

Using Zotero Online Citation Manager for a Group Literature Review Assignment

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Free online reference software Zotero can be used to help students build a skill set in scientific writing. Workshop participants learn how to use Zotero in such a way that students can keep track of many papers, share their annotations of the primary literature with other students, and benefit from other students' tags and notes. This writing-intensive activity is not grading-intensive, it promotes sharing work with peers, and provides students valuable practice using citation software. This activity is appropriate for any instructor who wants to add a scaffolded writing assignment to a lab or lecture class or who wants to build on written work from past academic terms. The workshop will be especially valuable to faculty in programs requiring written senior theses.

Keywords: Zotero, literature review, citation software, reference software, writing

Introduction

Biology programs sometimes require that students write a senior thesis yet provide little training in how to write such a document. In science, literature reviews provide an overview of what is known and how it is known. For undergraduates, writing a literature review provides a gateway to writing that mimics primary literature papers, especially the title, abstract, introduction, figures, captions, and references cited. This lecture or laboratory assignment is broken up into subunits that provide ample opportunity for feedback from both the instructor and from peers (see Appendix B) on literature searches, scientific writing, and development of appropriate figures. Each student in the class writes his/her own unique literature review based on a shared group of fifty citations annotated by everyone in the course. Shared annotated citations allow students to cut down on the number of papers that they read. Students share their citation annotations with each other through the free online citation manager Zotero. This activity was developed for sophomores and juniors in an ecology course at a small liberal arts college that has a senior exit requirement.

Student Outline

Introduction

For this assignment, you will be writing a literature review. Scientists write literature reviews to provide an overview of what is known and how it is known. They also often use a literature review to make a specific argument. Your literature review will be on some aspect of the gall communities induced by species of *Diplolepis* wasps on wild rose bushes. You do not have time to read and digest the over fifty papers published on this topic, so we will divide up the work. First, everyone needs to be familiar with Web of Science and with Zotero. Proficiency with these two tools will also help you in your senior research project, I guarantee it. Much of the whole class's work will be on Zotero, available to all. The project is divided up into a series of steps, most of which build on the previous steps. As a result, you will be able to speak and write authoritatively on the community ecology of rose galls by the end of the semester. At the end of the semester, you also will be more confident about designing the written aspects of your senior thesis project.

The project is worth a total of 70 points, but the points are distributed among nine different sub-assignments as follows.

Rose Gall 1: Install Zotero & Sponsor Two Papers in Rose Gall Group Library

Install Zotero

You can use the stand-alone version or the browser embedded version of Zotero. Installation might be really intuitive, and it might not, depending on your computer set-up. Assume that it will not go smoothly at first and that you will need to read installation instructions online. Put time into making sure that Zotero is working: trouble-shooting this installation is *part of the assignment*.

Get Oriented to Zotero

I highly recommend the Zotero video tour before you proceed:

http://www.zotero.org/support/quick_start_guide.

Find the Rose Gall Group Library

Group libraries appear in the far left frame of the Zotero software.

Sponsor Two Papers from the Rose Gall Group Library

Look through the titles and abstracts of the papers in the Rose Gall group, and choose two papers that you will be sponsoring for this annotation project. First come, first served, and just one person per paper.

Create a Zotero “note” for each of these two papers and title it, “To be annotated by ____.” Use your full name. This note is how I will know that you have successfully completed the assignment.

Due on Zotero by Tuesday, September 6. (5 pts)

Rose Gall 2: Light Reading

1. **Retrieve** the two papers you chose in Rose Gall 1 as pdfs. To retrieve papers, I usually use the Web of Science database through Penrose library. Here is one way to get there:

Penrose Library > A-Z Subject Guide > Biological Science > Web of Science

If you have trouble accessing the PDF through Web of Science, then contact a librarian for help. You will likely be directed to fill out a request for Inter-Library Loan (ILL) in which case the paper will usually arrive in 2-3 days.

