Indiana University South Bend Assessment

2008 Third Year Review for Department of Biological Sciences

Program name: Department of Biological Sciences
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1. Attached Files

2004, 2005, 2006 Annual reports are attached (see Document: 2004-06 Annual Reports.pdf)

The departmental assessment plan was revised in 2006 (see Document: 2006RevisedBioAssessmentPlan.pdf). Copies of the Faculty course survey, Senior Survey, and Alumni Survey are included in this file.

2. Describe any changes to the program's education goals since the last Third Year Review, and the rationale for those changes.

We revised the Biology program's educational goals in 2006 in response to changes in the General Education Curriculum and to more clearly articulate the skills we expect Biology majors to master. The original eight goals were simplified to four categories (Discipline specific knowledge and skills, Basic academic skills, Higher order thinking skills, and Academic values).

3. Describe any assessment techniques used for measuring the Educational Goals that have been added or discontinued since the last Third Year Review, and the rationale for those changes. Attach any assessment instruments that have been used during the past three years, and the data collected, (or, summarized data, if that is more appropriate.)

We continued using the Capstone course and undergraduate research as assessment techniques. We added three assessment techniques (**Faculty Course Survey, Senior survey, and Alumni survey**) since the last third year review. Copies of these surveys are included in the 2006 Revised Assessment Plan.

The faculty course survey was developed in 2005 to help the department coordinate curriculum on courses covering specific laboratory techniques and skills such as writing, analysis of primary literature, data analysis, and presentation of data. We have hired 4 new faculty in the past 6 years, and several new upper level courses have been developed. The course survey helped us identify skills that were being covered well and skills or assignments that needed more emphasis in courses. We will repeat the faculty course survey, as needed in response to major curriculum changes. Course rotations are discussed each year in faculty meetings to reduce conflicts with courses in Biology, Chemistry, and Physics, and in response to changes in student enrollment.

The Senior survey and Alumni Survey were developed in 2006 to obtain more feedback from Biology majors on their experiences in the Biology program. Although we regularly receive informal feedback from students, these surveys allow us to gather feedback from all graduating seniors. The alumni survey allows us to track the types of jobs that our graduates have and get their perspective on ways to improve the Biology program. We did the senior survey and alumni survey for the first time in spring 2007. The senior survey will be completed each year, and the alumni survey will be done every 3-5 years so that each alumnus is surveyed twice (relatively soon after graduation, and later after graduation).

4. What analysis has been done with this data? What conclusions has your department drawn? What changes have been made to the program as a result? (Curriculum, classes offered, classes discontinued, scheduling, advising, faculty education etc...)

Based on faculty discussions and the course survey we have increased the number of upper level labs that requires students to discuss/analyze and/or present data in formal presentations (e.g. L308 Organismal Physiology, L311 Genetics, L317 Developmental Biology, L318 Evolution, L473 Ecology lecture, and L474 Ecology lab). To improve data analysis skills, Biostatistics (L220) was added as a new course in Fall 2007. Previously, Biology majors could take statistics courses offered in other departments (Math, Psychology, Sociology), but are now encouraged to take the Biostatistics course instead.

A summary of the 2007 senior survey and 2007 alumni survey is attached (Document: 2007 student survey summary.pdf). The department's summary of the survey results is discussed in the 2006-07 Annual assessment report. A brief summary is provided here.

The majority of Seniors (82%) felt they had mastered Discipline specific knowledge and skills "quite well." Several students commented that lab courses, senior seminar (L403 the capstone course), and undergraduate research were very helpful in developing Academic skills and Higher order thinking skills. Academic values (ethics, collaboration skills, and citizenship) received the greatest number of "below average" responses. All of these students began their program before the new General Education requirements were implemented in 2005. There is a greater emphasis on citizenship skills and courses that emphasize connections among disciplines so these scores may improve as more students complete the new General Education program. Aspects of the Biology program that students ranked highest were accessibility of faculty, small class size, the recent addition of new upper-level majors courses, and opportunity to do research.

Both Seniors and Alumni commented that they would like to have more upper-level majors courses, and offer more upper-level electives every year (rather than every other year) because it was difficult to fit some electives into their schedules. Due to budget constraints and small enrollment in upper-level courses, we cannot offer more upper-level courses each year, but we have been able to increase the diversity of upper-level courses in the past three years. Recent additions to our upper-level electives include: L280 Bioinformatics, Z301 Zoology, Z373/Z383 Entomology, M430 Virology, Z460 Animal Behavior, A464 Human Tissue Biology.

