

TO: Dean Charles Kratz, Dean of the Weinberg Memorial Library and Information Fluency

FROM: Jessica Bachman, Assistant Professor, Exercise Science
Bonnie Oldham, Associate Professor, Library

DATE: May 29th, 2015

SUBJECT: Information Literacy Stipend for 2015

Background Information about the Information Literacy Project

The 30 students enrolled in EXSC 435 – Exercise, Nutrition and Women’s Health for the Spring 2015 semester were introduced to a new set of student learning outcomes for the class which focused on increasing their competency of information literacy. The main manner in which students were exposed to information literacy was through the completion of a multi-part semester long project titled “Research Reference Project.” This project was designed to integrate Frame 3 “Authority is Contextual and Constructed” from the ACRL’s Framework for Information Literacy for Higher Education. Specifically, students were asked to assess the accuracy of citation practices of authors of published, peer-reviewed, original journal articles as a means to assess the quality of the reference. Additionally, this project was an important part of their learning experience at the University both within and outside of this classroom as it required students to develop their critical evaluation skills.

Student Learning Outcomes Related to [Information Literacy Standards](#)

The following student learning outcomes were added to the EXSC 435 course syllabus (see attached) to specifically assess the application of information literacy in the course.

At the completion of this course, students should be able to;

- Discover, interpret, analyze and summarize research related to women’s health.
- Critique the origins and reliability of information related to women’s health.

Class Activities Related to the Information Literacy Project

The Research Reference Project was integrated into smaller assignments, course lectures and group discussions throughout the semester. The first step require students to select a general topic area of interest related in some way to nutrition and/or exercise and women’s health. Topic areas were selected and submitted to a discussion board on the course Desire2Learn site by February 11th, 2015 for approval by Dr.Bachman.

On February 16th, 2015, Bonnie Oldham was a guest lecturer for the class which was held in WML 306. Ms.Oldham reviewed information and provided a hands on workshop that broadened the students understanding of how to search for, assess and obtain scholarly, original research articles. She first led a discussion about what makes an article an original, peer-reviewed research article (as compared to editorials, case studies, reviews and meta-analyses). Next,

Ms.Oldham discussed the differences between trade and scholarly journals and described the peer-review process for publishing research articles. The remainder of her instruction led the students through a hands-on experience on using the library databases to find an appropriate article for the assignment. Ms.Oldham showed the students how to use both the CINAHL and ProQuest databases and included information such as how to effectively use search terms, subject heading and limiters to find articles that met the assignment criteria. Students had time to search for their main research article while receiving assistance from Ms.Oldham and Dr.Bachman for the remainder of the class period.

Students were required to keep a journal (search log) of their experience searching the literature to retrieve their main article. Students were asked to record the following information; a. where they searched for the article (which databases, search engine, other resources), b. search strategy (key words used, combination of key words, limits set), and c. how the full-text of the article was retrieved (if it was available from the databases, another website, or had to be requested through ILLiad). The search logs were submitted to a dropbox on Desire2Learn by March 4th, 2015 (see Ms.Oldham's assessment in the evaluation section of this document).

Once a student found their peer-reviewed, original research article, they were asked to summarize the information found in that article using a Research Article Review form that has been developed by Dr.Bachman (see attached). Students submitted this completed form by March 4th, 2015 and Dr.Bachman assessed the accuracy and comprehensive of their evaluation of the article.

The final part of the Research Reference Project first required students to find 3 articles that were cited within the text and reference list of their 1st article. On March 23rd, 2015, Ms.Oldham prepared another presentation for the students that was held in WML 306 which specifically focused on the different options available for finding full-text versions of these citations. While no formal evaluation was completed for this experience, students verbally reported that they were amazed at how challenging it was for them to be able to find some of the articles in the reference list but that the information reviewed by Ms.Oldham was very helpful. In particular, showing the students a variety of ways to search for articles (typing in the full citation information or searching by key area, author or the name of the journal) as well as encouraging the students to use ILLiad if they did not have immediate access to the article (previously students would just select another citation rather than take the extra step to request the one the originally wanted).

