A GPS FOR ASSESSMENT: MAPPING THE WAY TO AN EFFECTIVE INSTITUTION

HIGHLIGHTS OF THE 2014 ASSESSMENT SYMPOSIUM

Friday, May 2, 2014
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INTRODUCTION

Each year the Academic Senate Assessment Committee of Nassau Community College conducts a seminar designed to provide information about the assessment process, especially as it is conducted at the College. In order to share the information presented at the seminar with the college community at large, speakers prepare synopses of their talks for publication in our annual *Highlights of the Year’s Assessment Symposium*.

This year’s main seminar topic was “Curriculum Mapping,” which is a program assessment tool. The day’s presentations were organized around Assistant Director of Curriculum and Assessment Michael A. Heel’s keynote address, which described the background and rationale for analyzing a program with this technique. Professor Heel demonstrated how to prepare a curriculum map step by step and showed how this can lead to centering and focusing the overall curriculum of a program so that it meets the program’s mission. In addition, Professor Heel showed how this process can guide assessments of the program and determine whether students are learning what is intended.

Professors Cohen and Imperato brought curriculum mapping home to NCC’s own assessment process. They spoke of their experience with this tool in the Physical Sciences Department, and how its use helped them align the courses that comprise the many programs in their Department. They also showed how preparing curriculum maps helped organize the programs’ curricular contents so they matched Taskstream categories. This facilitated entering information into the Tasksteam program.

Many in the audience who had been unfamiliar with curriculum mapping before the symposium came away eager to apply curriculum mapping procedures to their own Departments’ assessment activities.

Professors Goering and Moscatelli’s presentation dealt with assessment at the institutional level. They presented the results of a cross-institution GEN ED pilot study, conducted to better characterize the current nature of assessment of the four infused GEN ED competencies at NCC. Among other things, the study revealed that most departments used rubrics derived from a sample rubric provided by SUNY, so departments had some common ground on which to assess. The findings suggested that the assessment of infused competencies across the curriculum might be enhanced by the continued development of a campus-wide assessment plan that embraces and documents the variety of measures used by faculty to assess these competencies.

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CURRICULUM MAPPING AND ASSESSMENT: UTILIZING EFFECTIVE CURRICULUM DESIGN PRINCIPLES FOR IMPROVEMENT

Michael A. Heel
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Preface

Professor Heel conducted the morning session of the 2014 Assessment Symposium. He demonstrated how to create and interpret the results of a curriculum map. Perhaps more importantly, he showed how to use curriculum maps in combination with assessments of course learning outcomes in select courses to help faculty determine whether students in the program are learning what the faculty intends for them to learn. Professor Heel’s effective presentation, enhanced by interactive audience participation, showed how assessments of course learning outcomes can be employed not only to improve individual courses, but to improve program curricula overall. Following is a brief synopsis of the main ideas presented by Professor Heel. It was compiled from his PowerPoint presentation (posted at http://www.ncc.edu/aboutncc/ourpeople/administration/assessment/spotlight.shtml) and supplemented by notes taken during the Symposium.

Betty Borowsky, Editor

Presentation

Introduction

Where we are today. Assessment started out as a paradigm of research in education, but is now focused on accountability. Assessments are necessary to satisfy the requirements of accrediting bodies, such as the Middle States Commission on Higher Education; external stakeholders, such as trustees; grant applications, donors, and parents; and because the federal government wants institutions of higher learning to be more mindful of how students are educated.

Assessment is not everyone’s favorite task. But assessment processes, designed and executed carefully and purposefully, can not only satisfy stakeholders’ requirements and needs, but they can also assist department faculties to organize some of the assessment activities they are already conducting, provide a sensible framework for those endeavors. Professor Heel’s presentation shows how assessments, combined with curriculum mapping, can be used to tighten the alignment of the curricula among the courses in a program, with the ultimate objective of helping students learn what was intended.

How assessment relates to the curriculum. Fundamentally, assessment should be aimed at educating faculty in ways to improve their curriculum and teaching methods. Assessment should inform faculty about the patterns and trends, and strengths and weaknesses of student
learning. It should also inspire faculty to engage in discussions about teaching and learning that lead them to make curricular improvements to programs and courses.

But assessment as a process cannot be useful unless the curriculum has a sound foundational design. As one might expect, the best curriculum design is one that does NOT take a "cookie cutter" approach. Specific curriculum designs need to express the intrinsic qualities and characteristics of their respective disciplines. While some programs truly require rigidity in curriculum design, most can be designed with a curriculum that possesses an appropriately unique character, but one that also meets common institutional standards.

