Vidmar (*Professor/Information Literacy and Instruction Librarian*) Southern Oregon University [Ashland, OR]

SOURCE CODE:
ASSESSING CITED REFERENCES TO MEASURE STUDENT INFORMATION LITERACY SKILLS

DALE J. VIDMAR

OVERVIEW

Sustainable instruction in today's environment of reduced resources must be aligned with student learning outcomes and measurements. As such, the assessment of student work—in particular, the assessment of foundational goals such as information literacy along with oral and written communication and critical thinking—is paramount to a thriving information literacy and instruction program that benefits the library, the institution, and ultimately the students themselves. The key is to assess what is valued in a way that is manageable and informative. At the same time, it is important to analyze actual work samples that students complete to the best of their ability. These embedded assessments could include capstone papers or course projects in order to provide a direct and more accurate picture of student achievement and program effectiveness.

INSTITUTIONAL ASSESSMENT AND LIBRARY ASSESSMENT

Assessment in the library, much like institutional assessment, can take many forms. Much like the institution, the library may find accreditation and accountability as motivating forces behind assessment. Gate counts, usage statistics, reference and directional questions, the number of classes taught, or one-on-one consultations are often collected and reported to represent what the library is doing and often to indicate why, where, and how it should be funded. On the other hand, evidence of teaching effectiveness and students meeting information literacy proficiencies is generated from a much different analysis.

Institutional assessment (Appendix A) generally follows from two interrelated practices: 1) program effectiveness centering on accountability, viability, and comparability; and 2) student achievement focusing on teaching, learning, and improvement. Whereas program effectiveness concentrates on accreditation, program review, effectiveness, and efficiency essential to the administration of a university or individual programs, student achievement focuses on learning outcomes and proficiencies. Often, accountability and accreditation can drive assessment activities, but central to this paper is the notion that well-done authentic assessment of student learning will satisfy program reviews, accreditation, and accountability goals.

When measuring student learning, there are indirect and direct means of assessment. Indirect assessment gathers perceptions through surveys, informal or anecdotal observations, interviews, student evaluations, and self-assessments. For example, Thompson, Morton, and Storch (2013) interviewed students to determine how they found, selected, and used sources in their assignments. Standardized forms of indirect assessments such as LibQual or the National Survey of Student Engagement (NSSE) provide useful information but not in the context of having students demonstrate nor apply what they have learned. Direct assessment taps into actual student work or performance through exams, papers, presentations, projects, and portfolios. Standardized assessments such a Project SAILS, the Information Literacy Test (ILT), the iSkills Assessment, and the Collegiate Learning Assessment (CLA) measure student learning through performance tasks, questions, or analytical writing, but students do not necessarily have any intrinsic motivation to complete these assessments to the best of their ability. Embedded assessments are a direct means of generating data based on actual work samples and coursework artifacts.

Classroom-based assessment that capitalizes on embedded student performance in the context of a course or an assignment is generally considered the most valuable institution level assessment. An embedded assessment is a more authentic measurement because students have a vested interest in completing the work to the best of their ability. However, assessment activities generally center on standardized testing that often employs multiple choice testing because they provide comparative data across institutions and are easier to compile. The primary motivation for such assessment is regional and specialized program accreditation. However, the internal drive and institutional commitment toward gaining a clearer understanding of student learning outcomes by faculty and staff is gaining momentum (Kuh, Jankowski, Ikenberry, & Kinzie, 2014).

FIVE BASIC STRATEGIES OF ASSESSMENT

There are five basic strategies to creating an assessment plan that benefits both the institution and the library's information literacy and instruction program:

Align Learning Outcomes

Prior to creating an assessment instrument, it is necessary to have clearly articulated and accepted a set of goal strands and measurable outcomes or proficiencies. What do we want our students to know? The Association of College and Research Libraries (ACRL) Information Literacy Competency Standards for Higher Education (2000), the Association of American Colleges & Universities (AAC&U) Information Literacy VALUE Rubric (2013), or the ACRL Framework for Information Literacy for Higher Education (2015) could serve to establish institutional outcomes that are implemented across the curriculum. In the AAC&U report, *College Learning for the New Global Century* (2007), information literacy and other skills such as critical thinking, written and oral communication, and quantitative literacy represent the essential learning outcomes within a student's plan of study, and these outcomes provide a framework that connects school, college, work, and life. They form the basis of the Liberal Education & America's Promise (LEAP) outcomes (2007). As such, information literacy along with the critical thinking, oral and written communication, and quantitative literacy constitute a set of assessable foundational goals that can be integrated throughout the educational experience from first-year to capstone and beyond.

