EXECUTIVE SUMMARY

Background:

In April 2013, the Bergen Community College Faculty Senate voted to accept the American Association of Colleges and Universities’ LEAP Essential Learning Outcomes as part of the College’s general education goals. These outcomes align with the College’s mission to offer high-quality programs and life-long learning opportunities. In addition, the LEAP Outcomes satisfy Middle States’ Standard 12 General Education requirement that students “acquire and demonstrate proficiency in general education and essential skills, including at least oral and written communication, scientific and quantitative reasoning, critical analysis and reasoning, and technological competency.”

The acceptance of the LEAP Outcomes led to the first integrative assessment of the General Education program. The 2013 – 2014 assessment which looked at written and oral communication as well as critical and creative thinking gave us a baseline of student abilities. In addition, as reported in the Assessment of Bergen Community College’s General Education Program Spring 2014 report, this assessment process provided an effective and inclusive means to assessing our General Education Program.

The results of that assessment led the General Education Committee to address weaknesses in student critical thinking abilities. Committee members reviewed all general education course syllabi to see whether they had a critical thinking requirement and to see whether the language used in the syllabi could be strengthened. The Committee sent an email to department chairs that suggested wording departments could use to strengthen the critical thinking requirement and that encouraged department chairs to discuss critical thinking requirements at their monthly department meetings.

The General Education Committee also had an opportunity to present their findings at the 2014 Middle States Commission on Higher Education (MSCHE) Annual conference and the American Association of Colleges and Universities (AAC & U) General Education conference. The positive reaction to the MSCHE presentation led to the first New Jersey General Education Round Table discussion.

The Committee also decided that it would assess the LEAP Outcomes of Quantitative Literacy and Problem Solving using the VALUE rubrics for the 2014-2015 assessment cycle.
Process:

The General Education Committee invited full-time and part-time faculty in all disciplines to submit student artifacts from one unmarked assignment that they believed represented the LEAP outcomes of Quantitative Literacy or Problem Solving. Emails were sent to faculty, department chairs, and deans encouraging participation. Once all the artifacts were received, Institutional Research identified the students who had a minimum of 45 credits – those students nearing completion of their degree – so that their work could be evaluated. The student and faculty names, and course numbers/sections were removed from the documents before they were shared with the readers in order to prevent reader bias. The General Education Assessment Group assessed the artifacts in May.

Conclusions:

This second year of integrative assessment confirms that our general education assessment process is sustainable, replicable and informative. Artifacts come from a variety of disciplines and student work demonstrates acceptable levels as measured by the VALUE rubrics. Nevertheless, the data suggests that more faculty assignments need to require higher order thinking.

In addition, faculty dialog is occurring and there is a greater understanding of what our student weaknesses are and how we can address those needs. Faculty development opportunities can facilitate these discussions and help instructors create more effective assignments.
Background:

In April 2013, the Bergen Community College Faculty Senate voted to accept the American Association of Colleges and Universities’ LEAP Essential Learning Outcomes as part of the College’s general education goals. These outcomes align with the College’s mission to offer high-quality programs and life-long learning opportunities. In addition, the LEAP Outcomes satisfy Middle States’ Standard 12 General Education requirement that students “acquire and demonstrate proficiency in general education and essential skills, including at least oral and written communication, scientific and quantitative reasoning, critical analysis and reasoning, and technological competency.”

In fall 2013, the General Education Committee piloted an assessment project and in spring 2014, conducted an assessment of written and oral communication as well as critical and creative thinking. This first college-wide integrative assessment gave us a baseline of student abilities. In addition, as reported in the Assessment of Bergen Community College’s General Education Program Spring 2014 report, this assessment process provided an effective and inclusive means to assessing our General Education Program.

In response to the 2013 - 2014 assessment results, in fall 2014, the General Education Committee focused on how the Committee could foster higher scores in critical thinking. To do this, the Committee members first reviewed all general education course syllabi to see whether they had a critical thinking requirement and, second, to see whether the language used in the syllabi could be strengthened. Based on this initial research, the Committee sent an email to department chairs suggesting language that departments could use to strengthen the critical thinking requirement. The letter encouraged department chairs to discuss critical thinking requirements at their monthly department meeting. A copy of Bloom’s Taxonomy was also included with the email.

The General Education Committee also had an opportunity to present their findings at the 2014 Middle States Commission on Higher Education (MSCHE) Annual conference and the American Association of Colleges and Universities (AAC & U) General Education conference. The positive reaction to the MSCHE presentation led to the first New Jersey General Education Round Table discussion. All New Jersey community college academic vice-presidents and general education committee chairs as well as academic vice-presidents and general education committee chairs from Bergen’s top four-year transfer institutions were invited to a meeting to share their assessment processes. Participants were engaged and a follow up meeting is being planned for August.
The Committee also decided that it would assess the LEAP Outcomes of Quantitative Literacy and Problem Solving using the VALUE rubrics for the 2014-2015 assessment cycle.

**Assessment Process:**

As during the previous assessment, the General Education Committee wanted to assess how effective the College’s approach to integrative learning was, whether our students were receiving a general education and how well we were preparing our students for 21st century opportunities.

