health organizations. Updated weekly.

There are many ways to assess a student’s understanding of the differences between scholarly and popular sources. One way is to use a multiple-choice format like the following, taken from the *Information Literacy Competency Inventory (Maryville Inventory)* at Maryville College in Tennessee.

Which of the following is a characteristic of scholarly journals?

- a. contains glossy pictures and advertisements
- b. reports news events in a timely manner
- c. contains a literature review within the articles
- d. provides an author’s opinion about a controversial event

A variation of this type of question, also from the *Maryville Inventory*, is replicated below. Both of these questions would benefit from having an “I don’t know” option to discourage guessing. Which of the following titles would be considered the title of a popular magazine?

- a. *Journal of Higher Education*
- b. *Newsweek*
- c. *Economic Review*
- d. *American Journal of Political Science*

Another option is to use the open-ended question format. In this option, students are required or expected to supply their own answers.

Scholarly periodicals like the *American Sociological Review* usually contain very few advertisements. What are two other characteristics of scholarly periodicals?

Information-literate students should be able to identify other characteristics, such as whether a source is written by a scholar or specialist, written in technical or scholarly language, or

includes cited references. A number of questions were identified that assess a student's understanding of the differences between primary and secondary sources.

Which of the following is not a secondary source?

- a. encyclopedia article
- b. letters
- c. newspaper article reporting about a research study
- d. biography

In developing a query for this aspect of Standard 1, it is important to have a clear understanding of what primary and secondary sources mean at your institution and in particular disciplines. In this way, the possibility of confusion over multiple "correct" responses are eliminated.

Which of the following is a primary source?

- a. a literary text, such as *The Scarlet Letter* by Nathaniel Hawthorne
- b. books written about *The Scarlet Letter*
- c. journal articles written about *The Scarlet Letter*
- d. dissertations written about *The Scarlet Letter*

The correct answer for this question, taken from the *Maryville Inventory*, is "a literary text." Another approach to assessing the understanding of the concept of primary and secondary sources is to ask students to select the proper definition of one or the other. These questions could be adapted to include an assessment of the definitions of secondary and tertiary sources as well.

A primary source is ____ the best source

____ a scholarly source

____ a source created by people involved with or observing events when they occur

A primary source is

- a. the most important source in your bibliography
- b. the first source you list in your bibliography
- c. a firsthand account: the original source of information
- d. an interpretation of an original source by a foremost expert

The question below, from the *Maryville Inventory*, is a variation of the queries above, providing a method and requiring the student to identify the research type. The "conducting a survey" option could be replaced by other examples of methods of primary research.

Conducting a survey would be an example of

- a. independent research
- b. secondary research
- c. primary research
- d. historical research

Assignments

One way to encourage students to see the value of using a variety of resources in various formats is to have them perform a search on a topic using different types of search tools. For this exercise, depending on the allotted time and the size of the class, it might be helpful to have preselected topics/searches for the students to work with. Students can be instructed to prepare a search statement for an Internet search engine and a database and then to implement the two searches. Students can then examine the results and consider the search strategies they used.

This exercise also demonstrates the differences between search tools regarding content and search strategy. For example, a search for "viral meningitis" using www.google.com retrieves pages from the Centers for Disease Control, various fact sheets from health organizations, and a variety of commercial health care sites. The majority of this information is aimed at the consumer, rather than a specialist. Students can compare these results with those found in a database such as *Medline*, which retrieves references to scholarly resources (dissertations,

refereed journal articles in a variety of languages, etc.) aimed at the practitioner or researcher. This assignment also demonstrates the importance of selecting the appropriate search tool for your particular information need (2.1).

The ability to identify the purpose and audience of various types of resources is a skill that college level students need in order to be successful in their research endeavors, but many students struggle with this and have a difficult time distinguishing between scholarly, popular, trade, commentary, and tabloid publications. There are many ways to assist students in learning this skill. By giving students specific criteria for evaluating sources, and teaching them to adopt a healthy amount of skepticism when reading and re-viewing information, students can gain a better understanding of the differences between sources. There are many useful library websites that clearly illustrate some of the major differences between publications, such as appearance, audience, content, advertisements, and references. It is useful to discuss these differences with students and to provide them with a copy of a chart or website that details the criteria.

Another exercise that encourages students to think about the differences between types of sources is to have them find a bibliographic reference to a study mentioned either in a newspaper or a magazine article, or in the broad-cast media (television, radio), and then to locate the study in a scholarly journal. Once they have located the original study, students should then compare the sources of the citation/reference to determine the value and limits of each. A variation of this exercise involves having students read a scholarly article on a topic and a popular article on the same topic and compare the manner in which the two sources deal with the material.

As discussed earlier, students frequently struggle with being able to differentiate between primary and secondary sources and in understanding how their use varies from discipline to discipline. Instructors can use a variety of discipline-specific assignments to teach students about primary resources. Concordia University Libraries has excellent suggestions for assignments that teach these skills. For history students, Patrick Labelle suggests students write a family history as a way to learn about primary sources. Students are encouraged to use primary sources of information such as interviews with family members and public records such as birth and death certificates, marriage licenses, directories, and newspapers. A variation on this exercise can tap into students' creativity and encourage the use of other underused primary sources such as family photo albums and family bibles. Business students can be required to develop a marketing plan for a potential advertising campaign. They will need to identify demographic and financial information, conduct market research, and research product reviews. Students enrolled in English and other writing-intensive courses can be required to write diary entries or the opening chapter of a historical novel, for example, in which they must research the daily routines and customs of people during a particular time period.

4.4. Assessing Knowledge of the Costs and Benefits of Acquiring Information

PerformanceIndicator1.3. The information literate student considers the costs and benefits of acquiring the needed information.

Outcome1.3.a. Determines the availability of needed information and makes decisions on broadening the information seeking process beyond local resources (e.g., interlibrary loan; using resources at other locations; obtaining images, videos, text, or sound)

Outcome1.3.b. Considers the feasibility of acquiring a new language or skill (e.g., foreign or discipline based) in order to gather needed information and to understand its context

Outcome1.3.c. Defines a realistic overall plan and timeline to acquire the needed information

It is important for students to have a realistic plan for acquiring sources and completing their research. This is challenging for students at any educational level. Success in the research process requires a commitment of time and energy on the part of the student.

Assessment Queries

Very few queries were identified for assessing this particular indicator and its accompanying outcomes objectively and independently. However, students can be asked whether or not they are familiar with the services their library provides, or they can be asked to respond to open-ended short-answer questions about their experiences using these services.

The following queries were taken from the *Assessment of Information Literacy Skills* and assesses outcome 1.3.a.

Interlibrary loan is a system for Saint Rose students to

- a. purchase books and journals
- b. borrow books owned by the Library
- c. get books and articles that are not owned by the Library
- d. travel to area libraries and check books out of them

Which of the following would be the best for identifying any book *not* owned by the Library?

- a. EBSCOhost *Academic Search*
- b. Modern Language Association (MLA) International Bibliography
- c. Neil Hellman Library Periodicals List
- d. *WorldCat*

The following query was taken from the *FGC Skunk Ape Tutorial* and assesses knowledge of outcomes 1.3.a and c.

What is the most realistic expectation for your library research?

- a. I must realize that I am limited to materials in the FGCU Library or those libraries that I can drive to.
- b. The current catalog is limited and can only search for materials owned by the FGCU Library.
- c. If I want to read older material, I am going to have to use microfilm.
- d. If it does not have what I need, the FGCU Library will get photocopies of materials for me from other libraries.

Assignments

It is clear that many students do not use resources beyond what is housed in their academic libraries. Though some students have discovered the value of using interlibrary loan services, many others are unfamiliar with the process of ordering material owned by another institution. Students need to have a basic understanding of the library catalog and must be able to use it to see which periodicals and other materials are owned by their institutions and which are not.

4.5. Assessing The Ability to Reevaluate One's Information Need

Performance Indicator 1.4. The information literate student reevaluates the nature and extent of the information need.

Outcome 1.4.a. Reviews the initial information need to clarify, revise, or refine the question

Outcome 1.4.b. Describes criteria used to make information decisions and choices

Assessment Query

One way to assess the last indicator of this standard is to ask students how frequently they do certain tasks related to revising and reevaluating their information needs. The following question asks students to specify how often they do each task. Students responded using a

Likert-type scale comprised of the following: very frequently, frequently, occasionally, infrequently, or never. After you have done your initial research for a paper, how often do you do the following?

- a. Understand all of the information.
- b. Discuss findings with friends and colleagues.
- c. Make an outline.
- d. Review the original research question to determine if additional information is needed.
- e. Discard irrelevant or useless findings.
- f. Look at material under each outline heading and synthesize major points and concepts.

4.6. Objectives

After reading this unit, you will be able to explain:

- Developing a topic and identifying sources of Information
- Nature and extent of the information need
- Ability to define informational needs
- Identify types of information sources
- Assessing knowledge of the costs and benefits of acquiring information
- How to reevaluate one's information need

4.7. Self Assessment Questions

Q1. What is information need? Also, discuss the process of developing a topic and identifying sources of Information with examples.

Q2. Define information sources. Explain the types of information sources with suitable examples.

Q3. Discuss the stages of how to reevaluate student's information need?

Q4. Write short notes on the following.

- Primary information and Secondary sources
- Electronic Database
- PubMed
- PsycINFO (psychology)
- Interlibrary loan
- *Medline*
- EBSCOhost *Academic Search*
- *WorldCat*

4.8. Activities

1. Develop a concept map for medical science students to determine key concepts and terms that describe their information needs.
2. Suppose you are a library manager and has given a task to revise and reevaluate students' information needs. What will you need to do? Discuss with examples.

UNIT NO. 5

ACCESSING INFORMATION EFFECTIVELY AND EFFICIENTLY

5.1. Standard 2: The information literate student assesses needed information effectively and efficiently.

Standard 2 covers a significant range of research-related activities, including selecting a methodology, searching techniques, and retrieving and managing information. This unit will provide examples of assessment questions developed to evaluate students' competency with this standard and will also describe some assignments that can be used to improve students' proficiency for this standard.

Standard 2 is one of the most detailed standards, with five performance indicators and twenty-two accompanying outcomes. It is critical for college level students to be able to access the information they need to complete assignments and other course requirements effectively and efficiently. The majority of students have little trouble finding data. The problems arise when they are required to select appropriate investigative methodologies for their research tasks (2.1.a); design and implement effective search strategies (2.2); retrieve information using a variety of methods (2.3); and extract, record, and manage the information they find (2.5). The literature of library and information science and higher education reveals that these are tasks that students are either unfamiliar with or are unequipped to complete adequately.