2. **Attach** each pdf to its corresponding Zotero reference online so it is available to everyone in the class. It may take you a while to figure out how to do this! Follow the following convention for naming your pdf file:

“AuthorLastName_Year.pdf”

3. **Read** each of the two papers. Before diving in, review the handout, Some Orientation to Reading a Scientific Paper (See Appendix A). Your goal is to read each paper “lightly.”
4. **Submit** a text file to your CLEo dropbox answering the following questions:
 - a) Did you have trouble locating either of these two papers? If yes, explain.
 - b) For each paper, what section was easiest to read “lightly?” Explain.
 - c) For each paper, what do you expect are the main challenges in fully understanding the figures? If the paper has no figures, say so.

Submit the text file using the following naming convention:

YourLastName_RoseGall2

For example, Altermann_RoseGall2.docx

Due on CLEo and on Zotero (see below) Tuesday September 13th. (5 pts)

Rose Gall 3: Natural History Figure & Citation Format Practice

The Figure

Academic papers are highly variable in how much natural history they provide. If the only source of information you had about rose gall ecology were the two papers you are sponsoring, what would the life cycle and trophic relationships of the system look like? Hand-draw a figure that summarizes either the species life cycles or the trophic relationships within the system based on these two papers.

The Caption

Include an informative caption for your figure. Be sure annotate important symbols, color coding, and abbreviations. The caption must be in full sentences.

The References

After the caption text, list the two paper references. This part must be typed, and the formatting is important. Format the references using the following style: “Chicago Manual Style 16th edition (author-date)”. Thankfully, Zotero will do this for you if you use the proper settings. You can change your Zotero citation output style as follows:

Zotero > Settings > Preferences > Export > Default Output Format > Chicago Manual Style 16th edition (author-date)

After setting the proper export format, you can highlight and then drag and drop your citations from Zotero into a word processor. It is a dream come true, really.

This assignment is due on paper! Due Tuesday September 20th. 10 points

Rose Gall 4: Tags & Related Links

Tags

Zotero provides user-defined “tags” to references. This can help with categorizing papers very quickly when using the software search engine. I have chosen a few tags for you to consider. Choose among the following tags for each of your papers. As an example, use “inquiline” only if the paper develops the topic, not if it just mentions the word “inquiline.” “Physiology” can refer to either the plant or the insect. “Development” refers to biological development (the progressive changes in size, shape, and function during the life of an organism by which its genotype is translated into its phenotype), not just any process. Note that most modern pdfs are searchable for such terms, but old pdfs are not. For older pdfs, you will have to do the search manually.

Development
Hyperparasite
Inquiline
Parasite
Parasitoid
Phylogeny
Physiology

Links

Zotero also allows you to “link” related papers. Look through the Rose Gall Group Library and decide which two references are most closely related to each of your papers in terms of content. Use the “related” feature in Zotero to formalize those links. If your paper is truly an oddball, do not link any papers to it.

Due on Zotero Tuesday September 27th. (5 pts)

Rose Gall 5: Translation of the Abstracts

Independent of the abstract, summarize the content of each sponsored paper. Use minimal jargon. “Translate” the content of the paper to something that a clever 12 year old could understand easily. It helps to imagine you are writing a letter to a favorite niece or nephew. Each summary should be uploaded to Zotero as a note titled “Translation.”

Due on Zotero Tuesday October 4th. (5 pts)

Rose Gall 6: Literature Review Title & Outline

Submit a title and an outline of your proposed literature review’s structure. The title and review content should match.

Two published academic review papers are posted on CLEo. You are looking to write something more modest than these example reviews, but they do give you sound examples of structure. Look through the headings in each paper. How will you structure your literature review? Chronologically? By player?

Your final literature review must cite, in a meaningful way, at least twelve papers from our Rose Gall Group Library. This means that you need to familiarize yourself enough with the contents of our Zotero group library to generate a literature review topic that both interests you and that has sufficient support to cite twelve papers. How will you go about this?