Once all of the full-text versions of the articles were found, the students worked on the project write-up which was due on April 29th, 2015. In this write-up, students were required to summarize the 3 new articles, quote where the new article was referenced in the 1st main article and provide an analysis of how accurately they believed the original article's authors described the cited article. The final part of this write-up required students to reflect on their findings as well as how the experience will affect how they search for and utilize health information in the future (results of these reflection are described below in the evaluation section).

Evaluation of Student Learning Outcomes

The complete project description and corresponding rubrics for each part of the project are attached to this document. Assessment of achievement of the student learning outcomes related to information literacy are described by each individual section of the project.

Search Log Assessment

After students selected their topic area and attended the presentation by Bonnie Oldham, they were required to retrieve a full-text version of an original, peer-reviewed research article published within the last 7 years and to log the procedure they used to find this article. Bonnie Oldham reviewed the students' search logs and submitted the following assessment to Dr. Bachman via email on March 23rd, 2015.

Based on what they wrote in their logs, here is how they met the Student Learning Outcomes I had set for the information literacy session:

1. All students will use one of the Library databases that I demonstrated in class to retrieve a research article.

68% of the class met my expectations.

- 12 students used CINAHL only.
- 1 student used CINAHL and ProQuest Central
- 7 students used one of the 3 ProQuest databases I demonstrated.
- 5 students used ProQuest Central, which I told them NOT to use.
- 1 student said she used ProQuest, but did not indicate which database she used.
- 2 students used ProQuest Biology journals.
- 1 student used ERIC and the ProQuest Research Library database. ERIC would not be an appropriate database to use for this assignment.
- 1 student used Google Scholar (perhaps this student was absent?)

2. All students will indicate how they limited their searches to get an original research article, depending on which database they used.

- **CINAHL:** research article
- **ProQuest Nursing & Allied Health; ProQuest Health & Medical Complete; and/or ProQuest Research Library:** peer reviewed, SUBJECT: studies

20% of the class met my expectations.

- 5 of the 12 students who used CINAHL limited their searches to RESEARCH in order to get a research article.
- 1 of the 16 students who used any of the ProQuest databases limited his/her search to the Subject Heading "studies" in order to get a research article.

3. All students will limit their search to the last 7 years or less.

76% of the class met my expectations. (Others did not indicate any limiters that they used.)

4. All students will use Boolean Operators correctly.

93% of the class met my expectations.

5. All students will be able to get the PDF of their article.

96% of the class met my expectations.

- 1 student apparently found an article, but did not indicate if the PDF was available in the database, or if he/she had to use Article Linker or Interlibrary Loan.

- 1 student had to request the article through ILL. (I'm not sure why because the student indicated that he/she limited the search to full text articles-although I never told the students to do that!)

Research Article Review Assessment

After finding the full-text of a research article, student's had to complete a Research Article Review form to summarize and assess the research article. The review form requires students to pick out key components of the research article that were reviewed both by Bonnie Oldham as well as Dr. Bachman in classes through the semester (study design, study population and sample size, independent variables (and how they are measured), dependent variables (and how they are measured), key findings as well as assess the strengths and weaknesses of the research design). 77% of students received a grade of 80% or better on this assignment suggested that they had a good understanding of how to assess an original research article. The area students struggled the most with was describing the independent and dependent variables and how they were measured. Two students had selected non-original (review) articles that did not meet the requirements for this assignment and thus had to resubmit their article review form. Dr. Bachman spent additional time in class reviewing other original research articles related to course topic areas using this same form to aid students in their understanding of these key components of assessing research articles.

Final Write-Up Assessment

The final part of the project required students to submit a paper that introduced the project, summarized the 3 referenced articles, assessed the direct quote where each of the references was cited, and write a conclusion that reflected on their findings and the process of completing this project. 97% of student received a grade of 80% or better on the final paper which suggests that students understand the process of evaluating the references very well. Student reflection showed that they found this to be a valuable project for this class, their time at the University in other classes as well as for their future. The following are a few direct quotes from the student's reflections.

