

## Fostering Information Fluency in the Introductory Biology Laboratory

### Personnel

- Principal Investigator: Gary Lindquester, Associate Professor of Biology  
Rhodes College  
2000 North Parkway  
Memphis, TN 38112  
(901) 843-3564; (901) 843-3565 (fax)  
[glindquester@rhodes.edu](mailto:glindquester@rhodes.edu)
- Collaborators: Robert Johnson, Dean of Information Services  
Darlene Brooks, Electronic Resources Librarian  
Allison Gratzler, Rhodes Class of '02
- Other participants: Alan Jaslow, Assistant Professor of Biology  
Carolyn Jaslow, Associate Professor of Biology  
David Kesler, Associate Professor of Biology

### Abstract

This project is a collaborative effort to integrate and expand upon several exercises that are a current part of the introductory laboratory, Zoology Laboratory, at Rhodes. The Principal Investigator will develop these exercises in consultation with the other professors teaching the lab, a senior biology student who has taken the course, and the Electronic Resources Librarian. The Dean of Information Services will administer an entrance survey assessing information fluency background and skills, and an exit survey assessing the success of the program in advancing those skills. The Zoology Laboratory is an ideal course within which to address these issues since it serves approximately 20% of the incoming class along with many upper class students, and success in further course work in Biology depends heavily on the use of these skills. Exercises developed as a part of this project will be made available electronically to ACS member institutions and results from this project will be reported via the information fluency web-site and, if possible, at a subsequent ACS Information Fluency Symposium.

### Rationale

The Internet is now used as an information resource of first resort, including Web pages, Usenet, and electronic mail. The Web represents the end of authorship, because the Web erases the distinction between writing and publishing, thereby abandoning the quality control that makes printed information efficient, but it is more democratic because it lets the reader be the judge.

Unofficial documents used to be a private matter – like photo albums or letters that were occasionally archived and preserved in public institutions. But the network includes everything, public and private, true and false, good and bad.

- Peter Lyman, "Information Literacy" in *Liberal Education*, Vol. 87, No. 1, Winter 2001.

With these statements, Peter Lyman attracts our attention to a fundamental issue facing education in the Liberal Arts. Where once educators could direct students to the written word with some

faith in the process of careful and informed review that preceded the publication of that word and thus in its validity, now educators must train students to assess the validity of that word themselves. What defines information as valid has not changed, but what defines publishable information has changed. The “official” documents to which Lyman alludes were once the only documents available. Now, unofficial documents can appear official to the indiscriminate viewer. With much less than 1 percent of new information produced in 1999 being printed on paper, and knowing that much of the vast amount of information published digitally is “unofficial”, the problem now facing students is finding the official needle in the haystack. One might argue that proper search technique allows one to find the needle. However, it is increasingly clear that while search technique may limit the quest to one haystack out of many, it takes knowledge of how information is generated, reviewed, published, and referenced in a particular field to serve as the magnet for the needle. Thus, it must be the goal of educators to provide students with this magnet early in their undergraduate careers.

Such a goal has been a part of Rhodes Zoology Laboratory for second semester introductory biology students for several years. Over those years, we have modified a series of assignments and worksheets whose goals are consistent with this aspect of Information Fluency. Our experience has underscored the need for a more refined and collaborative approach. Anecdotal evidence suggests that we had some success in our efforts with students three or four years ago. However, despite more careful guidance in assignments, incoming students seem less and less able to critically evaluate information sources. I suspect that this is because today’s incoming students are more inclined to use the Internet as the “resource of first resort” yet are no more familiar with information hierarchy in biology. Thus, it is critical at this point for us, as educators in introductory biology, to collaborate with information services staff, librarians, and students to formulate the most effective approaches to fostering information fluency among our students and ourselves. Any insight gained in this endeavor will be of benefit to the common population of students on ACS campuses and should have relevance for fields outside of the biological sciences.

### **Preliminary Description**

Zoology Laboratory (see attached syllabus) covers animal diversity, anatomy and physiology, development, behavior and ecology. Throughout the course, we employ a combination of observational and investigative pedagogies. One set of goals is relevant to information fluency. We seek to provide students with an understanding of and practice in the scientific method. This includes the ability to find and evaluate secondary and primary (peer-reviewed) information and use that information in supporting hypotheses and conclusions; to conduct experiments and analyze results; to present results and conclusions orally and in writing, and to appropriately document and reference information. We provide students with assignments, exercises, and handouts to lead them through individual steps of these processes. After this introduction, the semester’s activities culminate with independent research projects designed and conducted by the students. They currently report their work in oral presentations facilitated by PowerPoint.

As stated in the rationale, our success in reaching our goals has been limited in some respects. The greatest difficulties have been in getting the students to understand how to define and where to find appropriate, valid information, and in how to use and reference that information. This proposal will seek ways to overcome these difficulties. During the fall semester, the principal investigator will review the current goals and exercises in the course and determine what changes are necessary in the structure and order of the assignments. He will work with the Electronic

Resources Librarian to develop a lesson that they will use to teach information structure in biology and the use of library resources (electronic and otherwise). This lesson will be in the context of an assignment associated with the first two weeks of lab. The assignment is likely to involve literature search on a topic of animal processes and diversity. For example, three students may be asked to research the ways in which animals of different taxonomic groups are adapted for locomotion in their environment. Each student would have to report on an animal from a different phylum and with a different mode of locomotion. Other groups may be assigned other processes such as gas exchange, reproduction, predator avoidance, etc. Other exercises in the context of subsequent labs will build upon the skills learned in the first assignment. Modifications to the exercises may be required upon analysis of the entry survey conducted by the Dean of Information Services during the first week of lab. Information to support skills-development will be compiled on a course Web page for ready reference by students. Competency in each of the skills will be assessed during evaluation of the research project reports by the professors teaching the course and by an exit survey.

### **Assessment**

Bob Johnson, Dean of Information Services, will develop a Web-based entrance survey to be administered to students during the first week of Zoology Laboratory. The survey will address relevant skills and knowledge such as those outlined in the ACS Guidelines for Information Fluency and the ACRL, Task Force on Information Literacy Standards documents. The results will serve as a base line from which to measure success of the exercises in promoting information fluency and as a reference to inform future modifications of the exercises. At the end of the semester, students will complete an exit survey to assess the program's success.

### **Dissemination**

All instructional materials and exercises will be posted locally on a course Web page. The URL for the Web page will be posted on the ACS Information Fluency WebBoard. A report on the entrance and exit surveys will be provided on the WebBoard, also. If appropriate, a report on the program will be made at a subsequent ACS Information Fluency symposium. We will also consider presenting at a national Council on Undergraduate Research meeting. Finally, our experience may allow us to adapt the approach for a broader disciplinary audience and sponsor a workshop on integrating Information Fluency into introductory courses for majors in a later year.