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*Article*

**Library Instruction and Academic Success: A Mixed-Methods Assessment of a Library Instruction Program**

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**Abstract**

**Objectives** – This study examines the connection between student academic success and information literacy instruction. Locally, it allowed librarians to ascertain the institution’s saturation rate for information literacy instruction and identify academic programs not utilizing library instruction services. In a broader application, it provides an argument for a tiered program of information literacy instruction and offers student perspectives on improving a library instruction program.

**Methods** – Focus groups with 15 graduating seniors, all of whom had attended at least one library instruction session, discussed student experiences and preferences regarding library instruction. An analysis of 4,489 academic transcripts of graduating seniors identified differences in grade point average (GPA) between students with different levels of library instruction.

**Results** – Students value library instruction for orientation purposes as beginning students, and specialized, discipline-specific library instruction in upper-level courses. There is a statistically significant difference in GPA between graduating seniors who had library instruction in upper-level courses (defined in this study as post-freshman-level) and those who did not.

**Conclusions** – Library instruction seems to make the most difference to student success when it is repeated at different levels in the university curriculum, especially when it is offered in upper-level courses. Instruction librarians should differentiate

between lower-division and upper-division learning objectives for students in order to create a more cohesive and non-repetitive information literacy curriculum.

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## Introduction

Libraries are often called the “heart of the university,” and have long assumed a vital role in academic life. In recent years, however, libraries (along with many other university departments and programs) have increasingly been asked to prove their value to governing and funding bodies. The research report from the Association of College and Research Libraries, *Value of Academic Libraries* (2010), provides a research agenda for academic librarians who seek to demonstrate the value of library services. One part of the research agenda is to demonstrate the value that library services add to a university in the form of student learning and academic success.

One way that librarians hope to affect student learning is by meeting students in the classroom. Over the past decade, information literacy instruction has become a major part of the work of some academic librarians. Information literacy is part of the general education program at the University of Wyoming (United States): each student is required to take a course with an embedded information literacy component, and most of those classes are freshman-level classes that introduce students to study within their majors. Since 2001 the library’s Research and Instruction Services department has collected statistics regarding how many instruction sessions librarians have conducted. The number has risen from 127 in 2001 to 380 in 2010, and we currently teach about 7,500 students per year (or half of the student body). In the past three years, around 50% of those instruction sessions have been aimed at freshman-level classes. This represents a huge time commitment on the part of librarians, and it is important to consider whether or not the investment of time and resources makes a difference to students.

This study attempts to see where librarians may have the most impact with face-to-face instruction, as well as to find out how the

library instruction program is experienced from a student point of view. The general education program is undergoing revision, and we would like to have an argument for embedding information literacy learning outcomes at different points in the curriculum, rather than embedding them all in freshman-level courses. This study aims to establish the value of library instruction at various levels with a scaffolded approach.

Creating a plan for the incremental mastery of information literacy skills throughout the college curriculum is becoming a more prevalent concern in the library instruction community. A tiered approach to teaching information literacy is in line with the way many universities teach other literacies, such as writing and math, with introductory skills at the freshman level and then more advanced practice as students matriculate. In the 2011 Instruction and Assessment Plan developed at University of Wyoming Libraries, we included a skills level table that suggests learning outcomes to be addressed at different points in the university curriculum (Appendix A). This study deals with the experiences of students who graduated before the new instruction and assessment plan was in place, and so there were no common guidelines for librarians to teach information literacy with increasing complexity; however, in the future with this common set of practices, we may know with more certainty which skills students have learned and at what level of study.

## Literature Review

Much of the research literature related to assessment of library instruction is summarized in *Library Assessment in Higher Education* by Joseph R. Matthews (2007), in which multiple studies are categorized as either supportive of the idea that library instruction has a positive effect on student performance or non-supportive of that idea. Results are fairly evenly split between studies that find a positive association and studies that

find no association. These studies take the form of skills testing, academic performance, opinion surveys, and more.

Matthews's review of the literature reflects the three major ways that librarians have established connections between library instruction and student academic success: surveys of student opinion or habits, examining student work or exams for specific skills, and analysis of grade point average (or another measure of academic performance) in relation to library instruction offered. All three of these methods have limitations: surveys provide an indirect and self-reported assessment of student success, examining student work places a limit on the sample size and is labour intensive for researchers, and while comparing grade point average with library instruction may suggest correlations between student success and library instruction, there are too many potentially confounding variables to claim that library instruction causes student achievement.

