Texas A&M International University
Annual Institutional Effectiveness Review (AIER)

Date Submitted February 4, 2007

Assessment Period Covered (2006)

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

Person(s) Preparing Review Dr. Sushma Krishnamurthy

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

In Y2005, 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 as also identified as ways of addressing weaknessess in their research presentations. The need for more student hands-on laboratory experiences to facilitate learning was identified by the deparment assessment report. Additional funding for laboratory equipment and supplies is necessary to meet these goals.

This year we have 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 has also been added to our student learning outcomes.

In Y2006, 1) critical thinking skills 2) Student research presentations and 3) Student exit surveys were used as tools of assessment. The third means of assessment (Student Exit Surveys) was implemented for the first time in Fall 2006. 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.

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

Critical thinking questions were administered throughout the semester by biology faculty in required senior biology courses.

Outcome 2

December 1, 2006

Outcome 3

December 4- 12

Graduating seniors were personally requested (by phone or verbally in class) to fill in the exit survey forms, which were kept in the department office and administered by Ms. Isabel Solis, the department secretary. The survey was available to the students during final exam week.

What were the results attained (raw data)?

Outcome 1

CRITICAL THINKING SKILLS
BIOLOGY SCORES

SPRING 2006
Class 1
CLASS SIZE: 40

	Correct	Incorrect	
Question 1	27	13	67.5%
Question 2	35	5	87.5%
Question 3	30	10	75%
Question 4	32	8	80%
Question 5	36	4	90%
Total	160	40	80%

Overall correct answers 160 (80%)
Incorrect Answers 40 (20%)

FALL 2006
Class 1
Class Size: 29

	Correct	Incorrect
Q14	29	2
Q15	30	1
Q16	18	13
Q17	28	3

Q26	18	13
Q28	21	10
	144	42

Overall Correct 144 (77%)
Overall Incorrect 42 (23%)

Class 2:

Question#	1	2	24	33	45
a	5	4	2	1	1
b	3	1	12	4	4
c	1	5	2	2	4
d	3	8	3	0	4
e	7	1	0	12	6
Correct%	15.8	42.1	63.2	63.2	21.1

Overall Correct 41.08%

The average score for critical thinking questions for the year 2006 is 66%. This does not meet our benchmark of 70%.

Outcome 2

SPRING 2006 Scores

STUDENT RESEARCH PRESENTATIONS

	A	B	C	D	E	F	G	H	I	J	Average
BIOL Presentation 1		6			5	5.0		8.0			6.0
BIOL Presentation 2	7.0	7			7	7.0	6.5	8.0			7.1
BIOL Presentation 3	7.0	9			8	9.0		8.0			8.2
BIOL Presentation 4	7.0	8			7	7.0		8.0			7.4
BIOL Presentation 5	7.0	6			7	7.0		8.0			7.0
BIOL Presentation 6	7.0	7			7	8.0		9.0			7.6
BIOL Presentation 7	7.0	6			7	9.0	7.0	8.0			7.3
BIOL Presentation 8		6				8.5		8.0			7.5
BIOL Presentation 9		7				7.0					7.0
BIOL Presentation 10											