The General Education Committee invited full-time and part-time faculty in all disciplines to submit student artifacts from one unmarked assignment that they believed represented the LEAP outcomes of quantitative literacy or problem solving. Once all the artifacts were received, Institutional Research identified the students who had a minimum of 45 credits – those students nearing completion of their degree – so that their work could be evaluated. The student and faculty names, and course numbers/sections were removed from the documents before they were shared with the readers in order to prevent reader bias.

To encourage understanding of the project and greater faculty participation, in both the fall and spring semesters, the Chair of the General Education Committee sent an email to all faculty explaining the assessment process. Two follow-up emails were sent to faculty as reminders to submit student work. In addition to the email blasts, emails were sent to deans and department chairs asking them to tell their faculty to submit artifacts, and individual emails were sent to faculty teaching 200 level courses. (It was more likely that students in those courses would have a minimum of 45 credits.) Committee members also spoke about the assessment project at department and division meetings.

Faculty who were interested in reading the artifacts were asked to notify the General Education Chair. Additional readers from the math department were asked to read quantitative literacy artifacts.

**Assessment Evaluators:**
The General Education Assessment Group included compensated faculty, faculty from both the General Education and the Learning Assessment Committees, and the CIE Fellows.

- Afsheen Akbar
- Denise Avrutik
- Joanna Campbell
- Maureen Ellis-Davis
- Gail Fernandez
- Maria Fressola
- Lenore Lerer
- Alina Malik
- Lisa Mayer
- Andrew Panyko
- Tracy Saltwick
- Sony Tiwari
Artifacts Collected from:
Chemistry
Drafting
Math
Business
Computer Information System
Dental Hygiene
Education
Psychology
Spanish
Theater

Number of artifacts assessed: 75

Quantitative Literacy: 43
Problem Solving: 32

Rubrics:
VALUE rubric for Problem Solving
VALUE rubric for Quantitative Literacy

Summary of Results:

Quantitative Literacy VALUE Rubric (24 points)

<table>
<thead>
<tr>
<th></th>
<th>Mean (Average)</th>
<th>Median</th>
</tr>
</thead>
<tbody>
<tr>
<td>Interpretation</td>
<td>2.9</td>
<td>3.0</td>
</tr>
<tr>
<td>Representation</td>
<td>3.1</td>
<td>3.0</td>
</tr>
<tr>
<td>Calculation</td>
<td>3.9</td>
<td>3.0</td>
</tr>
<tr>
<td>Application/Analysis</td>
<td>2.6</td>
<td>3.0</td>
</tr>
<tr>
<td>Assumptions</td>
<td>2.3</td>
<td>3.0</td>
</tr>
<tr>
<td>Communication</td>
<td>3.2</td>
<td>3.0</td>
</tr>
<tr>
<td>Total Score</td>
<td>13.5 (or 56%)</td>
<td>12.0 (50%)</td>
</tr>
</tbody>
</table>

Problem Solving VALUE Rubric (24 points)

<table>
<thead>
<tr>
<th></th>
<th>Mean (Average)</th>
<th>Median</th>
</tr>
</thead>
<tbody>
<tr>
<td>Define Problem</td>
<td>2.6</td>
<td>2.5</td>
</tr>
<tr>
<td>Identify Strategies</td>
<td>2.5</td>
<td>3.0</td>
</tr>
<tr>
<td>Propose Solutions/Hypotheses</td>
<td>2.6</td>
<td>3.0</td>
</tr>
<tr>
<td>Evaluate Potential Solutions</td>
<td>2.2</td>
<td>2.0</td>
</tr>
<tr>
<td>Implement Solution</td>
<td>2.7</td>
<td>3.0</td>
</tr>
<tr>
<td>Evaluate Outcomes</td>
<td>2.5</td>
<td>3.0</td>
</tr>
<tr>
<td>Total Score</td>
<td>11.7 (or 49%)</td>
<td>12.0 (or 50%)</td>
</tr>
</tbody>
</table>
Conclusions from Rubrics:

Quantitative Literacy Rubric:
- Scores were in the Milestones range.
- As noted in the description of the Quantitative Literacy VALUE rubric, solving mathematical problems alone doesn’t demonstrate whether a student is able to think about and understand the meaning of the data she is using. Many of the assignments we received were mathematical calculations and did not give students the opportunity to analyze quantitative information, represent quantitative information, complete calculations to answer questions, make judgments or communicate the results.
- Students scored lowest on Application/Analysis and Assumptions. Two possible reasons for this are (1) most assignments only required students to perform calculations and not make judgments or draw conclusions or (2) application/analysis requires critical thinking. As in the previous year’s assessment, critical thinking is an area of weakness for students and this may be the reason for the low scores.

Problem Solving Rubric:
- Scores were in the Milestones range.
- The rubric is designed to measure the quality of a process, rather than the quality of an endpoint. However, most of the assignments we received did not look at the process, but only the answer.
- Students scored lowest on evaluating potential solutions. Two possible reasons for this are (1) it is possible that assignments did not ask students to evaluate solutions or (2) evaluation is a critical thinking skill. As in the previous year’s assessment, critical thinking is an area of weakness for students and this may be the reason for the low scores.
- The first measure “Define Problem” was difficult to assess because in most of the assignments we received, students were not asked to define a problem. They were usually told the problem and then had to solve it.
- Many instructors did not give specific “problem solving” assignments. Therefore, the readers sometimes took an artifact and created an interpretation of problem solving that the instructor probably did not intend. This may have led to skewed results.