Student achievement is defined in *Value of Academic Libraries* (2010) as one of several dimensions of student learning. It is often represented by GPA or scores on tests like the GRE. A student's GPA is an imperfect measure of learning and achievement, since grades cannot be directly mapped to learning outcomes like information literacy. There are factors besides learning or skill mastery that may be measured in a grade, such as attendance or participation. Despite these confounding variables, GPA remains a widely accepted surrogate for student learning.

This literature review will examine studies of the correlation between library instruction and grade point average as well as several studies that use focus groups to assess library instruction programs, because those are the two research methods used in this study. It will also discuss studies employing a mixed-methods approach to assess library instruction, which is an emerging area of research without many articles published to date. Finally, one of the major research questions of this study is whether a tiered approach in a library instruction program is effective. While there is

literature regarding tiered learning in information literacy within a class or within a major, there seem to be no such articles regarding a cross-curricular library instruction program, so although that topic is included in this study, it is not addressed in the literature review.

Moore, Brewster, Dooroh, and Moreau (2002) at Glendale Community College in California published results from a project begun in 1999 that studied the impact of library classes and workshops on student success, with student success defined as GPA score in the following semester. Their study showed a positive correlation between library classes and grade point averages, as compared with a group of students who did not receive library instruction. The study sample size, however, was quite small. Still, the study is an early example of a positive correlation between library instruction and student achievement.

Kirk, Vance, and Gardner of Middle Tennessee State University (2010) collected data from their institution's student database, including GPA, gender, ACT score, and retention, and matched that data to students who were enrolled in classes that received library instruction. The researchers hoped to demonstrate a relationship between library instruction and retention, but they found no measurable effect on freshman to sophomore retention, nor did they find an effect on GPA. There were important outcomes of the study, however. According to the authors, the study provided librarians with encouragement to seek access to student data for research purposes, which can help librarians not only to prove value, but to learn about saturation rates for library instruction and find out about gaps in instruction programs.

The largest study of GPA and library instruction took place at Hong Kong Baptist University Library, and analyzed the library workshop attendance and graduation GPA of over 8,000 students (Wong & Cmor, 2011). The study found that if several workshops were offered to students, there was a higher tendency for library instruction to have a positive impact on grade point average. The

authors suggested that multiple library workshops (as many as three or four) do have a positive correlation with greater academic success. The study marked a difference between undergraduate students who attend library workshops and graduate students who attend library workshops, but with no consideration of whether the undergraduates had library instruction in lower-division or upper-division classes.

Focus groups have been successfully used to assess various aspects of library services, including library instruction programs. Academic librarians have utilized focus groups in order to learn about students' perceptions of the role of the library and developing information literacy skills (Morrison, 1997), to evaluate library services related to a problem-based learning curriculum in a school of medicine (Canning, Edwards, & Meadows, 1995), and to evaluate an information literacy program for a freshman-level biology course (Spackman, 2007). The first two focus group studies were composed only of students, while the final study included teaching assistants as well as students. The benefits of using a focus group include the opportunity to get multiple perspectives at once (as opposed to a one-on-one interview) as well as the spontaneous interactions between focus group participants, which can provide interesting avenues for conversation and for learning (Morrison, 1997).

Mixed-methods research is a distinctive methodology that combines quantitative and qualitative research methods. Combining research methods can offer a better understanding of the research problem as each approach adds an angle for analysis (Ary, Jacobs, & Sorenson, 2010). Some published library research projects have made use of this method in order to assess information literacy. One such study investigated the relationship between critical thinking and library anxiety among undergraduates in their information search process (Kwon, 2008). Kwon's study used a survey instrument as the quantitative method and an examination of student essays as the qualitative method. By combining the two methods, the researcher found significant negative associations between critical thinking

and library anxiety. Another study utilizing mixed methods assessed a first-year information literacy course via pre- and post-tests and focus group sessions (Wakimoto, 2010). These examples of mixed-methods studies illustrate the value of combining qualitative and quantitative methods in order to understand complicated, multi-faceted issues like student learning.

