

**MAJOR FIELD ASSESSMENT  
B. S. BIOLOGICAL SCIENCES  
Report on Results and Use  
January 2008**

## **Goal 1**

Students taking Biological Science courses will feel that they have had a quality educational experience.

### A. Expected Outcome

Students taking Biological Sciences courses will compare the experience favorably to other courses they have taken in the College of Arts and Sciences and in the University in general.

#### Assessment

a. On the Student Opinion of Teaching (SOT) survey given to each class each semester by the University, students will rate Biological Science classes favorably compared to student rating of classes overall for the college and the University. On the majority of the 24 criteria for teaching effectiveness judged by the SOT, the faculty of the Biology department will rate at least equal to the faculty of the college and university.

#### Results

SOTs have continued to improve since the last assessment (2005) and dramatically since the Major Field Assessment Report of 2003.

For the last two semesters SOT results were available (Spring and Fall of 2006), the Department of Biological Sciences faculty demonstrated excellence in teaching with **100%** of the 24 teaching criteria rated by the students at or above the average rating for the College of Science and Technology and **98%** for the University as a whole!

In the Spring 2006 Semester, the Departmental SOTs were at or above the College SOTs on 24 of 24 criteria or **100%**! Thus, we far exceeded our goal of 50%. The Department **exceeded** the college average on 18 of 24 or 75% of the criteria, which was outstanding considering the Department is the largest unit of the College and greatly influences the college average. Compared to the University, the Department was at or above the average on 23 of 24 items for a 96% result. The Department **exceeded** the University rating on 13 of the 24 items.

The Fall 2006 Semester results were even more impressive. The Departmental SOTs were at or above the College SOTs on 24 of the 24 criteria or **100%** which again far exceeded the goal of 50%. Departmental SOTs were **above** the College average on 23 out of 24 criteria (96%) and tied for the 24<sup>th</sup>! Compared to the University average, the faculty of the Department again exceeded or met the average on 24 of 24 criteria and **exceeded** the average on 20 of the items.

## Use

The goal of 50% was greatly exceeded with the **100%** result. It will be hard to improve on that! It shows that the students believe the Department has excellent teachers and courses. The Department has a large number of faculty teaching who are assessed by the students. We have 40 full time faculty and several part time faculty as well as several graduate students who teach freshman labs. Considering this large number of faculty, it is wonderful that so many exhibit excellence in teaching. Our goal is to continue to set such a high standard for the College and University to follow.

Does the increase in favorable SOT averages mean that instruction has improved in the Department over the past several years? Yes! However, the Department has always had some excellent faculty with high SOTs.

In looking at what caused the poor outcome in the Spring 2002 semester, it was discovered that of the 46 faculty members who had SOTs, 37 of them meet or exceeded the Departmental averages on a majority of the 24 criteria measured. Only 9 were below the average but these nine pulled down the whole department below the college because their scores were so low. Some of these were part time instructors, but most were tenured full-time faculty. A couple of these faculty have since retired. However, other faculty with low scores were new faculty. Their scores have improved with more experience in the classroom.

These results show an overall improvement in the student perception of teaching performance in the Department since the last report (2005) and a huge improvement since the 2003 report. SOTs have been used as one of the main criteria for evaluating teaching effectiveness, and faculty have apparently responded with more attention to the characteristics that lead students to feel that they are receiving good instruction.

Note that the high SOTs in the Department have not been due to easy courses. The average grades given in Biological Sciences has always been in line with the grades given in the University and average around 2.8 to 2.9.

## Assessment

b. On the SLU exit survey, at least 80% of the graduating seniors surveyed will be satisfied (3 or 4) or highly satisfied (5) with the "Effectiveness of the faculty as teachers" and the "Effectiveness of beginning courses in preparing you for advanced courses" and "Quality of instruction in advanced courses".

## Results

On the latest exit survey available of graduating seniors (2005-2006), of the 54 students who responded to the question of "Effectiveness of the faculty as teachers", **100%** were either very satisfied or satisfied and none were dissatisfied. This was an improvement of 12.3% over the exit survey (from 2002-2003) used in the last report where 87.7% were satisfied or very satisfied, and 12.3% were dissatisfied or very dissatisfied. In both surveys the overall level was still very high and exceeds our goal of 80%. Also the level of those "highly satisfied" increased to 37% in the last survey.

