Undergraduate Perceptions of Scientific Literacy: Assessment of a Project-based Intervention in an Introductory Biology Course

**Introduction**

Information Literacy (IL) is the ability to effectively locate, evaluate, and synthesize information to enhance one’s knowledge1. Studies show that there is a discrepancy between students’ perception of their ability to locate credible scientific sources, and their actual ability to do so2. Science faculty view information literacy as important feature of undergraduate research experiences3. In addition, students perceived IL to be a “product” rather than a process and information seeking stops when the answer is found4. Undergraduate students experience IL in a “complex, multi-tiered way” that many studies do not take into account leading to an “inappropriate pedagogic strategy”5. As a result, significant efforts have been made to enhance student IL5. Thus the first step in developing these skills is to train students to become scientists, but also to be informed consumers of scientific information. To improve learning, an understanding of student perspectives is necessary to provide faculty with the tools necessary to enhance student IL5. Thus the first step in developing these skills is knowledge about students’ perceptions of the type, quality, and source of scientific information. To improve learning, an understanding of student perspectives is necessary to provide faculty with the tools necessary to enhance student IL5. Thus the first step in developing these skills is knowledge about students’ perceptions of the type, quality, and source of scientific information. In this study, we assessed the impact of a semester-long project, designed to address this need, on the ability of students to categorize sources of scientific information.

**Methods**

**Pre Class 1**

- Survey containing open ended questions about scientific sources
- Annotated Bibliography

**Plan Of Action**

- Individual Coding
- Multiple codes of inter-rater reliability established by reaching consensus
- Code Refinement

**Poster Draft**

- Pre-test/Post-test data collection.

**Post Class 2**

- Data Analysis

**Results**

- Students recognized that the process of peer-review was important for assigning credibility to a source (16.7% increase).
- At the end of the semester there was an 18.9% increase in the number of students recognizing trustworthiness as being important to the credibility of a source.
- There was no change (<4%) in codes pertaining to the qualifications of the author, where the information is published, and how the information was presented.

- There was a 12.9% increase in student identification of primary sources as being descriptions of studies performed by scientists.
- Students were more successful in identifying PS as being written by the scientists who conducted the research (17.4% increase).

- Students were able to describe original research articles as including at least one of the following components from the process of inquiry based science: hypothesis, methods, experiments, results as seen from the 12.9% increase.

**Discussion**

- Our results highlight the significance of project-based interventions in enhancing student understanding of the function of published scientific literature, specifically ORA and PRJ, as result of the scientific process.
- Our analysis confirms the need to provide continued training in the development of information literacy skills throughout the biology curriculum.
- In the future we will include student grades and year to compare pre- and post-data sets for data triangulation purposes.
- We would also like to assess the role of the project in the development of scientific literacy skills as an extension of our current findings.

**References**