
Writing, Measuring and Analyzing Student-Learning Program Objectives

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What is assessment as it pertains to us and our roles?

- Marchese: “Assessment is the systematic collection, review, and use of information about educational programs undertaken for the purpose of improving student learning and development.”
 - A way of determining if students are achieving what we say they will in our mission and objectives
 - A means of making sure we’re doing what we say we will
 - Proving to ourselves and important others that we are accomplishing our purposes
 - A way to improve teaching and learning
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Who or what is being assessed?

- Though we rely on information originating from students, the outcomes of individual students are not the focus of assessment, nor is it intended to be a “faculty accountability” tool
 - ***The academic program itself is the focus of assessment; aggregated results from groups of students regarding their educational objectives are used to assess the program***
 - Therefore, a representative sample of students is often sufficient for effective assessment of academic programs
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What are the key questions assessment should answer?

- What should college graduates know, be able to do, and value?
 - Have the graduates of our institution acquired this learning?
 - What are the contributions of the institution and its programs to student growth?
 - How can student learning be improved?
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Assessment asks you to think about the following questions as well:

- What should students be learning and in what ways should they be growing?
 - What are students actually learning and in what ways are they actually growing?
 - What should you be doing to facilitate student learning and growth?
 - How would you measure student learning and growth?
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What are student learning objectives?

- Nichols on learning objectives: “...descriptions of what academic departments intend for students to know (cognitive), think (attitudinal) or do (behavioral) when they have completed their degree programs, as well as their general education or ‘core’ curricula.”
 - Objectives should describe, using action verbs, intended student learning or behavior rather than merely subject matter coverage
 - Each learning objective is assessed as to the degree students are exhibiting knowledge or abilities related to it
 - Each academic program is to have a set of intended student learning objectives that is reviewed periodically and updated as appropriate
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How do you develop “good” learning objectives?

- At both the course and program level, it is critical that they be *measurable* and *actionable*
 - Unacceptable: “Students will acquire a knowledge of ...”
 - Better: “Students will evaluate the ethical dimensions of a given decision situation...”
 - We must also be keenly aware of the *level* of objective – graduate should be higher than baccalaureate
 - A good guide is Bloom’s Taxonomy
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Developing Program Objectives:

- Program objectives transform the general program goals into specific student performance and behaviors that demonstrate student learning and skill development along these goals.
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Developing Program Objectives: Ask 3 Questions

- For each of your stated goals, what are the specific student behaviors, skills, or abilities that would tell you this goal is being achieved?
 - Ideally and briefly, what would a skeptic need (evidence, behavior, etc.), in order to see that your students are achieving the major goals you have set out for them?
 - In your experience, what evidence tells you when students have met these goals - how do you know when they're "getting" it?
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Developing Program Objectives: Another Perspective

- Describe your ideal student in terms of strengths, skills, knowledge and values, and identify which of these characteristics are the result of the program experience.
 - Keeping this student in mind, ask what the student knows, can do, cares about.
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Developing Program Objectives: 3 Types

Three types of learning objectives, which reflect different aspects of student learning:

- **Cognitive Objectives** -- What do you want your graduates to know?
 - **Affective (Attitudinal) Objectives** -- What do you want your graduates to value or care about?
 - **Behavioral Objectives** -- What do you want your graduates to be able to do?
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Writing program objectives: Where do you start?

- When writing program objectives, describe realistic and achievable outcomes in simple language.
 - Even if a learning objective that is important to you seems difficult to measure, try to word the objective into language that focuses on student behavior.
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Example in Action

- General Program Goal:
 - “Students and academic advisors will understand the nature and importance of academic advising to the educational experience.”
- Ask Yourself:
 - ‘what does a student need to demonstrate they know, are able to do, or value in relationship to this goal?’
- Possible Objective:
 - “Students will be able to describe how academic advising has contributed to their educational experience.”