What aspects of the rose gall system interest you the most? For example, perhaps the inquilines interest you. Do a Zotero tag search for the word “inquiline.” Other students will have already tagged many of the papers in the database, so this is easy. Read the abstracts for these papers to gauge whether there is enough material for you to write a literature review. For abstracts that are overly technical, use the translations written by fellow students. Translations of abstracts are available for most of the papers. Hopefully, this way, you can quickly assess whether your topic is supported well enough to launch a literature review.

Examples of Literature Review Titles from Fall 2015

Current Literature on Mossy Rose Gall Development
Wolbachia Symbionts in Gall Wasps
Morphological Diversity of Diplolepis-Induced Rose Galls
A Review of Existing Literature on Inquilines and Parasitoids of Rose Galls
A Brief Overview of the Geographic Distribution of Cynipid Gall Studies

Naming convention for your file: LastName_Outline.
For example: Altermann_Outline.docx

Due on CLEo Tuesday October 11th. (5 pts)

Rose Gall 7: Literature Review Draft

Recall that within the scope of a given topic, a literature review summarizes *what* is known and *how* it is known.

Requirements

- Write a three to five page single spaced literature review (one inch margins) on your topic.
- Include a figure that summarizes an aspect of the system's natural history. This will likely include a food web or a life cycle, but check in with me if you aren't sure what makes an appropriate figure for your literature review. Make sure that the caption is informative and in complete sentences. All symbols, abbreviations, colors and other cryptic features of the figure must be explained in the caption.
- Include a description of the methods used in at least four different papers. This satisfies the criterion of how we know what we know.
- Cite at least twelve papers from within our Zotero group library.
- Format the citations using the following style: Chicago Manual Style 16th edition (author-date).
- Using the drag and drop feature of Zotero, highlight and drag the appropriate citations to the end of your paper.
- Some citation format corrections need to be done by hand. Although Zotero does do a lot of the work for you, some things still need to be adjusted by hand. Here are two formatting issues that you are responsible for fixing:
 - Make sure that each citation in your paper includes the full name of the journal. If Zotero currently only includes the journal title abbreviation, you can enter the full name into the Zotero database field and never have to edit that field again.
 - Italicize all Latin names. This can be done with HTML tags within Zotero, but for some reason it introduces capitalization errors. For now, this must be done in your text document *after* you have imported the citations to your word processor.
- Submit on CLEo as an MS Word file using the following naming convention:

YourLastName_LitReview.docx

For example: Altermann_LitReview.docx

- Submit on CLEo Tuesday October 25th. (10 pts)

Rose Gall 8: Peer Feedback

You will receive another student's literature review (the identity of the student will likely be unknown to you). You will provide written feedback on the literature review according to a rubric provided by the instructor.

Due on CLEo Tuesday November 8th. This is a hard deadline. (5 pts)

Naming convention: AuthorLastName_LitReview_Feedback.docx

For example, Crook_LitReview_Feedback.docx

Rose Gall 9: Literature Review Final Version

In the final version of your document, incorporate all the instructions and feedback provided in the steps outlined above in Rose Gall 1-8.

Naming convention: YourLastName_LitReview_Final.docx

For example: Altermann_LitReview_Final.docx

Due on CLEo Tuesday November 29. (20 points)

Notes for the Instructor

Working with software that students need to install on their own computers can take a lot of time. It is important to encourage the students to troubleshoot the installation as much as possible on their own. This is simply not something that students should attempt the day the first assignment is due. I have had with best luck with Zotero for Firefox, and I avoid the standalone versions since they require a second downloading step for the browser extension followed by a synchronization step in the software settings.

I give the students small five-minute in-class orientations to the Zotero software.

Acknowledgments

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About the Author

Susanne Altermann is a lecturer at Whitman College in southeast Washington state. She earned her doctorate in Ecology and Evolutionary Biology at University of California Santa Cruz. She teaches courses in diversity of life, symbiosis, ecology, and plant physiology.