The necessary elements of program design for Associateâ€™s and Bachelorâ€™s degrees are:

- A program level Mission Statement.
- Program level goals and program learning outcomes (PLOs).
  - Note that Mission Statements and PLOs frame the broad structure, aspirations, and expectations of degree programs as well as general education.
- Course teaching objectives and course learning outcomes (CLOs).
  - CLOs provide the basis for the specific expectations of student learning and should support and link to PLOs in meaningful ways.
- An "aligned curriculum." 
  - The course contents of the program’s required curriculum should, taken together, lead to students learning what is intended.

The language of assessment is still not uniform, so it can be confusing. For example, differentiating "goals" from "objectives" and "outcomes" can be difficult and irritating; how does one distinguish the differences among "mission" versus "vision," "values," or "principles"? The institution should find a sensible, common internal language standard, and develop its own internally consistent approach.

Professor Heel used the following definitions for terms used in the presentation:

- **Program level goals**: Defined as the faculty’s aspirations (broadly expressed) for the program’s operation, linked in supporting the program mission statement.

- **Program level outcomes (PLOs)**: Statements summarizing specific summative learning targets that students are expected to meet cumulatively throughout their educational experience in the program.

- **Course Teaching Objectives**: Statements that frame the instructor’s aspirations of learning for the student, and that express the learning environment and/or the learning experience the student will have in a particular course.
Course Learning Outcomes (CLOs): Statements summarizing specific summative learning targets that students are expected to meet cumulatively upon the completion of a particular course.

Student Learning Outcomes: Statements summarizing specific summative learning targets that students are expected to meet—a generic, umbrella term that may apply to a single course, several courses, or a student’s entire institutional experience.

Course teaching objectives and learning outcomes should stem from, and be consistent with, program level goals and outcomes; and these, in turn, should stem from, and be consistent with, the program’s mission statement.

But course learning outcomes are where “the rubber meets the road.” CLOs as presented on syllabi should serve as the foundation for course organization. Common content should be agreed upon by participating faculty, and CLOs should convey to external and internal stakeholders an honest representation of the common learning that will occur in each course (and each section), regardless of who teaches it. In fact, Middle States calls this our “contract” with students, parents, and the community served.

In summary, mission statements and program level learning outcomes frame the broad structure, aspirations and expectations of degree programs, as well as general education. Course learning outcomes provide the basis for specifying specific expectations for student learning. So CLOs should support and link to the PLOs in meaningful ways.

Curriculum Mapping

Introduction. Curriculum mapping and alignment provide the gateway to meaningful assessment processes. Curriculum alignment as a process gives us the chance to:

- Connect what we do in the classroom with what’s going on in the real world
- Demonstrate that students are learning what we intend for them to learn
- Understand whether or not the courses we are teaching substantively support the curriculum we have designed
- Pause and consider whether the education we are providing supports the needs of our constituencies

The curriculum map creates a picture of a program that helps us discern patterns of coverage. It facilitates our ability to:

- Look for gaps: Are all PLOs all covered?
- Look for reinforced learning: Are PLOs covered sufficiently?
- Look for redundancy: Are some PLOs getting too much attention at the cost of other curriculum content?
- Look for course purposefulness: Are particular courses seemingly adding very little to the curriculum?
- Look for course content overload: Sometimes, less really is more!
Creating a curriculum map. Professor Heel demonstrated how to develop curriculum maps for several programs during his presentation. Here we will describe one, on Beekeeping, as an example. Details of the Beekeeping Program, its courses and PLO definitions may be found in the Appendix on page 25. The other programs discussed in the presentation may be found online at: http://www.ncc.edu/aboutncc/ourpeople/administration/assessment/spotlight.shtml

The first step in creating a curriculum map is to determine which (if any) of the PLOs is covered in each course of the program as a MAJOR or a MINOR part of the course content. To do that, follow these steps:

- Distribute a numbered/lettered list of PLOs among the relevant faculty members.
- Next, have the faculty determine whether each specific PLO is met in each course as a major or minor part of the syllabus.
- Create a grid (the curriculum map) showing which PLOs are covered in each of the courses in the program, and indicate whether they are a major or minor part of the syllabus (M or m respectively).

Table 1
Grid of First Curriculum Map Prepared for the Beekeeping Program

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Table 1, the initial curriculum map constructed from faculty's determination of whether specific PLOs are met in their courses, is really interesting, as it immediately reveals that:

- Some of the PLOs are covered in almost every course (such as ņmò for example).
- PLOs ņe, ņe, and ŋò are under covered overall.
- And PLO ŋmò (communication skills) is not covered at all. Faculty discussion of PLO ŋmò revealed that:
  - Virtually every faculty member thought others were covering the outcome in their respective courses.
  - Most faculty members did not feel qualified to teach or grade students on their communication skills.
- Other PLOs, such as ŋbò and ŋgò are overly emphasized given their relative importance to the entire curriculum.
- The ENV 111 and APS 112 courses include only two minor and one major PLO, and seem of little value to the curriculum.

