

## Assessment 101: The Nuts and Bolts of Assessment

Workshop at the NCSU  
Undergraduate Assessment  
Symposium

Thursday, April 6, 2006

## Structure of Workshop

1. What are the outcomes for our program?  
**Part 1: Generating Outcomes**
2. How do we know if we are achieving our outcomes?  
**Part 2: Assessing Outcomes**
3. How do we take what we know about the extent to which we are achieving the outcomes and improve the program?

## Overview

- What is assessment?  
“Assessment is the systematic collection, review, and use of information about educational programs undertaken for the purpose of improving student learning and development.”  
Assessment Essentials, Palomba and Banta

## Overview

- What is the purpose of assessment?
  - ✓ To improve student learning and development (formative)
  - ✓ To demonstrate the impact of a program or service on students (summative)
  - ✓ Accountability

## Overview

- Steps in the “assessment cycle”
  - What do we want students to know, think, or be able to do as a result of our programs and services?
  - How do we know that they have achieved this? Evidence
  - How can we use this evidence for program improvement?

## Overview

- Objectives – broad general statements of what students will learn from a program (not meant to be measured)
- Outcomes – specific statements of what students will learn (must be measurable and achievable)

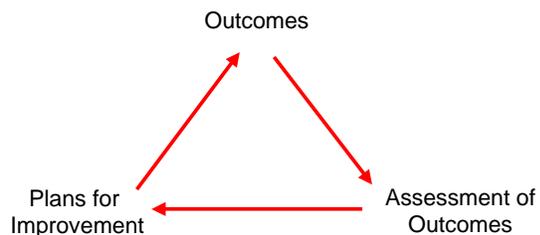
## Generating Outcomes

Dr. Michael Carter  
Professor, Department of English

## What Is Outcomes-Based Assessment?

- Outcomes-based assessment poses and answers three questions:
  1. What are the outcomes for our program?
  2. How do we know if we are achieving our outcomes?
  3. How do we take what we know about the extent to which we are achieving the outcomes and improve the program?

## What Is Outcomes-Based Assessment?



## Structure of Workshop

1. What are the outcomes for our program?  
**Part 1: Generating Outcomes**
- n How do we know if we are achieving our outcomes?
- n How do we take what we know about the extent to which we are achieving the outcomes and improve the program?

## What Are Outcomes

- Outcomes are expectations of what will “come out” of a program
- Outcomes are the values that guide a program, why we are there
- Outcomes are the criteria by which we evaluate our programs and strive to improve our programs

## What an Outcomes Approach Suggests for Assessment

- Our perspective on what we do shifts from inputs to outcomes
- We need make our values explicit in order to be able to evaluate them
- Outcomes need to be observable to be evaluated



## Example of Program Outcomes

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See  
"Workshop Materials Package"



## How to Generate Program Outcomes

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1. Establish a program assessment committee



## How to Generate Program Outcomes

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1. Establish a program assessment committee
2. Guide the committee in identifying values of the program



## Identifying Program Values

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- Ask open-ended questions designed to get participants to talk about values
- Avoid starting with pre-established program goals and asking directly what the program outcomes are
- Let them talk (your job is to listen carefully and take notes)
- Encourage everyone to participate



## How to Generate Program Outcomes

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1. Establish a program assessment committee
2. Guide the committee in identifying values of the program
3. Draft objectives and outcomes



## Drafting Outcomes

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- Create electronic version of notes
- Read them several times
- Mark broad themes that emerge
- Rearrange notes by themes
- Draft objectives: "The objectives of program X are to:"
- Draft outcomes: "Specifically, students should be able to (action verb: *analyze, design, evaluate, describe, apply, construct, etc.*)"

## How to Generate Program Outcomes

1. Establish a program assessment committee
2. Guide the committee in identifying values of the program
3. Draft objectives and outcomes
4. Revise draft with committee

## How to Generate Program Outcomes

1. Establish a program assessment committee
2. Guide the committee in identifying values of the program
3. Draft objectives and outcomes
4. Revise draft with committee
5. Get approval of full program