Susan Campbell, NACADA Advising News

Examples of Program Objectives

Social Science Program Objectives

- Students can identify the role that cultural diversity plays in defining what it means to be a social being.
 - Students can identify the origins, workings, and ramifications of social and cultural change in their own identity.
 - Students can compare the distinctive methods and perspectives of two or more social science disciplines.
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Examples of Program Objectives

Natural Science Program Objectives

- Students can apply scientific methodology.
 - Students can evaluate the validity and limitations of theories and scientific claims in experimental results.
 - Students will demonstrate an understanding of basic scientific principles by restating the principle in their own words and giving a real-world example of the principle in action.
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What is Bloom's Taxonomy?

- Benjamin Bloom created this taxonomy in 1956 for categorizing the level of abstraction of everything from test questions to course objectives to program objectives in the *cognitive* domains
 - Departments should take into account the level of their expectations of their students' learning when crafting course or program objectives, and Bloom's is a validated and longstanding tool for such
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Bloom's Level 1: *Knowledge*

- observation and recall of information
 - knowledge of dates, events, places
 - knowledge of major ideas
 - mastery of subject matter
 - Question/objective Verbs:
list, define, tell, describe, identify, show, label,
collect, examine, tabulate, quote, name, who,
when, where, etc.
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Bloom's Level 2: *Comprehension*

- understanding information
 - grasp meaning
 - translate knowledge into new context
 - interpret facts, compare, contrast
 - order, group, infer causes
 - predict consequences
 - Question/objective Verbs:
summarize, describe, interpret, contrast, predict,
associate, distinguish, estimate, differentiate,
discuss, extend
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Bloom's Level 3: *Application*

- use information
 - use methods, concepts, theories in new situations
 - solve problems using required skills or knowledge
 - Question/objective Verbs:
apply, demonstrate, calculate, complete, illustrate, show, solve, examine, modify, relate, change, classify, experiment, discover
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Bloom's Level 4: *Analysis*

- seeing patterns
 - organization of parts
 - recognition of hidden meanings
 - identification of components
 - Question/objective Verbs:
analyze, separate, order, explain, connect,
classify, arrange, divide, compare, select,
explain, infer
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Bloom's Level 5: *Synthesis*

- use old ideas to create new ones
 - generalize from given facts
 - relate knowledge from several areas
 - predict, draw conclusions
 - Question/objective Verbs:
combine, integrate, modify, rearrange, substitute, plan, create, design, invent, what if?, compose, formulate, prepare, generalize, rewrite
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Bloom's Level 6: *Evaluation*

- compare and discriminate between ideas
 - assess value of theories, presentations
 - make choices based on reasoned argument
 - verify value of evidence
 - recognize subjectivity
 - Question/objective Verbs:
assess, decide, rank, grade, test, measure,
recommend, convince, select, judge, explain,
discriminate, support, conclude, compare,
summarize
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What about affective objectives?

- Bloom's relates to *cognitive* domains; there is a similar taxonomy for *affective* objectives as well (*Krathwohl, Bloom, & Masia, 1964*):
 1. Receiving – passive but attentive
 2. Responding – complying and aware
 3. Valuing – behavior consistent w/ attitude
 4. Organization – bringing together different values and building internally consistent value system
 5. Characterization – behaving according to “life style” and maintaining a consistent philosophy regardless of surroundings

Summary: writing objectives

- To be useful, objectives should contain three basic elements:
 1. A verb that describes an observable action
 2. A description of the conditions under which the action takes place: “when given x, you will be able to...”
 3. The acceptable performance level
(*Diamond, 1998*)
 - *An alternative to the abstract.* ask yourself “If I’m your student, what do I have to do to convince you that I’m where you want me to be at the end of this unit/course/program?”
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What should these objectives do for you?

- No matter what the specific form, statements of intended objectives (or learning objectives) should do the following:
 1. Describe in performance terms what your goals are
 2. Communicate to your students your expectations and how the students will be assessed
 3. Serve as the basis for selecting instructional methods
 4. Serve as the basis for your assessment of student academic achievement, including selecting instruments and measures (*Diamond, 1998*)
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What are some sample objectives from other programs?

