

2018

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Cano, Andrew, "Working out the Bugs: Piloting Library Instruction in an Online Entomology Graduate Program" (2018). *Faculty Publications, UNL Libraries*. 368.

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Published in *Journal of Library & Information Services in Distance Learning* (2018)

doi 10.1080/1533290X.2018.1498630

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# Working out the Bugs: Piloting Library Instruction in an Online Entomology Graduate Program

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## Abstract

Like most of its peer institutions, the University of Nebraska–Lincoln Libraries faced the challenge of meeting the needs of a growing number of students taking online courses. The author, hired as the new Virtual Learning Librarian in January 2016, was charged with creating a new Virtual Learning Program. This tutorials-based program was first fully implemented in a fully online Entomology graduate program. This paper summarizes the development of the Virtual Learning Program, how it was adapted to the Entomology program, and the initial results from the first semester of implementation.

**Keywords:** Information literacy, tutorials, entomology, online, virtual

## Background

For the past several years, the University of Nebraska-Lincoln Libraries faced the same challenge as many other academic libraries: A steady increase in the number of fully online courses and students requiring asynchronous library support. Between 2013 and 2014, the University experienced a twenty-two percent increase in fully online student credit hours (Niemic, 2015) and an analysis of data provided by the University's Office for Online and

Distance Education revealed that approximately fifty-eight percent of all enrolled students (approximately 25,000 at the time) took at least one on-line course and approximately eleven percent of these students took their courses fully online (Cano, 2016).

In addition to the need to better serve fully online students, faculty within the Libraries' Reference and Instruction Services (RIS) department realized that virtual learning should not be restricted to online courses. The department was receiving an average of over 300 one-shot instruction requests per academic year and the relatively small number of RIS faculty (approximately one for every 1,000 students) was having difficulty meeting that demand. Furthermore, there was a lack of standardization of instruction, leading to a challenge meeting the requirements of increasingly complex assignments and needs. While the University Libraries did offer a half-semester credit-bearing course, few departments required it and decreased enrollment led to the course's discontinuation.

Consequently, the Libraries converted a vacant faculty line to create a new Virtual Learning Librarian position, charged with creating a fully online library instruction program, and hired the author to fill this position effective January 2016. The author, in collaboration with the RIS Chair and the Libraries' Instruction Coordinator, expanded the role of the Virtual Learning Librarian position to include the development of all asynchronous library-related instruction as part of a comprehensive Virtual Learning Program.

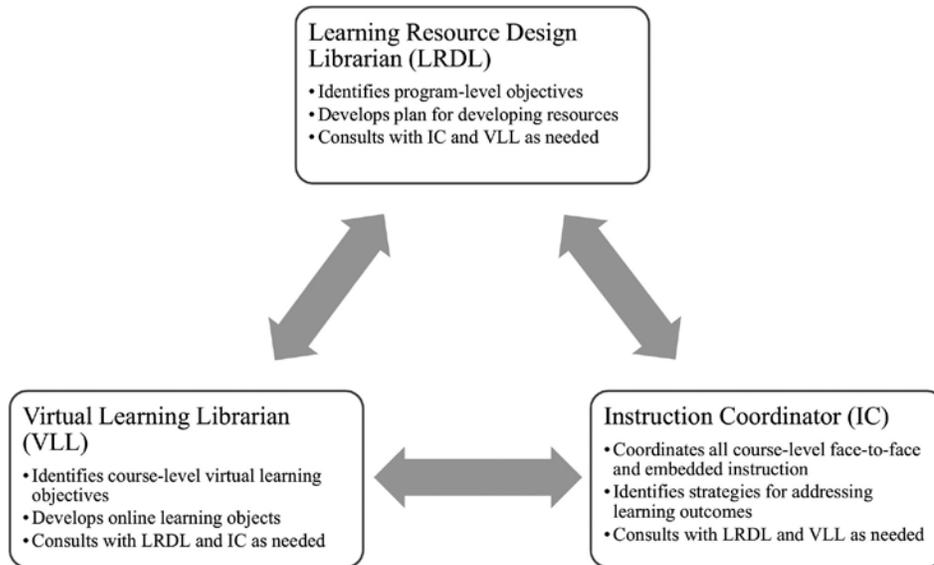
Soon after, the Libraries converted another vacant faculty line to create a new Learning Resources Design Librarian, filling the position in January 2017. The primary charge of this position is to develop program-level library-related curriculum materials. Along with the author and the Instruction Coordinator, the Learning Resource Design librarian forms the core teaching and learning team within the RIS department. This collaboration has led to the creation of a workflow through which Subject Specialist librarians can submit requests for instructional assistance as diagramed in Figure 1. Given the need to move more library instruction online, the Virtual Learning Program is central to the work being done by this team.