On the question of beginning course effectiveness, **88.8%** were positive about this in the latest survey, up from the 80% in 2002-2003 (just meeting our goal) with 22.2% highly satisfied.

On the quality of instruction in advanced courses, **100%** were satisfied or highly satisfied, again up from the 92.3% in 2002-2003 and the percentage of highly satisfied (50%) was significantly higher.

#### Use

The increase in these scores to 100%, 88.8%, and 100 percent corresponds well with the increase in SOTs over this time period. All three greatly exceed the goal of 80% that was set to be met by the Department and again indicate that the students overall are satisfied with the courses and teaching offered. The next goal will be to try to increase the percentage of respondents who are highly satisfied on these three questions. The question of beginning course effectiveness may be misleading since it does not specify beginning biology classes and some students may have been rating all their freshman classes on this question.

#### B. Expected Outcome

Graduating seniors will feel they were satisfied with the department and their major.

#### Assessment

On the SLU Exit Survey at least 70% of the graduates will indicate they were satisfied or very satisfied with the overall quality of the department and the overall quality of the degree program.

#### Results

On the 2005-2006 survey published, **100%** of the respondents were satisfied or very satisfied with the department. Also, **98.1%** were satisfied or very satisfied with the degree program. This far exceeded the 70% goal.

On the question about the quality of the department, 33.3% gave a 5, 48.1% a 4, 18.5% a 3, and none gave a 1 or 2. This is better than in previous surveys. In the previous survey (printed 2003) used, the percentages were: 5, 15.4%; 4, 40%; 3, 32.3%; 2, 4.6%; 1, 7.7%. Thus, a major change occurred, with the percentages that were at least satisfied (3-5) being 87.7% in the previous survey and 100% in the current survey.

On the question about the overall quality of your degree program the percentages in 2005-2006 were 5-22.2%; 4-55.6%; 3-20.4% and 2-1.9%. For 2002-2003 the results were: 5, 27.3%; 4, 27.3%; 3, 36.4%; 2, 9.1%; 1, 0%. Thus, the percentages of students at least satisfied was again higher, with 91% in 2003 and 98.1% in 2006.

#### Use

We are disappointed that the number of students who were highly satisfied

about the overall quality of the Department in the surveys was not higher (15.4% in 2003 and 33.3% in 2006, although it did double in the last survey which is a good sign.

The number of students who were highly satisfied with the overall quality of the degree program was slightly down in the latest survey (22.2% down from 27.3%). but the overall percentage of individuals at least satisfied was up (98.1% up from 91.1%).

There are other questions on the survey that can help us determine the areas of high and low satisfaction. On all questions relating to quality of instruction, faculty, and courses there was a high level of satisfaction.

In the past a lot of dissatisfaction was with the quality of the facilities such as labs and classrooms and equipment. We continue to try to address this problem, and much progress has been made since the Department has been able to move into the new 12.4 million dollar Biology Building in spring of 2004. This building has three floors of state of the art laboratories and the questions on the survey that relate to facilities has show a great improvement in satisfaction over those before we moved in.

In analyzing the other questions on the 2006 survey, a lot of the dissatisfaction now is over the availability of courses and the design of the curriculum. Many students have complained that they have a hard time fitting all the required upper level classes in their schedule because of conflicts. Many of these classes are offered only once a semester or year. We are attempting to address this by changes in the curriculum to give the students more flexibility in the upper biology classes. These changes are currently in the Curriculum committee. However, we will always have some scheduling problems, because we deal with over 6000 students in some 240 course sections each semester. With that many students, it is almost impossible to avoid some scheduling conflicts. Also, we are limited somewhat in our course offerings by lack of enough faculty and labs to teach additional sections.

Some other areas that need improvement, based on the questions in the survey, involve quality of advisement and career counseling, interactions with the office staff, and access to biology clubs and professional activities.

### C. Expected Outcome

Students who wish to continue their education will be adequately prepared to pursue a graduate degree in a biological or professional field or to obtain a job after college.

#### Assessment

At least 10% of recent graduates will indicate they are enrolled in a graduate or professional program on the Southeastern Alumni Survey. At least 80% of the graduating seniors will be positive about the outlook for a job or further study in the field.