The mixed methods study described in the current article replicates elements of Wong and Cmor's examination of connections between library workshop attendance and GPA, but adds the student perspective from focus groups to support and fill in gaps from the quantitative analysis. The utility of a tiered approach to information literacy instruction is not thoroughly addressed in the library literature, and this study of University of Wyoming students seeks to fill that gap by providing an argument for a programmatic approach with library instruction at various levels in the curriculum.

## **Aims**

The purpose of this research is to learn about the relationship between students' academic success and information literacy instruction. The author hypothesized that graduating seniors who had continuing library instruction in their sophomore, junior, or senior year would be more successful, as reflected by GPA, than students who had library instruction in their freshman year alone, due to repeated practice and reinforcement of library research skills. The author also sought to understand students' perceptions of their own learning and their experience with library instruction.

The study was undertaken with several research questions in mind:

- What is the relationship between student academic success and information literacy instruction?
- Which students receive library instruction and which do not?

- Is there a good argument for creating a tiered program of information literacy instruction?
- How can we improve our program of information literacy instruction?

Librarians often approach these questions from a librarian-centred perspective: we gather data on how many students attend information literacy instruction sessions, how many students successfully complete research assignments, and so on. At the University of Wyoming all of our assessment data on this subject has been from the librarian perspective rather than from the student perspective. The author felt it was important to find out what the library instruction program looks like from a student perspective, which is one of the things this project attempts to do.

## **Methods**

Assessment of student learning is bound to be imperfect, as so many factors lie outside of the instructor's and the librarian's control, but using a mixed-methods approach to gather both quantitative and qualitative data can give a more complete picture. The qualitative method for this study was a focus group discussion. In March 2011, with the assistance of another librarian, the researcher conducted two focus groups with graduating seniors to learn about their engagement with the library, and more specifically to find out what they learned from library instruction sessions. Fifteen graduating seniors were recruited at the spring Graduation Fair. There were 10 women and 5 men, with majors in humanities, arts, sciences, applied sciences, and social sciences. This research method, of course, does not aim to be representative of the whole group of graduating seniors, but to learn more in depth about a few students' experiences. The incentive for students to participate was a free meal and a USB drive. Students in the groups gave their informed consent to participate and to be recorded. The facilitator had a script (Appendix B) with questions that each student answered in turn. Recordings of the two focus groups were transcribed and the author analyzed responses by organizing comments into six themes, which emerged

from the participants' comments: 1) suggestions for library instruction services; 2) anecdotes regarding the value of library instruction; 3) comments regarding the value of library sources, library space, and library staff; 4) suggested timing for library instruction; 5) barriers to asking for help; and 6) miscellaneous suggestions or requests. All of these themes proved useful for answering the questions addressed in this study.

Later in 2011, after spring graduation exercises, the author requested data from the registrar's office for the quantitative element of the study. The Institutional Review Board approved the transcript request, as well as the focus group element of the study. The author analyzed the academic transcripts of students who entered the university between 2005 and 2007 and who graduated between 2006 and 2011, excluding graduate and professional students. The dataset includes, for each student, a list of classes taken each year with grades for every class, major when the student entered the university, major when the student graduated, GPA at graduation (calculated on a four-point scale), and sex. A total of 4,489 student transcripts were involved.

This analysis required a list of the classes that librarians have met with for the past several years. The Research and Instruction Services department has kept records of this since 2001, but with varying levels of detail. A fairly comprehensive list of classes librarians taught from 2005 to the present was compiled, but in some cases it was impossible to find out if every section of the classes had library instruction or if it was just select sections visiting the library. The list of classes that received library instruction does not include individual student names or numbers, so when collating the list of classes that received library instruction with students' academic transcripts, it was assumed that if a student completed a course with library instruction, then that student attended class on the day or days when library instruction was provided.