6.0	5			6.5				5.8		
BIOL Presentation 11										
	5			6.0			7.0		6.0	
BIOL Presentation 12										
	6			7.0	6.0		6.0		6.3	
BIOL Presentation 13										
8.0	8			9.5	9.0		8.0		8.5	
BIOL Presentation 14										
	5	8.0	6	6.5	7.0	8.0	7.0	8.0	6.9	
BIOL Presentation 15										
7.5		7.0		7.5	8.0		7.0	7.0	7.3	
BIOL Presentation 16										
7.0		8.0		8.0	9.0			8.0	8.0	
BIOL Presentation 17										
7.5		7.0		7.5		8.0		8.0	7.6	
BIOL Presentation 18										
7.5		7.0		7.5	6.0	7.0	6.5	8.0	7.1	
BIOL Presentation 19										
6.5		8.0		7.0	7.0	7.0	6.0	7.0	6.9	
BIOL Presentation 20										
7.0		8.0		8.0	6.0		6.5	7.0	7.1	
GRAD BIOL Presentation 21										
7.0				8.0	8.0	8.0	6.0	7.0	7.3	GRAD
GRAD BIOL Presentation 22										
	8.0			8.5		8.0	7.0	8.0	7.9	GRAD
BIOL Presentation 23										
	8.0	8.0	9	9.0			7.0	9.0	8.3	
CHEM Presentation 24										
7.5	7.0	8.0	8	8.0			8.0	9.0	7.9	CHEM
BIOL Presentation 25										
	6.5	7.0	7	8.0			7.0	8.0	7.3	
BIOL Presentation 26										
	6.5	8.0	7	8.0	7.0			7.0	7.3	
BIOL Presentation 27										
5.0	4.5	6.0	4	5.0	5.0			7.0	5.2	
GRAD BIOL Presentation 28										
	7.5	8.0	7	7.0	8.0	8.0		8.0	7.6	GRAD
GRAD BIOL Presentation 29										
	6.5	6.0	5	7.0	6.5	8.0	6.0	8.0	6.6	GRAD
GRAD BIOL Presentation 30										
7.0	7.0	8.0	7	7.5		7.0	4.0	8.0	6.9	GRAD
BIOL Presentation 31										
6.0	7.5	7.0	8	7.5		8.0	6.0	8.0	7.3	
GRAD BIOL Presentation 32										
6.0	7.0	7.0	7	8.0		8.0	5.0		6.9	GRAD

GRAD BIOL Presentation 33

7.0		7.0	6.0	8	7.5		8.0	6.0	7.1	GRAD
AVERAGE SCORE	6.9	6.5	6.9	7.3	6.9	7.5	7.1	7.9	6.4	7.8

OVERALL AVERAGE
7.2

Evaluation was performed by 10 faculty members in the Department of Biology & Chemistry (Listed A-J)
25 BIOLOGY PRESENTATIONS
1 CHEMISTRY PRESENTATION
7 GRADUATE STUDENT PRESENTATIONS

BIOLOGY PRESENTATIONS
(UNDERGRADUATE)

7 PRESENTATIONS
OUT OF A TOTAL OF 25 PRESENTATIONS DID NOT MEET OUR STANDARDS
AVERAGE SCORE
7.2
72% OF THE PRESENTATIONS MET OUR STANDARDS

STANDARD MET

CHEMISTRY PRESENTATION #32
(UNDERGRADUATE)
1 PRESENTATION
SCORE
7.9
STANDARD MET

FALL 2006 STUDENT SEMINAR PRESENTATIONS
1-Dec-06

Pres. #	Faculty	Content	Format & style	Total
1				
	A	5.0	3.0	8.0
	B	5.0	3.0	8.0
	C			
	D	5.0	3.0	8.0
	E	5.0	3.0	8.0
	F	5.0	4.0	9.0
	G	5.0	3.0	8.0

H				
I	5.0	3.0	8.0	
J	5.0	4.0	9.0	
K	5.0	3.0	8.0	
L	4.0	3.0	7.0	
M				
Average	4.9	3.2	8.1	

2				
A	5.0	3.0	8.0	
B	4.0	3.0	7.0	
C				
D	5.0	3.0	8.0	
E	4.0	2.0	6.0	
F	6.0	2.0	8.0	
G	3.0	3.0	6.0	
H				
I	4.0	3.0	7.0	
J	5.0	4.0	9.0	
K	4.0	2.0	6.0	
L	3.0	2.0	5.0	
M				
Average	4.3	2.7	7.0	