Discussion of Results:

After all the artifacts were assessed, the evaluators shared their observations of the tool, quality of work, and process. The following section summarizes their observations.

Tool:

In contrast to the previous year, the readers were more comfortable grading with the rubrics. They did not feel constrained to give “low scores” by the fact that the rubrics were used in two
and four-year institutes. Instead they viewed each artifact as having the potential to score a “4.” In addition, they believed the rubrics were clear, straightforward and easy to use. They also concluded that the rubrics added validity to our assessment project because they were created with input from educators and employers, and are used at many institutes in the U.S. Although the rubrics were not appropriate for all of the artifacts, the readers agree that we should continue using the VALUE rubrics for future assessment work.

**Quality of Assignments:**

The readers did not focus too much on the quality of the assignments. As this was an assessment of student learning, the evaluators did not consider the quality of instruction or the discipline from which the artifact came. In fact, there seemed to be a presumption that students simply answered what they were asked to do.

During our discussion, it was suggested that faculty give assignments based on the rubrics. In fact, faculty was notified about what we would assess and were sent the rubrics at the beginning of the fall and spring semesters. They had an opportunity to create specific assignments for the rubrics although we did not suggest that they do this nor did we advocate it. That being said, one of the evaluators who had also submitted her class artifacts, commented that in her assignment, she didn’t ask students to make assumptions or to communicate their work as described on the qualitative literacy rubric. However, after reading artifacts, she saw the VALUE of these qualities and going forward, she may change her assignment to ask for these elements.

**Process:**

The readers felt that the assessment day “worked.” The norming was beneficial. The discussion that occurred between partners grading with the one rubric was valuable. There was some frustration that faculty participation had not really increased from the previous year. Possible causes for this included:

- Faculty needing to hear messages repeatedly.
- Faculty not understanding the assessment project including the process, reasons for, and benefits.
- Faculty being unfamiliar with the LEAP Essential Learning Outcomes.
- Poor faculty morale because the faculty is working without a contract.
- Little financial incentive to do additional work.

The evaluators discussed alternative means of assessment including a standard assessment project such as a case study that all students would take. However, this raised a number of issues including:

- When/where/who would give the assessment?
• Who would create the assessment?
• Possible pushback from faculty.

The readers concluded that we should continue with our current assessment strategy because it occurs regularly, consistently and is faculty-driven.

Next Steps:

1. The General Education Committee and General Education Assessment Group will take the lead in bringing more faculty into the assessment process:
   a. The General Education Assessment Group will speak at department meetings. They will explain what, why and how we are assessing. The Assessment Group will look at department syllabi before attending the meetings so that they will have an understanding of course content and expectations. They will suggest types of assignments that faculty can submit for assessment.
   b. The General Education Assessment Group will encourage deans and department chairs to become more involved in assessment.

2. Offer professional development on LEAP Outcomes:
   a. How to incorporate them more into curriculum.
   b. Create opportunities (brown bag lunch, workshop) to discuss specific LEAP Outcomes.
   c. Discuss the VALUE rubrics.
   d. Work on making general education assessment a part of our culture.

Conclusions:

This second year of integrative assessment confirms that our general education assessment process is sustainable, replicable and informative. Artifacts come from a variety of disciplines and student work demonstrates acceptable levels of the VALUE rubrics. Nevertheless, the data suggests that faculty give assignments that require higher order thinking.

In addition, faculty dialog is occurring and there is a greater understanding of what our student weaknesses are and how we can address those needs. Faculty development opportunities can facilitate these discussions and help instructors create more effective assignments.
November 3, 2014

Dear Colleagues,

Last year, the General Education Committee began an annual assessment of its program. There were two main reasons for this. First, it is important for us, the faculty, to see how well our students are learning what we say we are teaching, and, second, our accrediting body, The Middle States Commission on Higher Education requires us to assess our General Education program. (Middle States Characteristics of Excellence Standard 12, http://www.msche.org/publications/CHX06_Aug08REVMarch09.pdf). Thanks to the participation of the many faculty who submitted artifacts, our assessment process was effective and the results helped us learn more about the strengths and weaknesses within our work. (General Education Report 2013 – 2014, http://www.bergen.edu/Portals/0/Docs/GenEdu/Report%20of%20GenEd%20Assessment%20YearOne7-10-14.pdf

This year, we will once again assess our program. We will continue using the same assessment model as last year; two new competencies will be assessed in fall 2014 and spring 2015. Both full-time and part-time faculty are invited to submit student artifacts (all artifacts from one ungraded assignment) that they believe are representative of the LEAP Essential Learning Outcomes, Quantitative Literacy or Problem Solving. The attached rubrics will be used to evaluate the student work. **Artifacts can come from all disciplines and do not need to be from math-related courses.** Faculty, course, and student names (once it’s established that the student has a minimum of 45 credits) will be removed from the artifacts. Electronic artifacts can be submitted to gfernandez@bergen.edu. Hard copy artifacts can be sent to the Vice-President of Academic Affairs, Room A-310. (Please mark as General Education Assessment.) All submissions are due by December 16th. (See attached documents for additional details.) Please keep in mind that this is an assessment of student learning, not of faculty or of quality of assignments.