The author created a database to compare the transcript data with records of library instruction sessions offered and sorted

students into four groups: 1) those who received freshman-level library instruction and upper-level (post-freshman) library instruction, 2) those who received freshman-level instruction only, 3) those who received post-freshman library instruction only, and 4) those who received no library instruction. In the statistical analysis ANOVA was used to compare the means of the four groups, which revealed a statistically significant difference ( $p < .0005$ ). Then a post hoc analysis was conducted to discover where the difference was found using the Dunnett test, with the fourth group (which received no library instruction) as the control or baseline group. Because there was no significant difference in GPA between groups one and three (both of which had upper-level instruction), it was appropriate to combine those groups. Students who did not receive freshman-level instruction at University of Wyoming (mostly transfer students) may have received freshman-level instruction at their previous institutions, which was not controlled for in the analysis. The resulting three comparison groups were: 1) those who received upper-level library instruction, 2) those who received freshman-level instruction only, and 3) those who received no library instruction. With these three groups the data was reanalyzed, using ANOVA and a post hoc Dunnett test once again. Following common statistical practice, the level of significance was set at 0.05.

## Results

### *Focus Groups*

The 15 graduating seniors who participated in the focus groups reported between one and four visits to the library for instruction and said that such visits were generally useful. Students expressed the need for two different types of instruction: an orientation in the first year followed by upper-division instruction in which students learn about resources in their majors.

When discussing when, in the course of a college career, library visits are most useful, 12 of the 15 students suggested that a first-year visit plus later visits would be ideal. One

student expressed it this way: "It would be cool if you had a freshman thing, then as you get more specialized in your field, more specific, scholarly instruction." Another suggestion on this topic was to create a library orientation (in-person or online) for transfer students or for review by upper-division students. Course guides that provide an opportunity for later review are also valued by students.

Eight students talked about asking a librarian for help when they lacked information about how to use the library. Others said they learned to use the library by asking friends or through trial and error. Some expressed real barriers to asking for help:

I think a lot of people – especially our generation – because we've grown up with the Internet and computers and that's the way we're used to finding things out, so we're not as inclined to ask people for help. We're just like, "Phhht, I can figure this out. Give me three hours and a mouse and I'll figure it out."

Another student's response suggests that an important aspect of library instruction is increasing awareness of library services:

If you're completely ignorant then you have no idea that you don't even know. So unless somebody tells you that you don't know you don't know, then you're not going to go look for that information.

In general, as students learn more in college they become more aware of what they do not know (part of the educational process), and that includes library and information literacy topics.

All of the students in the focus groups talked about research projects completed in specific classes and the databases, sources, and tools used for those projects that they learned about from library instruction sessions. Students also said that the library enabled them to do other

things, such as valuing scholarly research over basic Web search results.

### *Academic Transcript Analysis*

Analysis revealed a statistically significant relationship between students' GPA at graduation and upper-division library instruction. The three comparison groups were: 1) students who received upper-level library instruction, 2) students who received only freshman-level instruction, and 3) students who received no library instruction at all. The mean GPA for each of the three groups is displayed in Table 1; though the variance looks very small, statistical analysis reveals that there is a statistically significant difference. Table 2 shows the results of ANOVA: there is a statistically significant difference between the three groups,  $F(2,4486)=3.089$ ,  $p<.0005$ . A post hoc analysis was conducted to find where the difference lies. The Dunnett test was used and the "none" group was considered the control or baseline group, as seen in Table 3. Dunnett t-tests treat one group as a control, and compare all other groups against it. The Dunnett test shows that

the only group different from the control group is the upper-level instruction group with a mean difference of .0748,  $p<.0005$ . Thus, students who receive upper-level instruction at the library also have higher GPAs, while there is no significant difference in GPA for students who have only freshman-level library instruction. Because this is ex post facto research, the author cannot claim that the instruction was the cause of the increase; there are too many confounding variables to claim causality in the relationship between information literacy instruction and GPA. Perhaps most notably, there is probably an effect from the repetition of instruction, which was not analyzed in this study. But the analysis shows a statistically significant positive correlation between upper-level library instruction and a higher grade point average at graduation.

Table 1  
Mean GPA for Three Comparison Groups

MEAN GPA	
Group 1: Upper-level library instruction	3.289
Group 2: Freshman-level library instruction	3.247
Group 3: No library instruction	3.214

Table 2  
ANOVA to Discover Difference between Groups with Upper-level Library Instruction and Groups

Table 2  
ANOVA to Discover Difference between Groups with Upper-level Library Instruction and Groups Without

ANOVA					
GPA					
	Sum of Squares	Df	Mean Square	F	Sig.
Between Groups	1.259	2	.630	3.089	.046
Within Groups	914.405	4486	.204		
Total	915.664	4486			

Table 3  
Dunnett Test to Find the Difference between Groups

Multiple Comparisons					
GAP Dunnett t(>control)					
(I) groups	(J) groups	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval
					Lower Bound
Upper-level instruction	No instruction	.07480*	.03607	.031	.0079
Freshman- level instruction	No instruction	.03328	.04469	.310	-.0496

\*The mean difference is significant at the 0.05 level.