3				
A	4.0	3.0	7.0	CHEM
B	4.0	3.0	7.0	PRESENTATION
C				
D	4.0	3.0	7.0	
E	4.0	2.0	6.0	
F	4.0	3.0	7.0	
G	3.0	3.0	6.0	
H	5.0	3.0	8.0	
I	4.0	2.0	6.0	
J	4.0	4.0	8.0	
K	4.0	2.0	6.0	
L	3.0	3.0	6.0	
M				
Average	3.9	2.8	6.7	

4			
A	4.0	2.0	6.0
B	4.0	3.0	7.0
C			
D	4.0	3.0	7.0

	E	3.0	2.0	5.0
	F	4.0	2.0	6.0
	G	3.0	2.0	5.0
	H			
	I	5.0	3.0	8.0
	J	4.0	4.0	8.0
	K			
	L	3.0	3.0	6.0
	M			
Average		3.8	2.7	6.4
5				
	A	4.0	3.0	7.0
	B	5.0	3.0	8.0
	C			
	D	4.0	4.0	8.0
	E	3.0	3.0	6.0
	F	4.0	2.0	6.0
	G	3.0	3.0	6.0
	H			
	I	5.0	3.0	8.0
	J	4.0	4.0	8.0
	K			
	L	4.0	3.0	7.0
	M			
Average		4.0	3.1	7.1
6				
	A	3.0	3.0	6.0
	B	2.0	3.0	5.0
	C	4.0	3.0	7.0
	D	2.0	2.0	4.0
	E	3.0	2.0	5.0
	F	3.0	2.0	5.0
	G	3.0	3.0	6.0
	H	3.0	3.0	6.0
	I	2.0	2.0	4.0
	J	3.0	4.0	7.0
	K	4.0	3.0	5.5
	L			
	M			
Average		2.9	2.7	5.5
7				
	A	4.0	4.0	8.0

	B	3.0	3.0	6.0	CHEM
	C	5.0	3.0	8.0	PRESENTATION
	D	4.0	4.0	8.0	
	E	4.0	3.0	7.0	
	F	4.0	3.0	7.0	
	G	3.0	3.0	6.0	
	H	5.0	3.0	8.0	
	I	5.0	4.0	9.0	
	J	4.0	4.0	8.0	
	K	4.0	2.0		
	L	4.0	3.0	7.0	
	M	4.0	4.0	8.0	
Average		4.1	3.3	7.5	

8

A	4.0	3.0	7.0	
B	4.0	3.0	7.0	
C	6.0	3.0	9.0	
D	4.0	3.0	7.0	
E	4.0	2.0	6.0	
F	4.0	4.0	8.0	
G	3.0	2.0	5.0	
H	5.0	3.0	8.0	
I	3.0	2.0	5.0	
J	4.0	4.0	8.0	
K	5.0	3.0	8.0	
L	3.0	3.0	6.0	
M	5.0	2.0	7.0	
Average	4.2	2.8	7.0	

9

A	3.0	3.0	6.0	
B	2.0	3.0	5.0	CHEM
C				PRESENTATION
D	3.0	3.0	6.0	
E	3.0	1.0	4.0	
F	3.0	3.0	6.0	
G	3.0	2.0	5.0	
H	3.0	3.0	6.0	
I	3.0	3.0	6.0	
J	3.0	4.0	7.0	
K	4.0	3.0	7.0	
L	3.0	3.0	6.0	
M	2.0	4.0	6.0	
Average	2.9	2.9	5.8	

10

A	4.0	5.0	9.0
B	5.0	3.0	8.0
C			
D	5.0	4.0	9.0
E	5.0	4.0	9.0
F	4.0	3.0	7.0
G	4.0	3.0	7.0
H	6.0	4.0	10.0
I	5.0	2.0	7.0
J	5.0	4.0	9.0
K	5.0	3.0	8.0
L	4.0	3.0	7.0
M	5.0	4.0	9.0
Average	4.8	3.5	8.3

FACULTY: 13 faculty members in the department of biology & chemistry evaluated the student research presentations. Faculty are listed A-M in the table above.

