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## ABSTRACT

This report examines the impact on students in the field of environmental studies. The study looked at how environmental studies courses and programs, which present biogeochemical facts to inform students of current problems and issues in the state of the planet, could change student attitude and behavior in relation to both the discipline of environmental studies and the environment. The study found that: (1) of all the students surveyed (n=66), 52% reported a great increase in knowledge of environmental issues as a result of taking an environmental studies course; and (2) of all students surveyed, 57% indicated a status of "very important" on issues relating to the conservation of natural resources. As a result of such findings, the study concluded that the impact of taking an environmental studies course is substantial. The report predicts that impact on student behavior could be increased even more in the future if additional, alternative forms of instruction are incorporated, such as field trips and required term papers. These would, in turn, provide for deeper immersion in the subject and increased ownership of the issues. Survey instrument is appended. (ND)

**Behavioral Impacts of an Environmental Studies Course  
at a New Jersey Community Collage**

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May 2002

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at a New Jersey Community College

Introduction

It has been said that the "ultimate aim of education is shaping human behavior" (Hungerford and Volk, 8). One field being taught at many levels of education today with an eye towards changing student behavior is environmental studies. Environmental courses and programs present the biogeochemical facts to inform the student of current problems and issues in the state of the planet. Solutions are also presented along with the economic, cultural and political tensions they cause. Hopefully the students will gather up the knowledge and critical thinking skills and apply them at least to their little corner of the world, being a little more respectful of all the forms of life with which they share the planet, and the environment and ecosystems which support that life.

What educator of any field of studies does not wish to convey a sense of beauty, wonder and enthusiasm for that field to their students? Yet, how many of us ever get to see the fruits of our labor ripen and multiply into actual behavioral changes and new personal responsibility? It is my opinion that such changes are especially important at the community college level where, theoretically, an enormous gain is to be made in the courses populated by students in the malleable zone between high school and the university.

How then to measure if such change has taken place?

Numerous studies in outcome research in environmental education have been conducted chiefly at the K-12 level in both classrooms and field experiences (Leeming, et al, all). Only one study was found which tested the effects of classroom environmental instruction on college students (Carpenter). In this study the author developed a scale to measure commitment to environmental issues at the beginning and end of a college course. Results indicated a significant increase in commitment to the environment after completion of the course.

Assessing behavioral changes in environmental education has itself evolved with research findings over the decades. The initial paradigm was that behavior could be changed by increasing knowledge: "Increased knowledge leads to favorable attitudes which in turn lead to action promoting better environmental quality" (Ramsey and Rickson). When research did not bear out this simple linear model for change, however, a meta-analysis of the behavior research literature in environmental education was conducted in 1986-7 (Hines, et al). This analysis yielded a more realistic behavioral model of environmental responsibility based on the following variables: attitudes, locus of control and personal responsibility as personality factors combined with situational factors, action skills, knowledge of the issues and intention to act (Hines, et al, all).

Distilled down, these variables fall into three broad

categories: entry-level variables, ownership variables and empowerment variables (Leeming, et al, 10). These can be further delineated as follows:

Major Entry-level Variables : Environmental sensitivity  
Major Ownership Variables: Knowledge about Issues  
Personal Investment in Environment  
Major Empowerment Variables: Knowledge of Action Strategies  
Locus of Control  
Intention to Act (Leeming, 11)

Based on the above research, I constructed a short survey (15 items) to be administered to the students of the ENV 105 Environmental Studies course at Brookdale Community College in Lincroft, New Jersey, at the end of the Fall Term 2001. The survey was kept short so that 1) the course instructors would administer it during a very busy time of the term and 2) the students would fill it out completely in less than 10 minutes. The very end of the term was selected to allow for maximum exposure to the content and ideas of the course in an attempt to gauge minimum attitudinal and behavioral change possibly enacted by course participation.

The major variables cited above were incorporated within the survey instrument. Entry-level environmental sensitivity was covered by questions numbered 1-4 which focused on past environmental courses and activities and membership in environmental organizations. Ownership variables were addressed

in questions 5, 9 and 14. Question 5, on regular outdoor activities, follows the general conservation idea that those who regularly use the environment appreciate its conservation more than those who do not. Question 14 focuses on continued commitment to natural resources based upon completion of the course.

Empowerment was embedded within questions 10 through 13. Action strategies were assessed through intention to join environmental organizations, future participation in environmental programs and volunteer activities, designation of where environmental studies should be taught (high school or college) and state and Federal funding for the environment.