## Discussion

Putting qualitative results together with quantitative results provides a well-rounded assessment of the instruction program. For each of the research questions listed, answers can be drawn from both the qualitative and quantitative elements of this study for a more complete picture.

### *Relationship between Student Academic Success and Information Literacy Instruction*

The students in the focus group all discussed specific skills or tools learned in library instruction sessions that they were able to use in research projects assigned for various classes, which points to the importance of library instruction in academic success. Additionally, the academic transcript analysis shows a significant relationship between upper-division information literacy instruction and GPA at graduation, which is one standardized way of measuring academic success. Clearly, the difference in GPA is very small (.075 between no library instruction and upper-level library instruction), but that difference can determine whether or not a student is accepted into a specific degree program and can also be an important factor for students applying to graduate schools.

### *Courses and Programs That Include or Do Not Include Library Instruction*

All of the students in the focus groups received library instruction, but the students who had transferred to the University of Wyoming after studying elsewhere expressed the need for a library orientation. An important consideration for librarians is to understand that transfer students are less likely to know the basics about the library. The analysis of academic transcripts also revealed degree programs in which students are less likely to receive library instruction. Data gathered and analyzed in this study may be useful in marketing library instruction to those departments; this is an area for future research and action.

### *The Argument for Creating a Tiered Program of Information Literacy Instruction*

One of the major questions going into this project was whether there is a good argument for creating a tiered program of information literacy instruction. When students were asked when they would like to have received library instruction, 12 of the 15 in focus groups said they would like a freshman visit to introduce the library and its services plus a later, subject-specific visit. The fact that there is a correlation between upper-division library instruction and higher GPA at graduation also suggests that information literacy instruction after the

freshman year is important. Additionally, learning theory argues that reinforcement and scaffolding are important to developing an understanding of concepts. The latest version of our departmental instruction and assessment plan includes a section that outlines appropriate learning outcomes for different levels, and we hope to make an argument that the new general education program should include information literacy learning outcomes at both the freshman-level and in an upper-division class in every major.

### ***Improving the Information Literacy Instruction Program***

Not every student takes the same path through college, but seeing the path that some take is enlightening for lesson planning and program development. Information literacy is integrated in the university curriculum, but that curriculum is somewhat fragmented and experienced differently by each student. Seeing how students actually experience the library instruction program is important to designing a cohesive (and non-repetitive) curriculum. In the focus groups, some students expressed irritation at hearing the same thing over again in library instruction sessions. It seems obvious, but instruction librarians should differentiate between lower-division and upper-division learning objectives. Students suggested creating videos or short tutorials to cover the basic orientation information that upper-division students could review and that transfer students could use. One important thing learned from the analysis of academic transcripts is that three-quarters of UW students receive freshman-level instruction, so librarians should be aware when going in to upper-division classes that we are speaking to students who already know the basics. Many of the students also said that they appreciated the availability of an online course guide to refer to after the library instruction session; students who had not found a guide for their class or major were jealous of students who had such guides. Students' comments about their willingness to talk to a librarian about research questions also suggest that meeting with them in their classes and inviting them to

ask questions are an important part of library instruction.

### ***Limitations***

The limitation of using focus groups is that results are not necessarily generalizable across a student body or between institutions. The analysis of academic transcripts was limited by the imperfect records kept regarding sections of courses that received library instruction. Additionally, it is important to remember that in ex post facto research such as this, researchers cannot claim that the library instruction was the cause of the improved grade point averages among students who received instruction in upper-division classes; there is simply a correlation. There are numerous other variables that will have an effect on GPA and learning: student motivation and preparedness, research assignments that are engaging and challenging, level of course instructor engagement, and many more. This analysis can hardly take all of those factors into consideration. Using GPA as a surrogate for student learning is not a direct measure of student learning, and there are differences in GPA that cannot be accounted for. Average GPAs differ between majors and colleges at University of Wyoming and at other institutions, and grade inflation is a common concern in higher education. Library instruction and its effects in various disciplines are another area for future study. Also, this study focused on the value of library instruction embedded at different levels in the university curriculum, but did not account for the effect that repeated library instruction sessions may have. Students in the transcript analysis comparison groups had between zero and six library instruction sessions and another analysis might look at the differences that emerge when students have repeated interactions with librarians in the classroom.

