Case Studies in Student Learning Assessment: 
Getting Started and Making Progress

The first student learning assessments have just been reported, some through this year’s Program Review self-studies, some in preparation for next year’s self-studies. We are pleased to share summaries of a selection of these assessments with you and hope that you can profit from the pioneering work of these faculties. We thank the assessment coordinators and the faculties of the departments of Chemistry, Spanish, and the Schools of Nursing and Continuing and Professional Studies for agreeing to share their assessment stories.

Note: for most of these case studies, we have not included detailed results of assessments, that is, how well students’ learning met expectations. Our intent is to focus on the process and lessons of implementation in the hopes that others’ experience will inform your own assessments.

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Improving the Process One Assessment at a Time
Chemistry- Undergraduate Program

**Summary**: Beginning in Spring 2006, the Chemistry faculty initiated assessments that included both direct and indirect approaches. Starting with exit interviews of graduating students, the Chemistry faculty then implemented rubric-based direct assessments of student learning. Over three semesters, the faculty improved and expanded the process. As a result, the faculty has a well-tested rubric and procedure that are expected to yield good information about strengths and weaknesses of the program. The three assessments have already led faculty to one tentative conclusion with curricular implications: undergraduate exams may not allow sufficient scope for critical imaginative or creative thought.

**Student Learning Outcome Assessed**: “Students demonstrate understanding of fundamental concepts of chemistry by definition, explanation, and use of these ideas in examinations and laboratory exercises.”

**Methods**: Exit interviews were conducted with fourth-year students; results were analyzed to highlight the best and the worst aspects of the program from the students’ point of view.

Faculty directly assessed student learning as reflected in answers to final exam questions. Using a rubric, the instructors and independent reviewers rated students’ answers to the test questions, which had been selected by the instructor. In the first assessment, a discrepancy in ratings related to the definition of “exceeds expectations”: what does an answer need to include in order to “exceed expectations”? Does it need to just be correct or to also reflect particularly creative or imaginative thinking? Does the test question call for creative or imaginative thinking? The assessment coordinators responded by clarifying the rating scale. Faculty ratings in subsequent semesters showed a steady improvement in agreement.

The faculty first assessed student learning in the subspecialties of physical and organic chemistry, and then included inorganic chemistry and biochemistry in subsequent semesters. Over the course of the three semesters, the faculty also increased the number of reviewers who completed rubrics from two (instructor and one independent reviewer) to three (added another independent reviewer).

**Conclusions**: These initial assessments led primarily to refinement of the tools (rubrics and supporting instructions and explanations) and identification and resolution of discrepancies in reviewers’ criteria for judgment. While these early assessments did yield recognition that the exams do not elicit creative or imaginative thought on the part of students, in the future the assessments are expected to lead to identification of persistent strengths and weaknesses in student comprehension, and subsequent curricular improvement. The exit interviews conducted with fourth year students confirmed already-acknowledged weaknesses in the program and affirmed existing priorities in faculty recruitment.

**This Assessment in Perspective**: Creating an assessment process that yields valid and reliable information can require time, multiple attempts, and determination. This department employed both indirect and direct assessment techniques to capture different kinds of information about the program. The exit interviews with students provided confirmation of programmatic weakness and of resulting faculty hiring priorities. The direct assessments of student learning, refined over three semesters, yielded valuable information about expectations of students and the purpose of exams. This is an excellent example of how a faculty’s ongoing willingness to collaborate, to discuss differences in expectations of students, and to seek students’ opinions can provide a solid foundation for assessment. This assessment is also a good example of “starting small” and “working the bugs out” before expanding to take on additional faculty, courses, and subspecialties.
Assessing Student Performance in Candidacy Exams in the Sciences
Chemistry- Graduate Program

Summary: Assessments focused on graduate candidacy exams, which are held during the spring semester. Conducted in 2007 and 2008 in four subspecialties, the assessments of the candidacy exams employed a common rubric completed by members of the Research Faculty Committee. Over the course of the two years, the rubric and data analysis process were refined to improve usefulness of results. While the assessments confirmed generally high quality of presentations and no serious weaknesses in student learning, some measures showed relatively low scores that will be monitored in subsequent assessments.

Student Learning Outcomes Assessed: Graduate students should 1) “conduct a research project within the context of a larger research effort”; and 2) “develop the ability to critically analyze their own results and the results of others, including published literature.”

Methods: Graduate student learning in four Ph.D. programs was assessed by focusing on the candidacy exam, a two-part written and oral exam that required students to present and defend their research proposal, and to demonstrate the ability to analyze research relevant to their field. A common rubric was used to assess exams in the four programs: spectroscopy and dynamics; chemical biology; molecular design; and bio-analytical chemistry. Multiple faculty members on the Research Advisory Committee rated each student’s exam, and the results were analyzed and shared at faculty meetings.