Preparing this grid allowed the department to recognize and fix these curriculum issues. The changes were: APS 112, APS 244, APS 260, and APS 252 were significantly redesigned to address both gaps and redundancies in the curriculum, particularly Outcome ŋmò.

- Outcome ŋmò is now covered in an APS course each semester of a student's plan of study.
- Outcomes ņe and ŋlò are dependent upon BIO 205, so courses scheduled in the second year had to address these outcomes.
- Although ENV 111 seemed of little value to the curriculum because it had only one minor PLO, it was retained to fulfill the Natural Science requirement, and because it is a prerequisite for ENV 172.
Table 2
Redesigned Curriculum Map of the Beekeeping Program after Modifications Introduced in Response to Deficiencies Revealed by the Initial Map

The grid in Table 2 shows where PLOs were introduced into courses (M or m in green) and where they were removed (M or m crossed off). PLOs in black were unchanged from the initial map.

Moving forward, the faculty now documents student learning by conducting course level assessments. In developing an assessment strategy for courses, the following criteria were to be kept in mind:

- Not all CLOs for all courses need to be assessed (although at some point, the program faculty might consider assessing more broadly with purpose).
- Some courses are stronger in some areas of interest than others.
- Although multiple courses may cover the same outcome, not every course provides good assessment opportunities.
- Some courses offer breadth over depth.
- Some PLOs can only be covered (and measured) in specific courses.

Among other things, the revised curriculum map in Table 2 is helpful for developing the assessment strategy because it shows, for example, that four courses, ENV 111, ENV 172,
ENV 231 and BIO 205 are not focusing sufficiently on PLOs (either there are two few covered or there is minor emphasis on the PLOs). Based on this, the faculty decided not to assess course learning outcomes for those courses.

**Table 3**
Redesigned Curriculum Map Showing Which Course Learning Outcomes to Assess in Which Courses of the Beekeeping Program

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The Course Learning Outcome Map in Table 3 shows that:

- All PLOs are covered in at least one assessed course.
- All APS courses are participating in the assessment of at least one CLO.

This information guides the program assessment process overall. The process allows faculty to show that since all CLOs are being assessed, all PLOs have been measured and analyzed. (Remember, MSCHE cares only that the Department faculty demonstrate that PLOs have been assessed; they aren’t concerned about the minutiae.)

The next step is to conduct course level assessments, place the results on the map, and interpret the overall results. Before this can be done, however, the faculty must develop their standards of learning.
The Beekeeping Program faculty set a benchmark standard of a learning achievement rate of 80% for each outcome based on historic rates of success in the program. They agreed that:

- The highest result would count, unless later results showed a backward trend of learning.
- If the result was < 80%, they would discuss the results.
- If the result was < 60%, then this outcome would need immediate and special attention.
- If the result was > 95%, faculty would double check for integrity and rigor.

Table 4
Redesigned Curriculum Map of the Beekeeping Program Showing Results of Course Learning Outcome Assessments

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</table>

Table 4 reveals that:
- Outcomes a, b, f, are in very good shape.
- Outcomes h, i, k, and l look good too.
- Outcomes c, d, e, g, j, m all need to be discussed.
- What’s up with APS 244? (THIS COURSE NEEDS TO BE REVIEWED!)

**Conclusion:** Thus, used as demonstrated in Professor Heel’s presentation, curriculum mapping and assessment can be very effective in revealing whether a program is teaching, and whether students are learning what’s intended. But there are additional, unexpected benefits as well. As with many assessment activities, once the group moves beyond the “worker bee” focus (pardon the pun), the opportunity to consider the bigger picture is usually gratifying and engaging. In addition:
  - The relationship and roles of individual courses within a curriculum are greatly clarified.
  - Other stakeholders can now be reassured that a program curriculum “delivers” on what is advertised.
  - The exercise can help build faculty consensus, teamwork, and identity.