"Before working on this project I never thought much about the accuracy for referencing research articles. I was ignorant in thinking that every paper that was published was appropriately referenced. Through this research reference project I have learned that my assumption was wrong... Through this project I also learned to not take everything written in a journal seriously unless it is backed up by multiple sources, as facts can be easily manipulated to fit a specific agenda." – D.F., student

"This was a pretty eye-opening project. As a senior Exercise Science major, it is surprising how much I am learning about research in my last semester as an undergrad. I wish I got a better background about research as well as the worth and faults associated with it." – C.N., student

“After doing this project, I have learned that even scholarly peer-reviewed research articles reference other sources incorrectly. As a student, we learn that it is very important to cite your references correctly and to accurately depict the findings of another research study. This project made me realize that not everything you read in a scholarly journal may be correct. It is important to be aware of some of their mistakes and check their references to make sure that their citations were accurate. This project was a great way to learn how to look up journal articles in a reference list and how to analyze if the references were cited correctly within a main peer-reviewed journal article.” – A.W., student

“I definitely learned a lot about research referencing by doing this project. I am now more aware of the fact that not everything that is cited in primary research is true and that it is important to follow the fact back to its origin to assure that what you are learning is correct. In my future research, I will be cognizant of the fact that I cannot interpret everything to be truthful. If it is really a topic of interest and importance I will now take the time to look at the source that it came from. I think that this project is very beneficial for students because we all hear about false referencing, but to actually witness it first-hand was valuable.” – J.O, student

Conclusion/Reflection

As a whole, the students reported learning a lot by completing this project and gained important tools that will aid them in assessing information resources in the future. Grades on the assignment and student reflections suggest that this assignment was very successful and beneficial for the students. Ms.Oldham has agreed to continue to work with Dr.Bachman on this same project for future sections of EXSC 435. We will meet to assess the strengths and weaknesses of this project and develop improvements if deemed necessary prior to future semesters. I look forward to continuing to develop the critical thinking and assessment skills of students related to information literacy in this course in the future.

Appendices

Research Reference Project description

Research Article Review Form

Assignment Rubrics

Research Reference Project

The purpose of this project is to evaluate referencing practices of authors of peer-reviewed manuscripts published in scientific journals on topics related to women's health with a focus on nutrition or exercise. This project is worth 25% of your final grade.

The follow steps are required for successful complete of the project;

1. **Topic Area** – Select a topic area for this project related to exercise or nutrition (or both) and women's health. Submit a topic area to the discussion board on Desire2Learn by **2/16**.
2. **Search Log** – After you have selected your topic area, you will begin your search for the primary, peer-reviewed article (see more details below) for this assignment. This search log is due on **3/4**. You must record the following information in your search log;
 - a. Where you searched for the article
 - i. Which databases, search engines, other resources
 - b. Search strategy
 - i. Key words used, combination of keywords, limits set
 - c. How the full-text of the article was retrieved
 - i. Was it available on the search engine as a full text or did you have to go to another website, request the article through ILLiad?
3. **Research Article Review** - Find one peer-reviewed, original (i.e. not a review or meta-analysis study) scientific research article published within the past 7 years within the topic area you selected. Complete the provided Research Article Review form and turn that in along with a copy of your full article on **3/4**.
4. **Reference Article Retrieval** - Using the reference list of the article you selected for the Research Article Review you will retrieve full-text versions of 3 of the references listed. You will submit copies of all 4 articles (original article plus 3 of the references) with the final Write Up on **4/27**.
5. **Write Up** – The write up is due on **4/27** and should include the following components;
 - a. *Introduction to the project* – describe what you are being asked to do in 1 paragraph
 - b. *Article summaries* – Include a description of each of the 4 articles (**1 page max**)
 - i. The description should include a brief overview of the introduction, purpose, methods, results and discussion/conclusion
 - c. *Assessment of referencing* – Describe how accurately the original article cited the references. For this description include;
 - i. The direct quote from the original article in which each of the 3 articles were cited.

