

***Assessing Student Learning Outcomes Across
a Curriculum for
Individual Student Development and Integrated
Programme-Focused Assessment***

Marcia Mentkowski

*Jeana Abromeit, Heather Mernitz, Kelly Talley, Catherine Knuteson,
William Rickards, Lois Kailhofer, Jill Haberman, & Suzanne Mente*

Alverno College

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Learning

Outcomes/Capabilities/Abilities

- Staff from across the disciplines and professions have already come to consensus on broad student learning outcomes/abilities: communication, analysis, problem solving, social interaction, valuing in decision-making...
- Abilities are pedagogically-developmental: beginning, intermediate, advanced
- Staff engage in continual revision: 13 published revisions since 1973
- Revision is institutionalized: regular meetings of Discipline and Professional Departments; regular meetings of Ability Departments
- Each Ability Department has membership from across disciplines and professions

Purposes: Mid-Programme Assessment

Staff assessors judge whether and how well

- students *integrate knowledge constructs and role performances: students do what they know*
 - students *apply, use, adapt, and transfer curriculum learning outcomes* across modules and over time, to an unfamiliar situation, in an outside-of-class / across-modules assessment
- 1) Each individual student is to be learning during the assessment
 - 2) Programme evaluation of scientific reasoning, quantitative reasoning, analysis, problem solving

Properties: Mid-Programme Assessment

Alverno definition of abilities:

Students' integration of knowledge constructs (subjects) and role performances (skills) that are taught for learning, transferred across curriculum, co-curriculum, and beyond. Student role: Citizen

- Problem-based
- Curriculum-embedded
- Students have already demonstrated learning outcomes/abilities in courses/modules
- Flexible administration at completion of two years of college and/or beginning modules in professions

Why undertake the costs?

“Too many of our students avoid using quantitative evidence to make arguments, even when it is right in front of them.”

Robert Birney Professor of Business and Management and Program Director, Marketing and Management

Why not give a standardized test of quantitative literacy instead?

- Staff need level of literacy for students in their department, but also which math and science problems they did/did not master
- The role performance is “using quantitative evidence to make arguments.” What kinds of arguments?

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Why not give a standardized test of quantitative literacy instead?

Professional school instructors would still not know what to expect. An “off-the-shelf” test would not provide specific evidence for the kinds of arguments students were taught to make. Professors faculty could not judge **whether students could transfer** their quantitative literacy skills to arguments they had not been taught.

Why not give a standardized test of quantitative literacy instead?

- Faculty need level of literacy for students in their department, but also which math and science problems they did/did not master.
- Faculty would not have specific evidence for students in their department on how well they integrated and transferred knowledge and abilities in performance.

Quantitative literacy needs to be integrated with faculty-designed math and science coursework

A citizen's role performance is "using quantitative evidence to make arguments." What kinds of arguments? Example: Can they support hypotheses with well-reasoned evidence?

Procedures

- Cross-disciplinary assessment design team optimized expertise in disciplines and design
- Team identified module learning outcomes and assessments that elicited student demonstration of scientific reasoning (knowledge constructs) integrated with quantitative literacy, analysis, and problem solving (role performances) across science and math curriculum during first two years of college
- Team gave module learning outcomes to departments
- Each department came to consensus on opportunities to learn: Reviewed pre-requisite modules while instrument was being designed

Mid-Programme-Focused Assessment

- Part 1. Student pre-work: 1) Do initial self assessment across prior modules and staff feedback across prior modules; develop strengths, weaknesses, and learning plan. 2) Use exercises in graphing, and math, to display personal use of bottled water.
- Part 2. Day of assessment: View film. Create research question, hypothesis: test it using national/local water data, interpret results. Met hypothesis? Complete final self assessment. Assessor reviews pre-work, self assessment, research question/hypothesis, evidence cited. Assessor comes to judgment based on pattern of *criteria met, partially met, not met*. If student did not succeed, coach confirms. Assessor meets each student for feedback and they interact around learning plan.

