

# **Evaluating General Education: Using a “Home Grown” Student Performance Assessment**

Jeana M. Abromeit, Ph.D.  
Chair, Council for Student Assessment  
Vice President for Academic Affairs  
Alverno College – Milwaukee, Wisconsin

1/9/12

In this paper, I describe a new external assessment that Alverno College faculty created and implemented to evaluate the effectiveness of general education. Through the leadership of the Council for Student Assessment, an interdisciplinary team of faculty developed the Mid-Program General Education Assessment, AC 309, to give students an opportunity to transfer and integrate their learning from courses in general education and their major/minor that focus on math, science, and/or the abilities of quantitative literacy, analysis, or problem solving. In other words, students have already successfully passed the prerequisite courses. In AC 309, can they successfully transfer and integrate that learning? The assessment also includes a substantive self assessment component in which students review and reflect on their past performances in order to identify learning goals and plans that can help them strengthen their knowledge and abilities in the future. Success in this assessment is a requirement for graduation. We piloted the assessment in the Fall 2009 semester, began implementing it in the Fall 2010 semester, and had our first faculty workshop involving student performance data results in November 2011.

## **Student Learning Outcomes and Assessment at Alverno**

For nearly forty years, faculty at Alverno College have been developing and implementing a curriculum based on student learning outcomes (i.e., an ability based curriculum). One of the graduation requirements is that all undergraduate students demonstrate eight abilities characterizing the liberal arts graduate. The specific abilities (or student learning outcomes) identified by our faculty as central to our approach to liberal arts and professional education are:

- Communication (includes Quantitative Literacy, Writing, Speaking, Reading, Listening)
- Analysis
- Problem solving
- Valuing in decision-making
- Social interaction
- Developing a global perspective
- Effective citizenship
- Aesthetic engagement

We specify learning outcomes at three levels – institution-wide (the 8 Abilities), program, and course. The institution-wide outcomes are integrated into the program outcomes; one or more program outcomes are directly linked to each course (and course outcomes); and each assessment in a course is tied to one or more course outcomes.

For each developmental level of the Abilities, we create generic criteria. These criteria are not tied to specific courses. Rather, they provide the faculty with a standard for: 1) creating more

explicit performance criteria in language appropriate to the context of specific courses and disciplines; 2) creating criterion-referenced rubrics; and 3) judging and certifying that the student has demonstrated the ability at a particular developmental level.

Our design of courses requires that students develop and demonstrate abilities in the context of disciplinary knowledge. However, we define the 8 Abilities generically into six pedagogically developmental levels. If students are to develop the Abilities, the Abilities need to be defined in a way that our teaching of them can be pedagogically developmental. Developmental Levels 1-4 correspond to general education and to beginning and intermediate levels in the major and minor areas of study; developmental Levels 5-6 correspond to advanced-level, specialized work in the major and minor areas.

For us at Alverno, *program assessment* is distinguished from *student assessment-as-learning*. We view the former as a process that yields general, aggregate patterns of student and alumna learning, development, and performance on a range of educational outcomes. (For more information on how Alverno faculty/staff approach program and institutional evaluation of our curriculum, see Mentkowski and Associates 2000, as well as Loacker and Rogers 2005.)

As a context for evaluating student demonstration of abilities, we developed the concept of *student assessment-as-learning* (student assessment) as “a multidimensional process, integral to learning, that involves observing performances of an individual learner in action and judging them on the basis of public developmental criteria, with [self assessment and] resulting feedback to the learner” (Alverno College Faculty, 1979/1994, p. 6). Student assessments at Alverno are embedded in every college and pre-college course and contribute to various kinds of learning at different levels of practice (i.e., institutional, program, course, individual learner). At each level of practice, assessment provides student performance data to be used for the improvement and evaluation of learning. It is performance data to be used, depending on the level, primarily by the student for ongoing learning; by the instructor for the student’s learning; by the instructor for reflection on his/her teaching; by faculty, staff, and administrators for deliberation on the curriculum and co-curriculum; and eventually by wider publics to critically examine student learning outcomes. This assessment practice keeps us, as a College, accountable to students, each other, the academic community, and to other stakeholders.

### **Essential Characteristics of External Assessment**

Some assessments are conducted in class; others, such as AC 309, are more “external”: that is, they constitute outside validity checks on students’ cumulative development in area(s) of study, often involving complex, real-life tasks that are evaluated by community volunteers. Faculty and community volunteers serve as assessors for AC 309.