Standard 2 is also the stage where a lack of knowledge about available discipline specific resources becomes most evident. If students do not know where to look for appropriate resources, then they are operating at an information deficit from the beginning of the research process. Faculty and librarians play a key role in helping students to identify appropriate resources for their research projects by making recommendations and suggestions for resources including, but not limited to, key print reference sources, subject-related databases, and professional, state, and federal websites.

5.2. Assessing the Ability to Select a Research Methodology

PerformanceIndicator2.1. The information literate student selects the most appropriate investigative methods or information retrieval systems for accessing the needed information.

Outcome2.1.a. Identifies appropriate investigative methods (e.g., laboratory experiment, simulation, fieldwork)

Outcome2.1.b. Investigates benefits and applicability of various investigative methods

Outcome2.1.c. Investigates the scope, content, and organization of information retrieval systems

Outcome2.1.d. Selects efficient and effective approaches for accessing the information needed from the investigative method or information retrieval system

In terms of library research, the first performance indicator for this standard addresses the ability to select a database or information resource. This means that students should be able to decide what research methodology (laboratory experiment, simulation fieldwork, survey, focus group, library research) they should use to satisfy their research task.

Assessment Queries

The *assessment queries* include several questions appropriate for outcome 2.1.a. One query provides students with a list of seven items, including an option for "other," and asks them, "Where do you go to find information?" In addition to options for asking friends, professors, teaching assistants, or graduate assistants, options for "use Internet search engine," "go to the library web page," "use faculty course website," and "go to the library" are also included. This type of question presumes very little about students' prior subject or general database

knowledge. In an effort to discern information seeking behavior, it asks where they go if they have an information need.

Again, an “other” option is included in the list of twelve types of resources, which include people (librarians, friends, faculty); print resources (encyclopedias, abstracts and indexes, newspaper archives); online (Internet, abstracts and indexes [databases]); and other types of resources (television/radio transcripts, radio news, television news). A follow-up question provides an excellent way to find out how the students decided which index or database to use.

- How did you decide which indexes/databases to use?
- I used the library research guide on the library webpage
- Suggestion by librarian Suggestion by instructor
- Suggestion by classmate or friend
- Other, please specify _____

This question reveals so much more than what it actually asks for. It tells whether the student has consulted a librarian for assistance; whether or not the course instructor is modeling positive information literate behavior by making suggestions about resources; whether the library’s website and research guides are being used; and if the student is relying on friends and colleagues instead of authoritative guidance in making decisions about information retrieval systems.

A second question from the same instrument asks students to determine which type of resources would be the most appropriate to consult for the information item described. This question relates to performance indicators 2.1.b and c and assesses students’ understanding of the applicability, scope, content, and organization of various types of information retrieval systems. The types of resources listed include:

- almanac bibliography
- biographical dictionary card catalog
- computer databases
- dictionary encyclopedia newspaper index periodical index
- statistical handbook

A sample of the information items described includes:

- magazine article on gun control
- titles of books written by Willa Cather available in Hutchins Library
- birthday of Tina Turner
- day-by-day accounts of the Oliver North trial
- names of all Nobel Peace Prize winners since 1901
- mailing address of Tom Hanks

It is important to remember when writing information items such as these that the subject matter should be appropriate for a particular discipline (education, psychology) or a particular group of students (freshmen, graduate students). Writing items that require or appear to require prior knowledge or subject expertise may be confusing and lead a student to focus more on the subject of the question than on the actual selection of the correct item. *For example,*

A brief overview, with a bibliography, on the economic history of agriculture in the South

A source that, by rapidly combining the subjects on in vitro fertilization, medical ethics, and legal issues, will provide access to a large number of journal articles published since 1983.

It can be assumed that the answer to the first item is “encyclopedia,” and the answer to the second one is “computer databases” and not “periodical index”, but will a student be able to make the same assumption? Regarding outcome 2.1.c, the *Information Literacy Assessment* instrument included a question to assess students’ knowledge of the scope of subject

databases and general periodical indexes. In comparing a subject periodicals index to a general periodical index, only the subject index:

- is broader in scope, cites more magazine articles.
- has more in-depth subject coverage, cites more journal articles.
- should be used to find popular-interest periodicals.
- includes “see” and “see also” references.

Assignments

A variety of assignments were identified to assist students in the acquisition of skills to select the most appropriate resources and databases in order to do their research; however, the majority of these required students to select an appropriate database for a list of unrelated research topics.

There are hundreds of databases, subject specific and multidisciplinary, and students need to be given instruction in and exposure to appropriate subject databases before they can be required to select which database might be most appropriate for identifying resources on topics unrelated to their major or department. Another assignment appropriate for this performance indicator requires students to write a critique of various databases in a particular discipline, including their coverage, design, and search interface.

5.3. Assessing the Ability to Develop Search Strategies

Performance Indicator 2.2. The information literate student constructs and implements effectively designed search strategies.

Outcome 2.2.a. Develops a research plan appropriate to the investigative method.

Outcome 2.2.b. Identifies keywords, synonyms, and related terms for the information needed.

Outcome 2.2.c. Selects controlled vocabulary specific to the discipline or information retrieval source.

Controlled Vocabulary

Before a student begins searching, it is always a good idea to identify “key-words, synonyms, and related terms for the information needed.” In order to obtain the most relevant search results, students must use the terminology that is used to index documents and resources in the database or library catalog. For most databases, these lists of words, called controlled vocabulary, are usually available in the form of a thesaurus or descriptor list; and for library catalogs, major cataloging schemes are the norm: Library of Congress classification system, Dewey decimal classification system. Browsing these lists, online or in print, can provide the student with the most appropriate search terms to use.

Natural Language Searching

In addition to controlled vocabulary, there are other ways that students tend to search. Many students will type in an entire sentence or fragment of a sentence hoping to obtain relevant results. This is known as natural language searching. This sort of searching is most effective in a full text database or in generally searching the Internet; however, students often use this method with systems that do not operate using natural language searching. Full-text databases usually allow searching in all fields and throughout the text. In other words, you are not limited to searching in a particular field such as title, author, descriptors, and so on.

Assessment Queries

The *Information Competency Assessment* at California State Polytechnic University, Pomona (*CalPoly Pomona Information Competency Assessment*), includes several questions that provide a research topic or question and then ask students to determine the key concepts in

the statement (2.2.b.). Queries such as these assist students in learning how to take a research topic and determine which words will be the most effective when searching for information. It also represents a natural progression from Standard 1 (recognizing and articulating a need) to Standard 2 (accessing the information needed).

What are the key concepts of the following statement?

“Discuss how the breakup of the Soviet Union has impacted U.S. foreign policy.”

- Breakup, foreign policy, U.S., Soviet Union
- Soviet Union, U.S.
- U.S. foreign policy, Soviet Union foreign policy

In terms of outcome 2.2.c, there are a number of assessment queries that can be developed to assess students’ knowledge of controlled vocabulary. When selecting subject terms from an online catalog, which of the following would you use terms from?

- *Dictionary of Education*
- *Thesaurus of ERIC Descriptors*
- Library of Congress Subject Headings
- Prior reading
- I do not know

Outcome 2.2.d. Constructs a search strategy using appropriate commands for the information retrieval system selected (e.g., Boolean operators, truncation, and proximity for search engines; internal organizers such as indexes for books)

Outcome 2.2.e. Implements the search strategy in various information retrieval systems using different user interfaces and search engines, with different command languages, protocols, and search parameters

Outcome 2.2.f. Implements the search using investigative protocols appropriate to the discipline

5.4. Searching Techniques

Developing successful search strategies requires a student to be familiar with information retrieval systems and to have the ability to select one that is appropriate for his or her research needs. There are a number of searching techniques: truncation; Boolean “and,” “or,” and “not”; limiters; proximity operators; cross and multiple field searching; and use of controlled vocabulary.

A question from the *CalPoly Pomona Information Competency Assessment* asks students: “Which of the following statements will get the best information from a database search on this topic?” The question assesses their ability to select appropriate keywords, given a topic, that will yield relevant resources. “Discuss capital punishment as a deterrent to crime.”

- Capital Punishment OR Crime
- Deterrent AND Crime
- Capital Punishment AND Crime

“Truncation” is a library computer-searching term meaning that the last letter or letters of a word [are] substituted with a symbol, such as “*” or “\$”. A good reason you might truncate a search term such as child* is that truncation will:

- a. limit search to descriptor or subject heading field
- b. reduce the number of irrelevant citations
- c. save searcher typing time
- d. yield more citations
- e. I do not know

Assignments

With the exception of Standard 3 (evaluating information), this performance indicator (2.2) is probably the easiest to develop assignments for. With concrete, measurable outcomes such as controlled vocabulary; keywords, synonyms, and related terms; and numerous search strategy options, there are many good assignment examples to choose from.

Librarian has developed an assignment in which students use the Library of Congress Subject Headings (LCSH). Students are asked to identify, off the top of their heads, a topic for their major or a subject area of interest. Another assignment in which students are asked to “develop a plan to retrieve information in a variety of formats, evaluate the located information, cite their sources appropriately, and present their findings to class.”

A librarian has also developed an assignment that addresses how subject headings change over time. Students are instructed to select a current topic that has been around for the past fifty years or so. Examples of the guidelines given for topic selection include:

- *Communicable diseases* have been around for a long time but *AIDS* has not.
- *Space travel* has been written about for centuries but the *space shuttle* is a recent invention.
- *War* has been around since Homer was a pup but the *Persian Gulf War* is a fairly recent event.

Depending on the assignment, whether historical or contemporary, students will be introduced to the concepts of controlled vocabularies, descriptors, subject headings, keywords, and thesauri.

Concept mapping, to teach students how to break down a research topic into key components and then explore that topic is advocated by librarians. Librarians approach this assignment by requiring students to select a topic from a list of common everyday terms. Students then develop a concept map or search strategy that is appropriate for searching databases, the library catalog, and the Internet for each term.

Another assignment requires students to paraphrase what they have learned about search strategies for a younger sister or brother who has asked for their help on a institute assignment. This assignment requires students to have mastered the nature of search strategies and the ability to communicate them in plain English, or layman’s terms, for a younger student.

