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 Science with a major in Science with K-12 Certification

Person(s) Preparing Review Dr. Sushma Krishnamurthy

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

Department of Biology & Chemistry Report

In 2006, we decided to focus on critical thinking skills, an essential tool common to all the sciences instead, rather than subject specific assessment. The student learning outcomes assessed was 'Critical thinking skills' . The results of the Y2006 assessment are not statistically valid, given the small sample size.

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

Compile Outcomes 1, 2, 3 as the COED part of the report, and the outcome on this report (from the Department of Biology & Chemistry) as outcome #4.

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 Science 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)?**

Identify Strategic Plan Goal related to Outcome 2
To Select Goal Click Here

Identify Strategic Plan Objective related to Outcome 2

Identify methods of assessment to be used

Indicate when assessment will take place
Click to select

Criteria/Benchmark

Outcome 3 ☐ **Is this outcome related to writing (QEP)?**

Identify Strategic Plan Goal related to Outcome 3
To Select Goal Click Here

Identify Strategic Plan Objective related to Outcome 3

Identify methods of assessment to be used

Indicate when assessment will take place
Annual

Criteria/Benchmark

Section II: Analysis of Results

When (term/date) was assessment conducted?

Outcome 1

A total of four junior and senior level classes were assessed in the spring ('07) and fall ('07) semesters.

Outcome 2

Enter text here

Outcome 3

Enter text here

What were the results attained (raw data)?

Outcome 1

2007 STUDENT LEARNING OUTCOME 4 ASSESSMENT
ASSESSMENT OF STUDENT CRITICAL THINKING SKILLS

CLASS 1
Sample size 38

	Correct	%
Question 16	29/38	76.3
Question 30	27/38	71.1
Problem 1		72.1
Problem 7		62.6
Problem 15		65.4

CLASS 2
Sample size 37

Q1	28/37	75.7
Q2	26/37	70
Q3	30/37	81
Q4	10(37)	27
Q5	34/37	91.9

CLASS 3
Sample Size 20

Q1	15
Q2	60
Q24	70
Q33	30
Q45	25

CLASS 4
Sample Size 37

Q1	26/37	70.27
Q2	20/37	54
Q3	19/37	51.35
Q4	11(37)	29.72
Q5	23/37	62.16

AVERAGE SCORE: 58.03

THE BENCHMARK OF 70% WAS NOT MET
Note: This data represents all the students who took Cell Biology, Genetics, Evolution and Ecology. The students in these classes are all biology majors. The data has not been broken down into the types of biology degrees offered (B.S. In Biology, B.A in Biology, B.S. in Science with K-12 certification, B.A. in biology with K-12 Certification, BSIS in Science with 8-12 Certification) since several categories, including this one (Bachelor of Science with a major in Science with K-12 Certification) had under 5 students in 2007. It is unlikely that we will have large numbers of students in this degree plan in the foreseeable future. We have detrermined that assessing pooled data is beneficial to the department than trying to derive meaning from data generated by the perfromance of a handful of students. This issue was was discussed and approved by Dr. Carol Waters.

Outcome 2
Enter text here

Outcome 3
Enter text here

Who (specify names) conducted analysis of data?
Outcome 1
The data was analyzed by Drs. Ruby Ynalvez, Garcia Rios, Vaughan, McReynolds and Krishnamurthy.

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 2007and 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 benchmark of 70% was not met. The average score was 58%, 12% below our expectations.

Outcome 2
☐ **Met** ☐ **Not Met**
Provide narrative: Enter text here

Outcome 3
☐ **Met** ☐ **Not Met**
Provide narrative: Enter text here

How have these data-based changes improved your program/unit?
Data for student outcome #4 has been collected for a total of 3 asessment 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.

This final AIER report is due too soon after the calendar year (2007), which leaves little time for the elaborate process of data compilation, analysis, dissemination of information, sharing of information with other colleges (eg. joint AIER reports), and meaningful deparmental dialogue about the issues. Our recommendation is to have these reports due in either late February or March.

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
☒ New resources required	☐ New or reallocated space	☐ Primarily faculty/staff time
☐ Reallocation of current funds		☐ University rule/procedure change only
		☒ 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): Student Outcome #4 needs at least one more cycle of assessment for more conclusive and actionable data.
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