Assess What is Valued

Choose to assess the outcomes and learning that is valued by the teaching faculty. Make sure faculty and interested individuals are involved in the process. "If faculty do not participate in making sense of and interpreting assessment evidence, they are much more likely to focus solely in finding fault with the conclusions than on considering ways that the evidence might be related to their teaching" (Banta & Blaich, 2011, p. 24). From the development of a plan to the discussion of the results, be flexible and listen to others.

Measure what is important rather than what is easy to assess. Traditional testing using multiple choice, true/false, and other similar questioning strategies is simpler to administrate and score but generally is a better measurement of factual knowledge. Performance tasks more effectively measure procedural skills and higher order thinking. Yet, many assessment instruments, particularly standardized assessment, rely on traditional test questions that do not reflect what teaching faculty want to know about student learning.

Keep It Simple and Sustainable

Assessment done well can become an all-encompassing job for individuals with a full-time job already. Where to start, what to do, how to review student work, and how to make assessment meaningful can quickly become an overwhelming activity. Interestingly, the tendency is to make initial assessments more unmanageable by trying to assess everything all at once and all the time. Although assessment is a continual, on-going cyclical process, it is not an all or nothing process. Set the goal to assess one or two outcomes and develop further assessment from the results and conclusions. Also, synchronize assessments to function at more than one level, such as using results of library assessment to supply the needs of institutional assessments.

Make It Relevant

The purpose of meaningful assessment is to improve teaching and student learning by direct rather than indirect means and assess what individual faculty assess in courses on an institutional level. In other words, assess actual student work samples such as capstones, papers, or presentations. These embedded assessments speak to coursework and assignments that students have a vested interest in completing to the best of their ability. These work samples can illustrate specific information literacy outcomes where evidence of achieving learning outcomes is found. In an ideal sense, the ultimate goal occurs when the assessment itself, beyond the findings, helps develop and strengthen both individual instruction and the information literacy program (Jastram, Leebaw, & Tompkins, 2014).

Communicate Assessment Results

Assessment activities generate data that needs to be shared and shared widely. For the most part, it is far easier to collect data than to productively use the data to improve teaching and student learning (Blaich & Wise, 2011). Communicate assessment results to those with the time and interest to improve student learning and engagement. In order to determine if assessment results are communicated effectively, Banta and Blaich (2011) suggested asking if faculty can do the following based on assessment data:

1. Name two or three strengths within the program.

2. Identify two or three areas for improvement within the program.

If they cannot, then assessment results need to be communicated better. A first step to improvement is to construct a plan for distributing the results and create professional development opportunities for faculty to discuss the findings in order to improve teaching and learning.

THE ANALYTIC RUBRIC

In the review of possible direct assessment instruments both standardized and self-developed, rubrics stood out as more beneficial than basic question strategies. Despite the limitations of traditional assessment questions that employ multiple choice, matching, and true/false questions, academic librarians focus on this type of testing as the primary means of evaluating information literacy skills (Oakleaf, 2009). At Southern Oregon University, librarians used a 20-question pre-test/post-test multiple choice information literacy survey to assess student learning. Although the survey was relatively simple to conduct, score, and disaggregate data, the overall discussion surrounding the hows and whys of the results and the significance of scores in terms of improving teaching and learning were not insightful. In fact, discussion of the results too often strayed over to redesigning the survey questions as opposed to improving instruction.

A well-designed rubric, on the other hand, can be more descriptive and can provide richer discussion in terms of how information literacy instruction can improve student achievement. Oakleaf (2009) found the instructional value of rubric assessment was significantly beneficial even though time and training was required before evaluators could use rubrics consistently and accurately. Another advantage is that a rubric works across a wide variety of disciplines (Moskal, 2000) and differing citation styles. Assessing information literacy as evidenced in student papers from all disciplines and grade levels, whether done at an institutional level or within the library, necessitates the review of references written in varying styles, languages, and disciplines—sometimes as works cited, references, footnotes, or endnotes.

The central element of a valid scoring instrument is to make a rubric that is descriptive it terms of what is valued by the institution and faculty. At the same time, the rubric needs to be descriptive of student work samples in multiple different contexts. Gervasio, Detterbeck, and Oling (2015) developed a rubric to assess student capstone papers with criteria that included "presence of a thesis statement, authority of references, variety of references, consistency of attribution, quality of citations (in text & works cited), ability to paraphrase/summarize/quote effectively, integration of resources to support a thesis, overall organization of content, and limitations of research" (724). Jastram, Leebaw, and Tompkins (2014) created a rubric based on three criteria: attribution, evaluation of sources, and consideration of evidence. Palmer, Andrews, Plovnick, and Williams devised a rubric that measured eighteen criteria within student papers (2012). All three of these rubrics were designed to measure information literacy and other outcomes within the entire paper.