5.5. Assessing the Ability to Retrieve Information

PerformanceIndicator2.3. The information literate student retrieves information online or in person using a variety of methods.

Outcome2.3.a. Uses various search systems to retrieve information in a variety of formats.

Outcome2.3.b. Uses various classification schemes and other systems (e.g., call number systems or indexes) to locate information resources within the library or to identify specific sites for physical exploration.

Assessment Queries

This type of assessment query can be used to discern primary sources from secondary sources (see out-come 1.2.d).

Outcome2.3.c. Uses specialized online or inperson services available at the institution to retrieve information needed (e.g., interlibrary loan/document delivery, professional associations, institutional research offices, community resources, experts, and practitioners)

Outcome2.3.d. Uses surveys, letters, interviews, and other forms of inquiry to retrieve primary information.

Assessment Queries

In order to determine if students are familiar with services offered in many libraries, ask the following: The service offered in most public and academic libraries that allows you to get almost any publication you need is called:

- a. reserves
- b. reference
- c. interlibrary loan
- d. full text

A more specific question about interlibrary loan service is:

Which of the following *best* describes how to locate dissertations from other institutes? They are available:

- a. at no cost from University Microfilm
- b. on computer in full-text format
- c. on microfiche at many university libraries
- d. through interlibrary loan

Assignments

An assignment where students are required to analyze a bibliography of sources, identify what the citations represent, and then determine whether the local library owns them. This is an excellent assignment in developing this skill, and moreover it goes a step further and illustrates outcome 2.3.b.

Librarians describe an assignment that challenges students to find alternatives to texts and resources recommended by teaching faculty.

5.6. Assessing the Ability to Refine Search Strategies

Performance Indicator 2.4. The information literate student refines the search strategy if necessary.

Outcome 2.4.a. Assesses the quantity, quality, and relevance of the search results to determine whether alternative information retrieval systems or investigative methods should be utilized.

Outcome 2.4.b. Identifies gaps in the information retrieved and determines if the search strategy should be revised.

Outcome 2.4.c. Repeats the search using the revised strategy as necessary.

Assessment Query

The *UMBC Survey* includes one question that asks students about their actions after completing their initial research. Students are asked to indicate the frequency with which they complete certain tasks. Of interest to outcomes 2.4.b and c are the following statements from this question:

- understand all of the information
- discuss findings with friends and colleagues
- review the original research questions to determine if additional information is needed
- discard irrelevant or useless information
- revise outline based on research findings

Assignment

An assignment developed by Sue Ann Brainard at the State University of New York, Geneseo, describes a scenario for students who have been exposed to databases but are not proficient at refining search strategies. Students are given a search topic along with a failed first search attempt and then told why the search was not successful. They are then asked to refine the search statement until they get satisfactory results. This assignment teaches troubleshooting skills and also enhances and reinforces critical thinking skills.

5.7. Assessing the Ability to Manage Information

Performance Indicator 2.5. The information literate student extracts, records, and manages the information and its sources.

Outcome 2.5.a. Selects among various technologies the most appropriate one for the task of extracting the needed information (e.g., copy/paste software functions, photocopier, scanner, audio/visual equipment, or exploratory instruments).

Outcome 2.5.b. Creates a system for organizing the information.

Outcome 2.5.c. Differentiates between the types of sources cited and understands the elements and correct syntax of a citation for a wide range of resources.

Outcome 2.5.d. Records all pertinent citation information for future reference.

Outcome 2.5.e. Uses various technologies to manage the information selected and organized.

Assessment Queries

Assessing students' ability to manage information using the following assignments.

Assignments No 1: Please select the items that describe your experience with databases and catalogs. Please select all that apply.

- a. E-mailed records directly from a library catalog or database
- b. Saved records directly from a library catalog or database
- c. Printed records directly from a library catalog or database using the database print function (not using the web browser or "print screen")
- d. Exported records from a database or catalog using bibliographic management software (e.g., EndNote, ProCite)
- e. Copied and pasted records from a catalog or database into a word-processed document
- f. Changed the viewing preferences (the way the record or list of results looks) within a catalog or database

Assignment No 2: If you collected information from web articles for a research paper, how would [you] save the information that you might quote from or paraphrase later? I would . . .

- a. write down or bookmark the URL so I could take notes from the screen later
- b. take notes on the information on the screen and refer to my notes later
- c. "cut and paste" information from the screen to a disc or file
- d. print out a portion of the article to read the information later
- e. print out the whole article to read later and then select the portions I need

Assignment No. 3: Which of the following includes the most complete list of elements that are typically required for an MLA or APA formatted citation for a *magazine article* from an *online database*?

- a. author, title of article, magazine's title, date of publication, pages, name of the database
- b. author, title of article, magazine's title, magazine publisher, date of publication, pages, name of the database, URL
- c. author, title of article, magazine's title, date of publication, pages, name of the database, URL
- d. author, title of article, magazine's title, date of publication, pages, name of the database, date of access, URL

Assignment No. 4: Which of the following statements is true?

- a. When citing articles, you retrieved from an online periodical database, you need to include the name of the database.

- b. Different disciplines, such as psychology or biology, have developed specific citation styles.
- c. The MLA style of citations is used by web search engines.
- d. Answers a and b.
- e. Answers b and c.

Assignment No. 5: As you collect sources for your project it is critical to:

- a. evaluate each source for accuracy and currency
- b. print the full text out
- c. record all bibliographic information for your Works Cited list
- d. answers a and b.
- e. answers a and c.

Assignments

Very few assignments were identified for this particular performance indicator. Students use different software to manage bibliographic citations. Students can be required to conduct the research and export records directly from the catalog or database, then automatically generate a bibliography using a specified citation style. The debate method has been used effectively to instruct juniors and seniors students in the importance of accessing, evaluating, managing, and presenting information. In each of these scenarios, groups of students are required to submit an annotated bibliography, using a particular citation method, that includes all of the resources they used for character development and their presentations.

5.8. Objectives

After reading this unit, you will be able to explain:

- Different stages of assessing the needed information.
- How to select a research methodology?
- How to develop search strategies?
- How to retrieve and manage information?
- Control Vocabulary
- Searching techniques
- Natural Languages

5.9. Self-Assessment Questions

Q1. Critically discuss the different stages of assessing the needed information for academic and research purposes.

Q2. Write a comprehensive note on different search strategies with relevant examples.

Q3. How to assess needed information effectively and efficiently?

Q4. Write short notes on each of the following.

- Control Vocabulary
- Searching techniques
- Natural Languages
- Related Term (RT)
- Truncation

5.10. Activities

1. Identify a topic for your subject area of interest and develop a plan to retrieve information in a variety of formats, evaluate the located information, cite their sources appropriately, and present your findings to class.

2. Make citation of the following according to APA and MLA formats.

“Cognitive load theory: Instructional implications of the interaction between information structures and cognitive architecture by Paas, F., Renkl, A., & Sweller, J.. 1-8. Instructional science, (2004). 32(1)”.

UNIT NO. 6

EVALUATING INFORMATION

6.1. Standard 3: The information literate student evaluates information and its sources critically and incorporates selected information into his or her knowledge base and value system.

The acquisition and application of this standard's principles by students are important in both learning and research. The ideal outcome for mastering this standard is that the information-literate student will have acquired transferable skills that are applicable in any situation that requires evaluation, critical analysis, and critical thinking.

Standard 3 is one of the most detailed standards, with seven performance indicators and twenty-five accompanying outcomes. The performance indicators can be characterized as falling into two broad groups: those assessing students' ability to incorporate selected information into their knowledge base and value system (3.1, 3.3, 3.6, 3.7), and those assessing students' ability to evaluate information and its sources critically (3.2, 3.4, 3.5).

6.2. Assessing the Ability to Incorporate Selected Information Into One's Knowledge Base and Value System

In order to successfully summarize main ideas from information sources, the student must be able to identify and understand key concepts from retrieved information, restate those concepts and details accurately by paraphrasing, and identify material that can be quoted. Additionally, the student must be familiar with the definitions for summarizing and paraphrasing and be able to understand and apply these concepts within the context of assignments and other course work. It is imperative that students possess the skills to be able to determine when to paraphrase and when and how much to quote verbatim.

PerformanceIndicator3.1. The information literate student summarizes the main ideas to be extracted from the information gathered.

Outcome3.1.a. Reads the text and selects main ideas.

Outcome3.1.b. Restates textual concepts in his/her own words and selects data accurately.

Outcome3.1.c. Identifies verbatim material that can be then appropriately quoted.

Assessment Queries

Recommended query types for assessing this performance indicator include those that require the student to demonstrate the ability to successfully complete tasks that represent the skills embodied by the outcomes. The following three queries were taken and address outcomes 3.1.a, b, and c, respectively. In the initial stages of your research, you find this paragraph:

'many studies have shown that the more corporal punishment is used in someone's childhood, the greater the probability that the adult will be physically violent. Physical violence to children can become a way of life. Moreover, family violence cuts across all socioeconomic groups'.

The above paragraph provides relevant information for which of the following topics?

- a. increase in adult violence.
- b. physical punishment of children.
- c. relationship between physical punishment of children and adult violence.
- d. violence and class differences.

This query is an excellent example for assessing students' ability to read critically and identify the key focus of a particular passage. The addition of an "I don't know" option would decrease the likelihood of students' guessing. Paraphrasing is the process of

- a. summarizing the author's ideas in your own words.
- b. selecting paragraphs to use in your paper.

- c. changing a phrase to mean something else.
- d. none of the above.

This query tests a student's knowledge of the concept of paraphrasing. Instead of an "I don't know" option, the query developers included "none of the above." This option will also prevent the tendency to guess, to some extent. This type of query also provides insight into the student's retention and processing skills.

Assignments

Assignment no.1: Students can be required to read a passage, abstract, or article and then prepare a summary that identifies the key concepts represented, along with a copy of the information source itself. Students could also be required to restate, summarize, or paraphrase the passage, abstract, or article as an inclass assignment. This assignment contains aspects of outcomes 1.1.e (identifies key concepts and terms that describe the information need) and 2.2.b and c (identifies keywords, synonyms, and related terms and selects controlled vocabulary).

Assignment no.2: Another assignment could require students to prepare a presentation, summarizing the resources they have identified for their research project. Students could identify and justify the selection of key quotations or passages from the information source that would best support their research topic.

PerformanceIndicator3.3. The information literate student synthesizes main ideas to construct new concepts.

