Assessing Student Learning Outcomes: Direct and Indirect Measures

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March 11, 2011

**Program Review and Assessment
(PRAC)**

How do I assess Student Learning Outcomes (SLOs)?

- A multiple methods approach is recommended to assess student learning outcomes indirectly and directly.

Mixed-Method Approaches

- Allows researchers to:
  - Triangulate findings from multiple sources.
  - Converge or corroborate findings.
  - Strengthen the internal validity of the studies.
  - Create elaborated understandings of complex constructs such as "critical thinking" or "integrative learning."

Employ Multiple Methods

1) Direct

- Projects, papers, tests, observations

2) Indirect

- Questionnaires, interviews, focus groups
- Unobtrusive measures
  Syllabi, transcripts

Direct Measures of Student Learning

- Require students to demonstrate their knowledge and skills.

- They provide tangible, visible and self-explanatory evidence of what students have and have not learned as a result of a course, program, or activity (Suskie, 2004, 2009; Palomba and Banta, 1999).

- Examples of direct student learning measures include objective tests, essays, presentations, classroom assignments, and portfolios.

Assessment of Student Work:
A Direct Measure of Learning

- "No assessment of knowledge, conceptual understanding, or thinking or performance skills should consist of indirect evidence alone" (Linda Suskie, 2009).

Use Authentic, Embedded Assessment

- Goal of many undergraduate programs is for students to become lifelong learners by enhancing students' communication skills, critical thinking, and problem solving abilities.
- With authentic, embedded assessment tasks students are asked to demonstrate what they know and are able to do in meaningful ways.
- Authentic assessment tasks are often multidimensional and require higher levels of cognitive thinking such as problem solving and critical thinking.
- Embedded assessment means that "that opportunities to assess student progress and performance are integrated into the instructional materials and are virtually indistinguishable from the day-to-day classroom activities"(Wilson and Sloane, 2000).
- The end-of-course *Research Paper* in Biology.

Indirect Measures

- Capture students' perceptions of their knowledge and skills.

- They supplement direct measures of learning by providing information about how and why learning is occurring.

- Students' perceptions of the extent to which courses and assignments have enhanced their achievement of the stated learning outcomes may be obtained by using the following methods: self-assessment, peer-feedback, end-of-course evaluations, questionnaires, focus groups, or exit interviews.

Indirect Measures Examples

Questionnaires, inventories, interviews

- Did the course cover these objectives?
- How much did your knowledge, skills, and abilities increase?
- Did the teaching method(s) help you learn?
- Did the assignments help you learn?

Measuring Student Learning

- Grades
- Exams, tests, papers, course assignments
- Standardized tests
- Self-report questionnaires
- Narratives
- Portfolios
- Interviews
- Focus groups

	Direct Measures	
Types	**Advantages**	**Disadvantages**
Authentic Course-Embedded: Exams/Tests, Quizzes, Papers, Oral Presentations, Group Work, Assignments .	- Require higher-order cognitive skills and problem solving. -Direct measures are most effective if they are also course-embedded which means the work done by the student is actually work that counts towards a grade. - Authentic and part of already existing faculty and student work (not add-on assessment). - Increasingly the mandate from accrediting agencies.	- Time consuming to develop standardized criteria for evaluating (e.g., rubrics). -Can be difficult to collect and aggregate for a large, public institution.
Electronic Portfolios	-Effective mechanism for collecting and storing student work (authentic direct measures). - Allows multiple formats (e.g., paper, video, audio) **.**	- Time consuming to develop standardized criteria for evaluating (e.g., rubrics). -Can be difficult to collect and aggregate for a large, public institution. -Technology can be difficult to develop, use, and navigate.
Locally Developed Exit Exams	- Match local goals. - Aligned with curriculum. - Faculty-developed. - Development and scoring processes are informative.	-Difficult to develop valid instruments. -Time consuming to develop.
Commercial Standardized Tests (e.g., Collegiate Learning Assessment)	- Low time investment. - National norms.	-Expensive. -May not match specific program goals. -Students may not be motivated to perform at best ability levels and this can negatively affect reliability and validity. -May measure "generalized intelligence" which may not change due to curriculum or classroom experiences.

Indic Measures		
Types	**Advantages**	**Disadvantages**
Grades	-Inexpensive. -Relatively easy to aggregate and collect - Available for almost all students. - Good indicator of academic success and progress toward degree. - Can be good proxy for student learning.	-Not standardized -Not ideal measure for determining students' actual knowledge, skills, and abilities. -Grades alone do not indicate if students are able to write well, think critically, problem solve, and apply values and ethics.
Surveys and/or Questionnaires	-Inexpensive -Critical to understand what individuals perceive, know, and think of programs and services -Acknowledges importance of student (or alumni), faculty, and staff opinions --Can provide information about how and why learning is occurring. - Statistical relationships, prediction control, description, hypothesis testing	-Not a direct measure of learning. -Difficult to develop valid instruments. -Low response rates for large sample, web-based surveys. -Do not involve higher order cognitive processes.
Interviews (e.g., senior exit interviews)	-Comprehensive, holistic, richly descriptive. -Provides in-depth information about students' learning experiences. -Allows individualization and follow-up probes. -May develop positive interactions with students.	-May be intimidating, biasing results. -Time-consuming to conduct and analyze data. -May not be representative.
Focus group interviews	-Same as interviews -Allows more students to be "interviewed" in less time.	-Same as interviews. -A few students can skew the results if not carefully facilitated

Planning for Learning and Assessment
T.W. Banta

1. What general outcome are you seeking?	2. How would you know it (the outcome) if you saw it? (What will the student know or be able to do?)	3. How will you help students learn it? (in class or out of class)	4. How could you measure each of the desired behaviors listed in #2?	5. What are the assess-ment findings?	6. What improve-ments might be based on assess-ment findings?

Creating a Culture of Evidence

- Embed assessment within courses.
- Create learning experiences that are designed to produce key learning outcomes identified for the department's or school's graduates.
- Learning results at the course level can flow upward to support program-level assessment and can provide evidence regarding the General Education learning outcomes (PULs).

References

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