

**Objective:** To develop the ability to assess, analyze, plan and implement actions needed to manage the environment.

**Outcome:**

Students will identify the requirements for performing environmental site assessments and environmental impact statements.

**Evidence Collected and Findings**

EVIDENCE COLLECTED: Exam questions mapped to outcomes, analyzed at the question level, or groups of questions to identify strengths and weaknesses in knowledge of the content. FINDINGS: Test questions from the final exam in ETC 410 were used to assess the outcome. 26 out of the 53 Seniors in the program were in the class. The questions were mapped to each content area for the outcome. 4 questions were mapped to site assessments and 5 were mapped to impact statements. Overall, students were able to answer the questions correctly with an average of 86% correct for the site assessments and 71% correct for the impact statements. When reviewing the questions individually, it was found that 43% of the students answered one of the questions in the site assessment group incorrectly. The basic data table (aggregate data only) is attached in the additional documents link.

**Evaluation: Strength and Areas for Improvement**

STRENGTHS: The program does a good job of teaching students to identify the requirements in site assessment and impact statements. AREA FOR IMPROVEMENT: The program needs to work to strengthen students ability to identify the requirements for the final step of that process.

**Actions Taken to Improve Programs**

The site assessment process is taught initially in ETC 220. It is a foundational course for the program. The faculty have agreed that additional time needs to be spent on this issue in ETC 220 but that it should also be stressed in other courses. The Director of Undergraduate Programs (DUP) is talking with faculty that teach two other courses to see if they will spend more time on it in their junior level courses as well. It is a more complex step and multiple opportunities to address the issue will be needed. UPDATE OCT 2015: The change was made to ETC 220 by adding additional class time and an additional case study to the course. The DUP was able to have one other course add class time and an assessment- ETC 340. It was deemed inappropriate to add it into another course at this time.

**Objective:** To develop the ability to utilize quantitative knowledge, skills, modern tools, and technologies for environmental management.

**Outcome:**

Students will collect, analyze and report environmental samples for physical, chemical and biological contaminants.

**Evidence Collected and Findings**

EVIDENCE COLLECTED: First measure: Senior course project measured with a rubric and analyzed at the dimension level to identify strengths and weaknesses within the outcome. Second Measure: Case study measured with rubric and analyzed at the dimension level. FINDINGS: First Measure: Senior level students were assessed in ETC 420. There were 34 out of 53 seniors in the program enrolled in the class. Overall students scored well on this difficult project. The average score was 4.1 out of 5 on the rubric. \*Dimension scores were varied. Students scored higher (4.7) on data collection related dimension and (4.2) on analyzing dimension. They scored 3.5 on reporting. The rubric used and basic data tables (aggregate data only-no identifiers) are attached through the additional documentation link. Second Measure: Students in ETC 380 completed a case study mid- semester (but after the information is taught.) The course is mostly juniors (29 out of 49 juniors in the program) but does include some sophomores (9 out of 48 sophomores in the program). The rubric had several dimensions in common with the rubric used in ETC 420 for program assessment but also had additional dimensions for the class. Overall, students scored well on the program assessment dimensions. Average score was 3.8 out of 5 on the rubric. \*Dimension scores were varied. Students scored higher (4.4) on data collection related dimension and (4.0) on analyzing dimension. They scored 3.0 on reporting. The rubric used and basic data tables (aggregate data only-no identifiers) are attached through the additional documentation link.

**Evaluation: Strength and Areas for Improvement**

The data was considered together to address the findings at the curriculum level. STRENGTHS: The findings for both measures suggest that the program does a good job preparing students to collect data. There may be some room for improvement on analysis but the findings suggest they did well overall in this area based on the frequencies of the scores in the dimensions. AREA FOR

IMPROVEMENT: The program needs to spend more time on teaching "reporting" for both groups. As expected, the data was worse for the 300-level course but a concern for the 400-level as well. Even in the 400-level course, the average score was much lower and frequencies for the scores suggest that there are almost one third of the students are below average in reporting.

### **Actions Taken to Improve Programs**

The faculty felt that students were not getting enough practice writing technical reports based on their own data. Two report writing sessions with small assignments will be added to the spring sections of ETC 380 and ETC 360 to assist with report writing. ETC 420 will add one report writing assignment early in the semester to gauge students abilities to be sure they do not need further instruction prior to the project. UPDATE OCT 2015: The additional writing sessions were added to the ETC 360, 380 and 420 sections and were reflected in the course syllabi.

### **Outcome:**

Students will develop management plans with multiple objectives and constraints.

### **Evidence Collected and Findings**

EVIDENCE COLLECTED: Course project. Measured with rubric and analyzed at the dimension level to identify strengths and weaknesses within the outcome. FINDINGS: The rubric used for this outcome was a thematic rubric. Categories were determined in advance and the faculty made notes on each area within the outcome to allow for a wide variety of projects. The categories were: Plan Organization; Comprehensiveness of Plan; Creative Elements in Each Area(Obj/constraints/solutions); and Comprehensive Obj/Constraints. Quality Solutions The thematic rubric was analyzed using coding. The findings are presented in themes. The strengths were within Comprehensiveness of both the plan and the obj/constraints. The theme that arose was "complete". The areas for improvement were in Creative Elements and Quality Solution. While the majority were strong, two less positive themes emerged within 30% of the projects and they were "Standard solutions" (Creative elements) and "incomplete"(Quality Solution).

### **Evaluation: Strength and Areas for Improvement**

STRENGTHS: The program does an excellent job of teaching the students how to provide complete plans and to research the constraints as they work through their problems. AREAS FOR IMPROVEMENT: While the students did well overall, the faculty wanted to see more creativity and higher quality in some of the solutions. It appears that they are not currently thinking as broadly as we would like so we need to consider ways to encourage more creative approaches.

### **Actions Taken to Improve Programs**

Based on the data, two 300 level courses (ETC 312 and ETC 343) are adding 2 creative thinking sessions into the syllabus. The faculty have offered to, while teaching the original content, add exercises and discussion about how to think more broadly and creatively about problems and solutions.

## **External Program Review: Summary of Progress in Implementing Reviewers Recommendations**

### **Directions**

Summarize progress in implementing the recommendations from the action plan of the most recent external review of your program. For recommendations that have not been implemented, briefly describe plans for completing them and/or obstacles to completion.

### **Potential Answers**

This is only for programs that recently (last few years) participated in our External Program Review process that is SEPARATE from outcomes assessment.

A program that has not had a review in the last 2 years might put:

"No recent external program review."

If the program has gone through a review recently, here is an example response:

"The program went through external review last year. Three recommendations were made that we are pursuing. We are implementing what we can now. The first two recommendations were related to space. One was to get additional lab space, but we were told we were not getting new space in the near future. It was also recommended that we get priority in reserving classroom space in the rooms on the 3rd floor of our building, R and R agreed to do this so that is complete. Another recommendation was to review the undergraduate curriculum. We are in the process of doing that this academic year and will report on findings next reporting cycle."