Outcome3.3.a. Recognizes interrelationships among concepts and combines them into potentially useful primary statements with supporting evidence.

Outcome3.3.b. Extends initial synthesis, when possible, at a higher level of abstraction to construct new hypotheses that may require additional information.

Outcome3.3.c. Utilizes computer and other technologies.

(e.g., spreadsheets, databases, multimedia, and audio or visual equipment) for studying the interaction of ideas and other phenomena.

PerformanceIndicator3.6. The information literate student validates understanding and interpretation of the information through discourse with other individuals, subject area experts, and/or practitioners.

Outcome3.6.a. Participates in classroom and other discussions.

Outcome3.6.b. Participates inclass sponsored electronic communication forums designed to encourage discourse on the topic (e.g., e-mail, bulletin boards, chat rooms).

Outcome3.6.c. Seeks expert opinion through a variety of mechanisms (e.g., interviews, e-mail, listservs).

This performance indicator broadly addresses communication skills. In order to participate in course related discussions, conduct interviews, and use other electronic means of discussion, students need good communication skills, written and otherwise. This performance indicator also contains an aspect of outcome 1.1.a: the information literate student "confers with instructors and participates in class discussions, peer workgroups, and electronic discussions to identify a research topic, or other information need."

Outcome 3.6.c is similar to outcome 2.3.d: the information literate student "uses surveys, letters, interviews, and other forms of inquiry to retrieve primary information." Students who are proficient with outcome 3.6.c must be aware that the information seeking process is multifaceted and that information can be obtained from a wide variety of sources.

Assessment Queries

Several queries ask students to self-report their familiarity with a variety of presentation methods. In your academic career (high institute, community college, college or university),

have you ever been given the opportunity to participate in a course that used the following technologies for facilitating communication:

- a. instant messaging
- b. bulletin board
- c. threaded discussions
- d. discussion forums
- e. file exchange
- f. internal e-mail
- g. online journal/notes
- h. real-time chat
- i. whiteboard
- j. other _____

Assignments

Assignment no. 1: Depending on the discipline and the availability of resources, students could be required to identify, subscribe, and register on a professional electronic discussion list or discussion group that represents their selected research topic. Students could monitor the discussion list for the entire semester or a specified length of time and then prepare and present (or submit via e-mail or post using course software) a summary of the key current issues discussed by practitioners and researchers who populate the list.

Assignment no.2: Another assignment could require students to identify a piece of research on their chosen topic, critically analyze that research based on basic evaluation criteria provided by the instructor, and then locate and contact the author and conduct an interview. Each student could then prepare a report that includes a summary of the interview and the list of interview questions, along with key concepts or passages extrapolated from the research that directly supports the student's research thesis.

PerformanceIndicator3.7. The information literate student determines whether the initial query should be revised.

Outcome3.7.a. Determines if original information need has been satisfied or if additional information is needed

Outcome3.7.b. Reviews search strategy and incorporates additional concepts as necessary

Outcome3.7.c. Reviews information retrieval sources used and expands to include others as needed

This performance indicator is similar in nature to indicator 2.4: the information-literate student refines the search strategy if necessary. In order for students to become proficient with performance indicator 3.7, they must have acquired and reinforced skills from each of the preceding standards (1 and 2) and their accompanying indicators and outcomes; specifically, assessing the original information need and comparing it to the resources they have gathered.

Assessment Queries

Students could be asked to self-report the frequency with which they complete tasks represented by the outcomes for this performance indicator. After you have done your initial research for a paper, how often do you do the following?

- a. Review the original research questions/thesis to determine if additional information is needed to satisfy the information need.
- b. Review search strategy and search using additional keywords and concepts.
- c. Review databases and other information retrieval sources used and identify and search additional ones.

Students' knowledge and mastery of the skills represented by these outcomes could also be assessed by their responses to the questions below.

- a. What was your original research question/thesis?
- b. Which of the information sources gathered provides appropriate support for your original research question/ thesis and why?

- c. Which of the information sources gathered do not provide appropriate support for your original research question/ thesis and why not?
- d. What search strategy did you use to identify the information sources gathered?
- e. If you need additional sources, what, if any, additional keywords will you use?
- f. Which databases and catalogs did you use to identify information and why?
- g. If you need additional sources, which, if any, other databases will you use and why?

Assignments

Assignment no.1: As part of learning the research process, students could be required to respond to a series of questions about the materials they have gathered for their project. Specifically, they could be required to restate their original thesis and indicate which of the identified materials best addresses the information need. Students could be partnered or divided into small groups.

6.3. Assessing the Ability to Evaluate Information and Its Sources Critically

This section addresses performance indicators 3.2, 3.4, and 3.5.

PerformanceIndicator3.2. The information literate student articulates and applies initial criteria for evaluating both the information and its sources.

Outcome3.2.a. Examines and compares information from various sources in order to evaluate reliability, validity, accuracy, authority, timeliness, and point of view or bias.

Outcome3.2.b. Analyzes the structure and logic of supporting arguments or methods.

Outcome3.2.c. Recognizes prejudice, deception, or manipulation.

Outcome3.2.d. Recognizes the cultural, physical, or other context within which the information was created and understands the impact of context on interpreting the information.

Once they have acquired effective evaluation skills, students will be equipped to organize, analyze, and manage all types of information. Library and information professionals have identified a number of core criteria that should be considered when evaluating information and sources of information. The following criteria are adapted from the ACRL's Objectives for Information Literacy Instruction and can be applied to both print and electronic sources.

Accuracy. Is the information verifiable? What is the source of the information presented? Is the data complete?

Audience. Who is the intended population for this information? Students? Professionals? Practitioners? Researchers? Educators? Consumers? Customers?

Author/Authority. Who is the author or creator of the information? What are their qualifications and background or training? Can this information be confirmed in biographical sources or other materials?

Bias/Point of View. Does the information present a one-sided view? Does it express opinions rather than facts? Are the information and sources designed to trigger emotions, conjure stereotypes, or promote support for a particular viewpoint or group? Are the conclusions reasonable? Are there references to other sources that confirm or question a point of view?

Currency. Is the information retrieved sufficiently current for the information need?

Publisher/Publication. What is the reputation of the publisher or issuing agency? Are they qualified to publish on this topic?

Scope/Coverage. Does this resource cover the topic adequately? What is the time frame or subject coverage? Is this information for only a specific period? Is it broad in scope or more narrow? Does it provide references to other sources for additional information?

Timeliness. When was the information published?

Validity. Can the information be either confirmed or verified in other sources?

Assessment Queries

The following query was taken that broadly assesses students' knowledge of and familiarity with evaluative criteria (3.2).

Which criteria should you use to evaluate whether or not a particular source is valuable for your research?

- a. expert author, reliable information, up-to-date, objective.
- b. famous author, high Internet search engine ranking, short, up-to-date.
- c. famous author, up-to-date, easy to find, large quantity of information.
- d. easy to read, Internet availability, visual aids (diagrams, photos), objective.

The following question addresses the authority aspect of outcome 3.2.a.

To determine if an author is qualified to write on a specific topic, which of the following would most likely provide trustworthy information about the author's qualifications:

- a. a general encyclopedia
- b. biography index or database
- c. author's web page hosted by the university where he or she is employed
- d. answers a, b, and c e. answers b and c⁵

The following query, investigates the student's perceptions about information found on the Internet and the credibility of the authors or source of that information.

When would you use an article located on the Internet in a research project? Please select all that apply.

- a. article written by an individual with no known subject-related credentials
- b. article written by an individual with a Ph.D.
- c. article written by a well-known scholar in the field
- d. article available from a website ending in .edu and/or connected to a institute, college, or university
- e. article published as part of the proceedings of a professional organization on their website
- f. full text of article available
- g. article available from a free website accessible via the World Wide Web
- h. article listed in the syllabus of a professor i. not at all

The following is one such query that also addresses outcome 3.2.a.

If you were writing a paper on crime in a newspaper and you found a newspaper article with statistics indicating that there was a 10% decline in 2002, which of the following is the next best step?

- a. Verify the accuracy of the figure by comparing with last year's newspaper.
- b. Check the statistics in a government source.
- c. Use the data, being sure to cite the article in your paper. d. I don't know.

The following two queries are from the same instrument and are appropriate to other aspects of outcome 3.2.a, including bias, reliability, and timeliness.

You are writing a report on automobile safety and tires. You have found several sources. Which would be the *most trustworthy* because of the likelihood of having objective information?

- a. report from an automobile association
- b. survey from a tire manufacturer
- c. article in an automobile magazine
- d. article in a consumer rights magazine e. article in a women's magazine

When evaluating sources of information, the date of the source

- a. is important depending on the topic
- b. should never be more than ten years old
- c. is only critical in medical research
- d. is usually not important if it is a reliable source

The following providing insight about the role and reputation of the publisher as a criterion for evaluation, also addresses the bias aspect of outcome 3.2.a.

When researching a controversial topic in the library, such as prayer in public institutes, could you evaluate an article for bias before reading it? Please select only one response.

- a. No. I need to read an article to find bias.
- b. Yes. The abstract usually evaluates the article and notes any bias.
- c. Yes. If the article is reporting research, it should be unbiased.
- d. Yes. The reputation of a journal publisher or author may indicate bias.
- e. I don't know.

6.4. Evaluating Websites

The criteria for evaluating websites are primarily the same as those for evaluating print and other resources, but the key elements relevant for this medium are accuracy, authority, currency, coverage, objectivity, and balance in presentation of ideas. Due to the lack of comprehensive oversight, any web page that was accessible yesterday could conceivably change or disappear by tomorrow. Information literate students need to be aware of the nature of this online medium as an information resource and practice critical thinking and evaluative skills with all information found therein. The following queries address website's evaluating criteria(outcome 3.2.a and also 3.4.e). Students are provided a link to view a website either as a graphic image or as a live site. They are then asked to respond (yes, no, cannot tell) to a series of questions.

- Is there an indication of when the information was created or updated?
- Is there information on the author or producer of the website?
- Is there information on the author or producer's credentials?
- Is there contact information (e.g., e-mail address for the author or producer)?
- Does the website cover the topic extensively?
- Is the information presented as fact (vs. opinion)?