1. Example quote from original article “Cardiovascular complications are the most frequent problems among type 2 diabetic patients (Kalofoutis C, 2007)”
- ii. A discussion about whether or not the reference was appropriately cited. Explain your thoughts.
 1. Example assessment “This reference was not an appropriate citation for the above quote. The cited article discusses current therapeutic approaches for individuals with type II diabetes related to preventing cardiovascular disease risk factors. The introduction to this article states how cardiovascular complications are a frequent problem in patients with type II diabetes however this data was not actually collected as a part of this research project.”
- d. *Conclusion* – Summarize your thoughts on how accurately the original article referenced sources, has your perception of referencing practices changed as a result of this project, provide suggestions for future research article authors, and reflect on this project as a whole.

A grading rubric can be found on Desire2Learn.

Research Article Review

Study Reference	
Study Location	
Study Design	
Study Population and Sample Size	
Independent Variable(s) and how they are measured	
Dependent Variable(s) and how they are measured	
Key findings of interest	
Strengths and Limitations (bias, small sample size etc...) of the study	
Other observations	

EXSC 435 – Research Reference Project Topic Area, Search Log and Research Article Review

Name: _____

Topic Area

Criteria	0 points	2.5 points
<i>Timeliness</i>	Topic was not submitted on time.	Topic was submitted to D2L on time.
<i>Appropriateness</i>	Topic area was not related to exercise and/or nutrition and women’s health.	Topic area was related to exercise and/or nutrition and women’s health.

Grade _____/5 points

Search Log

Criteria	0 points	1-2 points	3 points
<i>Location of article search</i>	This description is missing.	The information is included but is incomplete.	The databases, search engines, and/or other resources where used to search for the article are described.
<i>Search strategy</i>	This description is missing.	The information is included but is incomplete.	The keyword, combination of words and limits that were used to find the article are included.
<i>Full-text retrieval</i>	This description is missing.	The information is included but is incomplete.	The process of retrieving the full-text version of the research article is described

Grade _____/9 points

Research Article Review

Criteria	0 points	1-2 points	3 points
Research Article	Article is missing 3 or more of the required criteria.	Article is missing 1 or 2 of the required criteria.	Article is a peer-reviewed, original research article, published within the last 7 years.
Study Design	The study design is inaccurately and incompletely described.	The study design is either inaccurate or missing some of the needed description for clarity.	The study design is accurately and comprehensively described.
Sample Description	The sample description is inaccurate or too brief to meaningfully describe the participants.	The description of the sample includes some but not all of the relevant information about the participants included in the study.	The description of the sample includes basic demographic information (age and sex) as well as other relevant information that is important to the specific population included in the study and sample size is also described.
Independent Variable	The independent variable(s) and the way it is measured is incorrectly described and lacks adequate detail.	The independent variable(s) or the way it is measured is either incorrectly described or lacks adequate detail.	The independent variable(s) is correctly identified and the way it is measured is clearly described.
Dependent Variable	The dependent variable(s) and the way it is measured is incorrectly described and lacks adequate detail.	The dependent variable(s) or the way it is measured is either incorrectly described or lacks adequate detail.	The dependent variable(s) is correctly identified and the way it is measured is clearly described.
Key Findings	The description of the findings is inaccurate and lacks adequate detail.	The description of the findings include some inaccuracies or lack adequate detail.	The findings are accurately described and include a comprehensive description of the significant findings (including numbers and p-values).
Strengths and Limitations	A discussion of strengths or weaknesses is not included or is both brief and copied directly from the manuscript text.	The description of strengths and limitations is lacking detail or is directly copied from the manuscript.	Key strengths and limitations of the study have been described in adequate detail. The description is in the student's own words (not taken exactly from the manuscript).
Other observations	No additional observations are included.	One additional observation is included.	Two or more additional observations are included.

