

Texas A&M International University

Annual Institutional Effectiveness Review (AIER)

Date Submitted September 30, 2007

Assessment Period Covered (2007)

Academic Program/AES Unit Bachelor of Arts with a major in Biology

Person(s) Preparing Review Dr. Ruby Ynalvez, Dr. Sushma Krishnamurthy

Provide summary of the last cycle's use of results and changes implemented

In Year 2005 1) embedded questions in examinations and 2) student research presentations were used in the assessment. The overall results of subject specific embedded questions on examinations met our benchmark of 70%. Informing students about criteria for assessment as well as increasing feedback regarding their presentations, were also identified as ways of addressing weaknesses in their research presentations. The need for more student hands-on laboratory experiences to facilitate learning was identified by the department assessment report. Additional funding for laboratory equipment and supplies is necessary to meet these goals.

In 2006, we decided to focus on critical thinking skills, an essential tool common to all the sciences instead, rather than subject specific assessment. A third indirect assessment was added to our student learning outcomes. The three student learning outcomes assessed were:

- 1) Critical thinking skills
- 2) Student research presentations, and
- 3) Student exit surveys (indirect measure)

Students presenting at the research seminars were made aware of the assessment criteria in advance. Student feedback was in the form of faculty comments and suggestions for improvement at the seminars. The department has also started collecting tabulating raw seminar scores for dissemination to the department faculty mentors. In the past, average scores were shared with the faculty. The third means of assessment was implemented for the first time in Fall 2006. The results of the Y2006 assessment are not statistically valid, given the small sample size.

The results of the Spring 2007 assessment in the three areas listed above were shared at a department meeting held on September 14, 2007. The Department of Biology & Chemistry voted (September 25, 2007) to keep the same three student learning outcomes for year 2007 as the last year (2006) in order to have statistically valid data. Hence no changes to the existing student learning outcomes are being proposed at this time.

Section I: Planning and Implementation

Institutional Mission

Texas A&M International University, a Member of The Texas A&M University System, prepares students for leadership roles in their chosen profession in an increasingly complex, culturally diverse state, national, and global society ... Through instruction, faculty and student research, and public service, Texas A&M International University embodies a strategic point of delivery for well-defined programs and services that improve the quality of life for citizens of the border region, the State of Texas, and national and international communities.

Academic Program or Administrative/Educational Support Unit Mission

The foremost mission of the department is to provide a high quality education for the students in Biology, Chemistry, Environmental Sciences and Geology. Upon completion of the program students will be prepared for employment in the private and public sectors as well as professional and graduate education. The department also strives to increase the body of scientific knowledge through research. We serve the university by providing General Education courses and service courses for students in Nursing, Kinesiology and Education.

Identify outcomes and the relationship to Strategic Plan

Outcome 1

Is this outcome related to writing (QEP)?

Students will apply critical thinking skills to solve problems in biology.

Identify Strategic Plan Goal related to Outcome 1

Goal 1 Academics

Identify Strategic Plan Objective related to Outcome 1

1.7 Establish and pursue student learning outcomes appropriate for each program with systematic assessment and use of results for continuous quality improvement.

Identify methods of assessment to be used

Embedded questions in examinations in required (core) upper division courses (Cell Biology, Genetics, Ecology and Evolution). The questions will be agreed upon by biology faculty in each of the fields listed.

Indicate when assessment will take place

Annual

Criteria/Benchmark

Seventy percent of the biology senior students will have applied critical thinking skills to solve problems in biology (70% of the embedded examination questions answered correctly).

Outcome 2

Is this outcome related to writing (QEP)?

Students will demonstrate the ability to plan and execute a research project then present the material in a logical manner.

Identify Strategic Plan Goal related to Outcome 2

Goal 2 Research

Identify Strategic Plan Objective related to Outcome 2

2.3 Broaden the educational experience for students through support of student research/scholarship and student participation in faculty research/scholarship

Identify methods of assessment to be used

Means of Assessment Students will present the results of their research projects to a combined group of their peers. Faculty panel of at least 3 will evaluate projects using a common rubric.

Indicate when assessment will take place

Annual

Criteria/Benchmark

Seventy percent of the (biology) senior students will demonstrate the ability to plan and execute a research project, then present the material in a logical manner.

Outcome 3

Is this outcome related to writing (QEP)?

Student will have utilized their undergraduate education to acquire employment or acceptance in professional graduate programs.

Identify Strategic Plan Goal related to Outcome 3

Goal 1 Academics

Identify Strategic Plan Objective related to Outcome 3

1.7 Establish and pursue student learning outcomes appropriate for each program with systematic assessment and use of results for continuous quality improvement.

Identify methods of assessment to be used

Exit survey for graduating seniors. Results of the survey will group students according to the following: employment resulting from the completion of the degree, graduate school placement, professional school placement, and undecided.

Indicate when assessment will take place

Annual

Criteria/Benchmark

No more than 30% of biology graduating seniors will be undecided in their career options on completion of their degrees.

Section II: Analysis of Results

When (term/date) was assessment conducted?

Outcome 1

Spring 2007, Fall 2007

Outcome 2

Spring 2007, Fall 2007

Outcome 3

2007

What were the results attained (raw data)?

