As you now know an interim report on the assessment of student learning is due to WASC in fall of 2010. We have been asked to demonstrate that we are using assessment data to improve student learning (i.e., “closing the assessment loop”) and that the assessment process is sustainable. To that end, we are asking programs to report on their most complete student learning outcome (SLO) during this reporting cycle. Please identify your selected SLO in the box below and provide the requested information.

Program Information

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<tr>
<th>Degree Program(s):</th>
<th>MS</th>
<th>Department:</th>
<th>Chem</th>
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<tbody>
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<td>Department Chair:</td>
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Student Learning Outcome (SLO)

**SLO #5. an enhanced ability to communicate effectively, both orally and in writing, for the purposes of conveying chemical information to both professional scientists and the public.**

Evidence for Need:

What evidence was used to identify this SLO as a candidate for improvement (e.g., describe the prior assessment activities, data, and discussions that led to this decision)?

Chemistry Graduate committee has examined SLO 5 four times (S06, S07, F07, S09) during the current program planning cycle. The committee is unanimous in our conclusion that there is systematic weakness in this SLO area. Quantitative assessment of the student written work has been undertaken as follows.

In our original approach (applied to S06) we selected samples of six term papers, and committee faculty score each one on five criteria. This did not work well because the detailed analysis generated noise and consumed copious amounts of faculty time and yielded significance only in the average scores. Consequently, for program assessment only, we have adopted a mixed approach wherein we interviewed the professor teaching the course and together reviewed the term papers to gather information of a both a qualitative and a quantitative nature. Subjective but often specific information is gathered regarding the student outcomes in this SLO area. For statistical purposes, we simply assess the papers as either excellent, acceptable or unacceptable and generate the class percentages in each category. A summary of these results is made in Figure 1 below.
Figure 1. Coarse assessment approach applied to writing samples collected in current program planning cycle. Note that Re-assessment was done on archived data from S06-F07 in order to establish a baseline of results.

Baseline data, reassessed under this new system, collected between S06 and S09, support the idea that continued improvement is needed in this area, and that pedagogical approaches such as those undertaken in F07 were successful in increasing the fraction of ‘excellent’ results.

The flip-flop in the last three semesters is troubling. The best result was obtained in F’07 when a majority of papers scored ‘excellent’ whereas in the other semesters most were scored ‘acceptable’. Our response to this is below.

**Changes to Curriculum or Pedagogy:**

What actions were taken to improve student learning related to this outcome (e.g., program changes, changes in pedagogy, process changes, resources requests, etc)?

From the perspective of assessment methods, it is fair to say that Chemistry has closed the assessment loop since we have undertaken SLO5 assessment, analyzed the results, and changed our method accordingly.

Similarly, we are close to closing the assessment feedback loop in the curriculum. In our response to SLO5 deficiencies we have taken several programmatic measures. These measures included a. implementing new rubrics for assessing student writing (broadly, but not universally adopted yet), b. publicizing these rubrics to the students c. raising our admission standards (see S09 report), b. implementing a rigorous rubric for assessing student success at the preliminary oral exam level (universally adopted since passing the prelim depends on a unanimous yes vote on the rubric), c. modifying the graduate student handbook to accommodate the new prelim-rubric, d. educating the faculty about the new process, and e. publicizing the procedural changes and new expectations to the appropriate graduate students. Our hope in this is to improve
student outcomes and also to prevent the advancement to candidacy (or the doing of extensive experimental work) by students who do not have the skills necessary to succeed in the complete MS program.

The spike in pedagogical improvements in F2007 is probably due to an approach taken to the term paper writing process. In this semester, papers were peer- and instructor reviewed prior to final submission and students were made aware that their papers would be compiled and published into a class-wide document. This seems to have increased the number of excellent results in this SLO. The early decrease in ‘unacceptable’ results may be a reflection of the promotion of our assessment rubrics to students. This is reasonable because it clearly codified our standards and gave weaker students a clearer bar to try to exceed. Grad teaching faculty will be urged to adopt this successful approach used in F’07.

**Evidence for Impact:**

What is the evidence that the actions taken above impacted student learning for this outcome?

Data reviewed above are exciting in terms of identifying areas where improvement may be made, but not yet satisfying in a quantitative sense. We expect to see a clearer baseline in order to see clear trends by F10. We will be collecting data and implementing changes that may reflect the outcomes from these changes.