Following is a brief summary of the characteristics of external assessments at Alverno College.

1. The external assessment must give students an opportunity to **transfer** knowledge and abilities across courses and over time to demonstrate the student learning outcomes being assessed.
2. The external assessment must give students an opportunity to **integrate** knowledge and abilities across courses and over time to demonstrate the student learning outcomes being assessed.
3. The assessment design, performance, and feedback help the student broaden her/his perspective beyond the immediate assessment context to consider future roles in the discipline, profession, and personal/civic life.
4. The assessor role is to: a) judge a self-contained performance based on public criteria; and b) make judgments independently, without reference to the student's past performance or consideration of future consequences. The course instructor is not the sole assessor for course-based external assessments.
5. The results of the assessment have consequences for student progress in the curriculum beyond a particular assessment. For example, the student may be required to re-take the external assessment, meet with the advisor, create a learning plan, receive additional instruction, obtain tutoring, or complete a supplementary assignment.
6. The results of external assessments enable improvement in student learning and institutional effectiveness.

### **Overview of AC 309 Processes**

The Council for Student Assessment took the lead in advocating for, conceptualizing, managing, and administering AC 309. We collaborated with academic Deans to obtain the essential faculty who served on the assessment design team. Throughout the process, the Council collaborated with many faculty, Discipline and Ability Departments, and administrative departments across the College. We also held several informational sessions for faculty about this assessment prior to the fall 2009 pilot. We have been training assessors since early fall of 2009 and have been evaluating each training session and assessment "experience." We fully implemented AC 309 in the 2010-2011 academic year.

We designed this mid-program external assessment so that it focuses on a narrow cluster of content knowledge and Abilities. We plan to change the content/focus of the assessment when we are reasonably satisfied with students' demonstrations of integration and transfer of learning. Drawing on academic literature on action research, this typically takes 3-5 action research cycles. We expect to change the assessment every 3-4 years. Within 12 years or so, we anticipate that all eight of Alverno's institutional abilities and a variety of discipline-based content will have been assessed.

For the initial AC 309, we decided to focus on scientific reasoning, quantitative literacy, analysis, and problem solving. Our rationale was based on faculty observations of students'

challenges with quantitative and scientific literacy. Our experiences are similar to concerns expressed at the national level and reflect the call for greater emphasis on science, technology, engineering and math education (STEM). The AC 309 Assessment concentrates on quantitative literacy and scientific reasoning because they are essential for students to be prepared for 21<sup>st</sup> century challenges. The assessment was designed with the idea that students would take it in their 4<sup>th</sup> or 5<sup>th</sup> semester – early enough so that any necessary remedial work could be accomplished before the students graduated.

The design team discussed several topics but finally agreed on focusing the assessment on bottled water. This issue fits with the abilities being assessed and it is relevant to students' daily lives, regardless of their major. Information about some of the controversies pertaining to bottled water is presented during the assessment. Students have an opportunity to examine their own practices regarding bottled water. After considering data and other information about bottled water, students are asked to discuss implications for their personal decisions regarding water. In other words, how will their analysis of the information and their use of the scientific method help them make informed decisions regarding their own behavior?

The goals of the assessment are to: 1) foster student learning; 2) provide students with opportunities for self assessment, which includes creating learning goals and plans that can help them strengthen their knowledge and abilities in the future; 3) assess students' capacity to integrate and transfer their learning across courses and over time; and 4) use performance data from the assessment to collectively evaluate, as a corporate faculty, student development of abilities and content knowledge and to make needed curricular improvements (or any other improvements deemed necessary).

Throughout the process, we collaborated with many faculty, academic and ability departments, and administrative departments across the College. We have been keeping detailed documentation of our processes and decisions, partly for validity purposes and partly for creating a more efficient process for the next iteration of the assessment. In addition, last summer we conducted an inter-rater reliability study in which two trained assessors independently assessed 40 randomly selected student assessments and then compared their judgments with each other and with the original assessors.