Additional questions could be developed to address other areas for this performance indicator, including an analysis of the URL to determine the origin, ownership, and domain of the site; questions about the intended audience; links to other sources; and whether the information can be verified in other sources. Additionally, students need to be aware that in the Internet environment anyone can be a publisher and that the content presented on a web page may not always be accurate or appropriate for college-level research. Additionally, students should be familiar with the variety of domain suffixes in order to be able to evaluate websites and their sources. The following query developed by the authors can be used to test students' knowledge of the more commonly used domains.

Match the domain suffix with the type of host that it represents:

- .com company
- .gov government
- .edu Commercial or personal sites .netEducational sites
- .orgNot-for-profit organizations .mil Internet infrastructure

It also touches on accuracy of web pages (3.2.a), 3.4.b (verifying information from other sources) and 3.4.e (questioning the source of the data).Which of the following is the *best* way to check the accuracy of a web page?

- a. E-mail the author of the web page.
- b. Ask a friend.
- c. Assume that the information is incorrect.
- d. Check the information against information from other sources.

Assignments

Assignment no.1: The assignment requires students to compare resources found on the Internet with articles found in preselected databases. By comparing the quality of information found in articles from both types of sources, students learn about selecting relevant resources for their topic and also enhance their critical thinking skills.

Assignment no.2: One excellent assignment for evaluation includes introducing students to fake or hoax websites or fake e-mails. Students can work in small groups to evaluate the websites using instructor-provided criteria or research the validity of a fake e-mail.

Assignment no.3: Another assignment is to provide students with the URLs to fake or deceptive websites and require them to answer a series of questions to determine the sites' accuracy and validity.

Performance Indicator 3.4. The information literate student compares new knowledge with prior knowledge to determine the value added, contradictions, or other unique characteristics of the information.

Outcome 3.4.a. Determines whether information satisfies the re-search or other information need.

Outcome 3.4.b. Uses consciously selected criteria to determine whether the information contradicts or verifies information used from other sources.

Outcome 3.4.c. Draws conclusions based upon information gathered

Outcome 3.4.d. Tests theories with discipline-appropriate techniques (e.g., simulators, experiments).

Outcome 3.4.e. Determines probable accuracy by questioning the source of the data, the limitations of the information gathering tools or strategies, and the reasonableness of the conclusions.

Outcome 3.4.f. Integrates new information with previous information or knowledge.

Outcome 3.4.g. Selects information that provides evidence for the topic.

Assessment Query

The following query directly addresses outcomes 3.4.b and c. It provides students with an information related dilemma and asks them to draw a conclusion based on the information gathered. Similar queries and assignments based on this particular aspect of the process, such as those used for performance indicator 3.7, could be developed for these outcomes.

You now own a 1996 Ford Windstar that has given you electrical problems. You need to buy a new car, so you look at the magazine *Consumer Reports*, which says Wind stars have fewer than average electrical repair problems. Which of the following is the *most likely conclusion* to make?

- a. You should buy another Windstar.
- b. *Consumer Reports* is wrong.
- c. You have a different model year from the one described in the report.
- d. A mechanic damaged your electrical system.

Assignments

Assignment no.1: In developing assignments that provide an opportunity for students to acquire and reinforce the skills represented by outcomes 3.4.c and f, students could be asked to submit the conclusions they have arrived at based on the information they have gathered.

Assignment no.2: Additionally, students could be asked to provide a comparison, in a narrative or table (visual) format, of the information they discovered and the information they had prior to conducting the research.

Assignment no.3: Students could be asked to conduct an analysis of the information-gathering tools they used, specifically indicating the accuracy of the information retrieved and the scope of the sources used.

PerformanceIndicator3.5. The information literate student determines whether the new knowledge has an impact on the individual's value system and takes steps to reconcile differences.

Outcome3.5.a. Investigates differing viewpoints encountered in the literature.

Outcome3.5.b. Determines whether to incorporate or reject viewpoints encountered.

This performance indicator is similar to 3.4 and involves significant higher order critical thinking skills. Students proficient with these outcomes understand that the knowledge and values they bring to the research process as individuals play an integral role in whether they reject or incorporate the varying viewpoints they encounter during their research. Additionally, this indicator presumes that students are familiar with and aware of their value systems in terms of information analysis and critical thinking. These two outcomes involve the student bringing some prior knowledge of the research topic to the table and in doing so prove to be difficult to assess objectively with traditional queries.

6.5. Objectives

After reading this unit, you will be able to explain:

- Evaluating information.
- Evaluating information sources critically.
- How to incorporate selected information.
- Various presentation methods
- Evaluating websites.

6.6. Self-Assessment Questions

Q1. What abilities are required to evaluate information and information sources? Justify your answer with examples.

Q2. Discuss the different process of evaluating a website.

Q3. What steps should be followed in order to successfully summarize key concepts from main information sources for research tasks? Discuss with examples.

Q4. Write short notes on each of the following.

- Website accuracy
- Information sources
- Accuracy of information vs author accuracy
- Presentation methods
- Fake or hoax websites or fake e-mails

6.7. Activities

- Visit a library and conduct an analysis of the information gathering tools that are used by you for assignment preparation, specifically indicating the accuracy of the information retrieved and the scope of the sources used.
- You are required to read an article on '*information needs and seeking behaviors*' and then prepare a summary that identifies the key concepts represented, along with a copy of the information source itself.
- You are required to read an article on '*information literacy*' and then prepare a summary that identifies the key concepts represented, along with a copy of the information source itself.

UNIT NO. 7 USING INFORMATION EFFECTIVELY

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

Standard 4 primarily addresses two areas of information literacy: the ability to organize new information and synthesize it with prior knowledge and the ability to communicate new information in an effective way. Using methods such as active course learning and collaborative learning exercises can provide insight into the actual abilities of students, while attitudinal assessment can be gathered through the use of carefully developed questions.

Standard 4 has three performance indicators and ten accompanying outcomes. Key concepts for students are the ability to organize information that has been acquired (4.1.a) and the ability to communicate that information effectively and efficiently to accomplish a specific purpose (4.3). In other words, it is important for students to be able to think critically about the information they have acquired in order to organize that information and communicate it in some meaningful way. Standard 4 represents the stage when a student brings together all of the information he or she has located, accessed, and evaluated, integrates it with his or her prior knowledge, and creates a new research product or performance. It is also the stage where many students get into trouble by cutting, pasting, and plagiarizing.

7.2. Assessing the Ability to Organize, Plan, and Create Information

Performance Indicator 4.1. The information literate student applies new and prior information to the planning and creation of a particular product or performance.

Outcome 4.1.a. Organizes the content in a manner that supports the purposes and format of the product or performance (e.g., outlines, drafts, storyboards).

Outcome 4.1.b. Articulates knowledge and skills transferred from prior experiences to planning and creating the product or performance.

Assessment Queries

Outcome 4.1.a focuses on students' ability to organize information in a way that supports the proposed end product (a research paper, oral presentation, etc.). When writing assessment questions for these outcomes, find out whether students logically follow the steps of the research process, specifically those steps that represent organizing information. One question asked students to indicate how often (very frequently, frequently, occasionally, infrequently, never) they have completed steps in the research process. After you have done your initial research for a paper, how often do you do the following?

- Understand all of the information.
- Discuss findings with friends and colleagues.
- Make an outline.
- Review the original research questions to determine if additional information is needed.
- Discard irrelevant or useless information.
- Revise outline based on research findings.
- Look at materials under each outline heading and synthesize major points and concepts.
- The key responses to this query are c, f, and g.

Outcome 4.1.c. Integrates the new and prior information, including quotations and paraphrasing, in a manner that supports the purposes of the product or performance.

Plagiarism and the misuse or unethical use of information become more apparent at this stage in the research process. One reason for this is that many teaching faculties fail to update or revise assignments, or they assign large classes the same assignment year after year. The

prevalence of full-text databases and the reported frequent use of nonproprietary Internet resources by students at all levels also contributes to the temptation to cut and paste information to complete assignments.

When writing up information found for a research project or for a research presentation, which of the following do you usually do? Please select all that apply.

- a. Present what you believe the author(s) said.
- b. Present what you thought your instructor wanted to hear.
- c. Present the opinions of the author(s) verbatim.
- d. Present your own opinions only.
- e. Present a combination of reflection and opinions (yours and author[s]’).
- f. Present a combination of reflection and opinions (yours and author[s]’) and previously read material.
- g. Present the opinions of the author(s) verbatim in quotation marks.
- h. None of the above.

On a basic level, this question addresses the propensity to plagiarize by not acknowledging the source of ideas and thoughts other than your own. Technically, there is no correct response to this item. The purpose of the question is to find out what students do when presenting or writing information. Ideally, we hope they will select items *f* and *g*.

Assignments

The following assignments will introduce students to Standard 4 and assist in their acquisition and mastery of the skills represented by outcomes 4.1.a–c.

Assignment no.1: students are required to select a research article and read the articles cited by it. Students are instructed to

- explain how each article is related to the original article.
- consider under what circumstances it is appropriate to cite other papers.
- determine what different purposes the citations serve.

The outcome of this assignment is that the student learns when it is appropriate to recognize the contributions of other authors in the development of new work.

Assignment no.2: Another assignment called “Facts, Opinions, and Reasoned Judgments.” In this assignment, students are given definitions for the terms *fact*, *opinion*, and *reasoned judgment*. Afterward they are provided with a list of questions to consider when evaluating information in any format. In this assignment, students enhance critical thinking skills as well as practice synthesizing and integrating information.

Outcome 4.1.d. Manipulates digital text, images, and data, as needed, transferring them from their original locations and formats to a new context.

Assessment Queries

Assessment questions for this outcome can be approached in a number of ways. You can ask students what skills they possess, you can ask them to self-assess on a set of skills (comfortable, very comfortable, etc.), or you can ask them to respond to questions that require them to demonstrate expertise or knowledge of a skill. The following list of skills is not meant to be comprehensive but was compiled to provide baseline information on the breadth and variety of technological skills that students are expected to know and have mastered by the time they join institution.

E-mail, preferably web-based, in order to e-mail web pages, citations, library catalog records, and full-text (text, HTML, PDF) journal articles by either using the database e-mail program or by attaching documents (text, images, etc.) to an e-mail message.

Online file management capabilities such as creating, opening, and closing documents (word processing, plain or rich-text, image, audio, video) and folders; and creating and saving/burning files and documents to disks (hard drive, floppy, zip, CD).

Electronic file and folder organization skills for file management and retrieval in a Windows-based environment.

