

## Sustainable Universities Initiative Mini-Grant Final Report

Sustainability Modules for Introductory Geology Courses (Grant Received in Summer, 2000)

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Introduction: As stated in my interim report, with partial support from the Sustainable Universities Initiative I developed modules for introductory courses in geology. These were first given in Fall, 2000 at University of South Carolina at Spartanburg. I began using what I developed in Geology 101 (Physical Geology) and Geology 131 (Earth Resources). I have continued refining and using the modules developed in other courses (some of which I am not presently teaching, but could cycle back to teaching in the future).

The future use of the modules in the courses I regularly teach is a natural extension of the work started. However, in addition to that, I was selected to develop a course for the new USC Spartanburg Metropolitan Studies Program. I developed the course, only to have the program die for lack of funds. However, I have resurrected some of the material for use in an honors course proposal for our new honors program. We shall see if that comes to be. If so, I will be offering it in the Fall, 2003. Of course, I will continue to offer my regular courses where I have used the sustainability modules in different proportions.

Below are the items required for the final report:

1. an evaluation of the module(s)
2. enrollment by major
3. student evaluations
4. modifications made while teaching course.

- **Evaluation of the module—**

Initially, the module was used in both Physical Geology (Geology 101) and Earth Resources (Geology 131). Both modules worked well, as the courses had not, up to that point, specifically talked about sustainability. What is interesting now is that since that time a number of textbooks for the Physical Geology course have started including discussions of sustainability.

The modules seemed to work well, except that I probably covered too much material (see below for discussion on modifications made). Pushing aside some of the material I had normally covered to make room for this new material was a challenge, but important. It became a matter of deciding what not to cover.

Prior to including the modules, there was virtually no understanding of the concept of sustainability. I had talked about “environmental awareness,” but had not developed a context or construct with which to carry that general view to the courses and back out to the world. Sustainability gave that structure (again, apparently recognized by others, as it becomes significant parts of some introductory texts).

The evaluation of the modules is based somewhat on questionnaires and tests, as well as on anecdotal evidence. I am aware that this sort of evaluation needs to be tightened up, which I will do. However, given I am evaluating the first attempts at using the module, I did not have my process tied down the way it should be at that time.

I gave a **pre-test/questionnaire** in the first session of class. This had a number of questions relating to sustainability. The response to those questions was virtually 100% incorrect. Nobody had an idea what sustainability was, nor had they given the surrounding issues much thought. A problem with the pre-test, however, might have been that it was too dependent on terminology. That is, some students might have understood the concept. Yet, they might have been unable to recognize the term “sustainability”—and therefore, would have seemed to have given the issue any thought.

The **follow-up test** occurred in both the first exam in the class, as well as occurring as a question on the final. Responses were much more informed in the first test, but still not enough. The responses to the question on the final exam were not particularly useful, as I had made the mistake of leaving that question as optional—they could choose that one among several. I had assumed it was one of the “easier” questions, and therefore would be chosen. I was wrong.

The **anecdotal evidence** is how I felt the discussions were going in class. These discussions showed a much greater awareness of sustainability issues, and that never would have happened without presenting the concept in the module. There were a number of students (a small number) in the classes that were excited by thinking about the issues and trying to wrap their minds around the implications. They would talk to me before or after class, or they would come in to my office and discuss sustainability. That was neat. However, I did not document that.

- **Enrollment by major— in the 2 courses (multiple sections) that used the modules**

Major	Geo. 131	Geo. 101
Undeclared	14	5
Math/Computer Science	5	9
English	0	2
History	4	0
Political Science	2	0
Psychology	1	5
Information Management	0	3
Sociology	1	1
Spanish	0	1
Elementary Education	3	6
Secondary Education	2	8
Special Education	0	1
Criminal Justice	3	2
Communications	4	10
Interdisciplinary Studies	5	7
Business Admin. & Econ.	8	13

- **Student Evaluations—**

Unfortunately, the student evaluations showed no significant difference between these course sections with the modules and earlier ones without the modules. Also, the university student evaluation forms didn't have specific questions on the modules, and I neglected to add extra questions.

Obviously, an effective form of evaluation has to be developed. I am not convinced that asking questions about each module would tell as much about the module's worth as it would about student focus. But that is a longer discussion.

- **Modifications made while teaching course—**

Above I have alluded to changes that would be needed (and some have been carried out already).

1. The first use of the modules was too filled with information. Given I was giving a geology course that also needed some "geology," I had been too ambitious with the amount of sustainability material that I could cover in the allotted time. I have greatly trimmed down the amount, keeping the basic information and focusing on using examples (both what I presented and what the students created) to further develop an understanding of sustainability.
2. The second change needed deals with assessment. I have trimmed down the material covered in the pre-test, and have required the sustainability question on the post-test (i.e. exams). This is, at least, change that I can document.
3. The third significant change is with the student evaluations. Still to be developed is a way to properly evaluate the module on sustainability. I am still unsure how to do so in a way that would measure anything worthwhile. This is particularly difficult since it is only a small fraction of the course. It has become easier in one of the courses, since the text has picked up the sustainability theme and run it through the whole book.

### **Summary.**

The Sustainable Universities Initiative Grant provided me the opportunity to develop modules that could be added to my courses. Depending on the course, I was able to modify the modules to fit what I perceive to be the needs of the course. Out of the original modules I have built sustainability into all of my courses. What I teach changes through time, depending on staffing and on new initiatives. I have carried the modified modules from the original two courses to 2 other course, to a lab, and now will carry it to an honors course that will likely be given in the Fall.

I am thankful for the opportunity. I have thoroughly enjoyed carrying the concept of sustainability to the students of this university through my courses. I believe they, the students, have enjoyed it too.