Outcome 1

Student Learning Outcome #1

Biology

Spring 2007

Class #1

Sample Size:37

%

Q1 75.7

Q2 70.0

Q3 81

Q4 27.0

Q5 91.9

average 69.1

Class #2

Sample Size:38

%

Q1 76.3

Q2 71.1

Q3 72.1

Q4 62.6

Q5 65.4

average 69.5

Spring 2007 Average 69.3 Standard Not Met

Fall 2007
 Class #1
 Sample Size:20
 %
 Q1 15
 Q2 60
 Q3 70
 Q4 30
 Q5 25
 average 40

Class #2
 Sample Size:37
 %
 Q1 70
 Q2 54
 Q3 51
 Q4 30
 Q5 62
 average 53.4
 Fall 2007 Average 46.7 Standard Not Met

Year 2007 Average 58.0 Standard Not Met

Outcome 2

Spring 2007
 Total Number of Group Presentors 24
 Number of Groups Rated 70% and higher 14
 % Number of Groups Rated 70% and higher 58.3 Standard Not Met

Total Number of Students Presented 77
 Number of Students Rated 70% and higher 45
 % No. of Students Rated 70% and higher 58.4 Standard Not Met

Fall 2007
 Total Number of Group Presentors 9
 Number of Groups Rated 70% and higher 8
 % Number of Groups Rated 70% and higher 88.9 Standard Met

Total Number of Students Presented 18
 Number of Students Rated 70% and higher 16
 % Number of Students Rated 70% and higher 88.9 Standard Met

Year 2007 Average
% Number of Students Rated 70% and higher 73.7 Standard Met

Outcome 3

Sample size: 2

Gender

Male: 0 (0.0%)

Female: 2 (100.0%)

0% are not undecided on their career options

100% are decided on their career options Standard Met

Who (specify names) conducted analysis of data?

Outcome 1

Dr. Ruby Ynalvez

Outcome 2

Enter text here

Outcome 3

Enter text here

When were the results and analysis shared and with whom (department chair, supervisor, staff, external stakeholders)? Submit minutes with data analysis to assessment@tamiu.edu (Please use Minutes Template located on the [Project INTEGRATE web page.](#))

The results of the Spring 2007 assessment were shared at a department meeting held on September 14, 2007. The results of the Fall 2007 and Year 2007 assessment will be shared with the department at our first department meeting of the semester in February 2008.

NOTE: Submit all assessment documentation (i.e., surveys, rubrics, course exams with embedded questions, etc.) to the Office of Institutional Effectiveness and Planning.

Use of Results: Indicate whether criteria were met/not met and what changes, if any, have been identified based on the data collected?

Outcome 1

Met Not Met

Provide narrative: The criteria was not met because it was only 58.0% of the biology senior students who have applied critical thinking skills to solve problems in biology. It was 12% lower than the 70% target.

Outcome 2

Met **Not Met**

Provide narrative: The standard was met since 73.7% (biology) senior students were able to demonstrate the ability to plan and execute a research project, and have presented the material in a logical manner. The standard was 70%.

Outcome 3

Met **Not Met**

Provide narrative: The target was no more than 30% of biology graduating seniors will be undecided in their career options on completion of their degrees. Outcome 3 was met as 100% of the students surveyed were decided of their career options. Although, it should be noted that only 2 senior students were surveyed.

How have these data-based changes improved your program/unit?

Data for student outcome #1 has been collected for a total of 3 assessment cycles (including that contained in this current report) . The benchmark of 70% was narrowly met the first year (2005 - 70%) and narrowly missed in the second year (2006 - 68%). The results from the 2 years (2005, 2006) have hovered around our benchmark, though not clearly exceeding it. This year, 2007, we missed our benchmark by 12%. Our overall data will be conclusive after at least one more assessment cycle in 2008.

Increasing hands-on investigative laboratory experiments and exercises, and encouraging undergraduate research projects, would help enhance the students' critical thinking skills. Biology & Chemistry faculty will further address the issue at the next department meeting in February 2008, since the scores have not surpassed the 70% benchmark.

Outcomes 2 & 3 have been met, however, the assessment must be continued to validate this data. While we met our standard for learning outcome #2 for the year 2007, the data from Spring 2007 does not meet our benchmark. The higher scores in Fall 2007 compensated for the lower scores in spring 2007.

The sample size for outcome #3 is 2, making the data statistically invalid.

Section III: Programmatic Review

Are resources affected by the changes identified in Section II? Yes No

If so, specify the effect(s) using the chart below:

| Funding | Physical | Other |
|--|---|--|
| <input checked="" type="checkbox"/> New resources required | <input type="checkbox"/> New or reallocated space | <input type="checkbox"/> Primarily faculty/staff time |
| <input type="checkbox"/> Reallocation of current funds | | <input type="checkbox"/> University rule/procedure change only |
| | | <input checked="" type="checkbox"/> Other: Smaller group size |

Provide a narrative description and justification for requested resources (include linkage to Strategic Plan)

University support in laboratory capacity building is essential to keep pace with changing technology, enrollment (consequently greater usage of instrumentation, increased wear & tear) and the push towards developing a culture of research in the university. Service contracts need to be purchased along with instrumentation. Smaller group sizes would help provide additional individual attention to the needs of our students.

| |
|--|
| Identify proposed outcomes for the next assessment cycle: |
| Continuation of present outcome(s) – (Indicate reason for continuation): The present outcomes need to be continued for statistically significant results. |
| New Outcome(s) – (List outcomes below): Enter text here |
| Modification of present outcome(s) – (Indicate reason for modification): Enter text here |

****** This section to be completed by dean/director/vice-president ******

Are resources requested a priority for the academic program/AES unit?

Yes No

Comments:

Enter text here

If funding, physical or other resources were requested, what is the impact of the budget decisions on the academic program/AES unit?

Enter text here

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