In the fall 2011, members of the Council for Student Assessment collaborated with members of Alverno's Educational Research and Evaluation department to analyze the student performance data and disaggregate results by subpopulations (e.g., School, Division, Department, weekend college vs. weekday college, high vs. low transfer credits, completion of science courses at Alverno vs. other academic institution, year in college, etc.). In November 2011 we held a workshop with all faculty; the Senior Vice President for Academic Affairs made a poignant case for the importance of the work and our collective opportunity to improve student learning. We gave the faculty summaries of student performance data relevant to their programs. We also gave them the handout, "Possible Questions You Might Discuss as You Explore Implications of AC 309 Student Performance Data" (see below). In addition, we asked each department (or Division or School) to create action plans for improvement. See below for "Faculty Workshop on AC 309 Student Performance Data." This semester, members of the Council for Student Assessment will be following up with departments/divisions/schools and Academic Affairs.

**Possible Questions You Might Discuss as you Explore Implications of  
AC 309 Student Performance Data**

- a. What are the strengths of our majors and what are they struggling with? How might AC 309 data inform our ongoing curriculum discussions?
- b. Within the major, in what ways are we reinforcing what students are learning about quantitative literacy and scientific reasoning in their general education courses?
- c. How are we teaching and assessing for Quantitative Literacy Levels 3 and 4? These levels are taught within the majors.
- d. How are abilities being taught and assessed in a developmental manner in our program? For example: where do students generally get their first and second Analysis L3, Problem Solving Level 3 or Quantitative Literacy Level 3 validations and how far are they in their curriculum when they generally achieve these validations?
- e. One of the main places students seek evidence for their development of abilities is the DDP. How many and what kinds of key performances need to be included for students to draw sufficient evidence from performances, self assessments, and peer/instructor feedback so students can make generalizations about their problem solving, analysis, and quantitative literacy development at mid-program?
- f. What are some implications for the general education program? For example, might the faculty decide to create a standing committee for dealing with issues related to general education?
- g. How are we helping students fully develop their self assessment skills?
- h. Are there particular advising practices that help or hinder student success on their first attempt at AC309?
- i. What other questions do we have about the student performance data in our school/division/department?

**Faculty Workshop on AC 309 Student Performance Data**

Please complete one form for your Department, Division or School and leave it on the table.

- Regarding patterns of performance on AC 309, what are the strengths of your majors and what are they struggling with? How might AC 309 data inform your ongoing curriculum discussions?
- What next steps have you identified for your work as a department, division, or school?
- What other topics/questions/issues does your department/division/school wish to address/raise/vent?

Name: \_\_\_\_\_ Division or School \_\_\_\_\_

**Thank you!**

Members of the Council for Student Assessment will review your response in order to guide our future work, including any follow-up that you might request.

This paper concludes with a short description of the AC 309 assessment, which includes the assessment outcomes and criteria, a very truncated version of the Abilities and Developmental Levels being assessed, and the list of prerequisites. Lastly, I have inserted the version of Part 1 and Part 2 of the Self Assessments that students receive.

If you would like to discuss this assessment further, feel free to contact me.

E-mail: [jeana.abromeit@alverno.edu](mailto:jeana.abromeit@alverno.edu) or 414 382-6261

### **Brief Description of the AC 309 Assessment**

**Prior to the assessment day**, students are expected to complete some preliminary analysis of their current practices regarding bottled water, by using basic mathematical skills. They also do an initial self assessment in which they reflect on what and how they are learning in terms of math and science and the abilities of quantitative literacy, problem solving, and analysis. They consider and assemble relevant materials (self assessments, feedback, and peer feedback) in related courses they have taken at Alverno or elsewhere, as well as learning they have had in other settings. After analyzing the materials, they identify 1-2 strengths or areas in which they have improved in Analysis, Problem Solving and/or Quantitative Literacy in the context of science and math. They also identify 1-2 areas still needing improvement.

**On assessment day**, students watch a 7-minute film on bottled water and respond to some questions. They are given two tables of data on contaminants found in bottled water and Milwaukee water. Their task is to accurately analyze, interpret, and create representations of the data. Further, to show their scientific reasoning, they are expected to use the data to articulate a research question and hypothesis that examine relationships between contaminants in bottled water and Milwaukee water. They are asked to present their analysis of the data by showing how their hypothesis is supported or refuted. Then they are prompted to reflect on the implications of their analyses for their personal decisions regarding bottled water, as well as implications at the local, national or global levels.