But perhaps the most important result of conducting assessment-informed curriculum mapping is that it enhances the faculty’s ability to accomplish the program’s mission.
THE NUTS AND BOLTS OF CURRICULUM MAPPING IN TASKSTREAM

Richard Cohen  
Assistant Professor, Physical Sciences  
Tracy Imperato  
Instructor, Physical Sciences

Abstract

This presentation highlights the Department of Physical Sciences as a model for how curriculum mapping can be effectively implemented and utilized. Professor Imperato first discussed how the department utilizes curriculum maps to ensure consistency of curriculum amongst its courses. Professor Cohen followed with a discussion of how to physically create an effective curriculum map for higher education assessment purposes in Taskstream.
Presentation

The Department of Physical Sciences offers eighteen different courses in a variety of disciplines including Astronomy, Environmental Science, Geology, and Meteorology. These eighteen courses are spread across more than sixty-five sections taught by over 30 professors each semester. It is possible that these numbers may lead to inconsistencies with regard to curriculum due to differences in pedagogical practices and methodologies. In order to mitigate the differences in curriculum, the Department's Curriculum Committee maintains and updates official course outlines (when needed) that highlight objectives and major themes and topics of the course which instructors then follow. Assessment methods, however, are still up to individual instructors to procure. How can we ensure that our students are learning the larger objectives of the course? How can we know if infused competencies, such as acquiring written and oral communication skills, are being met? In the department certain courses are suggested in sequence; one example of this is SCI 109 and SCI 110, Environmental Science and Environmental Resources, respectively. The department needs to ensure that these courses are aligned appropriately, while meeting the educational goals already mentioned. This is accomplished through curriculum mapping.

By aligning multiple courses through one major curriculum, we can ensure that the major ideas that drive the learning goals of individual courses are being addressed. We can incorporate infused competencies throughout the coursework. It is not uncommon for instructors of different courses to cover similar material, sometimes even overlapping. Curriculum mapping ensures that there is minimal redundancy from course to course. Curriculum mapping can also be used in another way; it can help the department find any gaps in the curriculum that are not being covered. The fact that there are sometimes over 30 different instructors from semester to semester, can unfortunately, potentially lead to isolation. Curriculum mapping, when done properly, leads to collaboration between colleagues within the department disciplines. We can build upon prior knowledge and, as an assessment tool, use curriculum mapping as the foundation for assessing learning goals and outcomes.

We have begun using Taskstream software as a way to document curriculum mapping in the Department of Physical Sciences. Our department has used mapping on both the departmental and course level. On each map that is generated, the major learning goals and outcomes are displayed. After the map has been set up in this fashion, we can then apply to each learning goal and outcome that it has been either Introduced, Practiced, or Reinforced. This involves collaboration with faculty that teach similar courses. Curriculum maps have been discussed and created during department meetings, committee meetings, and content area meetings during the annual Winter Workshop. After the map is complete, we check for inconsistencies, redundancy, or gaps in instruction. Curriculum mapping in Physical Sciences has also been used to align goals and objectives of courses with SUNY General Education goals.

Taskstream has very powerful tools for curriculum mapping. First, Taskstream allows one to align early learning goals/outcomes to SUNY General Education goals. This allows all instructors and reviewers of departmental curricula to understand the purpose of each departmental or course learning goal/outcome. Additionally, Taskstream allows each learning goal/outcome to be assigned a rank of Introduced, Practiced, or Reinforced.
These ranks allow the professor to understand to what level they should expect students to have prior knowledge, and how they should teach the curriculum. If a learning goal/outcome is “Introduced” in a course, then the professor knows not to assume any prior knowledge and their lesson should be geared toward making sure the students understand the core concept before attempting to show the students how to apply that knowledge. On the other hand, “Practiced” informs the professor that any student taking their course should have already been exposed to the core concept previously, although potentially only once before or relatively briefly. Therefore, the professor knows that he or she should offer at least a brief review before delving into a deeper level of understanding of the concept. Finally, “Reinforced” informs the professor that students are expected to fully understand the core concept, and that the professor does not have to use any class time reviewing the topic, but instead can devote time to applying the knowledge of the concept to higher order questions and problems. The presentation offered a step-by-step tutorial as to how to accomplish each of these tasks in Taskstream.

The Department of Physical Sciences uses curriculum mapping as a tool to facilitate student learning. It enables us to make appropriate decisions in terms of curriculum and instruction in all of our courses. It ensures that our learning goals are being effectively addressed and that we leave no gaps in our instruction. We are able to address infused competencies and ultimately help our students learn in a clear and organized manner from course to course. Taskstream provides a centralized location to create and store different curriculum maps while providing powerful curriculum mapping tools. The Department of Physical Sciences hopes to further our usage of curriculum mapping into future assessment cycles.
HOW GENERAL EDUCATION COMPETENCIES ARE INFUSED ACROSS THE CURRICULUM: A PILOT STUDY

Elizabeth Gaudino-Goering
Assistant Professor, Psychology
Richard Moscatelli
Associate Professor, Mathematics, Computer Science, Information Technology

Professor Goering earned her doctorate in Experimental Psychology/Cognitive Neuroscience from SUNY Stony Brook. She has conducted research and published in scholarly journals on chronic neurological illnesses, cognition, emotion, and disabilities. Dr. Goering has been teaching at NCC since 2007 and currently teaches General Psychology I: Introduction to Psychology, and General Psychology II: Research Methods and Human Development. She has also taught Child Psychology, Adolescent Psychology, Brain and Behavior, and Abnormal Psychology. In addition to the classes she teaches at NCC, Dr. Goering is the co-founder and a faculty advisor for the Moms Club, Chairperson of the Student Activities Committee, a member of the Assessment Committee and a founding member of the NCC Organic Community Garden.