Conclusions: After the first student learning assessment, the faculty refined and clarified the rubric and also revised the process for analyzing and presenting assessment results. While in the first assessment only aggregate results were available, analysis of the 2007 data provided graphical representations of results by rubric category and subspecialty. Results reflected generally high student achievement; however, for one area—students’ ability to apply their knowledge to new contexts—the scores were somewhat lower than for the other areas. It is expected that future assessments may highlight additional areas that need attention, such as writing and oral presentation skills.

This Assessment in Perspective: The assessment process built on and enhanced an existing review of students’ readiness to continue in the doctoral program. By focusing on a culminating experience, the assessments were able to capture the full range and depth of expected student learning. Although the skills and knowledge required of students seeking doctoral degrees in such diverse areas as spectroscopy/dynamics and chemical biology must differ significantly, this faculty was able to craft and successfully apply a common rubric to exams in four distinct subspecialties. With a revised approach to analysis and presentation of results, the faculty will be able to better identify program areas in need of improvement.
Using an Incremental Approach to Introduce Rubrics  
Spanish- Graduate Program

Summary: The Graduate Program has long relied on multiple faculty members’ qualitative reviews of students’ performance on the multi-part comprehensive exams. Introduction of a very basic rubric in 2007 was met with appreciation and success, mostly. Analysis of rubric results from Spring 2007 exams suggested that students met performance standards for all criteria except perhaps one: sophistication of analysis, suggesting that this area was one in which the program might improve. Because a quarter of rubric results could not be used due to a typing error, acceptance of the results and follow-through will wait until the next rounds of comprehensive exams. The major outcome of the first assessment was a more refined rubric that accommodates faculty members who are “on the fence” about passing or failing a student.

Student Learning Outcome Assessed: “Graduate students will be able to discuss intelligently significant texts in the Spanish and Latin American literary traditions, both orally and in writing.”

Methods: In 2007, ten faculty members used a common rubric to evaluate the written portion of comprehensive exams for Master’s and Ph.D. students. Each student had written responses to questions focused on different historical periods, and each of their written responses was reviewed separately by two faculty members.

The rubric contained four criteria by which to assess student work: 1) knowledge of texts, 2) sophistication of analysis, 3) coherence of written answers, and 4) relevance of the answer to the question posed. Student work was judged according to all four elements along a four-category range from “demonstrates incompetence” to “demonstrates competence”. The rubric provided a “final grade” for the reviewers to check and a space for qualitative comments.

The faculty encountered two problems in the application of the rubric. While by far most faculty complied with the structure (checking boxes), some chose to “seek middle ground” between the boxes or outright failed to note a final grade. In addition, due to a typing error, some faculty received and completed rubrics with six instead of four categories. As a result, 23 percent of the 146 rubrics were not usable; 112 rubrics were analyzed.

Conclusions: Over 90 percent of the exams were judged at least competent in the areas of “Knowledge of Texts,” “Coherence of Written Answers,” and “Relevance of the Answer to the Question Posed.” Somewhat fewer (85 percent) were judged at least competent in “Sophistication of Analysis,” suggesting that the program may want to focus more attention in this area. The basic rubric has been replaced with a more sophisticated rubric that not only guides the reviewer in making judgments by spelling out criteria for achievement, but also accommodates faculty members who find themselves undecided about pass/fail.

This Assessment in Perspective: This assessment demonstrates how rubrics and assessment can be introduced to faculty members: start simple and initially allow plenty of room for adjustment and discussion. Start with an established process that 1) uses work already being done by both students and faculty, 2) does not focus on just one course, and 3) naturally includes multiple faculty members. Overall, this approach invited faculty members to try a new rubric, to have input into rubric definition, and to share responsibility for determining how to assess student work and how to respond to assessment results. A significant outcome is the more sophisticated rubric that contains clear criteria for assessing student performance. It is worth noting that one assessment of a handful of students, such as this one, will yield only preliminary information; the addition of subsequent assessments will strengthen and clarify the findings.
Summary: One BSN program outcome states that the School should prepare students to pass the NCLEX licensure exam. In order to guide future student learning assessments, a study was conducted to discover if there are “bellwether” courses that predict failure on the licensure exam. School of Nursing faculty offered “hunches” about which courses are most difficult for students and thus might be predictors of failure on NCLEX. These hunches were tested by analyzing student performance as reflected in course grades and test scores. The analysis revealed that one course especially stood out as a strong predictor.

