Assessment at Penn State Panel Discussion

FACILITATOR: KAREN POLLACK

PANEL: ANDY COLE, JACKIE EDMONDSON, TANYA FURMAN, MAGGIE SLATTERY, AND MICHAEL VERDERAME
ASSESSMENT EXERCISE

FACILITATOR: SUZANNE WEINSTEIN
BREAK
INNOVATIVE PRACTICES PANEL DISCUSSION

FACILITATOR: BETTY HARPER

PANEL: PETER HEANEY, NELS SHIRER, AND BARBARA WIENS-TUERS
Guiding Principles

1. Faculty driven: Administratively supported
2. Educate faculty and staff
3. Start small and build on success
4. Promote competency and comfort with assessment
5. Creating a culture of assessment takes time and sustaining a culture of assessment takes more time.
EMS Assessment Strategy

- Identify relationship between learning objectives and courses:
  - Program objective ← Course objective ← Course assignment/test
  - Choose appropriate assignments/test questions

- Identify assessment method:
  - Quantitative (scores on assignments or tests)
  - Mixed qualitative/quantitative (rubrics)
  - Pick method that fits assignment chosen

- Can focus on attainment of knowledge
  - Within one semester
    - Relevant course assignment(s) or quiz/mid-term question(s)
    - Pre- and post-tests between beginning and ending of a course
  - From one semester to another
    - Test of retention of material presented in prerequisite course(s) at the beginning of a subsequent course
Example: Assignment Within One Semester

• Energy and Sustainable Policy BA (online degree)
  • EME/GEOG 432 Energy Policy course
    • Maps to program learning objective: *Graduates will be able to explain the consequences of energy policy and regulation*
  • Policy briefing assignment chosen
    • One-page brochure/flyer
    • Narrated 5-7 minute PowerPoint presentation
  • 3 faculty reviewers used 5-point Likert scale (0—does not meet criteria through 4—exceeds criteria) rubric to assess:
    • Engaging the Audience
    • Demonstrating Content Expertise
    • Communicating Effectively
    • Overall
  • One result indicated that brochures did not meet expectations
  • Changes in course implemented this spring to discuss best practices in brochure creation
Example: Retention of Prerequisite Material from One Semester to Another

• Materials Science and Engineering
  • MATSE 201 prerequisite for MATSE 413
    • Maps to program learning objective: *Graduates will be able to apply knowledge of mathematics and advanced science and engineering principles to materials systems*
  • 13-question quiz given at beginning of MATSE 413
  • Eight questions from midterm 1 that was given in MATSE 201
  • Additional questions examined material from other prerequisite courses for MATSE 413
  • Performance on some questions indicated that some assumed prerequisite material was not covered
  • More time will be devoted to some topics in MATSE 201
  • Additional review and practice of prerequisite material in MATSE 413 will be done to solidify mastery of the foundational topics
Learning Objectives: Geosciences BS

4. To produce graduates who possess the ability to pose questions, collect and interpret data, and solve geologic problems, communicating the results of this scientific inquiry through writing and speaking.
Geosciences Senior Thesis Evaluation Rubric for Advisors

Rating (1-Low; 5-High)

___ Rationale: Has the student stated the problem clearly?

___ Literature Review: Has the student placed the research in the context of the existing literature on the topic?

___ Methods: Does the student’s data collection reflect careful, thoughtful work in the lab and/or the field?

___ Results: Has the student separated observations from interpretations?

___ Discussion: Are the student’s interpretations justified by the data?

___ Conclusions: Is the student reasoning from an informed foundation and drawing valid and novel insights?

___ Overall: Has the student learned the scientific method and demonstrated some mastery of communicating new knowledge?

Written Comments:
Assessment Exam for All Graduating Seniors in Geosciences BS Program

5) Which best describes your immediate career path?
   A. Industry/Private Company  B. Government Agency/Public Sector
   C. Graduate School            D. Other
   E. Don’t know yet

6) If you selected A (Industry) for Question 5, which sector best describes the field of specialty for the company that you are joining?
   A. Petroleum/Natural Gas      B. Environmental Consulting/Hydrology
   C. Mining/Mineral Engineering D. Business/Finance
   E. Other

7) If you selected C (Grad School) for Question 5, are you pursuing an M.S. or Ph.D?
   A. Master’s                   B. Ph.D.
Careers for Penn State Seniors 2014 and 2015 (N=53)

- Grad School: 30%
- Industry: 32%
- Don't Know: 30%
- Gov Agency: 6%
- Other: 2%
Learning Objectives: Geosciences BS

1. To produce graduates who possess a broad understanding of the origin and evolution of the Earth, including the geosphere, hydrosphere, biosphere, and atmosphere.

2. To produce graduates who can apply knowledge of the mathematics, physics, chemistry, and biology of Earth processes to the solution of geologic problems.
EARTH SCIENCE LITERACY PRINCIPLES

The Big Ideas and Supporting Concepts of Earth Science

www.earthscienceliteracy.org
17) Potassium-40 decays to Argon-40 with a half-life of 1.3 billion years (Ga). You examine a granite and discover that a biotite grain in the rock has 4 trillion atoms of $^{40}\text{K}$ and 12 trillion atoms of $^{40}\text{Ar}$. What is the age of the granite?

A. 0.54 Ga  
B. 1.3 Ga  
C. 2.6 Ga  
D. 5.2 Ga

18) An acid is a compound that releases ____ into solution when it is dissolved in water.

A. protons  
B. electrons  
C. neutrons  
D. alpha particles
Senior Performance on Assessment Exam: UP vs non-UP

- Non-UP: Median 65%
- UP: Median 71%
ASSESSMENT PROCESS OVERVIEW

LANCE KENNEDY-PHILLIPS
Learning Outcomes Assessment
Goals

• Create the optimal learning environment for our students supported with sound and rigorous assessment data

• Engage faculty members in a process that adds value to teaching and scholarship

• Develop an assessment process that assesses student learning at all degree levels (graduate, undergraduate and certificate)

• Acknowledge learning that takes place both inside and outside of the classroom

• Embrace the broad disciplinary community of Penn State through the assessment of student learning
A Graphical Representation of the Programmatic Assessment Process

Learning Objectives
Statement of what a student is expected to learn once they complete the degree program

Mapping
Graduate programs map learning objectives to grad school goals; undergraduate programs map courses to learning objectives

Assessments
Conduct at least one assessment per cycle; compare outcomes assessment to learning objectives

Report to colleges
Reports entered into AMS; feedback from college regarding results and next steps

Implement Change
Demonstration of intentionality to use data to improve student learning.

University-wide student data sharing; leading to innovations in the student learning environment
ASSESSMENT EXERCISE

FACILITATOR: BARBARA MASÍ
A Graphical Representation of the Programmatic Assessment Process

- **Assessment** = program improvement using student performance data
- **Student learning** is the result of program processes
- **Ideals:**
  - Connect to other review processes
  - Asks important questions by exploring performance data
  - Leads to education innovation

1. Define learning objectives, 2. connect to performance concerns, 3. choose/design assessment methods to connect the two
CONCLUDING COMMENTS, AND NEXT STEPS

LANCE KENNEDY-PHILLIPS
Next Steps

University Feedback

April 4th Quality Advocates
University-Wide Assessment Working group
Faculty Senate
College and Campus visits

Baccalaureate assessment reports due in June
Graduate Education Assessment Workshops
Roll-out of new process August 2016
MSCHE Monitoring Report April 2017