## Task: Generate Outcomes

- Divide into groups of 3
- Choose 1 group member (#1) whose program you will write outcomes for
- Member #2 will ask questions, #3 will take notes on responses
- 10 minutes: questions and notes
- 10 minutes: all three members generate outcomes from notes

## Generating Outcomes

- Take notes on responses to questions
- Group member #3 review notes for #1 & #2
- Together, draft outcomes
  - Look for what students are expected to be able to do (to demonstrate that they have achieved the expectation)
  - Write outcomes statements: "Students should be able to ..."
  - Finish sentence with an action verb (*analyze, design, evaluate, describe, apply, construct, produce* etc.) and the object of the verb

## Evaluating Outcomes

- Does each outcome represent an expectation valued by the program?
- Does each outcome describe what students should be able to do (to show that they have met the expectation)?
- Does each outcome point to a result that is observable?

## HOW TO USE COURSE-BASED DATA FOR ACADEMIC PROGRAM REVIEW

Joni E. Spurlin, Ph.D.

University Director of Assessment  
North Carolina State University

## Dr. Spurlin's Presentation

### Presentation Outcomes:

- By the end of this session, participants will be able to discuss pros and cons of course-based assessment.
- By the end of this session, participants will be able to articulate various course based assessment methods that can be used for program assessment.

## Outline

- Part 1: Assessment methods.
- Part 2: Defining course-based assessment.
- Part 3: How to develop and use course-based data for program assessment.

## Assessment Cycle

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- Step 1 – Develop/refine your assessment outcomes
  - Step 2 – Define assessment methods that will gather evidence
  - Step 3 – Implement assessment methods, gather evidence, analyze data
  - Step 4 – Interpret the results in terms of your assessment question
  - Step 5 – Make decisions based on results and interpretations

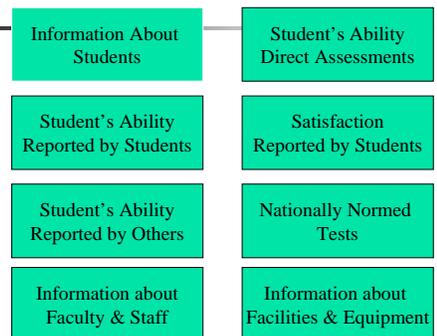
## Assessment Plan

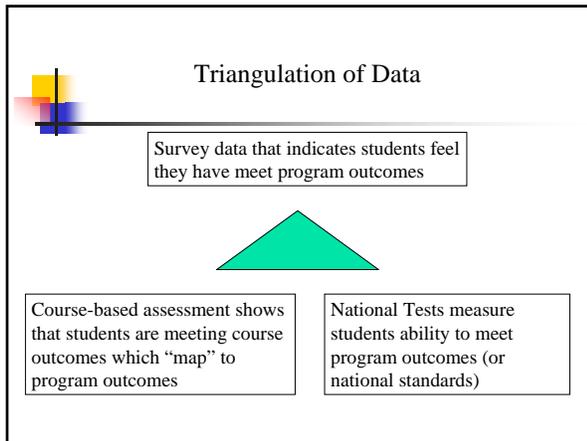
- Consists of:
  - Program Educational Objectives
  - Program Outcomes
  - Implementation of Outcomes: How the program implements/teaches the outcomes
  - Assessment: How the program assesses its objectives and outcomes
  - Plan for Data Collection: Who, when, how

## Exercise A:

- Now that we have defined outcomes – what are some assessment methods you are familiar with?
- What data do you already have for your program? Where can you find this information?

## DATABASE





## Part 2. Coured-Based Assessment

- Defining Course-Based Assessment

## What is Course-Based Assessment?

- Exercise B: Given our list of methods, which of these are “course-based” methods?
- Can you think of others?

## What is Course-Based Assessment?

- Method of collecting information that demonstrates that students are acquiring the skills and knowledge defined by the program (or course) outcomes.
- Collection of information generated in the classroom for assessment of the program.
- One of many program assessment tools.
- Uses material already generated by students.
  - Or faculty can create new materials that will be used for purposes of assessment.