Their final step is to conduct a **self assessment** in which they evaluate how well they performed, make comparisons to their initial self assessment, and develop a plan to improve their quantitative literacy, problem solving, or analysis ability over the next two semesters. They **meet with their external assessor** to discuss their performance on the assessment and to fine-tune their learning goal and plan. Self assessments and feedback will be uploaded to the Diagnostic Digital Portfolio.

### **Assessment Outcomes and Criteria**

Simply put, outcomes are statements that indicate what we expect students to be able to do with what they have learned. In the assessment students have the opportunity to demonstrate what they have learned in prior courses (especially prerequisite courses) and other experiences as they integrate and transfer their learning in this assessment. The specific outcomes and criteria follow.

- Outcome #1:** Accurately interpret and create representations of quantitative data.
- Criterion 1:** Correctly illustrate data using a spreadsheet.
  - Criterion 2:** Accurately solve quantitative problems involving arithmetic, percentages, ratios, and descriptive statistics.
  - Criterion 3:** Accurately interpret quantitative information, including how data are related to each other.
- Outcome #2:** Critically evaluate data and make meaningful relationships among multiple sources of information about scientific questions.
- Criterion 4:** Create a researchable question and relevant hypothesis.
- Outcome #3:** Effectively evaluate a data-driven problem-solving process.
- Criterion 5:** Use basic quantitative abilities to accurately interpret quantitative information, evaluate arguments, and make reasonable conclusions.
  - Criterion 6:** Make reasonable inferences about how representations of data affect your thinking.
- Outcome #4:** Clearly articulate connections between present performance and ongoing development of own abilities.
- Criterion 7:** Logically evaluate own analytic, quantitative, and problem solving abilities and create purposeful goals for ongoing development.

### **Brief Descriptions of Abilities and Developmental Levels in AC 309**

Following are brief descriptions of the Abilities and developmental Levels being assessed in the AC 309 Mid-Program General Education Assessment (Ability-Based Learning Program, 1973/2010):

**Communication-Quantitative Literacy Level 2:** Interprets math models such as formulas, graphs, and tables and draws reasonable inferences from them; constructs graphs and applies concepts of measurement systems and conversions.

**Communication-Quantitative Literacy Level 3:** Thinks critically about her own and others' use of quantitative information and language; shows awareness of the assumptions behind quantitative information; shows awareness of the use/misuse of quantitative information. [This is a "stretch" opportunity; demonstration is not necessary to be successful on AC 309.]

**Analysis Level 3:** Uses disciplinary concepts and frameworks with growing understanding; perceives and makes relationships.

**Problem Solving Level 3:** Takes thoughtful responsibility for process and proposed solutions to problems; performs all phases or steps within a disciplinary problem solving process, including evaluation and real or simulated implementation.

## Prerequisites

Weekday College	Weekend College
<ul style="list-style-type: none"> <li>• <u>CM 156 Q</u> Mathematical Connections or <u>CM 176 Q</u> Mathematical Connections for Educators, which results in CM Quant Lit L2</li> <li>• <u>CM 212</u> Integrated Communication Seminar III: Strategies and Sources</li> <li>• <u>SC 118</u> Integrated Science 2 or <u>SC 120</u> Foundations for Natural Sciences II</li> <li>• Level 3 Analysis completed</li> <li>• Level 3 Problem Solving completed</li> </ul>	<ul style="list-style-type: none"> <li>• <u>CM 156 Q</u> Mathematical Connections or <u>CM 176 Q</u> Mathematical Connections for Educators, which results in CM Quant Lit L2</li> <li>• <u>CM 114</u></li> <li>• <u>LA 282</u>, <u>LA 283</u>, or <u>LA 284</u> completed</li> <li>• Level 3 Analysis completed</li> <li>• Level 3 Problem Solving completed</li> </ul>

## Part I – Initial Self Assessment

This purpose of this self assessment is to help you reflect on what and how you are learning in the areas of math and science. **This self assessment must be completed before you take the AC 309 assessment.**

1. Analyze your experience in your **math** and **science** courses and any other courses offering validations in **Quantitative Literacy, Problem Solving, or Analysis**. Look for patterns in your learning from trends in assessor comments and self assessments.