Program Outcome Assessed: “The SON baccalaureate program should prepare nurse graduates that are successful at attaining entry-level licensure as a professional registered nurse as demonstrated by the NCLEX-RN national pass rates.”

Methods: The study analyzed grade and test data from students who graduated in 2006 and 2007. Since NCLEX scores were unavailable, test scores from the HESI exam (a NCLEX preparedness test), which correlate highly with NCLEX, were used. A multiple regression analysis was conducted to determine which courses, if any, were strong predictors of HESI scores. Results were shared with the BSN Committee, and are under consideration.

Conclusions: While performance in all seven courses individually correlated with HESI scores, when all other variables were controlled for, one course stood out as the best predictor of HESI scores. This course had been among the faculty “hunches” of bellwether courses. This finding suggested that assessments of student learning in this course, followed by curricular or pedagogical improvements, could have significant benefits for BSN students as they seek licensure. The study also revealed considerable differences in grading practices. Some courses tested had little variation in grades (giving nearly all A’s and B’s) where a high percentage of students who earned B’s did not do well on the HESI.

This Assessment in Perspective: This study solicited and tested faculty “hunches” to identify courses where assessment of student learning might be most useful in highlighting needed changes to curriculum or pedagogy. By soliciting faculty input from the outset, this pre-assessment approach took advantage of existing knowledge and facilitated faculty buy-in to future assessments. The results regarding which course tends to be most difficult for students were clear-cut and provide a strong foundation for initiating assessments of student learning. Grading study also may initiate a discussion about grading practices. This is a case in which assessment of a program outcome (entry-level licensure) informs decisions about where to focus subsequent student learning assessments.
An Established Assessment Process
Continuing and Professional Studies- Bachelor of Interdisciplinary Studies

Summary: Assessments of student learning outcomes, ongoing in BIS for years, have focused primarily on core competencies—critical thinking, analysis, writing, research, giving and receiving critique, and oral presentation skills—and independence of work. Student learning in these areas is assessed using rubrics tailored to the level of expectation (targeted courses vs. Capstone Project). Rubrics have been revised and refined in response to results and to changes in curriculum and pedagogy. Student and alumni feedback, as well as Faculty Advisory Committee monitoring, contribute to the process.

Student Learning Outcomes Assessed:
“Coursework: By the conclusion of the targeted coursework, the student will be able to demonstrate basic competency in critical thinking and analysis, in clear and coherent writing, and in understanding the fundamentals of inquiry and evidence.
End of Program (Capstone): By completion of the program, the student 1) will be able to demonstrate a high level of competency in critical thinking and analysis, in clear and coherent writing, in use of evidence in constructing and sustaining an argument, and in presenting ideas orally; and 2) will demonstrate an ability to work independently and successfully design and conduct a research project.”

Methods: Two faculty members assessed student work completed in targeted courses using a specifically-designed rubric. Results were compiled, analyzed, compared to targets, and shared with the faculty and director. The “end of program” outcomes were measured through students’ capstone research projects, including written and oral presentations. Each student’s work was assessed by two faculty members employing a rubric. Results were compiled, analyzed, compared to targets, and shared with the faculty, the director, and the Faculty Advisory Committee.

Conclusions:
Coursework: Assessment of students’ coursework revealed that an unacceptably high percentage of students were not competent in writing and research methods. The chair and faculty worked together to articulate clearer purpose and objectives for the courses, including revising rubrics. Also, a more personalized approach was adopted: faculty members now write evaluative narratives for each new student and identify those students that needed more support. Students in need of writing skills are referred to the University’s Writing Center, as well as one developed specifically for the program. A pre-Capstone Project course was created to help prepare students for the research experience.

By the end of the program, almost all students demonstrated a minimum level of competency. Oral communication, however, was the one area identified as needing attention. As a result, specific standards of excellence for the Capstone Project were developed, and the rubric revised accordingly. A manual for mentors was developed, and a Capstone website was created for students. A practice “oral run-through” of students’ presentations was required. Student evaluations of the Capstone are used to further refine the experience. A survey of graduates regarding their academic experience and subsequent professional work is in preparation.

This Assessment in Perspective: These assessments are successful because they utilize well-crafted rubrics tailored to the task, are course-embedded, and are conducted by a faculty used to collaborative teaching. On an ongoing basis, the faculty develops, tests, refines, and employs rubrics in the assessments. Since most of the faculty teach the targeted courses and mentor Capstone Projects, discussion among the faculty regarding ongoing assessments, results, student progress, alternative approaches, and suggested changes to the curriculum, pedagogy, or student support is also ongoing and part of the normal discourse. In this way, the assessments are fully integrated into the management of the specific courses.