## What is it? continued

- Cost-efficient.
- Students motivation is less a factor than with some other methods.
- Over time – may be able to determine “value added”- as the instructors follow cohorts of students throughout the curriculum.
- Classroom assessment is information collected to improve teaching effectiveness – “Muddiest point” – “Minute Paper” – NOT the topic of today’s session (usually anonymous).

## Example of Program Objective and Related Program Outcomes

- To produce graduates who are knowledgeable about a variety of engineering materials (including metals, semiconductors, ceramics, polymers, and composites), and the relationships among processing, structure, properties, and performance.*

  - By graduation, students will be able to identify the structure-processing-property-performance relationships for metallic materials.
  - By graduation, students will be able to identify the structure-processing-property-performance relationships for ceramic materials.
  - By graduation, students will be able to identify the structure-processing-property-performance relationships for polymeric materials.
  - By graduation, students will be able to identify the structure-processing-property-performance relationships for electronic materials.

## Discussion

- Given that these are your program outcomes, what are the first things that need to be considered to conduct course-based assessment? (Write your answer on the Worksheet, Exercise C.)

## How would you relate the courses to the outcome? What criteria?

	MAT 201	MAT 225	MAT 245	MAT 301	MAT 345	MAT 395	MAT 442	MAT 495
Outcome 2a	I				I		A	
Outcome 2b	X			X				
Outcome 2c			X					
Outcome 2d	Basic					Major		

## Course Based Assessment Links Program Outcomes to Outcomes in Each Course

- Matrix of courses by program outcomes –
  - Does that course add significantly to the learning of that outcome? Does that course add significantly to the assessment of that outcome?
- Relationship of course outcomes to program outcomes-
  - Redefine course outcomes as learning outcomes
  - Map to program outcomes

## Course Outcomes should map to Program Outcomes

- Faculty may have to redo their course syllabi to develop course outcomes that map to program outcomes.

## For our example program outcomes, we can define some course outcomes:

- Objective 2. To produce graduates who are knowledgeable about a variety of engineering materials (including metals, semiconductors, ceramics, polymers, and composites), and the relationships among processing, structure, properties, and performance.**
  - Outcome A. By graduation, students will be able to identify the structure-processing-property-performance relationships for metallic materials.
    - Course MAT 325 Outcome 1: students will be able to identify the structure for XYZ metallic materials.
    - Course MAT 325 Outcome 2: students will be able to identify the structure for ABC metallic materials.
    - Course MAT 325 Outcome 3: students will be able to identify processing methods for XYZ metallic materials.
    - Course MAT 325 Outcome 4: students will be able to identify processing methods for ABC metallic materials.

## Part 3. Use of Course-Based Data

- How to develop and use course-based data for program assessment and program review



## What Is Our Next Step?

- For each course most closely related to the program outcome, define **where** in the courses we can get course-based data.
- Develop course-based data for use in assessment of program outcomes.

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## Assessment Examples

- Final test in course X has 5 questions related to one program outcome.
- Lab reports are examined by a group of faculty to determine how well student can write lab reports (using a rubric).
- Outside experts are invited into a classroom and given a grading scheme as they listen to student presentations. Experts can judge content, oral skills, presentation style.
- Students rate each other using a team work survey – can be used to see where most student have difficulty.

## Handout – Assessment Methods



- Review Handout Material  
"II. Identify Assessment Methods"

## Concerns Expressed by Faculty

- "This year, the students are a "low-ability" group of students and I don't want to base my assessment of the program on this group of students who have limited ability."
  - (look at trends and aggregate data)
- "Do I need to obtain student work from every student in the course?"
  - (sample size calculator: <http://www.researchinfo.com/docs/calculators/samplesize.cfm>)
- "How many different assignments, homework, reports and tests from the course do I need to collect?"
  - Principle of Good Practice for Assessing Student Learning:**  
"Assessment makes a difference when it begins with issues of use and illuminates questions that people really care about."

