



Biology: Science Literacy through concept, investigative, and issue-oriented activities

A three-term introductory course for non-science majors entitled "Workshop Biology" by the Department of Biology at the University of Oregon (1996)

Course Design:

Workshop Biology is laboratory-based and designed to increase "science literacy" by promoting the skills necessary for students to make informed and critical decisions, consistent with personal values, on issues relating to science. Unlike traditional biology courses, Workshop Biology emphasizes investigative learning in small groups over instructor lectures. Students spend one-and-one-half hours in assemblies and four hours in the laboratory per week.

Laboratories are organized into student-selected, term-long workshops, each of which addresses a different theme, such as genetics or the human heart. Assemblies for all the students enrolled in Workshop Biology replace class lectures. The assemblies are centered around a particular problem and involve class discussions, instructor presentations, and small group activities; they explore concepts more abstract than those that students have encountered in their laboratory work.

Assemblies and workshops consist of three different kinds of activities. *Concept activities* allow students to discover fundamental biological concepts through discovery and hypothesis-testing exercises based on their own observations. *Investigative activities* focus on the practice of scientific inquiry and analysis of scientific controversies. Students learn the skills and attitudes necessary for effective problem-posing, problem-solving, and persuasion by designing, carrying out, and presenting the findings of their own studies. In *issue-oriented activities*, groups of students research a particular area and use scientific concepts, reasoning, and their own values to address socially important scientific issues.

Higher Level Learning:

The central goals of Workshop Biology are to promote sound student decision-making (**Thinking**) and scientific inquiry (**Acting**). Towards that end, workshop and assembly activities are designed to integrate students' understanding of fundamental concepts and abstract ideas into their personal values (**Connecting**). Students not only

identify their own scientific misconceptions and those of others (**Thinking**), but also come to understand how to make informed decisions about biological issues that are consistent with their values (**Thinking, Connecting**). Students are highly involved in their learning experiences and as a result discover the value of self-direction in their other courses (**Learning**).

Active Learning:

Direct engagement with concepts, ideas, and values (**Doing**) leads students to better understand complex scientific issues. Frequent reflective writing and self-evaluation in Workshop Biology also emphasize the importance of students' self-directed probing of such issues (**Dialogue with Self**). The focus on developing informed decision-making skills in harmony with personal values is paired with the need to address biological issues in a heterogeneous group context (**Observing, Dialogue with Others**), thus modeling the cooperative endeavors required in many different disciplines.

Lessons Learned from FIPSE Projects III. (199) D. Marcus (Ed.) ERIC document ED. 403841, 103-111.

The University of Oregon: Workshop Biology [On line]. Available: http://biology.uoregon.edu/biology_www/worshop_biol/wb.html