1 Abridged from *General Education Infused Competencies: Institutional Assessment Pilot Study* prepared by the 2011-2013 General Education Subcommittee of the Academic Senate Assessment Committee, and edited by Dr. Goering.

Gregory Spengler, Chair, Academic Senate Assessment Committee (ASAC)
Mathematics/Computer Science/Information Technology Faculty

Janice A. Grackin, Assistant Vice President, Academic Assessment and Program Review

Members of the ASAC General Education Subcommittee (2011-2013)
Rona Casciola, Chair, Marketing/Retailing/Fashion Design/Interior Design Faculty
Betty Borowsky, Biology Faculty
Shani Bruno, Africana Studies Faculty
Craig Capria, Chair, Engineering/Physics/Technology
Wesley Doody, Biology Faculty
Elizabeth Gaudino-Goering, Psychology Faculty
Salvatore Masi, Allied Health Sciences Faculty
Richard Moscatelli, Mathematics/Computer Science/Information Technology Faculty
Lisa Tine, Allied Health Sciences Faculty
Abstract

The data collected in this pilot study provide critical information for future, in-depth assessments of NCC students’ performance across the four Infused GEN ED competencies. Although the details of assessment measurements varied by discipline, the main findings were: almost all departments made use of rubrics based upon a sample rubric provided by SUNY. This provided departments with some common ground on which to assess. The study also found that tabulating student performance by type of measure (paper, essay, lab report), and by learning objective, provided the most flexibility for interpreting data later on. Finally, the results suggested that the assessment of infused competencies across the curriculum might be enhanced by the continued development of a campus-wide assessment plan that embraces and documents the variety of measures used by faculty to assess these competencies. This would also encourage collaboration among faculty to promote continuous improvements in competencies-related assessment practices.

Presentation

Introduction

The General Education subcommittee of the Academic Senate Assessment Committee has been tasked with investigating ways to incorporate SUNY-required General Education Assessment into NCC’s faculty-designed classroom assessment process. In an effort to better characterize the current nature of assessment at NCC, the subcommittee carried out a pilot study for assessment of Infused Competencies (Critical Thinking, Information Management, Basic Written Communication, and Basic Oral Communication) across the campus during the 2012-2013 academic year. The following narrative summarizes the process and outcome of this pilot study.

History

The SUNY General Education campus-wide assessment plan calls for assessment of four Infused Competencies. Three of the competencies—Critical Thinking, Information Management, and Basic Written Communication—were last addressed campus-wide through the SUNY Strengthening Campus Based Assessment (SCBA) initiative in 2006-2007, at which time funding was provided by SUNY for campuses to develop and implement the assessments. The fourth competency, Basic Oral Communication, was originally included in the SUNY General Education assessment requirements but the SCBA initiative never completed development of learning goals and outcomes for this competency and it was not included in the first assessment. NCC concluded the SCBA effort in 2008-2009.

During 2009-2010, in response to changes in SUNY system general education reporting requirements, the campus-wide SCBA subcommittees for the Infused Competencies and the SUNY General Education Assessment Review (GEAR) subcommittees were reorganized by NCC’s Assistant Vice President for Academic Assessment and Program Review into a transitional General Education working group. This group, which met between 2009 and 2011, began developing a plan to increase the focus on and systematically address the four infused competencies within the scope of ongoing course level student learning assessment. Part of this effort included developing learning
goals and measurable outcomes for Basic Oral Communication, as this task had never been completed by the first SUNY-GEAR Taskforce. The working group asked that this task be completed locally for NCC by the faculty of the Department of Communications, one of whom was a member of the working group.

At the recommendation of the Assistant Vice President for Academic Assessment and Program Review, the working group transitioned to an ad hoc subcommittee of the Academic Senate Assessment Committee in 2010-2011 and subsequently to a permanent standing subcommittee in 2011-2012. Status as a permanent subcommittee emphasizes the central importance of the Infused Competencies and the need for ongoing systematic assessment of these complex general education student learning outcomes.

Process

The General Education (GE) Subcommittee was first charged with identifying the courses across the College curriculum that might best address the teaching and learning of these competencies. The goal of this charge was to select a group of key courses from a wide range of representative academic departments, from which to collect benchmark data which would be used for institutional assessment of the Infused Competencies. The selected courses would have potential to provide good aggregate data regarding students' general education outcomes across the College curriculum and inform the development of effective campus-wide general education assessments to be conducted in the future.