Word-processing skills, including the ability to navigate using the tab, home, end, and arrow keys; to format using bold, italicize, underline; to change fonts (size and style); insert items (page numbers, end/footnotes, files, images); copy, cut, and paste text; add, edit, and delete text; use page setup (set and change page margins, paper size, orientation, and layout); use spell check; and print a document.

In an attempt to assess the technological skills of students the following questions could be asked:

- What word-processing program do you most commonly use (name and version)?
- Do you know how to convert a document to Rich Text Format (an .rtf file)?
- Do you know how to scan a document (or disk) for viruses?
- Do you know how to FTP a file?
- Match the file extension to the type of document it represents:
 - a. .txt MS Excel
 - b. .doc MS Word
 - c. .htm,.html Acrobat Reader
 - d. .jpg MS PowerPoint
 - e. .mdb MS Access
 - f. .xls Graphic
 - g. .ppt Web Page
 - h. .pdf Text

Please select the items that describe your experience with computers. Please select all that apply.

I use computers for:

- a. e-mail/chat rooms/IM
- b. word processing/spreadsheets
- c. searching databases
- d. Internet/World Wide Web
- e. games/entertainment
- f. work-related/telecommuting
- g. other: _____

A review of the information literacy instruments identified several questions that were also appropriate for this performance indicator. From the following list, mark all the situations in which you have used the Internet:

- ___ to read a newsgroup
- ___ to transfer files
- ___ to get software
- ___ to write and send correspondence
- ___ to participate in online discussion groups
- ___ to browse the Web
- ___ to create a web page

This query asks respondents to indicate under which circumstances they have used the Internet. Responses to this query provide insight into whether or not students have transferred files, downloaded and installed software, and wrote and sent correspondence electronically. From the following list, mark all the situations in which you have used electronic mail:

- _ to ask a teacher/instructor a question
- _ to schedule a meeting for a group project.

- _ to turn in assignments.
- _to discuss with classmates an issue raised in one.of your classes.
- _ general chat.
- _to keep in contact with friends and family.
- _ other (please specify): _____

The use of citation management software such as ProCite and EndNote is fast becoming popular. This software, which was developed to facilitate the management of citations for bibliographies and notes, requires additional technological skills and could be considered a higher-order skill for this standard. However, in terms of technological competency, in order to make the best use of theses bibliographic management tools, students need more than basic computer skills.

Assignments

Students can be instructed to demonstrate their ability to attach a document (full-text article in the HTML or PDF file for-mats), image, or other file to an e-mail message and send it; retrieve a document, image, or file attached to an e-mail message; or copy and paste an image or file from one location to another. The appropriate use of word-processing software packages, PowerPoint, and other presentation software also demonstrates expertise with this outcome.

7.3. Assessing the Ability to Revise the Development Process for the Research Product

PerformanceIndicator4.2. The information literate student revises the development process for the product or performance.

Outcome4.2.a. Maintains a journal or log of activities related to the information seeking, evaluating, and communicating process.

Outcome4.2.b. Reflects on past successes, failures, and alternative strategies.

Assignments

The most common require the student to maintain a log of his or her progress in writing a research paper, including the changing focus of the paper relative to topic development and the search for information. This type of assignment requires students to think critically about the research process and organizing and presenting information.

7.4. Assessing the Ability to Communicate Information

PerformanceIndicator4.3. The information literate student communicates the product or performance effectively to others.

Outcome4.3.a. Chooses a communication medium and format that best supports the purposes of the product or performance and the intended audience.

Outcome4.3.b. Uses a range of information technology applications in creating the product or performance.

Outcome4.3.c. Incorporates principles of design and communication.

Outcome4.3.d. Communicates clearly and with a style that supports the purposes of the intended audience.

Assessment Queries

In your academic career (high institute, community college, college, or university,), have you ever been given the opportunity to present your research using the following methods/formats? Please select all that apply.

- a. written research paper
- b. visual project

- c. presentation using PowerPoint or other presentation software
- d. presentation using nontechnical methods (flip charts, overhead transparencies, etc.)
- e. web pages/site
- f. dramatic performance (singing/dancing/recitation/musical interpretation).
- g. CD
- h. DVD
- i. VHS
- j. other

Successful presentations are also dependent on the presenter's mastery of and comfort with the technology he or she uses. The greater exposure a student has to presentation technologies and methods, the more comfortable he or she will be during the presentation.

Additional questions for this performance indicator could be grouped to elicit a range of responses, such as;

7. Do you have any experience constructing web pages?

8. If yes, please rank your abilities constructing web pages on a scale of 1 to 10:

12345678910

BEGINNER

INTERMEDIATE

ADVANCED

9. If you answered yes to question 7, what software do you use to create web pages?

Assignments

Assignment no.1: Students are required to create a newsletter on a particular topic, for example, training/sports medicine/health issues. The students are encouraged to gear their newsletter toward a fictitious yet realistic audience, such as coaches, rehabilitation faculty, and so on. In this way, they are learning that information can be organized and communicated to different audiences in a variety of ways. They also learn that the final product or presentation is likely to be more effective when the information is presented in an appropriate format. This assignment demonstrates proficiency with outcome 4.3.a.

Assignment no.2: In addition, students can be instructed to develop a web page, a website, or a special subject journal or magazine issue to communicate information to an audience that might include their course colleagues, departmental faculty, conference attendees, or the news media. Students could also prepare a presentation for a potential employer that is appropriate for their major or profession.

7.5. Objectives

After reading this unit, you will be able to explain how:

- to use information effectively
- the information literate student, individually or as a member of a group, uses information effectively to fulfil their information needs
- to organize, plan, and create information for different needs
- to revise the development process for the research product.
- to communicate information.

7.6. Self-Assessment Questions

Q1. As an information literate student, discuss how to use information effectively for various academic as well as research purposes.

Q2. How to organize, plan, and create information for different needs? Discuss with examples.

Q3. Discuss the different types of communicating information with relevant examples.

Q4. Write short notes on each of the following.

- Online file-management
- Word-processing skills
- Quotations vs paraphrasing
- Plagiarism
- Information processing skills

7.7. Activities

• Librarians at the University of Puget Sound (Washington) advocate an assignment called “Create an Anthology. “Students are required to create an “annotated book of readings.” The guidelines for this assignment can include limitations on the type of items annotated, for example, only scholarly sources produced “within the last ten years,” or broader limits that include “chapters or excerpts from monographs and significant older materials.” Other guidelines include:

- introduction written by students.
- each included item annotated (including a description and justification for inclusion).
- bibliography of items considered for inclusion appendix of copies of items selected.
- allowed the flexibility and creativity to present information using a variety of formats.

UNIT NO.8

INFORMATION, SOCIAL CONTEXT, AND ETHICAL AND LEGAL ISSUES

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

Standard 5 has three performance indicators and thirteen accompanying outcomes. The standard is complex, somewhat philosophical, and above all requires students to think critically about information issues. Student outcomes relating to these issues can be summarized as the ability to understand and apply local and national information policies (such as acceptable-use policies and copyright) in multiple contexts; to demonstrate an understanding of the conventions and implications of scholarly, mass market, and not-for-profit publishing; to interact ethically with information and its technologies; and to recognize the social and political implications inherent in information production and systems.

8.2. Assessing the Understanding of Knowledge Production and Information Access

Performance Indicator 5.1. The information literate student understands many of the ethical, legal, and socioeconomic issues surrounding information and information technology.

Outcome 5.1.a. Identifies and discusses issues related to privacy and security in both the print and electronic environments.

Outcome 5.1.b. Identifies and discusses issues related to free versus fee-based access to information.

Outcome 5.1.c. Identifies and discusses issues related to censorship and freedom of speech.

Outcome 5.1.d. Demonstrates an understanding of intellectual property, copyright, and fair use of copyrighted material.

Assessment Queries

To raise students' understanding of the complexity of the issues surrounding Standard 5, it is best to apply methods of instruction and assessment on the course and assignment level that give the instructor an opportunity to gain an understanding of what students know in order to make changes in teaching and learning opportunities during the course itself. This type of assessment is known as formative assessment, and its use gives students the opportunity to see the gap between their current knowledge and the stated goal.

The following queries rely on self-perception and reporting:

- How often do you copy multiple chapters of books?
- How often do you download MP3 files from peer-to-peer file sharing networks?
- How often do you share licensed computer software with others?
- In your opinion, is it okay to make a compilation CD for a friend from CDs you purchased?

The following are true-or-false queries to directly test students' knowledge:

- Copyright law protects both published and unpublished works.
- Architectural works are not protected by copyright laws.
- Copyright law protects ideas and facts.
- Copyright laws do not protect slogans or logos.
- It is legal for a professor to tape a program off television and show it to the class.

The queries above could be supplemented with the following ones to more completely address the performance indicator:

- In your opinion, is it okay to bypass the security system on a DVD to get it to run on a player purchased in another country?
- True or False--Preventing a student from stating their personal opinion in an essay is censorship.

Asks the following questions, allowing the student to respond either “yes,” “no,” or “don’t know” for each item listed.

Copyright is a form of protection provided by the laws of the government to the authors of “original works of authorship,” including literary, dramatic, musical, artistic, and certain other intellectual works. This protection is available for both published and unpublished works. If you were creating your own website, which of the following could you legally use on your web page without permission?

- Pictures of Britney Spears from the Internet
- The theme song from *Titanic* by Celine Dion
- Letters that you found at the National Archives written by Martha to her husband, President George Washington
- President George W. Bush’s Inaugural Speech
- Pictures of Anna Kournikova scanned in from *Sports Illustrated* magazine.
- Text you scanned in of *Harry Potter and the Prisoner of Azkaban*
- Text of the Homeland Security Act introduced in Congress

Assignments

Assignment no.1: an assignment that presents students with an “event happening on their campus that highlights basic rights of citizenship such as privacy (5.1.a) or free speech (5.1.c).” Students are then instructed to research these “rights” and apply the information they found to the campus event by writing an essay. The implications of current information policy should be discussed by students as users of public and private information and information delivery systems, as lifelong learners, and as informed citizens. Outcome 5.1.a addresses technological and information policy issues related to privacy and security of information use and access.

Assignment no.2: there are two assignments titled “Legislative Progression” and “Policy Progression.” These exercises ask students to track a piece of legislation or policy through Parliament. They ask the questions, “Who are the organizations involved? What is the history of the issue? What are the ideological conflicts?” The authors believe that this will help students understand the processes of government and follow the politics and social implications of a critical issue. To address performance indicator 5.1, this can focus on a specific piece of information policy.

