

Assessment Report for BGES Undergraduate Program in ENVIRONMENTAL SCIENCE: 24 June, 2010

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1. Goals

Environmental Science majors will possess a broad general knowledge of the fundamental facts and principles in all of the major areas of Environmental Science by the end of their senior year, as well as advanced knowledge in the major areas of Environmental Science, as defined by standard textbooks.

This goal was developed by the Department: initially by the chair and associate chairs, undergraduate program directors, and the Undergraduate Committee on Curriculum & Academic Standards [UCCAS], then discussed and approved by a formal vote at a faculty meeting. Because of the relatively small number of majors (less than 30) in a program that was initiated only in 2000, the Department decided to use standard textbook topics as the knowledge base. No changes in the goals have been made since that time.

2. Outcomes

The Department decided to define outcome measures as *satisfactory improvement in performance on a standardized test from entry to completion of the program*. This outcome measure was adopted by the Department in the same way and at the same time as the determination of the goals.

3. Research Methods

The current testing procedure (implemented only since Fall, 2003) uses an objective exam of 59 multiple-choice questions. The questions used in the pool were selected from faculty input and then subsequently approved by faculty that teach in this area.

The exam is administered at two time points in a student's career: at entry, operationally defined as the beginning of the first required course for majors (EVS 206, Introduction to Environmental Science), and just before graduation. The last point is administered by requiring all majors to complete before graduation a zero-credit course (EVS 499, Exit Evaluation) that consists solely of the assessment examination.

All of these direct measures are collected as aggregate values for the entire set of students writing the exam in each semester. No attempt is made to track the performance of individual students until sufficient cohorts have been sampled at start and end..

In addition to these direct outcome measures, indirect evidence sometimes comes in the course of informal exit interviews with the Environmental Science Undergraduate Program Director [in the BGES Department, all Environmental Science majors are advised by the same person]. The suggestion by the assessment review panel for us to consider *systematic* indirect measures (such as a simple student survey) now has been implemented. When students take the exit

examination, they complete an anonymous survey; in addition, they are provided the opportunity to write any comments they wish. The current, revised survey instrument is appended to this document.

4. Findings

A set of standard statistics are calculated for each set of data and appropriate comparisons are made. In particular, overall average scores always will be compared between the entry and exit categories as new data accumulate each semester. The entry data—actually all students in EVS 206 whether majors or not (Fall, 2003 through summer session 2005, AY07-08 and AY08-10)—show an average score of 26.0 of 59 or 44% (based on data for N = 400 students); this year's group did significantly better with an average of 29.5 or 50% (N = 101). Twenty students previously completed the mandatory EVS exit evaluation that was introduced in Fall, 2003. Their average exit score was 71.1%. The six graduates this year averaged 63.6%. See Figure 1a-c.

It is clear that students in the introductory course have poor initial knowledge of environmental science facts and principles. At least 20 graduated seniors have good objective knowledge of Environmental Science.

Summary results of the first ten questions on the anonymous exit surveys are attached. These are from the thirteen surveys completed this year. On the five questions that attempt to solicit performance ratings (Table 2), the mean values are similar to those from previous years. These graduating Biology seniors give good ratings (modes of 2.0 or “good”, or 1.0 or “very good” in all categories: improving career prospects, their knowledge, their instructors' abilities, the teaching assistants, and the experiments. Means were between good and very good for the instructors and teaching assistants (1.77 and 1.83, respectively, or between very good and good); they were between good and adequate for the experiments (2.38). Of possible improvements, “more hands-on research” was first or second choice of most; better lab courses and instructors were a distant second. (Table 3).

Most graduates expect to work in a job related to their degree (Table 1); informal reports tell me that the job market is very difficult this year and most have not yet achieved this goal. Several are looking at other areas. Like the biology students, half the respondents expect to be in Northeast Ohio in a year, but most expect to be elsewhere in the U.S. in five years (Table 4).

Sheets for anonymous comments were distributed along with the survey, but numbers are too small to report..

5. Review

Results of the data analysis are reviewed each Fall by the Undergraduate Program Director, Associate Chairs, and Chair, as well as by members of the Department's undergraduate committee (UCCAS). Any significant findings are reported to the faculty generally for

discussion and action. Furthermore, all faculty receive copies of this report annually.

6. Actions

There are too few results for this program to justify any actions based on this formal assessment at this time. However, it may be worthwhile to divide the exam into broad subject areas, so that future analyses may identify specific weaknesses in the objective knowledge of graduating Environmental Science seniors. On-going review by the faculty has identified several needed improvements, including additional techniques courses and experience and a separation of majors and non-majors students in the introductory course. This was done within the existing structure in Fall 07 on a trial basis time and enabled instruction of majors at a higher level and faster pace; staffing constraints forced single combined courses since then academic year. Additional equipment for a needed laboratory in aquatic ecology is needed; some has been purchased and will be introduced into courses next year. Staffing additional techniques courses will remain a problem, given the small number of faculty. The department has for the past four years identified plant science and the interface of biology and environmental science as a high priority for new faculty. We've been allowed to search in 10-11 for the following year. Soil science and hydrology are other areas identified from job requirements.

Anticipated difficulties in ensuring student compliance with taking the outcome assessment exam just before graduation resulted in the creation of the Exit Evaluation course requirement for the major, approved in Spring, 2003. As a result, numbers of students completing the assessment exam at graduation have increased.

Several problems with the assessment routine itself were corrected and we have better data on the entry assessment data. Gaps in the collection of the exit survey are partly linked to the departure of our long-time departmental secretary with no overlap to train her replacement and the repetition of this event again Spring 08. This aspect was addressed as part of the discussion of this report and addressed with the training of the new secretary. Data for the current year are reasonably complete.

No additional specific actions (other than the addition of an indirect assessment measure) were taken in Academic Year 2009-2010. However, intermittent discussions on the focus of the EVS program as well as the role of the Environmental Center that coordinates all CSU environmental activities have taken place and will continue year. As noted above, several changes will be discussed and possibly implemented in the coming year.