The GE Subcommittee members individually contacted Department Chairs, asking them to identify the courses that might best address the needs of the Infused Competencies Initiative assessment pilot. Using the results of multiple outreach efforts, the subcommittee eventually identified 16 courses for inclusion in the pilot study. During 2012-2013, the GE subcommittee met regularly to review all information collected from the Academic Departments volunteering to participate in the assessment pilot project.

The GE Subcommittee developed criteria for measurements of learning outcomes aligned with the Infused Competencies, and provided Academic Departments with matrices for assessment data collection for each of the four competencies. Completed data collection forms were returned from nearly all courses selected for the pilot. Additional outreach was needed to clarify details of assessment methods and data formats, in order to ensure an accurate report of results of the pilot study.

The four goals and related learning outcomes are summarized below:

CRITICAL THINKING: Students will develop critical thinking skills through their exposure to the methods of evidence and reasoning utilized to advance understanding in a subject field.

Learning Outcomes:

1. Identify, analyze and evaluate arguments as they occur in their own or other’s work
2. Develop well-reasoned arguments
INFORMATION MANAGEMENT: Students will demonstrate competency in the methods of information literacy/management through their exposure to information resources and research techniques in applications relevant to the subject field.

Learning Outcomes:

1. Perform basic operations of the computer
2. Identify key words, concepts, synonyms, and related words
3. Locate, evaluate, and synthesize information from a variety of sources

BASIC WRITTEN COMMUNICATION: Students will develop college level writing skills within the context of their coursework.

Learning Outcomes:

1. Produce coherent texts within common college level forms.
2. Revise and improve such texts.

BASIC ORAL COMMUNICATION*: Students will demonstrate an appropriate level of competence in oral discourse.

Learning Outcomes:

2. Organize information in a logical pattern.
4. Deliver articulate messages in a pleasing, energetic manner appropriate for the audience/occasion.
5. Use appropriate language for the audience/occasion.

*Since SUNY never completed the work to define this goal, they deferred to each college/university’s definition.

Upon aggregating the data collected from departments across campus, we found that diverse measures of competencies were used, including term papers, essays on exams, oral presentations, laboratory reports, outlines, role-playing exercises, and objective exams/quizzes. Furthermore, results were reported in varied formats, including

- A single summary table for each goal
- A summary table for each learning outcome (sometimes multiple outcomes were measured)
- A summary table for each method of measurement (e.g., paper vs essay), or
- A table for each learning outcome, broken down by method of measurement
Results

For the detailed description of results broken down by goals, departments, and learning outcomes, please refer to the full report (*General Education Infused Competencies: Institutional Assessment Pilot Study*). Below is a brief description of the subcommittee’s findings. The constitution of the pilot study sample is summarized below. Thirteen different departments from a variety of disciplines contributed data for this analysis. Several departments drew from a variety of their course offerings and reported findings on more than one goal.

<table>
<thead>
<tr>
<th>Goal</th>
<th># Departments</th>
<th># Sections</th>
<th># Students</th>
</tr>
</thead>
<tbody>
<tr>
<td>Critical Thinking</td>
<td>10</td>
<td>158</td>
<td>3272</td>
</tr>
<tr>
<td>Information Management</td>
<td>7</td>
<td>88</td>
<td>1894</td>
</tr>
<tr>
<td>Written Communication</td>
<td>6</td>
<td>47</td>
<td>862</td>
</tr>
<tr>
<td>Oral Communication</td>
<td>3</td>
<td>18</td>
<td>358</td>
</tr>
</tbody>
</table>

Overall, departments reported that 65% or more of their students were meeting or exceeding their General Education goals.

<table>
<thead>
<tr>
<th>Goal</th>
<th>Approximate % Meeting or Exceeding Faculty Expectations</th>
</tr>
</thead>
<tbody>
<tr>
<td>Critical Thinking</td>
<td>67%</td>
</tr>
<tr>
<td>Information Management</td>
<td>65%</td>
</tr>
<tr>
<td>Written Communication</td>
<td>70%</td>
</tr>
<tr>
<td>Oral Communication</td>
<td>70%</td>
</tr>
</tbody>
</table>

CONCLUSIONS

The data collected in this pilot study provide critical information for future assessments of NCC students' performance across the four infused competencies. It is important to emphasize that the purpose of the present study was not to reach any firm conclusions about
student performance, but to obtain enough information to devise methodology for conducting meaningful, in-depth studies in the future. Although the details of assessment measurements varied by discipline, the totality of our study has revealed several results that will be very useful for this purpose. It is our intent to recommend that this effort be continued in the coming year, and that the number of courses be expanded by 10-15%, with the goal of including departments and disciplines not represented in this first pilot study. The ultimate goal is a permanent, systematic assessment of the General Education Infused Competencies that will contribute to a comprehensive institutional assessment plan.