## Develop Written Course Assessment Plans: Example: Course Assessment Plan for TE 205

Program Learning Outcome Related to Course TE 205	Course Learning Outcome: TE 205	Assessment Methods	Assessment Tools
Be able to design new systems, components, products to address needs	-Demonstrate ability to design and implement electrical systems to solve a problem	-Lab Practice, Lap Report	-Faculty will develop and use Rubric to analyze Lab Reports
Be able to demonstrate competency in use of modern engineering tools for desired solutions	-Demonstrate ability to use Analog and Digital tools of engineering to solve electrical problems (Matlab)	-Exam	-Grade on each problem will identify weaknesses across the class
Recognize an effective team	-Discuss how to help a team operate effectively -Define the value of diversity in team-based problem solving	-Group Exercise -Paper - discuss effectiveness of team as it relates to diversity	-Teams will complete a Rubric on each member of the team -Faculty will assess paper in terms of understanding diversity and team effectiveness

## Summary: Develop Course-based Assessment

- Pilot in two courses, first year
  - Curriculum Matrix
  - Faculty for the chosen courses define and map their course objectives to program outcomes
  - Develop course-based assessment methods (define who, when, what)
  - Each faculty who is doing this gathers summary data on their course
  - Feed data into other data for assessment system and decision making

## Strengths of This Method



- Clear connection of assessment to outcomes
- Clear connection of learning to curriculum
- Ease of understanding where to make changes in the program

## Limitations

- Use of this method may rest on willingness of faculty to share info about their course and assessment findings with other faculty members.
- Time / cost can increase if have several faculty examining student work.
- Initial design of instruments, test, assignments can be time consuming.
- Getting agreement of faculty that any specific assessment instrument is effective can take time.



## Additional Resources

- Internet Resource: <http://www2.acs.ncsu.edu/UPA/assmt/resource.htm> (by Ephraim Schechter)
- NC State's Program Review: [http://www.ncsu.edu/provost/academic\\_programs/uapr/UAPRindx.html](http://www.ncsu.edu/provost/academic_programs/uapr/UAPRindx.html)
- Engineering Website: [www.engr.ncsu.edu/assessment/](http://www.engr.ncsu.edu/assessment/) (see Terms, Presentations, Resources)

## Assessment in Student Affairs

Carrie L. Zelna, Ph.D.  
Director  
Student Affairs Research and Assessment  
North Carolina State University

## Determining a structure

- Division-wide
  - Choose common terminology: Goals, objectives, outcomes....
- Grouping by mission
- Individual units
  - Issues: Audience-all students or 'users'
  - Issues: Layering-sub-outcomes vs. criteria
- \*Keep in mind:
  - Relationships: between objectives of system, institution, division, unit, accreditation...
  - Meaningful, manageable, and on-going (Palomba and Banta, 1999)

## Defining Purpose: Mission, Objectives, Outcomes

### Resources for Outcomes in Student Affairs: Places to Start

- Council on the Advancement of Standards (CAS)-ACPA
- Learning Reconsidered- NASPA
- Developmental Theory
- National Organization Standards

## CAS Outcomes

- Students will demonstrate effective communication.
- .....enhanced self-esteem.
- .....social responsibility.
- .....clarified values.
- .....independence.
- Examples of achievement are provided (criteria/sub outcomes)

## Learning Reconsidered: Persistence and academic achievement

- Objective: Multicultural Student Affairs will support students in their achievement of academic success.
  - Possible Outcomes:
    - Students in the PM program will act in congruence with their values.
    - Students in the Peer Mentor program will articulate a strong sense of connection to campus.
- \*the decision as to what constitutes "support students in their achievement of academic success" may come from developmental theory or theories on retention

## Captive Audience or No Captive Audience...two approaches to outcomes

- Student board members will demonstrate improved critical thinking skills.
  - Program indicator: This will allow for improvement in a specific area.
- 80% of students will know the academic integrity policies.
  - Dashboard: If there are a variety of ways we teach the policies, we won't know what specifically to improve. We will know if there is a problem and can move forward from there. You can measure the learning that occurs in some of the efforts to make improvements.

