University of Oregon Science Literacy Program

Judith Eisen[1], Michael Raymer[2], Ronald Beghetto[3], Peter O'Day[1], and Eleanor Vandegrift[1]
[1]Department of Biology, [2]Department of Physics, [3]College of Education, Eugene Oregon

Enhancing Non-Majors General Education Science Courses

Introduction

We offer general education courses for non-science majors to improve scientific awareness and general science literacy (Table 1). Objectives :

- empower undergraduates to consider scientific approaches to societal issues
- assist faculty in improving teaching techniques using modern pedagogy
- enable graduate and undergraduate science students to communicate with non-scientists
- define and assess science literacy behaviors to improve SLP courses

Table 1. Needs and Activities of

Participants	Needs	Activities
Non-science Students	• Greater science literacy	• Enroll in SLP courses • Assessment of science literacy behaviors
Science Students •Graduate SLP Fellows •Undergraduate SLP Scholars	• Improved communication • Understanding of teaching pedagogy • Skills to engage public • Inspiration to pursue teaching career • Deeper understanding of subject • Ability to understand public policy	• Co-design and co-instruct SLP courses with faculty mentors • Training workshops • Journal club
Faculty •Biology, Chemistry, Geological Sciences, Physics, Journalism, Environmental Studies, Human Physiology, and Computer Science	• Improved teaching skills • Increased interest in teaching general science courses • Instructional support and recognition • Classroom assessment	• SLP courses • Training workshops • Journal club • Develop active learning tools • Mentor Fellows and Scholars • Assessment • Multi-discipline collaboration

Figure 1. Faculty and students participating in weekly journal club

Journal Club

Faculty, graduate fellows, and undergraduate scholars participate in the Science Literacy Teaching Journal Club, co-sponsored by the Teaching Effectiveness Program to explore scientific teaching and pedagogy. Participants practice new teaching activities, and report that the journal club has greatly influenced their teaching decisions. Articles by Weiman[1] and Allen and Tanner[2] are ranked as favorites by participants.

Training Workshops

Nationally recognized speakers (Stephanie Chasteen—University of Colorado, Cynthia Bauerle—HHMI, Peggy Brickman—University of Georgia) presented hands-on workshops:

- Active learning
- Inquiry-based learning
- Case Studies
- Assessment
- Cognition and learning

Courses 2011-2013

Biology	Teaching Science
Chemistry	Science, Policy, and Biology
Chemistry	Information, Quantum Mechanics, and DNA
Physics	Physics of Sound and Music
Physics	Physics Behind the Internet
Physics	Physics of Energy and Environment
Physics	The Physics of Life
Physics	Nanoscience, Nanotechnology, and Society
Geosciences	Scientific Revolutions
Geosciences	Earthquakes
Geosciences	People, Rocks, and Fire: How Societies Navigate Energy Transitions
Journalism	Reporting Science

What is Science Literacy?

Science literacy is often defined within the context of educating the general public about a basic understanding of science[3]. Sometimes the term is combined with social value or science appreciation[4]. We are exploring "science literacy behaviors" in different courses, with the goal of developing content specific science literacy tools.

Figure 3. Faculty and students working on a stream table

Figure 2. SLP Faculty workshop on teaching

Defining and Measuring Science Literacy

Figure 4. Students in Scientific Revolutions answering clicker question

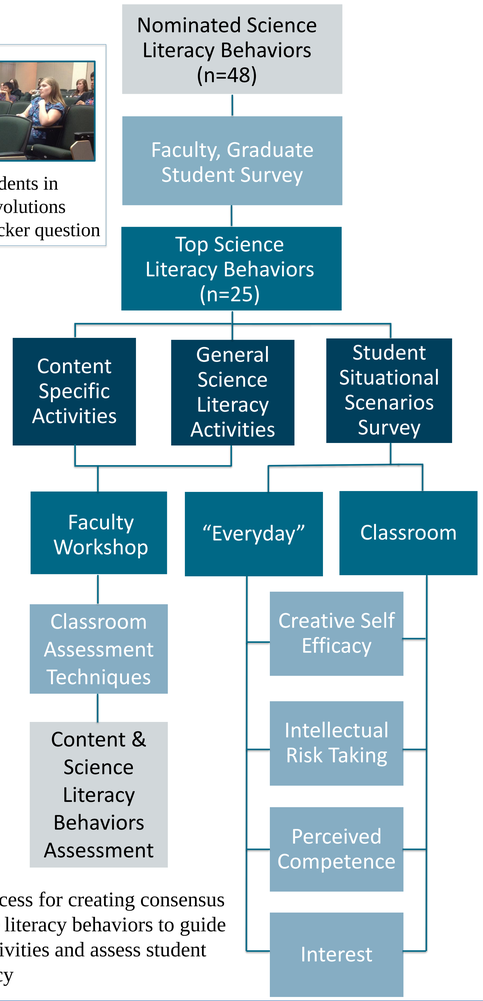

Figure 5. Process for creating consensus list of science literacy behaviors to guide classroom activities and assess student science literacy

Assessment

Our faculty reached consensus on the following statements that they identify with science literacy behaviors in students (Figure 5):

1. Understands science as presented in popular media (e.g. *New York Times*)
2. Understands how and why people misrepresent scientific information (e.g. for personal or political gain)
3. Can separate credible scientific information from opinion, conjecture, fabrication, and embellishments in advertising
4. Reconsiders previous conclusions with new information

Figure 6. Students working together to complete physics activity

Future Plans

- Develop comprehensive assessment tools
- Work with institution to improve classrooms for modern pedagogy
- Train next generation of science educators

Figure 7. Chemistry classroom designed for group learning

Literature cited

[1]Weiman, C. 2007. Why not try a scientific approach to science education. Change:9–15.
[2]Allen, D. and K. Tanner. 2007. Putting the horse back in front of the cart: using visions and decisions about high-quality learning experiences to drive course design. CBE Life Sci Educ 6(2): 85-89.
[3]Deboer, G. E. 2000. Scientific literacy: another look at its historical and contemporary meanings and its relationship to science education reform. Journal of Research in Science Teaching 37:582–601.
[4]Holbrook, J., and M. Rannikmae. 2009. The meaning of scientific literacy. International Journal of Environmental and Science Education 4:275–288.

Acknowledgments

We thank Adam Unger for program assistance. Funding for this program is provided by the Howard Hughes Medical Institute, UO College of Arts and Sciences, and UO Graduate School. Additional support from UO Center on Diversity and Community (CoDaC), Biology, Chemistry, Geological Sciences, and Physics Departments.

SCIENCE LITERACY PROGRAM

For more information

Please contact *scilit@uoregon.edu*. More information on this and related projects can be obtained at *http://scilit.uoregon.edu*