In January 2015, a small group of compensated faculty working with the CIE Fellows will use rubrics to examine the anonymous work to see if we meet our desired results. The group will also make any necessary revisions to the plan so that the assessment project can be repeated in the spring.

The General Education Committee thanks you in advance for making this a truly faculty driven process. By working together, we can make Bergen an even stronger student-centered institute.

Sincerely,

General Education Committee
Gail Fernandez, Chair
William Mullaney, Vice-President of Academic Affairs
Goals to be Assessed: *Intellectual and Practical Skills*
- Quantitative Literacy
- Problem Solving

Means of Assessment:
Class assignments that faculty believe demonstrate the outcome.

Assessment tool:
Rubrics (see attached)

Sources of data:
Student artifacts submitted by full-time and part-time faculty.
Faculty should submit unmarked artifacts (one assignment) from the *entire class*. These artifacts can be, but are not limited to, an exam, a paper, a lab report, or presentation. Only artifacts from students with a minimum of 45 credits will be reviewed.

Timeline and process for data collection:
Artifacts may be submitted electronically or in hard copy. Please attach a copy of the assignment.
Electronic artifacts can be submitted to gfernandez@bergen.edu. Hard copy artifacts can be sent to the Vice-President of Academic Affairs, Room A-310 (Please mark as General Education Assessment.) Photocopies of the work can be made and originals will be immediately returned to you. All submissions are due by **Tuesday, December 16th**.

How data will be analyzed:
The CIE Fellows and a small group of compensated faculty will meet in January to analyze the artifacts. All participants will norm together and then each artifact will be examined by two faculty members.

Any full-time faculty interested in participating in the analysis should notify Gail Fernandez at x7525 or gfernandez@bergen.edu.
December 1, 2014

Dear Colleagues,

Just a reminder . . . the General Education Committee is conducting an assessment to see whether Bergen students nearing completion of their degrees (those with a minimum of 45 credits) can demonstrate proficiency in the LEAP goal of *Intellectual and Practical Skills*, specifically **Quantitative Literacy** and **Problem Solving**.

We are asking full-time and adjunct faculty to submit student artifacts (all artifacts from one ungraded assignment) that they believe are representative of either Quantitative Literacy or Problem Solving. Faculty, course, and student names (once it’s established that the student has a minimum of 45 credits) will be removed from the artifacts. Electronic artifacts can be submitted to gfernandez@bergen.edu. Hard copy artifacts can be sent to the Vice-President of Academic Affairs, Room A-310 (Please mark as General Education Assessment.) Photocopies of work can be made by Barbara Mollino and originals will be immediately returned to you. All submissions are due by **Tuesday, December 16th**.

Please contact Gail Fernandez at gfernandez@bergen.edu or x7525 if you have any questions.

Thank you for your help.

General Education Committee
Gail Fernandez, Committee Chair
William Mullaney, Vice-President of Academic Affairs
December 17, 2014

Dear Colleagues,

The General Education Committee thanks all the faculty who have submitted artifacts for our fall assessment.

This year, our focus is on the LEAP Outcomes of Problem Solving and Quantitative Literacy. To clarify, problem solving does not refer to math only. In many courses, including the natural sciences and social sciences, students are presented with situations that require them to identify the problem and alternative means to solve it. Similarly, quantitative literacy may be found in courses that have a research or lab component.

If you have not yet submitted artifacts, we encourage you to do so. We will look at the work of students nearing completion of their degrees -- those with 45 credits or more. (Institutional Research will identify those students.) All student artifacts from one ungraded assignment can be sent electronically to Gail Fernandez at gfernandez@bergen.edu. Hard copies can be sent to the attention of Barbara Mollino in the office of the Vice President of Academic Affairs, Room A-310.

If you have questions, please contact Gail Fernandez. We will be accepting artifacts until January 6th.

The General Education Committee thanks everyone for making this faculty driven project a success and wishes everyone a happy and healthy holiday.

General Education Committee
Gail Fernandez, Chair
February 11, 2015

Dear Colleagues,

The General Education Committee invites both full-time and part-time faculty to participate in its annual assessment. This year we will be looking at whether students nearing completion of their degrees can demonstrate competency of the LEAP Essential Learning Outcomes of Problem Solving or Quantitative Literacy. Here is how you can participate:

- Submit all student artifacts from one ungraded assignment (and a copy of the assignment). Electronic artifacts can be submitted to gfernandez@bergen.edu. Hard copy artifacts can be sent to Barbara Mollino in the office of the Vice-President of Academic Affairs, Room A-310. Mark as General Education Assessment.

- Faculty, course, and student names (once it’s established that the student has a minimum of 45 credits) will be removed from the artifacts. In May, a group of compensated faculty working with the CIE Fellows will use rubrics to examine the anonymous work. The findings will then be shared with the college community.