## Layering: Criteria vs. Sub-Outcomes

- Students that violate *The Code* will demonstrate problem solving skills.
  - Criteria: the students are able to identify the problem, recognize all the options, consider the consequences of each option, and choose the best ethical solution.
- Layering: Students will demonstrate effective leadership skills.
  - Sub outcomes:
    - Students will list the seven most important issues for leaders.
    - Students will analyze an organizational issue.
    - Students will explain three communication strategies for working with groups.
    - Students will demonstrate a communication strategy at a group meeting.

## Example: One Objective with Outcomes from Various units

- Objective: encourage a physically active and healthy lifestyle.
- Outcome:
  - Students will demonstrate knowledge of outdoor recreation safety procedures. (**Campus Recreation** -may be a semester long class on a particular outdoor activity such as kayaking with observation as the measure)
  - Students will identify the recommended daily number of serving for each food group. (may be a one hour program on nutrition by **University Dining** -program evaluation at the end to measure learning)
  - Students will apply knowledge of healthy lifestyle choices to their day to day life (Part 2 of **Health promotion** program-measured through journaling or portfolio)

## Possible Methods

- Observations
  - Document analysis
  - Case studies
  - Portfolios
  - Interviews/Focus groups
- \*\* You need to identify the outcomes to be measured before choosing a method for measurement.
- \*\*\*Everything should be systematic: Sampling, development of instruments, analysis and interpretation.

## Observations

(Bogdan & Biklen 1998, Glesne 1999, Marshall & Rossman 1999, Berg 2001, Patton 2002)

- Formal
- Consider your role-participant/observer
- Open notes or check-list
- On-going documentation
- Take complete notes-include all elements of the situation-setting, people, clothing, etc....

Outcome: Student staff will demonstrate the ability to confront policy violations.

## Document Analysis

Bogdan & Biklen 1998

### Types of Documents:

- Minutes from meetings
- Pop culture documents-web sites, advertisements, etc.
- Photographs
- Videos
- Magazines/Newsletters
- Letters/email
- Files

Student Leaders will facilitate large program planning.

## Case Studies

(Wasserman, S. 1994)

### Elements of a good Case

- Centered around a big issue
- Interdisciplinary
- Series of discussion questions for small group that provoke thought
- Debriefing session for large group

Students will identify ethical dilemmas in the academic setting. Students will compare various solutions to the ethical dilemmas. and so on.....

## What is a Portfolio?

(Bresciani, Zelna, Anderson, 2004)

- Collection of artifacts that demonstrate learning/that an outcome was met
- Portfolios can be used at a number of levels:
  - Individual student
  - Course
  - Program
  - Institution
  - Professional
- Artifacts may be chosen by the staff or student
- Often includes reflection

## Interviews and Focus Groups

- Protocol Structure (Patton, 2004):
  - Unstructured
  - Semi structured (questions vs. topics)
  - Structured
- Where: private location, quiet, few distractions, size/set up of room
- Analysis-open/axial coding

## Strategies for Analysis

- Rubrics: written work, observations, document analysis, portfolios, cases
- Content Analysis: written work, observations, document analysis, portfolios, cases, open ended survey questions
- Coding: interviews and focus groups, document analysis, observations

## Example Outcome

- **Objective:** Reduce student misconduct through a variety of educational interventions.
- **Outcome:** Students that violate *The Code* will demonstrate insight into how their behavior affects all aspects of their life. *(This is one component of reducing misconduct-the development of insight into behavior)*
- **Activities:** Assigned paper with specific questions regarding incident and reflection
- **Measures:** Rubric using a theory on Insight to review papers.

## Example Outcome

- **Objective:** Educate students about the importance of being engaged within their communities.
- **Outcome:** Students who participate in the service programs will articulate how being engaged within their communities is connected to their personal growth. *(this is one component of "importance of being engaged...")*
- **Activities:** Various Unit programs such as HOWLS, Campus Pals, AFB / ASB, VLC, EMERGE
- **Measures:** Survey/self-report, student portfolio (artifacts with reflection-rubric to review)

## Example Outcome

- **Objective:** Challenge students to excel academically and value the acquisition and application of knowledge.
- **Outcome:** Students will demonstrate an ability to critically analyze ideas and information.
- **Activities:** Forums
- **Measures:** Focus groups, Interviews and observation from large group discussion (systematic observations)

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