WHY CITATION ANALYSIS?

What do citations reveal about student learning of information literacy proficiencies? Moed (2010) regards citation references as "manifestations of underlying processes" that can indicate the content, importance, and utility of a document or paper. The citations are a measure of research quality, and, perhaps even more importantly, the critical choices made by the individual author.

In a pilot project that was part of an Institute of Museum and Library Science grant, Knight (2003) used an analysis of bibliographies from senior capstones. The scoring rubric had four outcomes aligned with information literacy standards. The rubric was shared with students initially and then used in the assessment of a small sample (18) of required research papers from an International Studies capstone course. Knight's preliminary data indicated that the majority of students constructed lengthy lists of works cited and approximately 60 percent of the sources could be found in the library. The assessment also provided insight into the use of the library and library resources.

Knight (2006) modified the target population in a second study to include first-year students instead of seniors and examined the works cited from 260 annotated bibliographies requiring ten sources. The study concluded that more emphasis should be placed on the importance of consistent and correct citations as well as the critical review of sources. Assessing student work samples proved to be an extremely useful measurement of student learning.

METHODOLOGY

Library faculty at Southern Oregon University evaluated a random selection of 36 papers from a total of 457 senior level writing submissions solicited from all academic programs. The 457 papers represented over half of the 816 bachelor degrees awarded. The names of students were removed for the blind review. The sample size was determined using a stratified sampling method in order to produce a smaller margin of error than simple random sampling. Also, each strata (program) had a least one paper within the sample group proportionate to the total number of submissions.

The analytic rubric (Appendix B) developed to measure information literacy criteria primarily assessed the citations or references used in senior level writing or capstone samples. The rubric included six criteria based on the university information literacy goal strands and proficiencies: 1) Necessity to Cite; 2) Consistent Format; 3) Timeliness of Sources; 4) Relevance of Sources; 5) Quality of Sources; and 6) Range of Sources. Reviewers had access to the entire paper, but the analysis of the citations was the central focus of the assessment instrument. How citations were used within each paper was assessed as a part of critical thinking, and the use of in-text parenthetical references was assessed as a part of written communication. Library faculty completed the citation analysis and forwarded the findings and recommendations to the

University Assessment Committee for institutional assessment purposes.

Interrater Reliability: The Process of Norming

Library faculty also met on three occasions and assessed ten senior work samples following a six-step process outlined by Maki (2010) stressing the importance of norming the rating process of scoring or "interrater reliability." Individual raters needed to reach consensus about scoring with the rubric by going through a "calibration period" to consistently apply the rubric to student work samples. Maki described the following process to ensure reliable scoring from different individuals:

a. Ask raters to independently score a set of student samples that reflects the range of texts students produce in response to a direct method.

b. Bring raters together to review their responses to identify patterns of consistent and inconsistent responses.

c. Discuss and then reconcile inconsistent responses, such as confusion about vocabulary in a performance descriptor that might require developing a key or glossary for scorers using the final rubric.

d. Repeat the process of independent scoring on a new set of student samples.

e. Again, bring all scorers together to review their responses to identify patterns of consistent and inconsistent responses.

f. Discuss and then reconcile inconsistent responses until there is agreement among the scorers about how to apply each performance descriptor to student work (p. 224)

RESULTS AND RECOMMENDATIONS

The findings of the assessment indicated an overall unevenness in the quality and makeup of the references. There was some indication that the requirements for the papers varied greatly from program to program. Scores for the six proficiencies on the rubric ranged from 2.24 to 2.73 on a 4-point scale. Library faculty made the following recommendations both campus-wide and within the library:

- Disseminate assessment rubrics to capstone and senior level writing professors, programs, and students.

- Compare results of information literacy assessment with other assessment measures (written communication and critical thinking for now, and later quantitative reasoning) to look for correlations.

- Collect samples of exemplary papers for each program; make them accessible centrally as models for

students engaged in writing and for faculty engaged in assessment.

In terms of recommendations for the information literacy and instruction program, library faculty made the following recommendations:

- Teach the citation features of databases and the necessity to ensure they are correct and accurate according to a discipline specific style guide.

- Teach the importance of finding and utilizing a wide range of quality and current sources.

- Engage in conversations with faculty in academic programs about our shared responsibility to promote information literacy and offer to assist with the assessment of student papers within the individual program.

- Emphasize information literacy goals by which students will be evaluated throughout their SOU academic experience.

- Improve the average information literacy scores on senior writing samples from 2.5 to 2.75 over the next year.

