Assessment - Third Year Review 2007 – 2009
Department of Mathematical Sciences

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Changes to the program’s educational goals since the last third year review, with rationale.

The overall educational goals of the mathematical sciences program remain constant.

Assessment techniques for measuring the educational goals that have been added or discontinued since the last third year review, with rationale.

We broadened the population for our student survey to include those who take our courses at the 200 level or above but are not mathematics majors. These include secondary education students (who take 40+ hours of our courses, equivalent to a BA in Mathematics), computer science majors, life science majors, chemistry majors, and a small number of other students including Purdue Technology students. Since these students form a significant part of our enrollment, we recognize the importance of serving these students well, while maintaining our commitment to our majors. Surveying these students gives us the opportunity to identify initiatives that would enhance our program for all students. This survey was carried out for the first time this school year (2008 – 2009) and the quantitative results appear in the attachments.

We have initiated a departmental teaching retreat. In the retreat evaluation, over 80% of the respondents agreed that the retreat should be annual, in some form. We believe that an annual retreat will increase the effectiveness of faculty inventory as an assessment technique. With broad participation across the department, informal sharing of information on formative assessment, classroom norms, and general pedagogy has the potential to strengthen teaching in our department at all levels. Current good practices of all faculty are highlighted and ways to adapt these practices to other courses are discussed. Minutes were taken at the meeting, identifying which individual shared the technique discussed, and shared with all part-time and full-time faculty members.

Analysis of survey data, with resulting conclusions

The survey form and the numerical data are attached. The student comments are kept internally for discussion. Overall, we see broad satisfaction with the program as it pertains to our teaching, interaction with students, and course content. Across the constituencies, the results are:

The courses I have taken in mathematics at IUSB enable me to

- read and understand mathematical writing: 86% strongly agree or agree.
- communicate mathematical ideas, both in written and oral form: 82% strongly agree or agree
- model problems in mathematical form, solve the problems, and translate the solution back to the context of the original problem: 79.6% strongly agree or agree
- use appropriate technology to explore and solve mathematical problems: 64.5% strongly agree or agree.
Complaints are largely about logistical issues over which we have limited control (having more than one choice of time or instructor, offering the upper level courses more often.)

The alumni survey appears in Attachment 5. Unfortunately, there were too few responses (7) to warrant analysis or conclusions.

**Changes made to the program as a result of data from assessment**

We continue to work on improving the scheduling of upper level courses. During the past two years we have discussed scheduling issues with the consortium members Bethel and Saint Mary’s and some students have taken advantage of the improved scheduling. A long term solution for us is to be able to increase the frequency of upper level offerings on this campus. Improved enrollments suggest that this may be possible in the near future; we are considering the viability of offering two fundamental courses (403 and 413) every year instead of in alternate years. This will especially help those with bachelors degrees who are returning to school, seeking teacher certification in mathematics. These individuals typically lack one or two upper level mathematics courses. Having more frequent offerings of these courses will allow them to finish more quickly and help fill the current strong demand for highly qualified high school and middle school mathematics teachers in our area.

**Changes to made to program and to assessment techniques for future, with rationale**

We decided to restructure our assessment data collection as it pertains to student work. We will now use topic portfolios rather than student portfolios. There will be a file for each aspect of the program including Algebra(403/404/405), Analysis(413/414/415), Applied Mathematics (447/448, 451, 471/472), and Probability/Statistics (463/466, 467/468). There are two reasons for this change. This will allow us to remove student ID information from the items included and protect student confidentiality during review of the data. It will also facilitate a more focused review of the data by area.

We see a need for more regular sharing of information regarding student advising. Faculty involved with student advising often become aware of aspects of departmental programs that are problematic for students and a shared awareness may help lead to programmatic improvements. For example, secondary mathematics education students have the most difficulty with scheduling because they have few electives. Once we identified this problem, we acted by planning to increase offerings of 403 and 413, by giving three different ways to meet the Probability and Statistics requirements (365 or 260/261 or 463/466), and by structuring two different ways of meeting a requirement that strengths across mathematical areas (either 447 (Modeling) or 380 (History).) The resulting program is more flexible but no less strong than in the past.

We need a better way to reach alumni electronically. To get a better response to the alumni survey, as well as to maintain a network of mathematical professionals associated with IUSB, it would be helpful to have an accurate database of email addresses. If we could send an email with a link to the online survey, we would likely have received many more responses. This
time, the link to the alumni survey was sent in an ordinary letter and required the recipient to type in the URL, which may have contributed to the low response rate.

The role of faculty, students, administration and alumni in assessment

The Department of Mathematical Sciences meets annually, usually in its last meeting of the spring semester, to analyze the assessment information collected. Changes to the department's degree programs, including curriculum and scheduling of courses, are considered in light of the accumulated assessment data. Further, the assessment plan itself is discussed and, if necessary, revised at this meeting.

The sharing of results with faculty, students, administration and alumni

In addition to submitting this report to the Campus Assessment Committee and the Dean of the College of Liberal Arts and Sciences, copies of the assessment plan, survey data, and reports have been placed on the departmental web page in a downloadable electronic format.

Summary of impact of the assessment of student learning on the program

While assessment of student learning is done very thoroughly at the classroom level in the Department of Mathematical Sciences through written work that includes graded homework, projects, and exams, it has been useful to step back and discuss the larger picture of student learning, from a programmatic view. This reflection and analysis has lead to improvements in our program in the areas of scheduling, strengthening of the prerequisites for all courses, and the addition of courses for the actuarial program necessary for VEE (Validation by Educational Experience) certification of the program.

Attachments

1. Annual report for 2008
2. Annual report for 2007
3. Departmental Assessment Plan
4. Student survey 2009
5. Alumni survey 2009