- **Artifacts can come from all disciplines and do not need to be from general education courses.** Keep in mind that **problem solving** and **quantitative literacy** do **not** refer to math only. In many courses, including the natural sciences, health professions, humanities and social sciences, students are presented with situations that require them to identify a problem and alternative means to solve it. Similarly, **quantitative literacy** includes the interpretation of data which is found in many of these same disciplines. **This is an assessment of student learning, not of faculty or of quality of assignments.**

- All submissions are due by **Friday, May 8th.** (See attached documents for additional details.)

The General Education Committee thanks you in advance for your support.

Sincerely,

General Education Committee
Gail Fernandez, Chair
William Mullaney, Vice-President of Academic Affairs

Attachments:
Spring 2015 Timeline
Problem Solving VALUE Rubric
Quantitative Literacy VALUE Rubric
LEAP Essential Learning Outcomes
GENERAL EDUCATION ASSESSMENT
Spring 2015
Process and Timeline

Goals to be Assessed: *Intellectual and Practical Skills*
- Quantitative Literacy
- Problem Solving

Means of Assessment:
Class assignments that faculty believe demonstrate the outcome.

Assessment tool:
Rubrics (see attached)

Sources of data:
Student artifacts submitted by full-time and part-time faculty.
Faculty should submit unmarked artifacts (one assignment) from the *entire class*.
These artifacts can be, but are not limited to, an exam, a paper, a lab report, or presentation.
Only artifacts from students with a minimum of 45 credits will be reviewed.

Timeline and process for data collection:
Artifacts may be submitted electronically or in hard copy. **Please attach a copy of the assignment.**
Electronic artifacts can be submitted to gfernandez@bergen.edu.
Hard copy artifacts can be sent to Barbara Mollino in the office of the Vice-President of Academic Affairs, Room A-310 (Please mark as General Education Assessment.) Photocopies of the work can be made and originals will be immediately returned to you.
All submissions are due by **Friday, May 8th**.

How data will be analyzed:
The CIE Fellows and a small group of compensated faculty will meet in May to analyze the artifacts. All participants will norm together and then each artifact will be examined by two faculty members.

Any full-time faculty interested in participating in the analysis should notify Gail Fernandez at x7525 or gfernandez@bergen.edu.
April 3, 2015

Dear Colleagues,

Just a reminder . . . the General Education Committee is conducting an assessment to see whether Bergen students nearing completion of their degrees (those with a minimum of 45 credits) can demonstrate proficiency in the LEAP goal of *Intellectual and Practical Skills*, specifically **Quantitative Literacy** and **Problem Solving**. Students practice these skills in many courses including those in the natural sciences, health professions, arts, business, humanities and social sciences.

We are asking full-time and adjunct faculty to submit all student work (papers, tests, presentations, etc.) from one ungraded assignment that they believe are representative of either Quantitative Literacy or Problem Solving (Please include a copy of the assignment). Electronic artifacts can be submitted to gfernandez@bergen.edu. Hard copy artifacts can be sent to the Vice-President of Academic Affairs, Room A-310 (Please mark as General Education Assessment.) Photocopies of work can be made by Barbara Mollino and originals will be immediately returned to you. All submissions are due by **Friday, May 8th**.

Please contact Gail Fernandez at gfernandez@bergen.edu or x7525 if you have any questions.

Thank you for your help.

General Education Committee
Gail Fernandez, Committee Chair
William Mullaney, Vice-President of Academic Affairs
April 30, 2015

Dear Colleagues,

The General Education Committee thanks all the faculty who have submitted artifacts for our spring assessment of the LEAP Outcomes of Problem Solving and Quantitative Literacy.

If you have not yet submitted papers, exams, lab reports, projects, etc., we encourage you to do so. All student work from one ungraded assignment (and a copy of the assignment) can be sent electronically to Gail Fernandez at gfernandez@bergen.edu. Hard copies can be sent to the attention of Barbara Mollino in the office of the Vice President of Academic Affairs, Room A-310. Both full-time and part-time faculty are welcome to participate -- you do not need to teach a general education course.

**Problem Solving** refers to the ability to evaluate and implement a strategy to answer an open-ended question. **Quantitative Literacy** asks students to explain information presented in mathematical forms, make judgments and evaluate assumptions. Many courses including those in social sciences, natural sciences, health professions and the arts ask students to demonstrate these abilities. This is an assessment of student learning, not of faculty or of quality of assignments.

We will be accepting artifacts until **May 8th**. If you have questions, please contact Gail Fernandez. Again, thank you for making this faculty-driven, college-wide assessment a success!

General Education Committee
Gail Fernandez, Chair
William Mullaney, Vice-President of Academic Affairs
Dear ________,

As a member of the General Education Committee, I am asking you to support our annual assessment of the General Education program. This year we are assessing whether students can demonstrate competency in Problem Solving and Quantitative Literacy. If you look at the attached rubrics, you will notice that they can be used to evaluate student work in various disciplines.

