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Information Literacy in the Discipline, Mellon Grant for Biology 499 partnership with W. Jaeckle

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Available at: https://works.bepress.com/crystal_boyce/5/
Integrating Information Literacy into BIO. 499 - Independent Research

A collaborative project developed by Crystal Boyce (Ames Library) and Will Jaeckle (Biology)

Background:

Biology 499 (Independent Research) is a course that has no common grading rubric among the Biology faculty. To objectify the awarding of a letter grade for research students, a generalized grading scheme was developed by Will Jaeckle and then collaboratively described by Will Jaeckle and R. Given Harper (see Appendix). This rubric is applied to Jaeckle’s research students and those students co-mentored by Harper and Jaeckle. With this tiered grading in place each student understands how a particular grade is earned.

Operationally, student training has focused more on the acquisition of data rather than elements of information literacy. The project described below fully integrates information literacy as a foundation of instruction for each research student working with Will Jaeckle. Additionally, it establishes a greater parity between activities related with data acquisition and those that involve information location, evaluation, synthesis, and dissemination to an audience. To that end, we propose the following revisions to the assignments undertaken by Will Jaecckle’s Biology 499 students. As each student knows the work necessary to earn a grade of ‘C’, ‘B’, or ‘A’, they may choose to not complete a manuscript or a presentation. Students who are not earning academic credit for their research activities will be encouraged to attend these sessions, but there will be no requirement of either a completed manuscript or presentation.

Timeline and Description

Fall semester

- **Library session (#1)** on processes and strategies to effectively search electronic databases to collect evidence relevant to each student’s research project. Session content will be created collaboratively by Biology and Library faculty and delivered by the Library faculty to the research group. *Information literacy outcome* – students will learn to refine and revise search strategies and to apply those strategies in various resource environments.

- **New assignment**: students will create an annotated bibliography with a minimum of 30 citations. Each annotation should describe (1) the value of the work (useful or not useful) and (2) how each work (that is useful) relates specifically to the project. A list of keywords used to locate the references will also be appended to the bibliography.

  - Within **two weeks** of the first library session, each group will meet with the Library faculty to demonstrate progress and, if needed, refine their search strategies. This interaction is meant to provide both a checkpoint for the students (are they progressing?) and a means to assess their engagement with the research process.

  - The annotated bibliography delivered no later than **4 weeks** after the first library session. The bibliography will be sent to both the Biology and Library faculty. The faculty will work together to assess each submission for completeness and content quality. *Information literacy outcome* – students will demonstrate their ability to recognize credible, authoritative sources relevant to their work.
Spring semester

- The Library and Biology faculty will meet with each student (or group of students) to discuss the process of integrating (or synthesizing) their collected information (original data and supporting literature) into a cohesive whole. This represents an intentional interaction designed to encourage students to see the relationship between what they are doing (research) and what has already been done (published information). We will expect them to describe how their work fits with the existing body of evidence and to justify their assertions. Each session will also contain a discussion regarding academic honesty and plagiarism.

- **Assignment:** Students will write a paper in standard IMRAD format (introduction, methods, results, analysis, discussion), demonstrating a scholarly engagement with the scientific literature. Drafts of each group’s paper will be delivered and evaluated by the Biology and Library faculty until the complete document has been accepted. The final due date for the accepted manuscript will be last day of class instruction in April. *Information literacy outcome* - students will learn to communicate the product of their research effectively to others and to demonstrate the proper use of information sources.

- **Library session (#2)** on the best practices for presenting research results to an audience. The topics in this session will include the attributes of an effective oral presentation, the attributes of an effective poster presentation, rhetorical argument development, as well as a discussion of copyright laws and intellectual property. *Information literacy outcome* – students will learn to organize the content of their work in a manner that supports an oral and visual presentation rather than a written manuscript.

- **New assignment:** Each student will be required to attend a Natural Science Colloquium during the spring semester and, reflecting upon what they learned at the second library session, provide a written critique of the quality of the presentation. The Library and Biology faculty will provide written comments on each student’s submission and will share with the students their own critique of the colloquium.

- **Library session (#3)** on the creation of an effective oral or poster presentation. This is an opportunity for students to come with specific questions about the mechanics of preparing a poster or individual slides (e.g., inserting animations in PowerPoint) for a presentation. Depending on the variability in the experience of the groups of students, this session could be offered as a more prescriptive “how-to” tutorial.