Assignment no.3:

1. Have students explain what an information database is and how it is relevant for finding information.
2. Have students discuss the differences among various web search engines.

Also provided are more advanced versions of these assignments, wherein students are asked to research a topic in a web search engine and subscription database, then compare and describe the resources available through the two tools, and finally discuss the similarities and differences between the tools. Outcome 5.1.c asks students to analyze the broader context of research and publishing and identify the absence of, impeded access to, and censorship of particular ideas as applicable to their field of study.

Assignment no.3: students browse the library stacks to examine book and journal titles in a specific discipline. The students should then write an essay in response to the following questions:

- What is (discipline), i.e., how might it be defined?
- How might the resources consulted be utilized in other courses, especially in other disciplines?
- From this exercise, what have (you) learned about the scope of the discipline?

8.3. Assessing Compliance with Information Policies, Laws, and Regulations

PerformanceIndicator5.2. The information literate student follows laws, regulations, institutional policies, and etiquette related to the access and use of information resources.

Outcome5.2.a. Participates in electronic discussions following accepted practices (e.g., “Netiquette”).

Outcome5.2.b. Uses approved passwords and other forms of ID for access to information resources.

Outcome5.2.c. Complies with institutional policies on access to information resources.

Outcome5.2.d. Preserves the integrity of information resources, equipment, systems, and facilities.

Outcome5.2.e. Legally obtains, stores, and disseminates text, data, images, or sounds.

Outcome5.2.g. Demonstrates an understanding of institutional policies related to human subjects research.

This performance indicator asks students to demonstrate that they understand the rules and regulations surrounding information use by complying with policies and laws. Where the first performance indicator is constructive, asking students to develop and demonstrate knowledge, the second indicator is behavioral and prescriptive in nature. It asks students to comply (through their behavior) with regulations and adopt or internalize etiquette and values. Performance indicator 5.2 asks students to work within and respect this environment. When students navigate, research, and create in the open universe of the World Wide Web, they should do so with the understanding that most of what they encounter is copyrighted, whether it carries stated authorship and copyright notice or not.

These rights do not remain pure, of course, and are open to negotiation, legal interpretation, and codified exemptions. The copyright world is, well, messy. With what was often seen as a moral right increasingly codified, authors and creators can parcel out their rights and sell portions off to publishers or whomever. Perhaps of greatest concern here is the fair use exemption, which allows the use of portions of copyrighted creative work in educational settings without first obtaining permission. Students and faculty must familiarize themselves with the parameters of this exemption in order to ethically and lawfully navigate the information universe of text, graphics, audio, and video. Following are the example of the Fair Use Guidelines for Educational Multimedia. Such guidelines are often incorporated into library publications or codified as institutional policy.

Student Technology Use, Including Acceptable Use of Computers

- requirements for instruction in technology use such as an “Internet Driver’s License”.
- consequences of violating the Acceptable Use Policy
- use of multimedia hardware and software
- access to the Internet in the media center.
- use of the Internet for research or recreational purposes
- appropriate use of technology during study hall, before and after institute.
- printing pages from the Internet for research or personal interest.
- designing and posting websites on the institute web server.
- access to e-mail accounts, either through an institute network or web e-mail services such as Hotmail.

Faculty Technology Use, Including Acceptable Use of Computers

- requirements for instruction in technology and Internet use.
- Internet access and use, including recreational surfing design and maintenance of class web pages.
- use of e-mail accounts on institute computers, either personal or through an institute network.

Copyright and New Technology Issues

- conducting software audits.
- fair use issues, including fair use of multimedia and Internet information.
- use of Internet filters.
- regulations about posting institute-related informational web pages.
- use of media with distance learning technologies.
- use of non-institute-owned software on institute computers.
- use of CDs and videos from home on institute owned hardware.

Assessment Queries

The following three queries assess a student's knowledge of policies and procedures in the use of and access to information (5.2.b–f):

- What disciplinary action might happen to community college students who violate the policies on plagiarism? (short answer required).
- To gain access to your college library's online databases from *offcampus* you would (short answer required).
- You must create a radio advertisement for your job. You want to use a small part of a popular song from a CD for background music. What is required of you, if anything, before broadcasting this advertisement?
 - a. Notify the songwriter that you will use part of his song.
 - b. Find out who distributed the song and negotiate with them for the right to play part of this song.
 - c. Nothing; you can use the song since you are only playing a small part of it.
 - d. You can use the song since you paid for the CD it is published on.

The next two questions to the outcomes in assessing students' knowledge of online discussion practices (5.2.a) and specific campus policy provisions (5.2.c), respectively:

Why should one never type an e-mail in all caps?

- a. It is "shouting" and a breach of netiquette.
- b. It is hard on the keyboard.
- c. It is hard on the eyes.
- d. It is culturally offensive for some.

Assignments

Assignment no.1: "Using/Not Using Copyrighted Information" (a small-group assignment) requires students to build a multimedia presentation (web page or PowerPoint presentation) to teach particular subject matter or address an assigned research problem that uses third-party copyrighted material. To address outcomes 5.2.d and 5.2.e, the students are to incorporate texts, images, and sounds as appropriate and actively seek permissions when necessary. The faculty member must make sure that students approach this assignment with a working knowledge of the concepts of copyright and fair use and that they understand when it is necessary and how to seek permissions.

Assignment no.2: titled "Web Site and Web Portfolio Project." In this assignment students build a website, research and evaluate material for content, and apply their knowledge of fair use and copyright laws for a freely available public website.

8.4. Assessing Academic Integrity, Plagiarism, and Scholarly Accountability

PerformanceIndicator5.3. The information literate student acknowledges the use of information sources in communicating the product or performance.

Outcome5.3.a. Selects an appropriate documentation style and uses it consistently to cite sources.

Outcome5.3.b. Posts permission granted notices, as needed, for copyrighted material.

Outcome5.2.f. Demonstrates an understanding of what constitutes plagiarism and does not represent work attributable to others as his/her own.

Assessment Queries

Results by a host of researchers over the past thirty years have essentially confirmed either a “significant” occurrence or a rise in self-reported/perceived academic dishonesty by students. Many of these survey queries addressed the contextual and personal factors involved in academic dishonesty, as listed below:

Relationship of field of study, discipline, academic level, or gender to occurrence.

Application of the honor code concept in face-to-face and distance education classrooms—traditional, modified, and no codes (no proctored exams, no pledge, no rat clause).

- Student’s perception of peer behavior.
- Student’s perception of the likelihood of policy enforcement.
- Student’s perception of the severity of punishment.
- Number of cases pursued by faculty.
- Student’s perception of an instructor’s ethics.
- Student’s institutional and disciplinary ethics.
- Personal indicators as cause (time, grade pressure, moral code/values, etc.).

In addition to contextual and personal indicators, a thorough assessment of performance indicator 5.3 should include assessing students’ understanding of the concepts of plagiarism and intellectual dishonesty and their demonstration of that understanding in their own writing.

For this performance indicator, self-perception and behavior queries could include:

- How often do you cut and paste text from an Internet source without acknowledging the author?
- Do you believe other students submit papers purchased from term paper mills for a grade?
- Queries to directly test students’ understanding could include:
 - Is this an example of proper use?
 - Is this an example of plagiarism? or, what is plagiarism?
 - What is a bibliography?
 - Why do bibliographies accompany most academic writing?

The following query, which assesses a student’s basic knowledge of the performance indicator and outcomes outlined in this section, when working with written text: Suppose you are writing a research paper and you read an article on your topic. In which of the following instances would you cite the material as a footnote/endnote/reference in your paper? Please check all that apply.

- a. When you copy a whole paragraph.
- b. When you write it over in your own words.
- c. When you quote one sentence from the article, using quotation marks.
- d. None of the above.
- e. All of the above.

f. I don't know.

Assignments

Many institutions have developed diverse avenues and methods to teach about the issue of plagiarism and foster academic integrity. One of the wonderful things about this topic is that you can typically find it being addressed at all levels of the institution. Among the methods used by librarians, individual faculty, academic departments, and campus-wide initiatives are:

- Workshops (writing centers, libraries, freshmen seminars, new student orientations).
- Online guides, tutorials, and campus information clearinghouses (writing centers, libraries, honor councils, and judiciary boards).
- In-class discussions (faculty).
- In-class overviews and guides (faculty).
- Student handbooks and policies (student services, academic deans, departmental chairs, faculty).
- Brochures (student services, libraries, honor councils, and judiciary boards).
- Bookmarks, mugs, pencils, and other novelty reminders (student services, libraries).
- Educational video clips (student services, libraries, honor councils, and judiciary boards).
- Plagiarism detection tools, services, and software (faculty, writing centers, libraries).

The case study method as an effective way to engage students in a discussion of ethics in research and specific academic disciplines. For example, if given a scenario in which a character named Carol Peterson is confronted by her instructor because of suspected plagiarism, the students in the course could be asked to:

- Decide which of the two positions to defend: Should Peterson copy the notes? Why or why not?
- Solve a problem: What should Peterson do?
- Take a role: What would you do if you were Peterson? Her instructor? The dean?
- Think about how the problem could have been avoided: What went wrong here?

8.5. Objectives

After reading this unit, you will be able to explain:

- social context of information.
- ethical and legal issues relating to the use and access of information.
- the understanding of knowledge production and information access.
- academic integrity, plagiarism, and scholarly accountability.
- issues with information policies, laws, and regulations.

8.6. Self-Assessment Questions

Q1. Discuss the ethical and legal issues relating to the access and use of information.

Q2. What do you mean by academic integrity? Also discuss how to evaluate academic integrity.

Q3. Write a comprehensive note on compliance with information policies, laws, and regulations.

Q4. Write short questions on each of the following.

- Formative assessment
- Social context of information
- Information policies
- Plagiarism
- Bibliography
- Copyright

- Academic integrity
- Economic and social issues of information

8.7. Activities

- It is an assignment for you take a text. Go through it with a class and pull out a quotable phrase. Talk about the elements included in a bibliographic citation and outline them. Construct a proper in-text reference and bibliography/ works cited reference. Discuss proper and improper ways of incorporating this into a writing assignment.
- Write a complete bibliographic citation for the three sources you selected using a standard citation format (e.g. MLA, APA, Vancouver).

UNIT NO. 9

BEYOND THE STANDARDS: WHAT NOW?