- Review the information literacy rubric for possible improvement and simplification.

- Continue the assessment process, but set aside a half-day workshop for reestablishing interrater reliability and the review of student papers. Library faculty preferred to work in small groups and being able to consult with the larger group.

In the study, the analysis of citations concentrated on sources used as a part of the research process. The sources the student found and referenced were indicators that addressed what librarians generally taught during information literacy and instruction classes. Therefore, citation analysis provided useful data about what librarians wanted to learn during instruction sessions. Also, aside from the findings, the assessment provide library glimpse into finished assignments and paper. The general consensus was that students did not reference the sources that were being taught by library faculty.

LOEX 2015: INTERACTIVE WORKSHOP RESULTS

LOEX 2015 attendees at the *Source Code* interactive workshop met in small groups of 4 or 5 to review and score a paper using the "Institutional Information Literacy Goal Strand Rubric" (Appendix B). Attendees participated in an abbreviated interrater reliability exercise that adapted the Maki procedure. After reviewing a student paper and scoring the six categories, attendees were asked to respond to the following questions:

- What conclusions could you draw about the library information literacy and instruction program based on the student work samples?

- Were the samples what you expected?

- What could we do better?

- How could we do better?

- Was the assessment doable and sustainable?

With the caveat that attendees had to extrapolate answers to the questions from a single work sample, the responses indicated that if these references were similar to a larger sample, then the citations were uneven, less than scholarly, and seemed to need further revision to select stronger, more reliable sources. If the references listed in the paper served as the credentials of the student to address the topic, then the student did not establish authority. The sources were less than what the groups expected. Overall, there was a consensus that the assessment process was simple and the rubric was useful as an assessment instrument. The small groups agreed that we could to do better in teaching our students how to find and use quality sources. To accomplish the goal of improving the results, a collaborative effort involving both library faculty and faculty from the disciplines is required to do the following:

- Distribute the rubric to the students prior to the completion of the paper.

- Have the students assess their papers using the rubric or have them score other student papers in peer edit groups.

- The self-scored rubrics should be turned in with the final papers.

- Provide samples of exemplary papers to the students.

- Post the best samples on the institutional repository.

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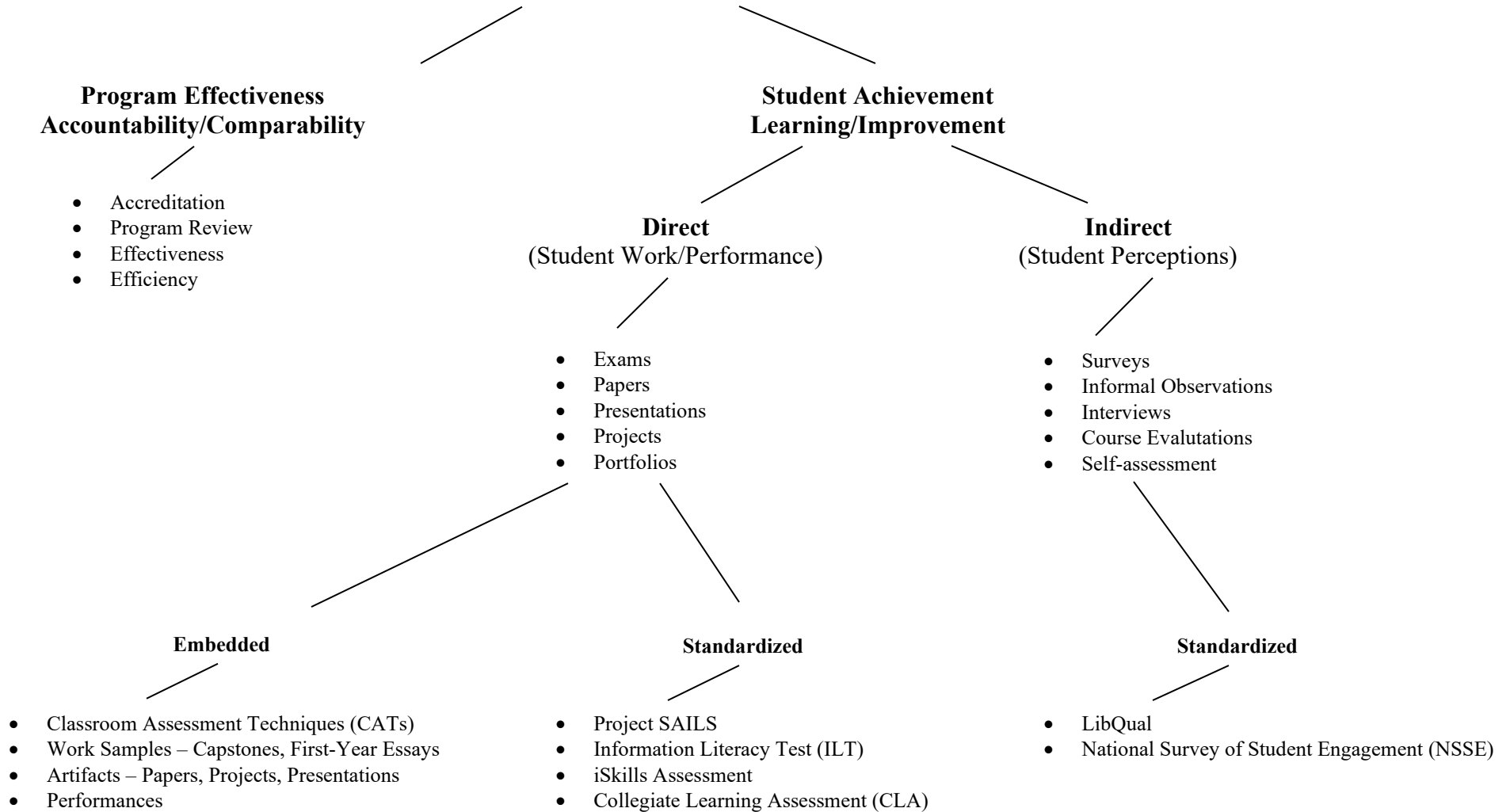
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APPENDIX A
INSTITUTIONAL ASSESSMENT