In all, questions 1 - 5 and 8 sought to assess environmental activity, interest and knowledge prior to taking the course. Questions 9 - 15 attempted to assess change in attitude and behavior at the end of the course. Questions 6 and 7 focused on immersion in course content via field trips and term papers for increased understanding of environmental issues.

This study was undertaken because no prior study in environmental outcomes assessment at the community college level was found in the literature. This study could serve as a pilot for a more comprehensive study of such outcomes in the future.

### The Study

The study was conducted at Brookdale Community College, Lincroft, New Jersey, at the end of the Fall Term, 2001. Five

sections of ENV 105 Environmental Studies participated during the last week of the term. Sixty-six students filled out the survey but three were found to be incomplete by omission of the reverse side and these were discarded. No identification or demographic information was asked.

For ease of assessment, the surveys were separated into three categories based on the answers to the first five questions. These questions focused on prior environmental experience and participation. If the student answered the first four questions with all "No's" and circled none of the listed activities in question 5, they were assigned a "Low Prior Experience" (Low PE) rating. They were also assigned this rating if only one "Yes" appeared among the first four questions and/or one activity was circled in question 5.

If "Yes" was selected 2 or 3 times among the first four questions plus at least one activity circled, that survey was rated "Moderate PE". If "Yes" was selected 4 or 5 times plus at least two activities circled, that survey was rated "High PE". The resultant breakdown among the surveys then became: 50% Low PE, 41% Moderate PE, and 9% High PE.

High Prior Experience There were no surprises among the six surveys which comprised the High PE group. Five out of the six felt that they knew a moderate amount about environmental issues before taking the course and four participated regularly in at least three of the listed activities. Three students wrote term papers (deeper immersion). Question 6 played no response

role as field trips were neither a requirement nor an option in any of these course sections.

Five students said that their understanding of environmental issues "greatly increased" due to the course and all stated that conservation of natural resources was "very important" to them. All of these students answered either "Yes" or "Maybe" to the questions on future participation in environmental organizations and activities and five said that environmental studies should be a required course in both high school and college. All felt that "more" money should be funded by state and Federal governments towards the solution of environmental problems.

The results of the High PE surveys appear to indicate that those students already engaged in environmental activities gained more from taking the course and felt they would continue their interests in the environment in the future. Therefore, those already actively involved in the environment saw the course as a benefit which gave them new information and strengthened their personal interest in the subject.

Moderate Prior Experience There were 27 surveys returned which fell into the Moderate PE category. Thirteen of these indicated a "moderate" amount of knowlege of the issues before taking the course while twelve indicated "a little" and two replied "none". Seven students reported regular participation infour or more of the listed activities with the majority (70%) at the one or two activity levels. Thirty-three percent wrote

a term paper. On question 9, 52% indicated that their knowledge of environmental issues had "greatly increased" due to the course while 44% felt that their knowledge had "somewhat increased". (One survey reported a decrease in knowledge due to the course.)

Of those with moderate prior experience with the environment, 70% answered either "Yes" or "Maybe" on joining an environmental organization or volunteering for activities in the future. Nineteen percent indicated that they would not do either of these. Sixty-three percent felt that environmental studies should be required in both high school and college while 26% thought it should be offered in high school only. Eighty-nine percent felt that governments should spend more money on environmental problems. And 89% said that conservation of natural resources was either "very" or "somewhat" important to them now due to taking the course.

Summary: Most of this group self-reported moderate to little understanding of environmental issues before enrolling in the course. The high percents on increase of knowledge, willingness to join organizations and participate in activities plus importance of conservation of natural resources seemed to close the gap in knowledge and understanding which these students reported for the start of the course. They seemed to end the course with a greater appreciation of the issues and an interest for more active participation. These sentiments are echoed in the comments of three of these students in response to question 15:

"I had no prior background in environmental studies and didn't realize the severity of environmental problems. I know that conserving our natural resources is very important but now I know that something needs to be done about the problem."

"I never realized how many negative environmental issues there are that concern everyone and how much damage is being done."

"I really didn't care [before], but now know more than I did. So I'm concerned [now]."

Low Prior Experience Students with Low PE scores seemed to have the most to gain from the course. Sixty-four percent reported knowing "little" or "nothing" about environmental issues prior to enrolling in the course. A full 79% participated in 0 or 1 of the listed outdoor activities regularly. Term papers were attempted by only 18% of the group.