To participate in this project, you should send all student work from one ungraded assignment (test, visual presentation, paper, lab report, etc.) electronically to Gail Fernandez at gfernandez@bergen.edu or hard copies to the attention of Barbara Mollino in the Office of the Vice President of Academic Affairs (she can photocopy the artifacts and return them to you) by May 8th. Your name, course section number and student name will be removed from the work before it is reviewed. Note: This is an assessment of student learning, not of faculty and you do not need to teach a Gen Ed course.

If you have any questions or concerns, let me know. Thank you for your help.

_____________
name

General Education Committee
March 31, 2015

Department Chair Reminder suggested by Alan Kaufman, Faculty Senate Chairperson

Dear Colleagues,

As you know, the Gen Ed Committee is assessing student learning. This year the Committee is looking at whether students can demonstrate problem solving or quantitative literacy abilities. If you look at the attached rubrics, you will see that problem solving involves evaluating and implementing a strategy to answer an open-ended question. Quantitative literacy asks students to explain information presented in mathematical forms, make judgments and evaluate assumptions.

Please remind your faculty to submit all student work from one **ungraded** assignment (and a copy of the assignment) to the attention of Gail Fernandez at gfernandez@bergen.edu (if electronic) or to Barbara Mollino in Room A-310 (if hard copy). I am writing to you at the suggestion of Alan Kaufman, Faculty Senate Chairperson, who suggested that the department chairs could help the General Education Committee with this semester’s assessment project. The work that is submitted can be a test, a paper, a presentation, etc. A group of readers will then evaluate the work using the attached rubrics. All work should be sent by **Friday, May 8th**.

This assessment gives us an opportunity to see how well our students understand key learning concepts. Please contact me at x7525 or gfernandez@bergen.edu if you have questions.

Alan
The Essential Learning Outcomes

Beginning in school, and continuing at successively higher levels across their college studies, students should prepare for twenty-first-century challenges by gaining:

Knowledge of Human Cultures and the Physical and Natural World
- Through study in the sciences and mathematics, social sciences, humanities, histories, languages, and the arts

  **Focused by engagement with big questions, both contemporary and enduring**

Intellectual and Practical Skills, including
- Inquiry and analysis
- Critical and creative thinking
- Written and oral communication
- Quantitative literacy
- Information literacy
- Teamwork and problem solving

  **Practiced extensively, across the curriculum, in the context of progressively more challenging problems, projects, and standards for performance**

Personal and Social Responsibility, including
- Civic knowledge and engagement—local and global
- Intercultural knowledge and competence
- Ethical reasoning and action
- Foundations and skills for lifelong learning

  **Anchored through active involvement with diverse communities and real-world challenges**

Integrative and Applied Learning, including
- Synthesis and advanced accomplishment across general and specialized studies

  **Demonstrated through the application of knowledge, skills, and responsibilities to new settings and complex problems**

**Note:** This listing was developed through a multiyear dialogue with hundreds of colleges and universities about needed goals for student learning; analysis of a long series of recommendations and reports from the business community; and analysis of the accreditation requirements for engineering, business, nursing, and teacher education. The findings are documented in previous publications of the Association of American Colleges and Universities: *Greater Expectations: A New Vision for Learning as a Nation Goes to College* (2002), *Taking Responsibility for the Quality of the Baccalaureate Degree* (2004), and *College Learning for the New Global Century* (2007). For further information, see www.aacu.org/leap.
PROBLEM SOLVING VALUE Rubric

For more information, please contact value@acu.org

Definition
Problem solving is the process of designing, selecting, and implementing a strategy to answer an open-ended question or achieve a desired goal.

<table>
<thead>
<tr>
<th>Capstone</th>
<th>Milestone</th>
<th>Benchmark</th>
</tr>
</thead>
<tbody>
<tr>
<td>Define Problem</td>
<td>Demonstrate the ability to construct a clear and insightful problem statement with evidence of all relevant contextual factors.</td>
<td>Demonstrate the ability to construct a problem statement with evidence of most relevant contextual factors, and problem statement is adequately detailed.</td>
</tr>
<tr>
<td>Identify Strategies</td>
<td>Identify multiple approaches for solving the problem that apply within a specific context.</td>
<td>Identify multiple approaches for solving the problem. Only some of which apply within a specific context.</td>
</tr>
<tr>
<td>Propose Solutions/Hypotheses</td>
<td>Propose one or more rational hypotheses that addresses a deep comprehension of the problem.</td>
<td>Propose one or more rational hypotheses that addresses a deep comprehension of the problem. Hypotheses are sensitive to contextual factors as well as all of the following: ethical, logical, and cultural dimensions of the problem.</td>
</tr>
<tr>
<td>Evaluate Potential Solutions</td>
<td>Evaluation of solutions is deep and insightful for example, compares through insightful evaluation, and includes, fully and thoroughly, all of the following: explicit history of problem, sets logical reasoning, examines feasibility of solution, and weight of solution.</td>
<td>Evaluation of solutions is brief for example, comparisons light depth, and includes the following: mention history of problem, sets logical reasoning, examines feasibility of solution, and weight of solution.</td>
</tr>
<tr>
<td>Implement Solution</td>
<td>Implement the solution in a manner that addresses the diversity of solutions.</td>
<td>Implement the solution in a manner that addresses the variety of solutions.</td>
</tr>
<tr>
<td>Evaluate Outcomes</td>
<td>Evaluate results relative to the problem defined with thorough, specific considerations of need for further work.</td>
<td>Evaluate results relative to the problem defined with some consideration of need for further work.</td>
</tr>
</tbody>
</table>