This unit will discuss areas that should be considered in information literacy assessment but are not covered by the ACRL Standards. The nature of the relationship between students and faculty, students' perceptions of and attitudes about the standards, detailed demographic and background information on student populations with regard to information literacy, and students' technological competencies are often overlooked in information literacy assessment. However, these areas are critical to the overall process in determining students' preparedness and information literacy exposure. Examples of assessment questions for these areas are also included in this chapter.

Of the four areas addressed, students' relationship with faculty is usually the most overlooked element in library-related instruction in general. Demographics are almost always included in assessment, but the analysis of many of the components is usually descriptive and limited. Technological competence is critical in order for college-level students to participate and succeed in academia and the workforce. The inclusion of questions in these areas is strongly recommended in order to enhance and improve your assessment endeavors.

9.1. Students' Relationship with Faculty

Statistical analysis of the sociological and psychological factors that contribute to a student's ability to make relevance judgments revealed that the student's relationship with the faculty is generally the most overlooked factor in library and information literacy assessment. As a function of how students acquire information literacy and library research skills and their attitudes about these skills, the student/faculty relationship is an important aspect at all levels of the academe.

Past research confirmed that faculty generally expect students at all levels to possess the research and information literacy skills in order to complete assignments and research projects and in doing so, structure class assignments and coursework accordingly. However, research shows that students' relationship with faculty indirectly affects the students' performance (when tested on information literacy skills) and attitude (how they feel about information literacy skills). This is so because their relationship with faculty affects students' exposure (to the library/information science environment) and their experience (within the library/information science environment). Simply put, faculty are key; students become exposed and experienced through their relationship with the faculty.

Assessment Queries

The *Test* includes seven items designed to glean more information about the nature of the relationships students might have with faculty members during their academic careers. The relationships were defined as either advisor/advisee (primarily graduate students) or classroom interaction (primarily undergraduate students). In responding to this question, please consider your experience with faculty in completing required assignments for courses. Please select all that apply.

- a. Faculty member requires no use of outside material for completing course assignments.
- b. Faculty member requires use of only lectures and assigned textbook(s) for completing course assignments.
- c. Faculty member requires use of library to retrieve reserve materials.
- d. Faculty member makes use of library materials (print and/or electronic) when presenting course material and lectures.
- e. Faculty member requires or suggests use of library materials (print and/or electronic) when assigning course work.

f. Faculty member invites librarians to introduce course-related library materials (print and/or electronic).

9.2. Attitudinal Data

The majority of assessment efforts do not consider students' perceptions or attitudes about the concepts on which they are being tested. Students' attitudes are important at every stage of the educational process, however. They are especially critical in terms of library instruction, the library in general, using computers, and library and information literacy-related anxiety.

9.4 Assessment Queries

Many of the surveys reviewed for this study guide included questions that asked students to report their comfort or confidence levels with library research skills. However, there was very little evidence that students had been asked how they felt about information literacy skills. Additional areas for attitudinal research include how students feel about computers and libraries (anxiety), conducting research, and interacting with librarians. Exploring students' confidence and comfort levels on different aspects of libraries and the research environment may also be beneficial. Because the profession has embraced the ACRL Standards, it is hoped that future information literacy assessment instruments will include an attitudinal component in order to build a body of research-based literature that accurately characterizes students' attitudes about these important skills.

9.3. Demographic Data

In addition to the demographics that are commonly gathered during information literacy assessment such as academic status, age, and major, it is a good idea to gather more detailed demographic data in order to provide an accurate profile of the student population you are assessing. The following data are deemed important for data analysis and for providing a holistic demographic profile of the student population such as gender, birthdate, ethnic heritage and race, country of citizenship; country of birth, native language, high institute, colleges and universities attended.

9.4. Technological Competencies

The impact of technology on higher education is becoming more and more significant. Technology has permeated all aspects of the learning environment, and faculty and students must be technologically proficient in order to be successful. *For example*, in order to register for classes, access grades, and pay tuition, students have to acquire and master certain basic technology skills. In order to be successful academically, they must be able to access, retrieve, evaluate, manage, and use information effectively and efficiently from a variety of print and nonpoint sources. Information resources are multiplying exponentially and are becoming more diverse, more complex, and more interdisciplinary. Successful students must be information literate, as well as technologically proficient, in order to complete basic course work and degree requirements.

Assessment Queries

The ACRL Standards do not specifically focus on technological competency, but a certain level of competency is presumed in order to complete the tasks described in the outcomes: using electronic discussions (1.1.a, 3.6.b–c, 5.2.a); selecting information retrieval systems, implementing searches, retrieving information online, and selecting from various technologies to extract, record, and manage information (2); using computer and other technologies to study the interaction of ideas and other phenomena (3.3.c); manipulating

digital text, images, and data (4.1.d); using a range of information technology applications(4.3.b); and understanding issues of privacy and security in electronic environments (5.1.a).

9.5. Developing Information Literacy Assessment Instruments

Developing an information literacy instrument first requires some groundwork, including gaining the support of administrators and others in the organization, assessing other instruments that are available, and creating goals and objectives that will help drive the process.

9.5.1. The first step: garner institutional support

Successful survey instruments cannot be developed in a vacuum. It is important to obtain input and feedback from the teaching faculty, students, library faculty and staff, and university administration. In fact, a best practice for information literacy programs is administrative and institutional support. Perhaps the most important place to begin eliciting support is at the top. The support of the head of the library can be instrumental to the success of an information literacy program in a variety of ways. A library director can use his or her influence and position on campus to further the cause of the information literacy program as a whole and to lobby support for institutional assessment.

9.5.2. Why are you assessing?

Before developing an assessment instrument, you must first determine why you are conducting the research. What is the purpose of the survey? The answer to that question will guide you through the development process. For example, a short information literacy pre and posttest to address short-term skills deficiencies or to determine current skill sets may be sufficient when you are assessing.

9.5.3. Review of existing instruments

Before developing an information literacy assessment instrument, it is a good idea to review the literature to see what others have done. This will prevent you from reinventing the wheel and will also allow you to benefit from the work of others. However, if you wish to update the list of survey instruments, keep in mind that there has been little research in information literacy, and much of what is available has been done as a part of dissertations and master's theses. In addition to identifying instruments via the research literature, we strongly recommend that you search the World Wide Web.

9.5.4. Developing survey instruments

The benefit of developing a survey that is more standard specific than subject or institution based is that students will be tested on broad concepts and skills rather than on localized information. It is important to teach students that there is a world of resources beyond the institution's online catalog and that databases owned by the local library do not necessarily represent all of the resources that are potentially available.

Also, keep in mind that query development is an ongoing process. Once you have developed an instrument, be prepared to add, delete, update, and revise queries on a regular basis. Many aspects should be considered in information literacy assessment, and it is virtually impossible to develop an instrument that will address them all adequately. Be realistic and recognize that surveying students is only one aspect of assessment. Try investigating other qualitative methods of assessing students along with a survey, such as behavioral observations, portfolios of student work (including papers and assignments) and research diaries.

9.6. How to Write a Query

Query development requires a great deal of hard work, and one instrument will never be *the* answer to all of your assessment dilemmas.

Types of Queries: All queries are not created equal. Typically, information literacy assessment uses various categories and formats of queries.

True/false or yes/no queries (e.g., “Have you ever had formal library instruction?”). Depending on the query, these types may require a follow-up or related query to ensure the collection of usable data. For example, using a true/false or yes/no query would be appropriate in the following query:

Do you use e-mail? Yes No Don't know

However, the following query would not provide enough usable data due to the lack of specificity:

Do you use productivity software? Yes No Don't know

This response does not tell you what kind of productivity software the student has used or if the student even knows what productivity software is. This query, could be rewritten to add the following in parentheses after the question: Microsoft Word, Excel, Access, PowerPoint. Alternatively, a follow-up question could be written: If yes, which ones?

_ Microsoft Word _ Excel __ Access __ PowerPoint

Multiple-choice queries (e.g., “The best place to look for an introduction to a topic such as astronomy is: a, b, c, d”). This type of query requires the respondent to select one or more options. This query should always include an “I don't know” option to discourage guessing.

Matching queries (e.g., “Match the file extension to the type of document it represents”). This type of query works similar to the pull-down menu.

Short-answer queries (e.g., “What do we call a book written by an individual about her or his own life?”) and *essay-type queries* (e.g., “What might be a research question to investigate ‘whether governments should get involved in regulating the use of the Internet?’”) work best in short-term pre and posttest assessments. These queries are also ideal for use with smaller populations.

Attitudinal/self-report queries (e.g., “strongly agree, agree, undecided, disagree, strongly disagree”; or “very comfortable, comfortable, undecided/neutral, uncomfortable, very uncomfortable”). These queries use Likert-type scales and generally require additional follow-up or related queries in order to provide a more holistic picture of students' actual abilities.

Demographic queries (e.g., age, academic status). These queries can be written in a variety of ways. The most common formats are multiple choice (e.g., select age from a range); pull-down menu (e.g., select race, major, or academic status from a predefined list); and short answer/fill in the blank.

9.7. Automating Assessment Instruments

Automating a survey instrument involves a wide range of issues, from staffing to compatibility with the campus system. It involves how to select staff with appropriate skills for instrument automation, technology compatibility with local area network platforms, as well as campus network platforms; the selection and use of an operating system, web server software, and web programming language; automated instrument aesthetics; query design issues; and testing. It also includes database development, data analysis, and data reports.

9.8. Objectives

- After reading this unit, you will be able to explain:

- The nature of the relationship between students and faculty.
- Students' perceptions of and attitudes about the IL standards.
- Demographic and background information on student populations with regard to information literacy.
- Students' technological competencies.
- Process of developing information literacy assessment instruments.

9.9. Self-Assessment Questions

Q1. Write a comprehensive note on the relationship between students and faculty with regard to information literacy.

Q2. Define survey instrument. Also, write a note on the development of survey instruments with examples.

Q3. How to write a query during developing instrument? Also, discuss its various types with relevant examples.

Q4. Write short notes on the following:

- Types of queries
- Demographic information
- Review of existing instruments
- Technological competencies
- Attitudinal data

9.10. Activities

- Write a list of questions asking students about their experience(s) in the classroom and in completing course work assignment.
- Develop an information literacy assessment instrument having all types of queries (e.g. yes/no, do not know, multi-choice questions, and short questions, etc.).