- **Assignment:** Students will present their research during the John Wesley Powell Undergraduate Research Conference, held each spring. The first draft of an abstract for the John Wesley Powell conference will be submitted to the Biology and Library faculty at least three weeks before the submission deadline. The first draft of the poster will be due to the Biology and Library faculty at least three weeks before the date of the conference. The final draft of the completed poster will be sent (as a .pdf file) to The Ames Library for printing no later than 1 week before the conference date. Students participating in the John Wesley Powell Undergraduate Research Conference will be encouraged to contribute their work(s) to Illinois Wesleyan University’s Digital Commons.
Appendix –

**The Grading Rubric for Biology 499**

There are two major elements involved in the successful completion of your Bio. 499 project: **Part 1** – doing the work and **Part 2** – disseminating your results. We will use your completion of these two elements as a means to assess your performance and ultimately assign a letter grade.

**Part 1: Doing the work**

For each unit of academic credit you seek we expect that you will work on your project an average of 10 hr each week. Although, some weeks you may have to devote less time to research because of exams in other classes, we expect that you will “payback” the time you owe to your project. You have self-selected into this program and we are hopeful that you will embrace these guidelines. Please note that “working on the project” is more than collecting data. Development and delivery of a proper experiment or study are important, but so also is gaining knowledge of the relevant scientific literature. In short, our estimate of 10 h each week incorporates all elements of your research project.

A list these elements might look something like this:

1. Explore the literature about the topic
2. Develop testable hypotheses
3. Devise creative and mutually exclusive ways to test your hypotheses
4. Collect data
5. Completely analyze your results and relate them to the tested hypotheses
6. Relate what you have learned to what is already known
7. Have weekly meetings with your faculty supervisors and other students working on research projects

Our role as research advisors is to help you develop or improve your ability to complete each element listed above. We think that if you satisfactorily complete items 1-5 above, then you will have satisfied requirements for Part 1: “Doing the work” and you have earned a letter grade of “C” for Biology 499.

What we are suggesting may seem unreasonable, but it is not. Like any other science class, you will be successful if you work in a consistent fashion. Together we (research students and faculty supervisors) will agree upon a reasonable timeline for the completion of elements of your project – and we (faculty supervisors) will work to hold you to this schedule.

Our role as faculty supervisors is to foster your learning about the process of science and how to think “scientifically.” We are here to help you develop the skills that will enable you to successfully complete all aspects of your research project. As we will not be with you at all times, it is critical that you are willing to seek our counsel. To enhance this communication, we will schedule weekly laboratory meetings where you can describe what you have accomplished, what you plan to do next, what is bewildering, etc. We may also use the scheduled meetings as tutorials, where we can help you with specific tasks (i.e., manipulating data in Excel or SPSS, formatting a poster, use of RefWorks®, “trolling” electronic databases for relevant literature).
However, if you have a question about anything, please do not wait for the meeting to voice it – come find one of us and together we will work to find a solution.

**Part 2: Reporting your Results**

Now, assuming that Part 1 has been successfully completed, what must you do to earn a higher grade? What follows relates to the process of disseminating your results. Thus, to earn a letter grade of “B”, you will complete one of the tasks listed below, and to earn a letter grade of “A”, you will complete both. The choice is yours to make.

1. Construct and deliver an acceptable presentation (oral or poster) at the John Wesley Powell student research conference at IWU (or at a professional meeting) and

2. Construct an acceptable research paper describing your project.

Both of these are logical extensions of Part 1 and, if you are intentional as you “do the work”, you will find that neither is onerous to complete. In fact, if you work to construct a research paper, you will find that a conference presentation simply represents a distillation of what you have already completed. Our role as advisors is to teach you how to successfully create and improve your presentation or paper. We will provide you with our deadlines for the delivery of drafts of the abstract, poster, (or oral presentation) and a manuscript. For example, we typically require that the first draft of abstracts for the John Wesley Powell (JWP) symposium be submitted to us at least three weeks before the submission deadline. In preparing oral or poster presentations for the JWP Symposium, we require that the first practice session for the oral presentation be scheduled at least two weeks before the symposium and the first draft of the poster should be submitted at least three weeks before the actual symposium. Oral presentations may require 2-3 or more practice sessions and posters may require 4-5 drafts (or more) before they are printed. If you choose to construct a paper, then together we will agree upon deadlines for the delivery of drafts of the different elements of the manuscript. **Do not panic** as we will help you develop an understanding the role of each portion on a scientific manuscript.