Establishing Validity of Assessor Judgment

- Instrument piloted in fall 2009 with students promised a “succeed”
- **Assessment experts designed training**
- 15 staff fellowships to serve as evaluators of assessor training sessions (\$100/person) and to assess the first student group (fall 2010)
- **Educational researchers recorded and categorized staff questions during 6 sessions for a policy and procedures document**
- Assessment experts resolved questions across time using action research; gave feedback

Validity/Reliability Findings Across Time

- Trained 52 staff assessors interactively across disciplines/professions
- Some assessors identified validity and reliability issues that were independently identified by a subgroup of experts in assessment/educational research
- **Except this issue:** Humanities staff insisted on attention to consequential validity Messick, 1980,1994
- **Rationale:** Students need to become competent whether or not they succeed on a mid-program assessment
- **Result:** Intervention workshop and re-assessment created for those who did not succeed

- Assessment subgroup interactively revised criteria based on student performances
- Inter-judge agreement was 95% for random sample (n=204) of student performances (succeed/did not succeed)
- 77% of students succeeded on the first assessment: disciplines/professions used a year's student performance data for programme assessment by department on November 18, 2011
- 79 assessors from disciplines in the liberal arts and professional schools have assessed;
- 4 of 457 students did not pass first assessment or re-assessment. Next step: Advisor discussions

Conditions That Limit Generalizability

- Assessment Council subgroup revised criteria interactively with each other, they confirmed criteria with staff assessors during training
- STEM staff interacted with professions staff during training about where they taught what, and when (dealt with the “but did you teach it?” question)
- Assessor training was based on when individual staff chose to attend: this ensured a mix of staff from across disciplines and professions
- During the first two years of college, most staff who teach STEM modules teach future professional school students
- Support from Educational Policies Committee

Insights from the Student Learning Initiative

- Performance assessments embedded in a curriculum encourage collaborative inquiry by staff about how students integrate knowledge constructs [**scientific reasoning across science, math modules**] and role performances [**quantitative literacy, analysis, problem solving as citizen**]. Later, these students can integrate a range of learning outcomes and gradually transfer them across curriculum, co-curriculum, and internships.

71 staff or administrator participants from 26 institutions
Student Learning Initiative, 2002, p. 3.

Student Learning Initiative

- Alverno College
- Avila College
- Birmingham-Southern College
- Bowling Green State University
- California State University, Fullerton
- California State University, Monterey Bay
- Central Missouri State University
- Clayton College and State University
- DePaul University School for New Learning
- Fort Valley State University
- Huston-Tillotson College
- Indiana University of Pennsylvania
- Indiana University Purdue University, Indianapolis
- James Madison University
- Niagara University
- North Carolina State University
- Olivet College
- Rivier College
- Rose-Hulman Institute of Technology
- Samford University
- Seton Hill College
- State University of New York College at Fredonia
- Truman State University
- University of Alaska Southeast
- University of Washington
- University of Wisconsin-La Crosse

**71 participants from 26 institutions funded by
The PEW Foundation**

Insights from the Student Learning Initiative

Student Assessment-as-Learning

- Is integral to teaching and learning
- Is designed by staff to determine each student's degree of success in module or programme
- Provides opportunity for students to apply their knowledge and skill in integrated performances in varied settings
- Involves expert observation and judgment in relation to explicit criteria/rubrics
- Involves diagnostic and prescriptive feedback combined with a student's own self assessment to strengthen future performance

Insights from the Student Learning Initiative

Program, Curriculum, and Institution-Wide Assessment

- Is integral to learning about student learning
- Creates processes that assist faculty, staff, and administrators to improve student learning
- Involves inquiry to judge programme value and effectiveness for fostering student learning
- Generates multiple sources of feedback to staff, staff, and administrators about patterns of student and alumni performance in relation to learning outcomes that are linked to curriculum
- Makes comparisons of student and alumni performance to standards, criteria, or indicators (faculty, disciplinary, professional, accrediting, certifying, legislative) to create public dialogue
- Yields evidence-based judgments of how students and alumni benefit from the curriculum, co-curriculum, and other learning contexts
- Guides curricular, co-curricular, institution-wide improvements

26 Institutions

(Student Learning Initiative, 2002, p. 22)

Alverno Abilities/Learning Outcomes

- Involve the whole person
- **Are teachable**
- Can be learned and assessed
- **Are integrated within subjects taught and skills learned in disciplines and professions**
- Can be adapted for transfer across settings
- **Are continually re-evaluated and re-defined in the context of new theories and practices**
- Are required for graduation

Alverno Abilities: Meaning, Context, and Assessment

- **Abilities are complex capacities of the person**
 - Multiple dimensions with multiple criteria for a picture of an ability
- **Abilities are defined in pedagogical/developmental levels of performance**
 - Beginning, intermediate, advanced levels
- **Abilities are taught, learned, and assessed across multiple contexts**
 - General education, disciplines, professions, internships
- **Abilities become metacognitive strategies that assist learners to connect knowing and doing, reasoning and performance**
 - Connect education, work, personal life, and citizenship

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Thank you for your attention