### **Developing a virtual learning program**

In developing the new Virtual Learning Program, the author had two primary goals:

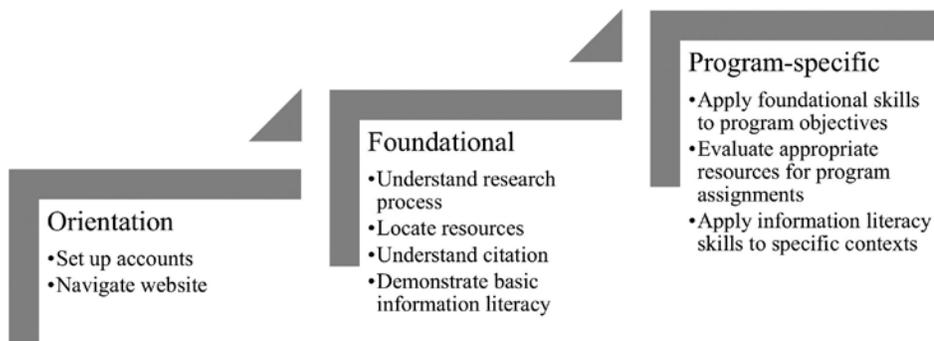
1. Integrate the library instruction organically into courses
2. Incorporate principles of active learning

Regarding the organic integration of library instruction into courses through the Learning Management System (LMS), (currently Canvas), the



**Figure 1.** Workflow when request received from Subject Specialist librarian.

author's goal was to reduce the perception of library instruction as "outside" of the course. Rather, he proposed building an iterative library instruction curriculum, diagrammed in Figure 2. Besides the practical benefits of reaching a larger percentage of students than traditional "one-shots," this approach also provides access to library instruction for the duration of a students' program rather than front-loading it at the beginning of their time at the University. Furthermore, this approach is consistent with established best practices (York & Vance, 2009) and work already being done at numerous institutions and often reflected in the literature in the form of case studies, including one at the University of Nebraska Medical Center's McCoogan Library (Hartman & Fial, 2015).



**Figure 2.** Virtual Learning Program stages with sample objectives.

This trend towards creating tutorials-based online library instruction also includes the incorporation of active learning techniques, the research on its benefits is substantial. As Chickering and Gamson (1987) explained:

Learning is not a spectator sport. Students do not learn much just by sitting in classes listening to teachers, memorizing pre-packaged assignments, and spitting out answers. They must talk about what they are learning, write about it, relate it to past experiences, apply it to their daily lives. They must make what they learn part of themselves. (p. 3)

Bonwell and Eison (1991) summarized this by defining active learning as “instructional activities involving students in doing and thinking about what they are doing” (p. 5). Bonwell and Sutherland (1996) advanced this work by providing a framework to “allow faculty to consider their course objectives and teaching style and to determine through self-reflection what active learning strategies best meet their needs” (p. 4). This framework included the development of course objectives, integration of an instructor’s personal style, minimizing the risk of failure, correctly perceiving the instructor’s role, and assessing students’ experience (Bonwell & Sutherland, 1996).