#### Results

The last alumni survey available was from 2004. It showed that **46.2%** of our graduates responding to the survey were enrolled in a professional or graduate program and 84.6% of the others planned on further education. This was greatly increased from the 2002-2003 survey which indicated that only 4.6% of the students were accepted into graduate/professional schools, and 72.3% eventually planned on doing postgraduate work.

On the question about "The outlook for a job or further study in your field", in 2006 **100%** were either satisfied or very satisfied with the prospects. In 2002-2003, the numbers were 84.4% with 15.0% somewhat dissatisfied respectively. So the outlook for our graduates has improved or at least their perception of it.

### Use

The ten-fold increase in graduates reporting that they are enrolled in graduate school or professional schools is astounding. However, since the alumni surveys have low return rates, the actual numbers are hard to determine. Anyway, we were very pleased to see such a high percentage and may reflect the work of the the Medical Evaluation Committee which has put out a major effort to increase the number of students who are admitted to medical or dental school. Also the faculty have been working to increase the awareness of our students to the various graduate programs available.

## **Goal 2**

Biological Sciences students should have a good understanding of the areas of Biology, especially those in their concentration.

### Expected Outcome

Senior biology students will have knowledge of the different areas of biology.

### Assessment

Biology Seminar (GBio 441) is a capstone course required for graduation with a degree in Biology. In the seminar, the students will be given a standardized multiple choice test with the questions about the main areas of biology including cell biology, cell physiology, biochemistry, genetics, animal diversity, evolution, microbiology, botany, ecology, and anatomy and physiology. At least 50% of the students will achieve a passing grade on the test.

### Results

The test given to the students in seminar is a very hard test. It was designed to be given to graduate students as part of their written exams that they have to pass to graduate from the graduate program. Passing for graduate students was 70% and some of them have to retake the test a second time.

If 60% is set as the passing score for undergraduates, then in a past semester 15 out of 34 or 44% received a score of 60 or higher. In one section of 25 students, 53 was the average score, whereas in the other section, all 15 students scored higher than 50. In the past, we have used 50% as the passing score, but the feeling of the Department Head is that this is too low. However,

if 50% was still used, the majority of the students would have passed the test this year.

#### Use

While we are unhappy that more of our students did not score higher on the test, as mentioned above it is a very hard test and covers the entire field of biology. Also, the student does not have to pass the test in order to pass seminar although it could reduce their grade in the class. We do not expect our undergraduates to do as well overall as our graduate students on the test. The graduate students are highly selected by GPA and GRE scores and many come from major universities though out the United States. Even these top students often have a hard time passing the test and they study very diligently for it.

We will be analyzing the results more closely to see which areas of biology seem to be the weakest. We have made major changes in the curriculum in the last several years that may start affecting the scores in the future. For instance, there is more emphasis on molecular and cell biology throughout the curriculum.

### **Goal 3**

Biology majors will have the skills needed to present Biological research.

#### Expected Outcome

Senior students will have good written, oral, and electronic communicative skills. These include being able to conduct a literature search (including on the internet), read and interpret scientific literature including charts, graphs, and tables, and present a scientific correct report of their findings.

#### Assessment

Senior students will present a well organized scientific seminar as part of Biology Seminar (GBio 441). It will include a Powerpoint© or other computer slide presentation.

#### Results

All senior students are now required to present a Powerpoint© slide presentation as a major part of their grade in Biology seminar. They are allowed to choose their own topic, and they must present the results of original research the subject that was published in scientific journals.

#### Use

Most of the students coming into seminar already have the computer skills need to create a good Powerpoint© presentation. If not, he instructor shows them the basics of Powerpoint© in the first semester. The other skills have been developed though out their academic career and most of them do an excellent job of creating and presenting the seminar.

### **Goal 4**

Students will feel that the department and university provided adequate resources including computer, library, technology in the classroom, and facilities and equipment.

### Expected Outcome

Graduates will have a positive view on the availability and quality of the above resources.

### Assessment

On the SLU Exit Survey, at least 80% of the graduating seniors will indicate their satisfaction with the resources they had including resources including computer, library, technology in the classroom, and facilities and equipment.