AAUH
PROBLEM SOLVING VALUE Rubric

for more information, please contact value@aacc.org

The VALUE rubrics were developed by teams of faculty experts representing colleges and universities across the United States through a process that examined many existing campus rubrics and related documents for each learning outcome and incorporated additional feedback from faculty. The rubrics articulate fundamental criteria for each learning outcome, with performance descriptors demonstrating progressively more sophisticated levels of attainment. The rubrics are intended for institutional-level use in evaluating and discussing student learning, not for grading. The core expectations articulated in all 15 of the VALUE rubrics can and should be translated into the language of individual campuses, disciplines, and even courses. The utility of the VALUE rubrics is to position learning at all undergraduate levels within a basic framework of expectations such that evidence of learning can be shared nationally through a common dialog and understanding of student success.

Definition

Problem solving is the process of designing, evaluating and implementing a strategy to answer an open-ended question or achieve a desired goal.

Framing Language

Problem solving covers a wide range of activities that may vary significantly across disciplines. Activities that encompass problem-solving by students may involve problems that range from well-defined to ambiguous in a simulated or laboratory context, or in real-world settings. This rubric distills the common elements of most problem-solving contexts and is designed to function across all disciplines. It is broad-based enough to allow for individual differences among learners, yet is concise and descriptive in its scope to determine how well students have maximized their respective abilities to practice thinking through problems in order to reach solutions.

This rubric is designed to measure the quality of a process, rather than the quality of an end-product. As a result, work samples or collections of work will need to include some evidence of the individual’s thinking about a problem-solving task (e.g., reflection on the process from problem to proposed solution; steps in a problem-based learning assignment; record of think-aloud protocol while solving a problem). The final product of an assignment that required problem resolution is insufficient without insight into the student’s problem-solving process. Because the focus is on institutional level assessment, sourcing team projects, such as those developed in capstone courses, may be appropriate as well.

Glossary

The definitions that follow were developed to clarify terms and concepts used in this rubric only.

- Contextual Factor: Constraints (such as limits on cost), resources, attitudes (such as biases) and desired additional knowledge which affect how the problem can be best solved in the real world or simulated setting.
- Compares: Involves analysis and synthesis of a full range of perspectives.
- Feasible: Workable, in consideration of time-frame, functionality, available resources, necessary steps, and limits of the assignment or task.
- “Off the shelf” solution: A simplistic option that is familiar from everyday experience but not tailored to the problem at hand (e.g., holding a bake sale to “save” an underfunded public library).
- Solution: An appropriate response to a challenge or a problem.
- Strategy: A plan of action or an approach designed to arrive at a solution. (If the problem is a river that needs to be crossed, there could be a construction-oriented, cooperative (build a bridge with your community) approach and a personally oriented, physical (swim across alone) approach. An approach that partially applies would be a personal, physical approach for someone who doesn’t know how to swim.
- Support: Specific rationales, evidence, etc. for solution or rejection of solution.

Evaluators are encouraged to assign a score to any work sample or collection of work that does not meet benchmark (call one level performance).
<table>
<thead>
<tr>
<th>Category</th>
<th>Level 1</th>
<th>Level 2</th>
<th>Level 3</th>
<th>Level 4</th>
<th>Level 5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Analysis</td>
<td>Detailed analysis of data, including all relevant factors, and correct conclusions drawn.</td>
<td>Analysis that is thorough, but may lack some relevant factors. Correct conclusions drawn.</td>
<td>Analysis that is superficial, but may still be correct.</td>
<td>Analysis that is lacking in depth and misses important factors.</td>
<td>Analysis that is completely incorrect.</td>
</tr>
<tr>
<td>Interpretation</td>
<td>Correct interpretation of data, with all relevant factors considered.</td>
<td>Interpretation that is somewhat correct, but may lack some relevant factors.</td>
<td>Interpretation that is incorrect, but may still be relevant.</td>
<td>Interpretation that is lacking in depth and misses important factors.</td>
<td>Interpretation that is completely incorrect.</td>
</tr>
<tr>
<td>Conclusion</td>
<td>Correct conclusion drawn from the analysis and interpretation.</td>
<td>Conclusion that is somewhat correct, but may lack some relevant factors.</td>
<td>Conclusion that is incorrect, but may still be relevant.</td>
<td>Conclusion that is lacking in depth and misses important factors.</td>
<td>Conclusion that is completely incorrect.</td>
</tr>
<tr>
<td>Application</td>
<td>Application of the results to real-world situations.</td>
<td>Application that is somewhat correct, but may lack some relevant factors.</td>
<td>Application that is incorrect, but may still be relevant.</td>
<td>Application that is lacking in depth and misses important factors.</td>
<td>Application that is completely incorrect.</td>
</tr>
<tr>
<td>Reflection</td>
<td>Reflection on the process and the results.</td>
<td>Reflection that is somewhat correct, but may lack some relevant factors.</td>
<td>Reflection that is incorrect, but may still be relevant.</td>
<td>Reflection that is lacking in depth and misses important factors.</td>
<td>Reflection that is completely incorrect.</td>
</tr>
</tbody>
</table>
QUANTITATIVE LITERACY VALUE RUBIC