The research on the application of these principles includes online courses. In recent years, however, research on active learning has shifted its focus to the online classroom. Koohang (2012), for instance, recognized the growth in online postsecondary enrollment (10 percent per year compared to two percent for the traditional classroom) and proposed a systemic model of active learning in online environments based on the existing body of active learning research. Koohang, Kohun, and DeLorenzo (2013) then applied factor analysis to validate this model. Some researchers have shared their personal experiences integrating active learning into an online course. For example, Donovan (2005) shared the professor’s experience with creating active learning environments in their online classrooms and recommended best practices. Similarly, Varela and Westman (2014) shared how their use of active learning in an online course led to better learning outcomes than the face-to-face section through the promotion of online discussions and use of web-based tools to complete assignments. The research has also shown that students support these efforts. In Koohang, Paliszkiwicz, Klein, and Nord (2016), for example, the researchers conducted a study of undergraduate and graduate students enrolled in online courses and “all elements of active learning received above average to high mean scores indicating learners’ favorable view of the importance of the active learning elements in the design of online courses” (p. 24). This affirmed the importance of designing online classes with active learning in mind.

This also extends to online library instruction. Dewald (1999) included active learning as criteria for good online library instruction practices, writing

that “[a]ctive learning in an online tutorial may be defined as exercises conducted by the student online, whether this involves using online forms to review material ... or sending online worksheets or quizzes to the librarian...” (p. 27). Lorenzen (2001) further defined active learning and applied it to several library instruction scenarios. More recently, Walsh and Inala (2010), summarize existing research on active learning and develop practical examples of how it can be applied in library instruction. Detlor et al. (2012) conducted a survey of undergraduate students who had experienced both passive and active learning information literacy instruction and found that active instruction produced more positive effects on student learning.

The author began to develop online library instruction tutorials that promoted active learning based on this existing body of knowledge in late Spring 2016. After initially creating tutorials on the Guide on the Side open source platform, the author decided to adopt Springshare’s LibWizard tool, which is an updated and enhanced version of the company’s LibSurveys product. He made this decision because the Libraries already used Springshare as a vendor (e.g. LibGuides, LibInsights) and LibWizard improved upon the features of Guide on the Side that promote active learning. Specifically, LibWizard provides the ability to create interactive tutorials integrating a variety of content (e.g. live websites, images, embedded videos) in individual slides and the ability to assess students’ learning through a variety of assessments. The platform also provides valuable analytics to aid in the assessment of the tutorials’ success. While these tutorials were initially rolled out as part of the University’s Educational Administration department’s fully online “success center” (Yao, Wilson, Garcia, Defrain, & Cano, 2017), it was when some issues within a fully online graduate Entomology degree program was brought to his attention that the opportunity arose to demonstrate the benefits of the new program.

### **Integrating the program into entomology**

Towards the middle of the Spring 2017 semester, the Entomology Graduate Program Manager met with the Entomology Subject Specialist to discuss issues that professors were identifying in students enrolled in fully online graduate program. According to the Program Manager, the professors observed the following:

- Students demonstrated ignorance regarding the Libraries’ resources and services
- Students lacked basic research skills, including locating reliable sources
- Students had difficulty properly citing their sources on research assignments

- Students were unfamiliar with copyright laws and guidelines on the use of images and other media in projects
- Students were experiencing difficulty meeting the department's expectations for academic writing.

While purely anecdotal in nature, these observations matched those made by faculty in other departments and the Entomology librarian sought out the input of the Learning Resource Design. Following the process outlined in Figure 1, the Learning Resource Design Librarian quickly brought the author and the Instruction Coordinator into the conversation. Soon, a meeting was held that included the Program Manager, a senior Entomology faculty member, the instructional designer assigned to Entomology, the Entomology Librarian, the Learning Resource Design Librarian, the Instruction Coordinator, and the author. During this meeting, the author summarized the Virtual Learning Program and it was agreed that a suite of tutorials would be integrated into the BIOS/ENTO 406/806 Insect Ecology course that is the prerequisite for the other courses in the two-year graduate program. The specific topics covered in these tutorials would be:

- Creating basic library-related accounts
- Introduction to the Libraries catalog
- Introduction to subject-specific electronic databases
- Introduction to Google Scholar
- Basic citation skills, focusing on APA format
- Overview of University's academic integrity policy
- Criteria for evaluating resources

The author incorporated these lessons into fifteen short tutorials grouped into four modules, which are listed in Appendix A. The author worked closely with the Program Manager to identify the best content for the individual tutorials and instructional designer to best present the tutorials in Canvas. After several months of ongoing discussion, the completed modules were included in the "Research Orientation" section of the Fall 2017 online section of BIOS/ENTO 406/806 Insect Ecology, taught by the Program Manager who holds the rank of Lecturer within the Entomology department. These modules, as was the rest of the research orientation, were required as part of the course and included in students' grades. While the students had some flexibility in completing the modules, they were encouraged to do so within the first few weeks of the program. Of the forty-three students initially enrolled in the course, forty-one completed at least one of the individual tutorials and just under half completed all of them (there were some issues with data-collecting as will be summarized in the 'Challenges' section).

## Challenges

Given that this project was the first in the new Virtual Learning Program, the author undertook it fully expecting that challenges would arise. The first of these challenges was no surprise. Namely, unlike with his previous work in Educational Administration, the author had no knowledge of the subject matter in Entomology. Consequently, he had to rely heavily on both the Program Manager and the Entomology librarian when designing slides and exercises specific to the field of study. This required much asynchronous collaboration but, for the most part, the process was smooth as the lines of communication remained open throughout the design phase.

Another expected challenge was record-keeping. From the outset of the project, it was decided that the tutorials should include a record of completion so that students do not have to needlessly retake the tutorials in future courses. At the time the discussions began, the author was optimistic that the Libraries would have some form of badging program implemented by the Fall 2017 semester to provide this record of completion, but administrative decisions made by the University's Information Technology Services (ITS) department required that program to be postponed. Several options were discussed, including the creation of a "master course" containing all tutorials to which the current course would link but, in consultation with the instructional designer, it was decided that this option would be cumbersome and highly confusing for students. Ultimately, the "low-tech" option of maintaining a simple Excel spreadsheet was agreed upon with the understanding that this solution was meant only for the pilot phase of this project.

The non-scalability of the spreadsheet option was demonstrated within days of the course opening. Per the request of the Program Manager and the Learning Resource Design Librarian, the author included their email addresses as recipients for the tutorials' certificate of completion. This resulted in dozens of emails coming into their inboxes and both quickly asked the author to remove their email addresses from the tutorials. While this was mostly an inconvenience (and a semi-humorous one at that), it quickly became apparent just how unsustainable this solution was as the author struggled to keep up with documenting students' completion and giving proper consideration to their feedback. Furthermore, Federal Educational Rights and Privacy Act (FERPA)-related policies prevented the author from storing the spreadsheet in a cloud-based folder or emailing it through unsecured email, thus making it difficult to track which students had completed the tutorials. Ultimately, the author negotiated the creation of a secure Box folder through ITS to store this spreadsheet and provided access to the others involved in this project.

Another unexpected challenge was the integration of the tutorials into Canvas. While the individual tutorials were organized into modules and saved in Canvas Commons, the tutorials themselves could not be integrated directly into Canvas because the Learning Tools Interoperability (LTI) feature was not active for the Libraries' Springshare products. Activating this feature would have required permission from ITS and the approval process would not have been completed in time for the start of the course. Therefore, the author initially included the tutorials as external URLs within the Canvas module but the Program Manager and instructional designer concurred that the appearance was confusing for the students as they may not have intuited that they were supposed to click the link to access the content. Furthermore, Canvas issues a warning regarding unsecured external content that too closely resembled an error message, thus increasing the likelihood that students would be confused. Consequently, the author and the instructional designer worked together to create individual pages for the tutorial that included the introductory text, learning outcomes, and instructions on creating the external URL.