Grade _____/24 points

EXSC 435 – Research Reference Project Final Write Up

Name: _____

Criteria	0-1 points	2-3 points	4-5 points
<i>Introduction</i>	An introduction is not included.	An introduction is included but the project's purpose or the means for conducting the project are not well-described or it is longer than 1 paragraph.	The purpose of and the means for conducting the project are well-described in 1 paragraph.
<i>Main Article Summary</i>	The article summary is longer than 1 page and/or more than 2 of the required criteria are not met.	The article summary is longer than 1 page and/or 1-2 of the required criteria is not met.	The article summary includes all of the following and fits on 1 page; <ul style="list-style-type: none"> • Overview of the introduction • Purpose of the study • Methods • Results • Discussion/conclusion
<i>Reference Article 1 Summary</i>	The article summary is longer than 1 page and/or more than 2 of the required criteria are not met.	The article summary is longer than 1 page and/or 1-2 of the required criteria is not met.	The article summary includes all of the following and fits on 1 page; <ul style="list-style-type: none"> • Overview of the introduction • Purpose of the study • Methods • Results • Discussion/conclusion
<i>Reference Article 2 Summary</i>	The article summary is longer than 1 page and/or more than 2 of the required criteria are not met.	The article summary is longer than 1 page and/or 1-2 of the required criteria is not met.	The article summary includes all of the following and fits on 1 page; <ul style="list-style-type: none"> • Overview of the introduction • Purpose of the study • Methods • Results • Discussion/conclusion
<i>Reference Article 3 Summary</i>	The article summary is longer than 1 page and/or more than 2 of the required criteria are not met.	The article summary is longer than 1 page and/or 1-2 of the required criteria is not met.	The article summary includes all of the following and fits on 1 page; <ul style="list-style-type: none"> • Overview of the introduction • Purpose of the study • Methods • Results • Discussion/conclusion

	0 points		1 point
Reference Article 1 Assessment of Referencing – Quote Included	The direct quote is not included.		The direct quote from the main article where this reference is cited is included.
Reference Article 2 Assessment of Referencing – Quote Included	The direct quote is not included.		The direct quote from the main article where this reference is cited is included.
Reference Article 3 Assessment of Referencing – Quote Included	The direct quote is not included.		The direct quote from the main article where this reference is cited is included.
	0-1 points	2-4 points	5-6 points
Reference Article 1 Assessment of Referencing – Discussion of accuracy of citation	The discussion of the accuracy of the citation is not included.	The discussion of the accuracy of the citation is minimal, lacks a thorough assessment or is not accurate.	The discussion of the accuracy of the citation is robust, thoughtful and accurate.
Reference Article 2 Assessment of Referencing – Discussion of accuracy of citation	The discussion of the accuracy of the citation is not included.	The discussion of the accuracy of the citation is minimal, lacks a thorough assessment or is not accurate.	The discussion of the accuracy of the citation is robust, thoughtful and accurate.
Reference Article 3 Assessment of Referencing – Discussion of accuracy of citation	The discussion of the accuracy of the citation is not included.	The discussion of the accuracy of the citation is minimal, lacks a thorough assessment or is not accurate.	The discussion of the accuracy of the citation is robust, thoughtful and accurate.
Conclusion	The conclusion is missing more than 2 of the required criteria	The conclusion is missing 1-2 of the required criteria.	The conclusion is a reflection that includes the following; <ul style="list-style-type: none"> • Summary of thoughts on the accuracy of citations in this article • Your perception of research article referencing practices • Suggestions for authors of research articles • Reflection on what you learned from this project • Reflection on the project at a whole
Criteria	0-3 points	4-7 point	8-10 points
Mechanics	There are many spelling, grammar, punctuation and referencing mistakes on most pages.	There are a more than just a few spelling, grammar, punctuation or referencing mistakes throughout the document.	Spelling, grammar, punctuation, and APA referencing are mostly correct throughout the entire document.

Grade _____/62 points