- M.B.A. -- critical thinking: Given a business situation, diagnose the underlying causes of the situation, evaluate possible solutions in relation to underlying business theory, and determine and defend appropriate course of action
 - B.A. Psychology -- foundations: Recognize the major concepts, theoretical perspectives, empirical findings, applications, and historical trends in psychology
 - M.A.Ed. -- information literacy: Access information from a variety of credible sources and apply that information to the solution of educational problems
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How does assessment relate to what takes place in courses?

- Each student learning objective can be “mapped” back to the courses in which it was taught (either introduced or reinforced)
 - Then when certain objectives are identified as needing improvement, we can work back to the courses where that skill or knowledge was introduced or reinforced, and strengthen that activity
 - The following matrix shows a sample graphic relationship between objectives and courses (the same can be done within a course relating its objectives to measures/activities)
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Sample Course-Outcome Linkage Matrix

	Courses Taken by Student in Major:						
	<u>English 101</u>	<u>Psych 105</u>	<u>Math 150</u>	<u>Engr 120</u>	<u>Engr 121</u>	<u>Engr 220</u>	<u>Engr 221</u>
Outcome #1	Intro						
Outcome #2			Intro		Reinforce	Reinforce	Reinforce
Outcome #3				Intro	Reinforce		
Outcome #4				Intro	Reinforce	Reinforce	Reinforce
Outcome #5				Intro			Reinforce

Selecting Measures for Student Learning Objectives

Assessment Methods and Strategies:

- By what measure(s) will you know that students are meeting program learning objectives?
 - From whom, and at what points, will you gather data?
 - How will the information be collected, analyzed, and used to improve the program?
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Assessment Methods and Strategies:

Make sure your assessment methods:

- answer questions that are important to you
 - are manageable, given available resources (including time and money)
 - result in useful feedback that highlights accomplishments and identifies areas requiring attention.
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Academic Assessment Methods and Strategies:

Relevant Existing Information

- existing exams, assignments, or projects common to a group of student in the major
 - writing samples completed for UWR
 - senior assignments accomplished as a part of a capstone experience
 - faculty teaching evaluations
 - graduating senior surveys
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Academic Assessment Methods and Strategies:

Relevant New Information

- student internships or performance
 - capstone courses for graduating seniors (summary course for major)
 - portfolio analysis (collection of student work)
 - standardized tests (nationally-constructed or department-based)
 - surveys, interviews, or focus groups of students at entrance and exit, alumni, faculty, employers or related to course content
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Academic Assessment Methods and Strategies:

- Use Multiple Methods
 - Use Multiple Raters (where possible)
 - Include Direct and Indirect Measures
 - Assess Strengths and Weaknesses
 - Include qualitative as well as quantitative measures
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What are direct measures of student learning?

- Direct measures require students to display their knowledge and skills as they respond to the instrument itself and include capstone courses, theses, dissertations, portfolio assessments, pre- and post-testing, standardized exams – where there is a one-to-one relationship to specific student learning objectives
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What are indirect measures of student learning?

- Indirect measures ask students to reflect on their learning rather than to demonstrate it (Palomba and Banta, 1999, pp. 11-12) and include surveys of alumni, students, and employers, as well as retention studies, course performance analysis, end-of-course evaluations, and job placement data
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Why use capstone courses for program-level assessment?

- Assessment experts like Nichols and Banta suggest capstone courses (including theses and dissertations) as especially rich sources of information for outcomes measurement
 - Alternatives such as portfolios and standardized pre- and post-testing can be extremely resource-intensive and cumbersome, as well as time-consuming while waiting for longitudinal information to emerge
 - In short, capstones provide the most useful information for the smallest investment of resources
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Can't we just use course grades as indicators?