### ***Recommendations***

This study helped the institution identify ways to improve instruction assessment practices, and other libraries can benefit from these observations as well. Tracking which courses

receive library instruction is vital. One recommendation that emerged from this study is to create or revise instruction reporting forms to collect data on the course, section, learning outcomes addressed, and assessment methods used. We must determine what coding is used in academic transcripts and use the same on reporting forms in order to facilitate data analysis.

There are other measures of student academic success that may be more meaningful than GPA, such as subsequent employment rates, employer evaluations of former students, or percentage of students who go on to graduate school. Those are valuable ways for librarians to assess the effectiveness of library instruction. Correlating GPA, however, does provide a starting point for proving the value of library instruction.

A mixed-methods study of this type can help an instruction program to plan for future assessment efforts. Overall, a program-level survey from a student-centred perspective can give libraries a starting place for a longitudinal, coherent program of assessment as it offers a view on how library instruction touches students, and can help librarians to design a cohesive and effective library instruction program. Asking students about their preferences, what they value, and how library instruction can be improved provides insight that librarians need.

### Conclusions

The focus groups and academic transcript analysis undertaken in this study demonstrated a positive correlation between higher GPA and information literacy instruction at University of Wyoming, when the instruction was offered in upper-division courses rather than solely in freshman-level classes. This data provides an argument for creating a tiered program of information literacy, with information literacy learning outcomes embedded at different levels in the university curriculum. The study also provided librarians with a more complete picture of which students receive library instruction and which do not, along with data

to provide to instructors and departments regarding the potential positive effects of library instruction. A library instruction program that has clearly defined goals for students at every level of university study and a scaffolded approach to student mastery of information literacy skills will have the greatest impact on student learning and student success.

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### References

- Ary, D., Jacobs, L. C., & Sorenson, C. (2010). *Introduction to research in education* (8th ed.). Belmont, CA: Wadsworth Cengage Learning.
- Canning, C. S., Edwards, A. J., & Meadows, S. E. (1995). Using focus groups to evaluate library services in a problem-based learning curriculum. *Medical Reference Services Quarterly*, 14, 75-81.
- Kirk, R., Vance, J., & Gardner, J. (2010). The impact of library instruction on freshman performance & retention. *Proceedings from Library Assessment Conference 2010: Building Effective, Sustainable, Practical Assessment*. Baltimore, MD: Association of Research Libraries. Retrieved 2 Feb. 2012 from [http://libraryassessment.org/bm~doc/kirk\\_rachel.pdf](http://libraryassessment.org/bm~doc/kirk_rachel.pdf)
- Kwon, N. (2008). A mixed-methods investigation of the relationship between critical thinking and library anxiety among undergraduate students in their information search process. *College & Research Libraries*, 69(2), 117-131.

- Matthews, J. R. (2007). *Library assessment in higher education*. Westport, CT: Libraries Unlimited.
- Moore, D., Brewster, S., Dorroh, C., & Moreau, M. (2002). Information competency instruction in a two-year college: One size does not fit all. *References Services Review* 30(4), 300-306. doi:10.1108/00907320210451286
- Morrison, H. G. (1997). Information literacy skills: An exploratory focus group study of student perceptions. *Research Strategies*, 15, 4-17.
- Oakleaf, M. (2010). *Value of academic libraries: A comprehensive research review and report*. Chicago: Association of College and Research Libraries.
- Spackman, E. (2007). Utilizing focus groups to evaluate an information literacy program in a general biology course. *Science & Technology Libraries*, 27(3), 3-28. doi:10.1300/J122v27n03\_02
- Wakimoto, D. K. (2010). Information literacy instruction assessment and improvement through evidence based practice: A mixed method study. *Evidence Based Library and Information Practice*, 5(1), 82-92.
- Wong, S. H. R., & Cmor, D. (2011). Measuring association between library instruction and graduation GPA. *College & Research Libraries*, 72(5), 464-473.