The following list offers some resources for this process:

- The Validations Matrix and Completed Courses sections of IOL
  - Assessments, self assessments, and feedback from these courses. The Diagnostic Digital Portfolio may be a helpful place to review your key performances.
  - Courses you have taken elsewhere
  - Math and science learning you have had in other settings
2. In a 1-page, typed document, titled and saved as "Initial Self Assessment", respond to the following:
    - a) Describe the patterns you found in your learning from trends in assessor comments and self assessments.



- b) Identify 1 or 2 areas where you have shown strength or improvement in math or science in any of the following abilities: Analysis, Problem Solving and/or Quantitative Literacy. If you showed similar improvements in non-science courses, include them. Share examples/evidence to support your statements.
  - c) Identify 1-2 areas still needing improvement in Analysis, Problem Solving and/or Quantitative Literacy in the context of math and science. Share examples/evidence to support your statements.
3. Assign AC 309 to yourself in the Diagnostic Digital Portfolio. Then upload your "Initial Self Assessment" **to the Work area in your AC309 key performance.**
  4. Print and bring 2 copies of your "Initial Self Assessment" to the AC 309 Mid-Program General Education Assessment.

Your self assessment will be evaluated by your external assessor using the following **criteria**:

1. Draws relevant conclusions regarding themes/patterns in past performances.
2. Provides convincing examples/evidence to support statements.

## Part 2 -- Self Assessment

**Your Full Name** \_\_\_\_\_ **Student ID** \_\_\_\_\_

Your final step is to evaluate how well you performed. The criteria for that performance follow.

- Correctly illustrate data using a spread sheet.
- Accurately solve quantitative problems involving arithmetic, percentages, ratios, and descriptive statistics.
- Accurately interpret quantitative information, including how data are related to each other.
- Make reasonable inferences about how representations of data impact your thinking.
- Create a researchable question and relevant hypothesis.
- Make reasonable interpretations of quantitative data and recognize patterns in the data.
- Use basic quantitative abilities to accurately interpret quantitative information, evaluate arguments, and make reasonable conclusions.
- Logically evaluate own analytic, quantitative, and problem solving abilities and create purposeful goals for ongoing development.

*You now have 45 minutes to complete the remainder of the self assessment. During this time you may be called for your oral feedback. When you are called, be sure to save your document but do not upload it; after you receive your oral feedback, continue to work on your self assessment.*

**Please answer both parts of question #1, providing evidence from your assessment.**

1. Using the criteria listed above:
  - a. Identify one criterion you did well on and explain. Support your statements with evidence.
  - b. Identify one criterion you struggled with and explain. Support your statements with evidence.
2. How does your performance in this assessment relate to what you observed in your “Initial Self Assessment”?
3. From your experience in this assessment, choose one of the abilities (Quantitative Literacy, Problem Solving, or Analysis) that you need to improve. Develop a plan to improve that ability over the next two semesters. Create the plan and include the following items in it.
  - a. Which ability have you chosen and what are your reasons for choosing this ability?
  - b. What is your goal?
  - c. What do you need to know and be able to do to reach your goal?
  - d. What resources do you need to reach your goal?
  - e. How will you know when you have reached your goal?

Your self assessment should meet the following **criteria**:

- Makes accurate judgments of performance on the basis of the criteria
- Provides convincing examples/evidence to support statements
- Makes meaningful, specific connections between “Initial Self Assessment” and today’s performance
- Creates a realistic plan incorporating a purposeful goal

## References

- Ability-Based Learning Program. (1973, revised 1980, 1983, 1985, 1988, 1991, 1992, 1993, 1994, 1996, 2000, 2002, 2005, 2010). Milwaukee, WI: Alverno College Institute.
- Alverno College Faculty. (1976, revised 1981, 1985, 1989, 1992, and 2005). *Ability-based learning outcomes: Teaching and assessment at Alverno College*. Milwaukee, WI: Alverno College Institute.
- Alverno College Faculty. (1979, revised 1985, 1994). *Student assessment-as-learning at Alverno College*. Milwaukee, WI: Alverno College Institute.
- Hutchins, P., & Marchese, T. (1990, July/August). Watching assessment: Questions, stories, prospects. *Change*. 22(5), 12-38.
- Loacker, G., & Rogers, G. (2005). *Assessment at Alverno College: Student, program, institutional*. Milwaukee, WI: Alverno College Institute.
- Mentkowski, M. & Associates. (2000). *Learning that lasts: Integrating learning, development, and performance in college and beyond*. San Francisco: Jossey-Bass.