The VALUE rubrics were developed by teams of faculty experts representing colleges and universities across the United States through a process that examined many existing campus rubrics and related documents for each learning outcome and incorporated additional feedback from faculty. The rubrics articulate fundamental criteria for each learning outcome, with performance descriptors demonstrating progressively more sophisticated levels of attainment. The rubrics are intended for institutional-level use in evaluating and discussing student learning not for grading. The core expectations articulated in all 15 of the VALUE rubrics can and should be translated into the language of individual campuses, disciplines, and even courses. The utility of the VALUE rubrics is to position learning at all undergraduate levels within a basic framework of expectations such that evidence of learning can be shared nationally through a common dialog and understanding of student success.

Definition
Quantitative Literacy (QL)—also known as Numeracy or Quantitative Reasoning (QR)—is a “habit of mind,” competency, and comfort in working with numerical data. Individuals with strong QL skills possess the ability to reason and solve quantitative problems from a wide array of authentic contexts and everyday life situations. They understand and can create sophisticated arguments supported by quantitative evidence and they can clearly communicate those arguments in a variety of formats (using words, tables, graphs, mathematical equations, etc., as appropriate).

Quantitative Literacy Across the Disciplines
Current trends in general education reform demonstrate that faculty and other stakeholders are recognizing the steadily growing importance of Quantitative Literacy (QL) in an increasingly quantitative and data-dense world. AAC&U’s recent survey showed that concerns about QL skills are shared by employers, who recognize that many of today’s students will need a wide range of high-level quantitative skills to complete their work responsibilities. Virtually all of today’s students, regardless of career path, will need skills such as the ability to draw information from charts, graphs, and geometric figures, and the ability to accurately complete straightforward estimations and calculations.

Preliminary efforts to find student work products which demonstrate QL skills proved a challenge in this rubric creation process. It’s possible to find pages of mathematical problems, but what those problems set, don’t demonstrate is whether the student was able to think about and understand the meaning of her work. It’s possible to find research papers that include quantitative information, but those papers often don’t provide evidence that allows the evaluator to see how much of the thinking was done by the original source (often carefully cited in the paper) and how much was done by the student herself, or whether conclusions drawn from analysis of the source material are even accurate.

Given widespread agreement about the importance of QL, it becomes incumbent on faculty to develop new kinds of assignments which give students substantive, contextualized experience in using such skills as analyzing quantitative information, representing quantitative information in appropriate forms, completing calculations to answer meaningful questions, making judgments based on quantitative data and communicating the results of that work for various purposes and audiences. As students gain experience with these skills, faculty must develop assignments that require students to create work products which reveal their thought processes and demonstrate the range of their QL skills.

This rubric provides for faculty a definition for QL and a rubric describing four levels of QL achievement which might be observed in work products within work samples or collections of work. Members of AAC&U’s rubric development team for QL hope that these materials will aid in the assessment of QL—but, equally important, we hope that they will help institutions and individuals in the effort to more thoroughly embed QL across the curriculum of colleges and universities.

Framing Language
This rubric has been designed for the evaluation of work that addresses quantitative literacy (QL) in a substantive way. QL is not just computation, nor just the citing of someone else’s data. QL is a habit of mind, a way of thinking about the world that relies on data and on the mathematical analysis of data to make connections and draw conclusions. Teaching QL requires us to design assignments that address authentic, data-based problems. Such assignments may call for the traditional written paper, but we can imagine other alternatives: a video of a PowerPoint presentation, perhaps, or a well-designed series of web pages. In any case, a successful demonstration of QL will place the mathematical work in the context of a full and robust discussion of the underlying issues addressed by the assignment.

Finally, QL skills can be applied to a wide array of problems of varying difficulty, confirming the use of this rubric. For example, the same student might demonstrate high levels of QL achievement when working on a simplistic problem and low levels of QL achievement when working on a complex problem. Thus, to accurately assess a student’s QL achievement it may be necessary to measure QL achievement within the context of problem complexity, much as is done in diving competitions where two scores are given, one for the difficulty of the dive, and the other for the skill in accomplishing the dive. In this context, that would mean giving both scores for the complexity of the problem and another score for the QL achievement in solving the problem.

Definition
Quantitative Literacy (QL)—also known as Numeracy or Quantitative Reasoning (QR)—is a “habit of mind,” competency, and comfort in working with numerical data. Individuals with strong QL skills possess the ability to reason and solve quantitative problems from a wide array of authentic contexts and everyday life situations. They understand and can create sophisticated arguments supported by quantitative evidence and they can clearly communicate those arguments in a variety of formats (using words, tables, graphs, mathematical equations, etc., as appropriate).

Examiners are encouraged to assign a zero to any work sample or collection of work that does not meet benchmark (all sub) level benchmarks.