## Appendix A Suggested Learning Outcomes

### *Skills taught at different levels*

In library instruction sessions, librarians can help students develop cognitively appropriate information literacy skills. The following are specific, discrete skills and concepts that we teach in information literacy instruction at University of Wyoming Libraries. These skills and concepts fit into the framework of the curriculum map, and identify additional library skills traditionally taught by librarians.

First-year students and **students in freshman-level classes** work on developing general information literacy skills that will be applicable to research in their discipline and to lifelong learning:

- **Inquiry & Analysis**
  - coming up with a researchable topic
  - articulating a research question
  - identifying useful keywords
  - finding known items by title or author
  - using advanced search tools on the web (Google Scholar, limiting searches by domain, etc.)
  - using library services and resources
- **Think Critically & Creatively**
  - evaluating sources for relevance and authority

**Students at the sophomore and junior level** develop the **above skills** and more subject-specific and advanced information literacy skills:

- **Inquiry & Analysis**
  - using both primary and secondary sources
  - using some subject-specific databases
  - developing more sophisticated search strategies (i.e., Boolean logic, truncation, and phrase searching)
- **Ethical Reasoning & Action**
  - understanding copyright and ethics
  - avoiding plagiarism and citing sources appropriately

**Students at the senior level** should become familiar with subject-specific resources, sophisticated search strategies, and should prepare for meeting their post-graduation information needs by developing the following skills:

- **Inquiry & Analysis**
  - finding and using subject-specific information tools and databases
  - using controlled vocabulary
  - becoming familiar with important journals in their area of study
  - citation mapping and other advanced strategies for searching the literature in their area of study
  - finding and using resources to meet their professional information needs after leaving UW
- **Thinking Critically & Creatively**
  - evaluating the quality of information resources
  - understanding the information life cycle and where different information needs can be satisfied

**Graduate students** need the same skills as students at the senior level, but may also focus on:

- **Inquiry & Analysis**

- strategies for maintaining current awareness
- citation management
- **Synthesize & Communicate**
  - writing a review of the literature

*Skill levels table*

<b>Freshman (general information literacy skills)</b>	<b>Sophomore and junior (emerging subject specialty)</b>	<b>Senior+ (subject specific)</b>	<b>Graduate+ (graduate student skills)</b>
coming up with a researchable topic	copyright & ethics	subject specific tools	citation management
articulating a research question	avoiding plagiarism	controlled vocabulary	writing a literature review
identifying useful keywords	citation styles	quality of information	current awareness
evaluating sources for relevance & authority	primary and secondary sources	journals in area	
finding known items	search strategies: Boolean, truncation, phrase	information life cycle (where can your information need be met?)	
Web-savvy (Google tools)		citation mapping and advanced strategies for literature searches	
using the library (orientation)		lifelong professional resources (non-UW subscriptions)	

## **Appendix B**

### **Focus Group Script**

- Welcome the students, thank everyone for coming, and introduce yourself.
- Invite everyone to get some food and drink.
- Provide consent forms for everyone to complete. We must have one on file for each participant.
- Give everyone a jump drive for participating.
- Make sure that everyone checks the “you may record this session” box and signs.
- Ask everyone to write their first name on a blank sheet of paper and make it into a table tent. Names will be removed during transcription, but will be useful for identifying the participants during the session. Go around and have everyone state her or his name.
- After collecting consent forms, let everyone know that you’re going to start the conversation, which will last no more than 90 minutes. Students may leave at any time and are not obligated to answer any of the questions. Their participation will help us improve library instruction for those who follow them. Request honesty, make sure they know that responses should be kept confidential, and invite students to ask any questions that they have during the session.
- Start the recording.
- **Ask everyone these questions, and any follow-up questions that suggest themselves:**
  - When have you visited the library with a class for a meeting with a librarian? (Freshman, sophomore, junior, senior year)
  - How useful were those class visits? How could they have been more useful?
  - At what point in your college career would class visits to the library have been most helpful?
  - Did you ever feel that you were lacking information about how to use the library or how to do research? When? What did you do?
  - What are some of the research projects you did while a student at UW? Did you use anything you learned from a librarian to complete those research projects? How?
  - What has the library enabled you to do?
  - What do you value about the library?