1. Almost all departments made use of rubrics based upon a sample rubric provided by SUNY. The use of a rubric was essential in providing departments some common ground on which to assess.

2. Tabulating student performance by type of measure (paper, essay, lab report) and by learning objective provided the most flexibility for interpreting data later on. Although this requires more time for data entry and management, it provides the greatest flexibility later on when departments are considering their teaching goals and methods of assessment. This practice should be continued at least until NCC has developed a college-wide standard for Gen Ed competencies.

3. It is also noteworthy that several departments took new and innovative approaches to assessing critical thinking for this study. For instance, creating a multiple choice test, as they did in Biology, may provide a simple method for assessing students. However it should be noted that this requires tremendous time and effort from faculty. The Math department created test items that could be integrated by instructors throughout the semester OR just added to the final exam. One observation that they made was that students might perform better on these test items if they were administered as part of the test on that topic rather than waiting until the final exam. Other departments may want to consider their own innovative ways of assessing Gen Ed competencies.

4. The English department devised a method of a planned follow-up with students as they progress through courses. This method provides a picture of how these competencies develop over time. This longitudinal approach would be the most sensitive method for tracking student progress. Electronic student portfolios may be one good way to do this tracking as these would provide a series of “snapshots” of student performance to follow their progress.

5. A follow-up study in which the SUNY rubric is used as the template, but each department interprets for their discipline may reveal more similarities in student proficiency than the current study found. This would promote more consistency in assessment methodology.

6. Assessment of infused competencies across the curriculum might be enhanced by the continued development of a campus-wide assessment plan that embraces and documents the variety of measures used by faculty to assess these competencies, while encouraging collaboration among faculty to promote continuous improvements in competencies-related assessment practices.
APPENDIX

“Mapping” Program Learning Outcomes
To Course Learning Outcomes

Case Study Information:

“Beekeeping at Cranmore Community College”

Michael A. Heel
Assistant Director of Curriculum and Assessment
Monroe Community College
FICTIONAL CASE STUDY: BEEKEEPING AT CRANMORE COMMUNITY COLLEGE

Background

The faculty of the Apicultural Science Program at Cranmore Community College has been encouraged by their dean to conduct a complete evaluation of their A.A.S. degree program. The faculty over time has changed the program curriculum in attempts to adjust to increasing needs in the agriculture industry for enhanced approaches to sustainability.

The Apicultural Science A.A.S. degree program at Cranmore Community College is small — only four full-time faculty members staff the courses, with a small corps of adjuncts who allow for all of the courses to run at least once per year. Given the small size of the program and the need for curricular support for courses provided by other science departments, the Apicultural Science A.A.S. degree contains no “program elective” course options for its students.

About 20 students graduate each year from CCC with their degrees in Apicultural Science. Cranmore has strong financial support for all of its science programs from external industry, and CCC science graduates with A.A.S. degrees tend to find jobs easily upon graduation within a 50-mile radius of the campus. It is likewise not uncommon for many of the A.A.S. students to transfer their degree credits to four-year institutions, although relatively few do so from the Apicultural Science program.

The Apicultural Science Program is housed within the Department of Applied Sciences and Technologies at Cranmore. The program faculty is considered to be a sub-discipline within the larger department, and the faculty meets together as a disciplinary unit at least once monthly. Larger departmental meetings with the other sub-disciplines are convened about once every two months.

Mission

“The mission of the Apicultural Science Program of Cranmore Community College is to train students pursuing the A.A.S. degree in Apicultural Science with the skills and knowledge necessary to become responsible, ethical, and knowledgeable apiarists capable of contributing to the profession of beekeeping as entrepreneurs, business owners, and technicians in the field.”

Program Goals

Apicultural Science as a specialized A.A.S. degree offers students the unique opportunity to contribute professionally to an increasingly important role in the maintenance and sustainability of American and world agriculture. The faculty of Cranmore’s Apicultural Science Program provides students with the most up-to-date knowledge and technological proficiency available in the field, with the intent of engendering within students an interest
in promoting further progress in the development of groundbreaking techniques in apiculture.