Total # of presentations	10
Biology Presentations	8
Chemistry Presentations	2

BIOLOGY SCORES
Overall Average Score: 7.1
6 out of 8 presentations did meet our benchmark (75%)

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.
STANDARD MET

Outcome 3
RESULT: The survey was administered to graduating biology seniors. Seven out of a total of 11 (64%) graduating seniors completed the survey.

FALL 2006

CATEGORY	Number of Students
Employment resulting from the completion of the degree	0
Graduate school placement	1
Professional school placement	2
Seeking employment in major	1
Not seeking employment or higher education	1
Will apply to graduate school	2

Undecided. 0

NOTE:
3 female students & 4 male students completed the survey
2 students were involved in summer internships.
5 students are looking for employment in their major.

Summary:
The exit survey was administered to graduating biology seniors for the first time in fall 2006. According to the survey, 3out of the 7 graduating seniors (42.8%) who completed the survey, were accepted into graduate or professional school. There were no students, in this batch of seniors, who did not have or make plans beyond graduation.
The results of this survey are inconclusive given the small number of students graduating. This survey will be administered at the end of each semester to obtain more meaningful data.
Four out of seven students surveyed (58%), utilized their education to acquire a job or acceptance into professional or graduate school.

Who (specify names) conducted analysis of data?

Outcome 1
Dr. Neal McReynolds, Dr. David Beck, Dr. Mario Garcia Rios and Dr. Tom Vaughan were responsible for data collection and compilation. A statistical analysis of the data can be performed when there are multiple data sets for analysis. The sample size at this point is too small for a meaningful statistical analysis.

Outcome 2
The department of Biology & Chemistry faculty (10 in the spring and 13 in the fall) evaluated the presentations. Dr. Mott collected and tabulated the data. A statistical analysis of the data can be performed when there are multiple data sets for analysis. The sample size at this point is not large enough for a meaningful statistical analysis. Multiple years of data would provide more conclusive evidence.

Outcome 3
The data was compiled by Dr. Sushma Krishnamurthy. A statistical analysis of the data can be performed when there are multiple data sets for analysis. The sample size at this point is too small for a meaningful statistical analysis. Our first data set (7 surveys) was obtained for this means of assessment in Fall 2006.

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.)

Spring 2006: The results of the student research assessment was shared with the faculty first by e-mail and them again at a department meeting on September 15, 2006. Hard copies of the results of the critical thinking questions were distributed and also discussed at the meeting.

Fall 2006: The results of the critical thinking questions, student research seminars and exit surveys (all three student learning outcomes) were discussed at length at our first department meeting held on Feb 2, 2007. Hard copies of the results were dirstributed to the department faculty.

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 overall score for the year was 66%, which falls short of our benchmark of 70%.

Outcome 2
☒ **Met** ☐ **Not Met**
Provide narrative: The overall score for the year 2006 is 7.15 (out of a total possible score of 10), This meets our benchmark of 70%. While we met our benchmark for the year 2006, we have not surpassed it handily. Assessing research presentations over a longer period of time would help statistically validate our data.

Outcome 3
☐ **Met** ☒ **Not Met**
Provide narrative: The raw data suggests that our goal was not met. The sample size is too small to arrive at satistically valid conclusion.

How have these data-based changes improved your program/unit?
The data base at this point is small and therefore inconclusive. However, to engage students in research, adequate resources are required to keep pace with changing technology and increasingly refined scientific methodology. Also, research opportunites must be available to our growing student population. This would mean acquiring additional instrumentation as well as replacing existing ones.

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: Enter text here

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

Enter text here

Identify proposed outcomes for the next assessment cycle:
Continuation of present outcome(s) – (Indicate reason for continuation): More data is required for a meaningful interpretation of the results. All the Student learning outcomes listed have been in existance for about 2 years. Small sample sizes are harder to analyze statistically.
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