Despite these challenges, the overall implementation of the tutorials in the pilot phase of this project went well and this is affirmed by the generally positive feedback given by the students who completed them.

### **Early feedback**

Student feedback was sought through two means. First, the individual tutorials included a form through which students can offer their comments. This initial round of feedback largely focused on specific issues encountered, such as:

- Some confusing or ambiguous wording in questions included within the tutorials
- Some technical issues, including the audio in embedded videos being too low
- Perceived clunkiness in some tutorials

For the most part, though, the initial feedback was positive and included comments such as:

- Easy-to-navigate
- Very informative
- Very helpful
- Quick and easy

More detailed feedback was gained in a required follow-up survey distributed by the instructor. These results, included in Appendix B, were overwhelmingly positive in regard to the tutorial-based modules. Furthermore, numerous comments were included by upper level undergraduates in the course to the effect that they wished they would have been exposed to the tutorials earlier in their studies.

### **Next steps**

Based on the experiences gained during the pilot project, the following steps are being taken for the Spring 2018 and Fall 2018 semesters:

- Permission has been received from ITS to activate LTI in Springshare products and tutorials will now be fully embedded in Canvas modules
- The author has accelerated the rollout of a Libraries-only badging program and is working with the Instruction Coordinator on this project
- Additional lessons based on the initial tutorials have been identified and are currently in production.

Furthermore, the author and his colleagues want to be able to continue to publish the work being done in this project. Consequently, a formal research project is being designed with the intent of gaining IRB permission to formally survey and/or interview students outside of the courses for the purposes of future publications.

### **Conclusions**

At the time of this writing, the first semester of this pilot project is coming to an end. Therefore, it is very difficult to truly assess the success that the integration of the tutorials will have on the long-term success of the students in this program. Based on the early feedback, however, it is evident that there is sufficient proof of concept to continue working on scaling online library instruction within the Entomology graduate program and expanding this approach into other academic programs. The challenges experienced during the design and implementation phase and feedback gained during the semester will inform the next steps in this project, summarized in the subsequent section, as the author and his colleagues continue to improve the quality of online library instruction to students.

Should colleagues at other institutions seek to reproduce this project, they should heed the following lessons learned by the author during the design and implantation stages of the pilot project:

- Ensure that this a strong working relationship among several stakeholders, especially the course instructor and instructional designer
- Collaborate closely with colleagues in the development of instructional resources, especially in specialized fields of study
- Try to anticipate logistical and technical issues and seek to proactively find solutions to them when possible
- Develop a good project management plan and ensure that there is good workflow during all stages
- Take all feedback constructively, regardless of how it is delivered (especially by students).

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## Appendix A. Entomology instruction modules

**Module 1:** Getting Started with the Libraries for BIOS/ENTO 406/806 Insect Ecology

- Tutorial: Introduction to the University Libraries
- Tutorial: Navigating the Libraries' Website

**Module 2:** Creating Libraries Accounts for BIOS/ENTO 406/806 Insect Ecology

- Tutorial: Creating a My Library Account
- Tutorial: Creating a Delivery Account
- Tutorial: Creating a Printing and Copying Account [for on-campus students]

**Module 3:** Conducting Research for BIOS/ENTO 406/806 Insect Ecology

- Tutorial: Introduction to Scholarly Research
- Tutorial: Using Quick Search [the Library Catalog] to Find Resources
- Tutorial: Introduction to Academic Search Premier
- Tutorial: Electronic Resources for Entomology
- Tutorial: Introduction to Agricola
- Tutorial: Introduction to BIOSIS Citation Index
- Tutorial: Introduction to Google Search
- Tutorial: Evaluating Resources

**Module 4:** Avoiding Plagiarism for BIOS/ENTO 406/806 Insect Ecology

- Tutorial: Fundamentals of Academic Integrity
- Tutorial: Introduction to APA Style

## Appendix B. Tutorial survey responses

