SoTL
the scholarship of teaching & learning

Gathering Evidence: Making Student Learning Visible

Gathering Evidence of Student Learning

How will you collect evidence of relevant student thinking and learning (i.e., data) that will answer your specific question(s)? First, consider how you know what your students are learning.

- Does doing well on a test mean they've really *learned* the material?
- How do you *measure* and *make sense of* what they're really learning?
- How can you gather evidence of their thinking at earlier stages of their learning process, not just in the final, summative assessments like essays and exams?

Use these questions to guide your selection of your project's assessment techniques—or how you'll make student learning visible. See some possibilities in the table to the right.[1]

No matter what form you choose, the *most important* aspect to consider is how well that evidence you gather responds to your research question.

Direct vs. Indirect Evidence

Direct evidence answers the question, "What did the students learn?" Examples include the following:[2]

- Samples of student work (essays, exams, in-class writings, lab reports, quizzes, portfolios, online assignments, etc.)
- Observations of students (in person, videotape, audiotape, online discussions)
- Students' reflections on their own values, attitudes, and beliefs

Thinking & Learning Made Visible

- Classroom assessment techniques/CATs (minute paper, muddiest point, clicker data)
- Evidence of how students actually think (think-alouds, process logs, reflective journals, concept maps)
- Exam scores, or scores on a single exam question
- Counts (online postings, office visits, number of pages read/written, hours studying, etc.)
- Samples of students' work (papers, journals, projects, presentations, performances, recorded or online group discussions)
- Institutional research data (grades, GPAs, admissions scores, retention rates, etc.)
- Students' reports of their learning (surveys, interviews, focus groups [indirect evidence])

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[1] For information on other classroom assessment techniques/CATs, see the Vanderbilt University Center for Teaching guide on CATs. For more information on using clickers to facilitate CATs, see Vanderbilt Center for Teaching's guide on clickers. For more information on think-alouds (an activity in which a student says out loud everything that comes to mind as he or she is solving a math problem, interpreting a historical document, or translating a passage—offering valuable insight into the thinking process), see this blog post about Lendol Calder's work. For information on concept maps, see "Best Tools and Practices for Concept Mapping."

[2] These examples are adapted from "Assessing Student Learning: Guidelines for SACS Reaffirmation of Accreditation," a workshop for department chairs and program directors provided by the Vanderbilt Provost Office on January 9, 2007, and the *Vanderbilt University Assessment Web Site*.

Indirect evidence answers the question, "What do students report they've learned?" Examples include the following:

- Responses to survey or interview questions asking students what help them learned (e.g., knowledge surveys)[3]
- Responses to survey or interview questions asking students to rate their satisfaction with a learning experience
- Reflections by instructors on student learning and teaching methodologies
- End-of-course grades[4]

Indirect evidence should always be complemented by direct evidence.

Aim for a variety of types of evidence, or multiple data sets, to provide a richer picture of the learning. Some of the strongest SoTL projects draw on the complementary pairing of quantitative *and* qualitative data.

Quantitative and Qualitative Data
Quantitative data is evidence of student learning in numerical form and is usually analyzed using descriptive and inferential statistics. Qualitative data is evidence of student learning in textual, verbal, or visual form and is most often analyzed qualitatively (interpretive text analysis for meaning, themes, patterns), but it can also be analyzed quantitatively (content analysis counting the frequency of an idea, phrase, theme, or pattern).

When working with people, neither type of data is better than the other, and it's often best to have both. For instance, if you use a pre- and post-test to measure the effectiveness of an intervention and see a major improvement, qualitative data (e.g., open-ended surveys, interviews, focus groups, think-alouds, essay questions) will help you identify what contributed to the difference—and what it looks like.

Quantitative Data
- Questionnaire/survey (e.g., Likert scale)
- Quasi-experiments
- Content analysis
- Secondary data (test data, student records)

Qualitative Data
- Questionnaire/survey (open-ended ?s)
- Text/discourse analysis
- Interviews
- Focus groups
- Observations
- Case study analysis
- Think-alouds/protocol analysis

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[3] For more information on knowledge surveys (tools for exploring students' confidence in their ability to solve problems and answer questions in a particular course), see "The Knowledge Survey: A Tool for All Reasons."

[4] Course grades are considered indirect evidence because they're synthesized over an entire course and often include non-learning measures like participation. Without detailed context and planning, it can be difficult to match a student's grade in a course to a specific learning activity or goal.