- Course grades are seldom directly linked one-to-one to specific end-of-program learning objectives
 - Astin: “Grades tell us little of what the student has actually learned in the course...(and) very little about what a student actually knows or what the student’s competencies or talents really are.”
 - Grades are global evaluations that represent the overall proficiency of students in a particular course.
 - They provide little information on the overall success of the program in helping students attain specific and distinct learning objectives of interest.
 - The following “grade book” exhibit shows the difference between grades (that measure multiple outcomes within a course) and measures of specific outcomes across many students
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**Column & Row Explanation of Relationship Between
Individual Student Grading and Outcomes Assessment**

**Intended Educational Objectives
(on a 1 to 5 point scale)**

Indiv. Students Graded by Faculty	Criterion a	Criterion b	Criterion c	Criterion d	Total (out of 20 points)	Indiv. Student Grade
Student 1	3	2	4	4	13	C
Student 2	4	5	5	3	17	A
Student 3	1	3	2	4	10	D
Student 4	2	2	3	5	12	C
Student 5	3	5	4	3	15	B
Average for Intended Educational Objective	2.6	3.4	3.6	3.8		

(Total across the rows for individual student grading; total down the columns for assessment of educ. objectives)

Assessment Methods and Strategies:

Be selective about what you choose to observe or measure

- comprehensive does not mean assessing everything
 - select a manageable number of methods that do not drain resources
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Assessment Methods and Strategies:

- Include direct as well as indirect methods of assessment
 - Use capstone courses or senior assignments, summative test and portfolios to directly assess student learning objectives
 - If none of these exist, adopt one or more of them in the near future. For now, employ a *faculty assessment panel* as a temporary direct measure.
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Analyzing and Using Results of Student Learning Objectives

How and When Do I Collect Data?

■ How

- In the classroom
 - In appropriate existing courses
 - In a capstone course
 - In a common experience “end of program” course
 - Comprehensive exams
 - Licensure exams
 - Essays
 - Internships
 - Juried Performances
 - Portfolio
 - Senior Project
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How and When Do I Collect Data?

- When
 - During each semester
 - At the end of every semester
 - Annually
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How and When Do I Analyze Assessment Data?

■ How

- ❑ Analyze each assessment separately
- ❑ Analyze all data pertaining to an objective
- ❑ Analyze all data pertaining to all objectives

■ When

- ❑ Each the end of each semester
 - ❑ As it is collected
 - ❑ Once a year
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How Do I Use Results To Improve My Program?

- “Map” the results back to the courses in which that objective is taught to possibly make:
 - Curricular Changes
 - New Courses
 - Revised Courses
 - Revised Course Sequence
 - Admission Criteria Changes
 - Instructional Methodology Changes
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How Do I “Close The Loop”?

- Use the results for improvement
 - Check if the improvements result in the intended change in student learning

 - Document!
 - Document!
 - Document!
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Analyzing and Using Assessment Results Specific Examples

- Capstone/Senior Project
 - Comprehensive Exam
 - Portfolio/Juried Performance
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How Do I Use a Capstone/Senior Project as Program Assessment?

■ **Capstone/Senior Project:**

Prepare a marketing and print campaign for a client with written prospectus and oral presentation

- **Objective 1:** Graduates will be able to write clearly and appropriately for the task
 - **Objective 2:** Graduates will be able to make an effective sales presentation
 - **Objective 3:** Graduates will be able to think critically
 - **Objective 4:** Graduates will be able to design an effective print advertisement
 - **Objective 5:** Graduates will be able to develop appropriate marketing strategies
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How Do I Use a Capstone/Senior Project as Program Assessment?

- Link project components to specific objectives
 - Written portion assesses Objective 1
 - Oral Presentation assesses Objective 2
 - Written portion and Oral Presentation assess Objective 3
 - Specific components of both written and oral portions assess Objectives 4 and 5.