Appendix A

Some Orientation to Reading a Scientific Paper

1. Read with a Soft Eye

Especially the first time you read a paper, don't even try to understand everything. Researchers include a lot of jargon. Some methods are especially difficult to understand when you have not done the methods yourself. Skim difficult sections looking for stuff that is readable. Often you can go back later and figure out the hard sections when you are more familiar with the system and the context. I note the parts I skip (I write "skip" in the margin) so that I have a record of my fatigue with that section. When I re-read the paper, I know to give that section more attention or to avoid it completely, depending on my state of mind and what I'm looking for

2. Use a Non-Linear Approach

Expect to skip around. You don't need to read a paper chronologically. Most people do start with the abstract. Some go straight to the methods. Others go for the figures. After the abstract, I'm a big fan of the introduction because it provides a lot of context. You are looking for an "in" to the paper. What is easiest for YOU to digest first? Start there! Later, go back to the abstract and re-read it. It should be easier after you have explored the paper a bit.

3. Sketch a Figure

Sometimes you just need to *visualize* the methods or the results. Some authors provide visual support, but many do not. You can generate your own figures. This is an excellent way to engage with the paper. I often sketch the physical layout of an experimental design because I simply can't hold it all in my head well.

4. Annotate!

Whether you are working with a hardcopy or a digital copy, interacting with the page is helpful. It slows you down, improves digestion of technical detail, and gives you a record of what you found interesting or confusing. I never read without a pencil (which implies an eraser) or without a software that allows me to highlight and make notes. *It's a waste of my time to read without a record of my reactions, questions and clarifications.* With the amount of reading I do, the worst thing it to re-read a paper to look for something that I could have just highlighted the first time. Your annotations will also help you during class discussions and they will help you retain the material in the future.

For active reading, it's good to develop some visual shorthand. For example, I draw boxes around words and acronyms when they are being defined in the text. When I'm confused about a term, I go back and look for boxes.

FYI. Some pdf softwares allow you to search your annotation notes in addition to content. This is very helpful when you don't know where to find a certain note you made.

5. Be Resourceful

You're likely to come across vocabulary and concepts with which you are unfamiliar. It's a good idea to look up select key words and ideas. Don't look up everything! Textbooks are excellent starting places to look up concepts.

Appendix B

Peer Writing Feedback for Mossy Rose Gall Literature Review (Rose Gall 8)

Reviewer's Name _____ Writer's Code: _____

Read all of the questions below, then read the writer's submission with an eye for answering these questions. Remember, *you are working for the writer*, trying to help him or her improve the effectiveness of their writing. Complete both sections "a" and "b" for each question below. For narrative responses, be specific, descriptive, and write in full sentences. You may write on the literature review directly for very localized feedback, or for your own notes.

1. To what extent did the writer follow basic directions? Here is a summary of the directions:

- Write a three to five page single spaced literature review (one inch margins).
- Include a captioned figure on the system's natural history.
- Include the methods used in at least four different papers.
- Cite at least twelve papers from within our Zotero group.
- The title of the review should match the content.
- Format the citations using Chicago Manual Style 16th edition (author-date)..

a. Circle one: FULLY FOLLOWED DIRECTIONS PARTIALLY FOLLOWED

b. Comments:

2. Please annotate sentences that you found yourself reading more than once. How frequently did you have to read a sentence more than once to understand it?

a. Circle one: NEVER ONCE SEVERAL TIMES MANY TIMES

b. Comments:

3. Based on what you have read, would you recommend that this writer have someone proof read their work?

a. Circle one: YES NO

b. Comments:

Mission, Review Process & Disclaimer

The Association for Biology Laboratory Education (ABLE) was founded in 1979 to promote information exchange among university and college educators actively concerned with teaching biology in a laboratory setting. The focus of ABLE is to improve the undergraduate biology laboratory experience by promoting the development and dissemination of interesting, innovative, and reliable laboratory exercises. For more information about ABLE, please visit <http://www.ableweb.org/>.

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