

Natural Resources and Environmental Issues

Volume 7 *University Education in Natural Resources*

Article 42

1998

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Recommended Citation

Donnelly, John R. (1998) "Use of collaborative techniques to promote learning in an environmental problem solving course," *Natural Resources and Environmental Issues*: Vol. 7 , Article 42.

Available at: <https://digitalcommons.usu.edu/nrei/vol7/iss1/42>

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USE OF COLLABORATIVE TECHNIQUES TO PROMOTE LEARNING IN AN ENVIRONMENTAL PROBLEM SOLVING COURSE

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ABSTRACT: NR 206, Environmental Problem Solving and Impact Assessment, is a senior-level course, the last in a sequence of seven CORE courses required of all students in our School of Natural Resources at The University of Vermont. These students represent seven different majors. Development and presentation of this course, which I began teaching in 1993, has proven to be the greatest teaching challenge I have faced in my 28+ years at the university. Although I have offered the course seven times (it is now offered both semesters), the course is still evolving; one of the major changes is that we now spend much more time in student collaborative (i.e., 'group effort') activities rather than in the typical 'lecture-listen' format. In this abstract, I briefly summarize the course content and some of its current activities.

I. Course content — The course focuses on the following topics: 1) concepts of environmental problem solving; 2) environmental impact assessment; 3) process of environmental problem solving as mandated by the National Environmental Policy Act (NEPA); 4) group dynamics as they pertain to environmental problem solving; 5) decision making (under conditions of certainty and uncertainty or risk); and 6) risk assessment.

II. Collaborative activities and other processes to promote learning in a less stressful environment:

1. Food and drink — The 'lecture' portion of the course meets from 9:30 till 10:45 a.m. on Tuesdays and Thursdays. For many students, this is their first class of the day. Consequently, I provide free coffee, tea or hot chocolate. Students are required to bring in their own non-disposable cups, and they are asked to sign up to bring in 'goodies' twice during the semester. Each class period, about four students bring in 'goodies' (which usually vary from fruit, to donuts, bagels, or homemade muffins). This activity has proven to be very popular; it appears to produce a much more relaxed learning environment.

2. Text — Although many texts are available dealing with individual components of this course, i.e., problem solving, environmental impact assessment, NEPA, group dynamics, etc., no single text covers all topics. Consequently, during our recently completed Christmas break, I compiled all of my lecture notes into a broad compendium and made it available to the students (\$10). Students are expected to complete the reading assignment (usually less than 20 pages) before each class period.

3. 'Lecture' format — Rather than providing 75-minute lectures based upon the assigned readings, much of the 'lecture' time is now spent having groups of students respond to questions designed to promote creative and critical thinking. The process for doing this is outlined below. Mini lectures are provided as needed.

4. Student involvement (collaborative activities) — Students are involved in several teams, usually with 4 or 5 students per team:

a) 'Lecture' teams — At the beginning of the semester, students were asked to form a 4- or 5-person team of their choosing, and each team was supplied with a notebook to record responses to questions I pose. Throughout the semester, usually at least once or twice per class period, I will pose some type of question, which requires critical or creative thinking. After the question has been posed, the students meet in their individual group, record their responses and record the names of all group members present. I collect these 'Activity Journals' at the end of each class period, look over the responses, and use them as the basis for comments during the following class. Responses are not 'graded', but I keep a record of who was involved and this comprises 15 % of each student's course grade.

b) Teams to complete an Environmental Impact Assessment — Students are formed into approximately 5-person teams that are as heterogeneous as possible (based upon their college major) and are given information regarding an actual land management project proposed to take place on a nearby national forest. Each team visits the project site and is required to complete an Environmental Impact Assessment for one environmental component (e.g., water quality, aesthetics or wildlife, for example) that might be affected by the proposed project. Each team's activities result in the preparation of a chapter for a document, which, in total, summarizes the expected environmental impacts of the proposed project. In addition to their written document, each team makes an in-class presentation of its findings.

c) Teams to complete an Environmental Assessment — Working in the same teams as those described above and working on the same proposed project, students complete an Environmental Assessment (EA) prepared in compliance with requirements of the National Environmental Policy Act (NEPA). This assignment requires that teams: 1) prepare a 'scoping' letter to identify issues of public concern (students in another of our CORE courses act as the public and respond to this scoping letter); 2) develop viable alternatives that work toward solving the initial problem and address the identified key issues; and 3) assess the expected impacts that each alternative would have on each of the identified key issues (much of this information is derived from techniques described in the previously prepared Environmental Impact Assessment). After finishing their Environmental Assessment, students prepare a Decision Notice and complete the NEPA process in a public meeting during which individual teams present and defend their decisions to the same group of students who responded to the scoping letter.

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5. Exams — Students complete two in-class exams, a mid-term and a comprehensive final. Exams are not ‘open book’, but students may bring in two pages of any ‘notes’ they’d like. In addition, in order to promote teamwork and to foster learning, students have the option of completing the exams individually or working with one other student of their choosing.

In my presentation, in addition to providing more details on the activities described above, I will:

- 1) involve the audience in developing group responses to some of the questions I have posed this semester in my problem-solving course;
- 2) describe some of the student-based, instructor-based, learning environment-based and institution-based challenges facing those who implement collaborative learning activities; and
- 3) show samples of my course syllabi, draft text, “activity journals”, and recently completed student projects (Environmental Impact Assessments, and Environmental Assessments and Decision Notices).