### Results

Satisfaction with resources was as follows (% at least satisfied):

|                          | 2003  | 2006         |
|--------------------------|-------|--------------|
| Computer resources       | 72.3% | <b>96.3%</b> |
| Library resources        | 78.4% | <b>96.3%</b> |
| Classroom technology     | 81.6% | <b>96.3%</b> |
| Facilities and equipment | 75.4% | <b>96.2%</b> |

### Use

Overall the students seem very pleased with the level and use of resources and the department more than met the goal of 80% satisfaction. Moreover, the percentages are much higher from the report based on the survey in 2003, when we only met our goal of 80% in that year in the category of “classroom technology.” The opening of the new Biology building with its state-of-the-art laboratories, including a new computer lab, had a positive effect on student perceptions of resources.

## **Goal 5**

To foster good faculty/student relationships.

### Expected Outcome

Graduating seniors will feel they have a close student/faculty relationship with faculty in their major field.

### Assessment

- a. On the SLU Exit Survey, 90% of the graduating seniors will indicate that they are satisfied with the faculty treatment of students both in and out of the classroom.
- b. 90% of students will indicate on the SLU Exit Survey that they are satisfied with opportunities to interact with faculty outside of class.

## Results

On the 2006 survey, **100%** of the students were at least satisfied with the treatment faculty give students. This question has changed slightly from previous surveys where it was about the “friendliness and helpfulness of faculty”. The 2002-2003 report indicated that 96.9% were at least satisfied, and that 3% were dissatisfied.

On the question about interacting with faculty outside class, **94.4%** were satisfied or very satisfied and 6.6% were dissatisfied in 2006. In the previous survey (2002-2003), the percentages were much lower, 70.8% satisfied and 29.2% dissatisfied so much improvement has been made in this area.

## Use

There was a significant increase in satisfaction from 2002-2003 in the satisfaction students have in the opportunities to have interactions with faculty “outside of class” and it is now above the 90% goal. In the Biology department, there are many opportunities for students to interact with faculty outside class. We have undergraduate research programs including various grants and seminars and other activities and we keep the students informed through mass email of these opportunities. There is another question in the survey closely related to this. The phrasing of the question actually reads: “Opportunity for meaningful interaction with faculty in research or other scholarly activity.” On that question there as a 98.1% satisfaction rate.

While the students recognize that they are provided these opportunities, most students however choose not to participate in these activities. For instance on the exit surveys, 70.8% in 2002-2003 and 83% in 2006 said they did not participate in undergraduate research. We need to find ways to get more students involved. Part of the problem is that we are largely a commuter school and many students work full or part time in addition to going to college and do not want to put in the time needed to participate in these activities. Also the faculty can only handle a few research students at a time. With approximately 900 majors this creates a limitation.

We also provide the students with other ways to have involvement. These include the Tri-Beta honor society, Delta Omega Alpha pre-professional society, and the Biology Club.

## **Goal 6**

To encourage a global perspective among Biology majors.

### Expected Outcome

Biology students will be aware of other cultures and languages and will have opportunities to travel abroad for study.

### Assessment

- a. All graduating biology majors will have taken four semesters of a

foreign language.

- b. Biology students will have been provided with opportunities for travel and study abroad.

### Results

All Biology majors are required to take four semester of a foreign language. We are one of the few departments on campus that still require a foreign language and one of very few that require four semesters. We feel that it is important for our students to have experience with a foreign language and the cultures it represents.

We have had several courses taught overseas in the last couple years. Last summer we offered an electron microscope course taught in Paris along with some French language and culture classes. Also last summer we offered two biology classes taught in Ecuador and the Galapagos Islands in conjunction with the Foreign Language department who offered Spanish classes. We have also offered a course in tropical ecology taught by our faculty in Costa Rica. Many of our students have also taken advantage of the summer programs offered by the foreign language department where they go out of the United States to countries like Mexico to study Spanish and other foreign languages and immerse themselves in the culture.

In the 2006 Exit Survey, there was a question about the “global perspective of courses.” 87% of the students expressed at least satisfaction with the topic, and only 13% were dissatisfied.

### Use

We will continue to require all our majors to have a global perspective by continuing to require fluency in a foreign language. The department will continue to offer courses taught overseas as often as possible and work with the office of International Studies to provide as many opportunities as possible. In many of our courses taught on campus, current events happening world wide are covered.