 - Establish criteria for success for the *program*
 - The average grade on the senior project will be no less than a 3.5 or 70%
 - On no individual objective area will the average be less than 3.5 points
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Capstone/Senior Project as Program Assessment

Assessment Data Entry/Reporting Template						
Student	Objective 1	Objective 2	Objective 3	Objective 4	Objective 5	Mean
Smith	4	5	2	5	3	3.80
Jones	3	5	2	5	2	3.40
Brown	4	5	1	5	2	3.40
O'Brien	4	4	3	5	3	3.80
Griffin	3	5	4	4	3	3.80
Finnerty	2	5	2	5	3	3.40
O'Hara	4	4	2	4	2	3.20
Mean	3.43	4.71	2.29	4.71	2.57	3.54
Objective 1: Graduates will be able to write clearly and appropriately for the task						
Objective 2: Graduates will be able to make an effective sales presentation						
Objective 3: Graduates will be able to think critically						
Objective 4: Graduates will be able to design an effective print advertisement						
Objective 5: Graduates will be able to develop appropriate marketing strategies						

Capstone/Senior Project as Program Assessment

- Program Improvement
 - Changes in course content to emphasize writing skills, critical thinking skills and marketing strategies in certain courses
 - Changes in course sequence
 - Creation of new course
 - Look carefully at the capstone/senior project
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How Do I Use Comprehensive Exam as Program Assessment?

- Link exam questions to program student learning objectives
 - Questions 1-17 assess Objective 1
 - Questions 18-34 assess Objective 2
 - Questions 35-50 assess Objective 3

 - Establish criteria for success for the *program*
 - The average grade on the senior exam will be no less than 70%
 - On no individual objective area will the average be less than 24 points
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Comprehensive Exam as Program Assessment

Assessment Data Entry/Reporting Template				
Comprehensive Exam				
Student	Objective 1	Objective 2	Objective 3	Total
Smith	23.0	33.0	22.0	78.0
Jones	14.0	26.0	21.0	61.0
Brown	28.0	29.0	20.0	77.0
O'Brien	34.0	31.0	29.0	94.0
Griffin	19.0	31.0	16.0	66.0
Finnerty	32.0	26.0	18.0	76.0
Clay	30.0	28.0	22.0	80.0
Mean	25.7	29.1	21.1	76.0

Comprehensive Exam as Program Assessment

- Program Improvement
 - Changes in course content to emphasize Objective 3 in certain courses
 - Changes in course sequence
 - Creation of a new course
 - Re-visit importance of Objective 3 as a Student Learning Objective
 - Look carefully at the exam
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How Do I Use Portfolio/Juried Performance as Program Assessment?

- Programs such as those in music and art frequently require senior recital or exhibition
 - Programs such as teacher education, psychology, and creative writing frequently require a portfolio
 - Program Outcome:
 - Program graduates will be able to deliver a polished and technically correct performance.
 - Program graduates will demonstrate through a portfolio an in depth understanding of and use of skills particular to the discipline
 - Means of assessment
 - Rubric scored by jury
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How Do I Use Portfolio/Juried Performance as Program Assessment?

- Means of assessment
 - Rubric scored by jury rating on a scale of 1 to 5 proficiency in tone, intonation, accuracy, rhythm, technique, and interpretation or phrasing
 - Criteria for program success
 - Average ratings will be at least 3.0 across all elements on the rubric
 - On no element will the average be less than 2.5
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Juried Performance as Means of Program Assessment

Juried Performance as Means of Assessment							
Student	Tone	Intonation	Accuracy	Rhythm	Technique	Interpretation/Phrasing	Mean
Walters	2	2	3	2	4	4	2.8
Keene	3	2	3	3	3	4	3.0
Telford	3	2	3	3	4	4	3.2
Sullivan	4	2	3	4	3	4	3.3
Burnam	2	2	3	3	2	3	2.5
Clay	4	2	4	3	3	2	3.0
Martin	3	2	3	3	4	3	3.0
Commonwealth	3	1	4	4	3	3	3.0
Mean	3.0	1.9	3.3	3.1	3.3	3.4	3.0