On the hypothesis that those reporting the least amount of prior knowledge had the most amount of ground to make up, a resounding 97% of these students reported feeling that their understanding of environmental issues had either "greatly" or "somewhat" increased due to the course. Intention for action in questions 10 and 11 was quite low, however, with only 21% reporting "yes" on both questions and 33% stating "no" on both. It may be hypothesized that increased knowledge needs a time period for full assimilation for some before action may take place.

It is interesting to note that 82% of the Low PE's favored a required environmental course at either the high school or college level or both while 85% advocated increased state and Federal funding towards solution of environmental problems.

Finally, 93% reported in question 14 that conservation of natural resources was either "very important", "somewhat important" or "important" for them upon completion of the course.

Low PE student comments ranged as follows:

"At the conclusion of this course, I now realize that the importance of environmental protection is far greater than I have previously ever thought."

"I wasn't aware of the problems."

"The fact that I now have more knowledge about the whole concept of environmental science is key. Before this class my knowledge of this study was very limited, but after this class I have gained a greater knowledge of this study."

### Summary

The High PE group was the smallest group and differed the most from the other two groups. These students expressed an interest in and commitment to the environment prior to beginning the course. Despite this background, these students also said that their knowledge of environmental issues greatly increased with the course.

The Moderate and Low PE groups were fairly homogenous in their reports of course effect. An equal number in both groups indicated that the course had greatly increased their knowledge of environmental issues and another nearly equal number felt that conservation of natural resources had become very important to them. Of course, many other variables could also be at work here besides the course over the length of this 15-week term.

The reporting of an environmental disaster somewhere in the world during this time period would have greatly increased knowledge of environmental issues outside of the course. The disaster of the World Trade Center in New York on September 11, 2001 was highly environmental and may have had some effect on these classes depending on how the individual instructors handled the situation. But media focus was on the terrorist and political elements, the search-and-rescue efforts and the declaration of war rather than on the contamination of lower Manhattan by debris, ash and toxic substances. Media focus is a substantial variable in the sensitization of the public to environmental problems. Unfortunately, this study was too small to address such alternate variables.

In all, the results of this study were heartening. On the two questions - #9 and #14 - 52% of all the students surveyed reported a great increase in knowledge of environmental issues due to the course and 57% indicated a status of "very important" for the conservation of natural resources. These may be considered to be substantial gains in these areas by community college students. They may possibly be increased in the future by incorporation of field trips and required term papers in this course for deeper immersion in the subject and increased ownership of the issues. Any such additions would at the least increase the relevancy of the course for these students.

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APPENDIX

STUDENT SURVEY

Brookdale Community College

Environmental Studies 105

STUDENT SURVEY

Please circle the answer of your choice for each question

1. Have you taken any environmental courses (high school or college) prior to ENV 105?      Yes      No
2. Have you taken any environmental programs with a local park system, the National Park System, the NJ Dept. of Env. Protection or a non-profit organization (Sierra Club, Audubon, etc)?      Yes      No
3. Were you a member of any environmental organization or group prior to taking ENV 105?      Yes      No
4. Have you ever volunteered for a non-profit organization or park system environmental activity such as beach sweeps, trail maintenance, invasive plant removal, protection of shorebird nesting areas, etc?  
Yes                  No
5. Do you regularly enjoy any of the following activities (please circle all that apply):  
Hiking      Canoeing      Kayaking      Hunting      Fishing      Birding  
Horseback Riding      Mountain Biking
6. Were field trips a requirement for ENV 105?      Yes      No
7. Did you write a term paper for this course?      Yes      No
8. Do you feel you knew (please circle one):  
A Great Deal      Moderate Amount      A Little      Nothing  
about environmental issues before taking ENV 105?
9. Do you feel your understanding of environmental issues has:  
Greatly increased      Somewhat increased      Not increased      Decreased  
due to this course?
10. Would you consider joining an environmental organization now that you have completed this course?      Yes      No      Maybe

Would you consider participating in environmental programs or volunteer activities now that you have completed this course?

Yes                      No                      Maybe

Based on the information in this course, do you think that environmental studies should be a required course in either high school or college?

HS              College              Both              Neither

In your opinion, should more or less money be funded by state and Federal government towards solution of environmental problems?

More                      Less

How important is conservation of all aspects of natural resources (plants, animals, atmosphere, oceans, open space, etc) to you now that you have completed this course?

Very important              Somewhat important              Important              Not important

Would your answer to Question #14 been different at the beginning of the course than it is now?              Yes              No

How different?



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