The Program faculty’s goals for its students are as follows:

A. Of students accepted into the program, at least 80% will successfully complete the A.A.S. degree within three years;

B. Graduating students will be substantively competent in all aspects of basic apiary science;

C. Graduating students will be technically competent apiarists, capable of managing beehives as a business endeavor;

D. Graduates will engage in lifelong learning and actively contribute to the community of beekeepers by belonging to either the Organization of Professional Beekeepers (OPB) or the American Association of Apicultural Science (AAPS);

E. Graduates will be sufficiently proficient in the environmental sciences to be able to transfer to a four-year institutions for further study, if they so choose;

F. Of students wishing to gain certification as professional apiarists, 100% will successfully pass the OPB certifying examination in no more than two attempts.

These goals were developed by the Apicultural Science faculty, in collaboration with their program’s Advisory Committee, several years ago. Frequent discussions with current professional contacts have confirmed that these goals are still appropriate for today’s A.A.S. degree in Apicultural Science.

NOTE: Because the faculty operated under a set of expectations framed by an outside accrediting body, Program Operational Outcomes were expressed as (and wrapped in with) their Program Goals. Cranmore Community College’s internal assessment processes allowed for the Apicultural degree program evaluation to proceed with this approach without any conflict.
Program Learning Outcomes

A graduate of the A.A.S. degree program in Apicultural Science will be able to:

a. Construct and maintain beehives of appropriate design relative to the beekeeper’s purpose (breeding, honey production, supporting agriculture, etc.) and the breed of bee;

b. Create appropriate breeding environments and apply professionally-recommended techniques in promoting healthy fertility and growth of bee populations;

c. Apply and interpret basic genetic tests of bee samples;

d. Conduct appropriate hybridization techniques;

e. Identify, recognize, and respond to insect behaviors, including those of bee, competing insect, and predator insect species;

f. Promote health and wellness among bee populations;

g. Cultivate plant species supportive of the healthy maintenance of bee populations;

h. Recognize and manage responses to threats to bee populations, such as changes in the seasons, extreme weather conditions, or the presence of pesticides and other toxins in the environment;

i. Apply basic business management principles to the management of the costs and expenses of beekeeping;

j. Discuss the ethical principles underpinning beekeeping as both a hobby and a profession;

k. Describe the role of bee species in the maintenance of a healthy and sustainable agricultural business;

l. Teach and train apprentice beekeepers in the rudimentary aspects of the practice of beekeeping;

m. Capably communicate the basic tenets of good beekeeping practices to individuals unfamiliar with bees and the practice of beekeeping.

It is generally understood that Program Learning Outcomes support the program’s broader overarching goals. In this example, these learning outcomes directly support Goals B and C, and indirectly support Goals E and F. Goal A of the program requires additional aggregate-level data outside of the classroom for support. Goal D can only be supported with an alumni network or graduate survey.
CURRICULUM DESIGN

With the Apicultural Science Program’s goals and program objectives/outcomes well-stated, the design of the department’s curriculum should next be considered.

*Required Courses for the A.A.S. Degree in Apicultural Science (in recommended sequence)*

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>APS 101</td>
<td>Introduction to Apicultural Science</td>
<td>3</td>
</tr>
<tr>
<td>ENV 111</td>
<td>Environmental Science – Intro to Zoology</td>
<td>4</td>
</tr>
<tr>
<td>APS 112</td>
<td>Principles of Apicultural Science</td>
<td>4</td>
</tr>
<tr>
<td>ENV 172</td>
<td>Environmental Science – Entomology</td>
<td>4</td>
</tr>
<tr>
<td>APS 122</td>
<td>Practices of Apicultural Science</td>
<td>4</td>
</tr>
<tr>
<td>ENV 231</td>
<td>Environmental Science – Agriculture</td>
<td>4</td>
</tr>
<tr>
<td>APS 201</td>
<td>Beekeeping Environments</td>
<td>4</td>
</tr>
<tr>
<td>BIO 205</td>
<td>Genetics</td>
<td>4</td>
</tr>
<tr>
<td>APS 244</td>
<td>The Science of Honey Production</td>
<td>4</td>
</tr>
<tr>
<td>APS 260</td>
<td>Beekeeping Business Practices</td>
<td>4</td>
</tr>
<tr>
<td>APS 252</td>
<td>Capstone Seminar in Apicultural Science</td>
<td>4</td>
</tr>
<tr>
<td>ENG 101</td>
<td>College Writing (required)</td>
<td>3</td>
</tr>
<tr>
<td>MTH 150</td>
<td>Business Math (required)</td>
<td>4</td>
</tr>
<tr>
<td>SOC 140</td>
<td>Human Relationships w/ Natural World (req.)</td>
<td>3</td>
</tr>
<tr>
<td>COM 110</td>
<td>Public Speaking (required)</td>
<td>3</td>
</tr>
<tr>
<td>Humanities elective</td>
<td></td>
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</tr>
<tr>
<td>Free elective</td>
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*Total required degree credits = 62*