Results from the Alumni survey indicated that alumni felt well prepared for graduate school, medical school, and lab/field research jobs. The main recommendations from alumni were to encourage more students to do internships or research and provide better career mentoring on a broader range of life science career options. In Fall 2007, in collaboration with the Biology-Chemistry Student club, several faculty presented short seminars on their research. These seminars were open to all Biology and Chemistry majors and were intended to raise awareness of research opportunities. In addition, there were several seminars in Fall 2007 and Spring 2008 (also hosted by the Biology-Chemistry Club) that discussed local and national resources learning about undergraduate research opportunities. We are also working on developing more internship opportunities for students. In spring 2008, an optional assignment was added to the Capstone Seminar (L403) in which students could get submit a resume and cover letter for their "dream" job, and get feedback on how to strengthen their application. Students have been encouraged to do this in the past, but formally including this in the syllabus has increased the number of students doing this. Information about the Career Services center was also included in L403.

In addition, alumni commented that the skills they found most important in their jobs included having strong communication skills, learning to troubleshoot and learn new techniques, and the ability to work independently and in collaboration with others. Some alumni suggested including more inquiry-based labs to help students develop trouble-shooting skills. This has encouraged faculty to include more independent research projects in upper-level courses. Course evaluations tend to be harsh on these types of assignments, but the results of the alumni survey suggest that doing more of these types of assignments

may be helpful. The department has also been discussing whether to include a summary of comments by alumni in course syllabi as a way to help undergraduates see how assignments will help them develop skills in communication, trouble-shooting, learning independently, or collaboration.

5. How did assessment data and analysis support these changes?

Assessment data and analysis has helped the Biology faculty identify ways to improve the curriculum, and begin to address ways of advertising and expanding opportunities for student research and internships. The Senior survey and Alumni survey helped us identify the things that we are doing well and areas where we need to better articulate the importance of assignments such as critiques of primary literature.

7. What changes does the department plan to make in the coming years to the program and to assessment techniques, and why?

Our assessment plan has changed quite a bit in the past 6 years due to changes in General Education, personnel changes in the department, and changes in University Assessment procedures. We plan to keep the current assessment techniques for at least a couple of years so that we can build a longer term data set that will allow us to track the effectiveness of our curriculum and mentoring of students.

8. How were faculty, students, administration, alumni and other groups involved in assessment?

Faculty discussed the results of assessment in department meetings, and helped develop the faculty course survey, senior and alumni survey. Informal discussions are also an important way that we coordinate course material and discuss ways to improve courses. Student performance is assessed in each course by the faculty member teaching that course. Overall mastery of the programs' educations goals was measured in the Capstone course (L403) and Undergraduate research. The senior and alumni surveys also gives all graduating seniors and recent graduates a chance to provide feedback about the Biology program.

9. How were assessment data and results shared with faculty, students, administration and alumni?

Assessment data were shared with faculty in meetings. We are discussing the most appropriate ways to share results of the senior survey and alumni survey with our current undergraduates. Providing a brief summary of results either on the Department website or on syllabi may be an effective way to help undergraduates see the relevance of assignments. In the 2007 Alumni survey, Alumni were invited to participate in an advisory board to provide feedback on changes that the department makes to the program. We envision this as a way to help us keep in touch with alumni and keep them informed of changes in the program.

All annual assessment reports are kept in the Biology Department office, electronic copies are sent to the Dean of College of Liberal Arts and Sciences, and electronic copies are available from the Assessment Committee Webpage (http://www.iusb.edu/~sbassess/Annual%20Reports/annhome.shtml).

10. In one paragraph, please summarize the most important impacts of the assessment of student learning on the program.

The most important impacts of assessment of student mastery of education goals have been in the following areas.

- First, there have been significant curriculum changes. The number of our majors has increased and with the recent hires of new faculty we have been able to add six more upper-level Biology courses. To improve training in data analysis, a Biostatistics course geared towards Biology majors has been developed.

- Second, the faculty recognize there is a need to provide more research and internship opportunities for students. However, each faculty member is limited in the number of research students they can mentor due to limited lab space, time, and budget constraints. Currently, independent research and mentoring internships is not included as part of a faculty member's teaching responsibilities. Funds required to cover the cost of doing the research project are currently covered by faculty grants or SMART grants. There appears to be no mechanism for using funds generated from L490 (independent research) to cover some of the cost of research supplies. The department has been discussing several options that would allow us to provide more research and internship opportunities for students, and address some of the time, space, and budget constraints.

- Third, the department is working on helping students network with other students (e.g. join the Biology-Chemistry club), and increase the visibility of information on undergraduate research, internships, and career resources (for example through advising, departmental seminars and adding more information about career services in L403).