Program Effectiveness
Accountability/Comparability

- Accreditation
- Program Review
- Effectiveness
- Efficiency

Student Achievement
Learning/Improvement

Direct
(Student Work/Performance)

- Exams
- Papers
- Presentations
- Projects
- Portfolios

Indirect
(Student Perceptions)

- Surveys
- Informal Observations
- Interviews
- Course Evalutations
- Self-assessment

Embedded

- Classroom Assessment Techniques (CATs)
- Work Samples – Capstones, First-Year Essays
- Artifacts – Papers, Projects, Presentations
- Performances

Standardized

- Project SAILS
- Information Literacy Test (ILT)
- iSkills Assessment
- Collegiate Learning Assessment (CLA)

Standardized

- LibQual
- National Survey of Student Engagement (NSSE)

INSTITUTIONAL INFORMATION LITERACY GOAL STRAND RUBRIC

Information Literacy	1 (Beginning)	2 (Developing)	3 (Accomplished)	4 (Exemplary)
Recognizes the necessity to cite appropriate sources	Cites very few or no discipline-appropriate sources.	Cites a few discipline-appropriate sources.	Cites several discipline-appropriate sources.	Cites many discipline-appropriate sources.
Cites sources in a complete and consistent format	References are incomplete and inconsistent. Not enough information is provided to locate sources.	References are somewhat complete and consistent. Some information is provided to locate sources.	References are mostly complete and consistent. Enough information is provided to locate most sources.	References are complete and consistent. Enough information is provided to locate all sources.
Distinguishes timeliness of sources—current unless of historical significance	Few or no sources published within an appropriate timeframe relevant to the subject matter.	Some sources published within an appropriate timeframe relevant to the subject matter.	Majority of sources published within an appropriate timeframe relevant to the subject matter.	All sources published within an appropriate timeframe relevant to the subject matter.
Chooses sources relevant to subject matter	Sources unrelated to research topic.	Sources somewhat related to research topic.	Sources mostly related to research topic.	Sources directly related to research topic.
Incorporates high quality, discipline-appropriate or peer-reviewed sources	Little or no information from discipline appropriate or peer-reviewed sources. Sources are superficial or weak.	Some discipline appropriate or peer-reviewed sources somewhat aligned to research topic.	Many discipline appropriate or peer-reviewed sources generally aligned to research topic.	Most or all discipline appropriate or peer-reviewed sources closely aligned to research topic.
Integrates a range of sources—books, articles, government documents, websites—appropriate for subject matter	Unbalanced sources relying primarily on a single work or author.	Somewhat balanced and varied sources relying on a few different works and authors.	Mostly balanced and varied sources relying on several different works and authors.	Well-balanced and varied sources relying on multiple different works and authors.

Information Literacy – The ability to know when there is a need for information, to be able to locate, evaluate, and effectively and responsibly use and share that information for the problem at hand.

Information Literacy Foundational Goals and Proficiencies:

1. Determine the nature and extent of information needed.
2. Access information effectively and efficiently.
3. Evaluate information and resources.
4. Integrate information ethically and legally.