Direct Assessment Methods: A Quantitative and Qualitative Synthesis

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Assessment Dilemmas

- Accreditation Board insisted on assessment-driven program evolution based on quantitative data from objective measures of program outcomes, but the validity of data from home-made tests was no where close to its apparent precision.
- There seemed no methodologically acceptable way for experience and expertise to enter into the assessment process as a check on quantitative data of questionable validity.
- Faculty was unenthusiastic about a process that lacked meaningfulness.

Triangulation

Triangulation is the key to validity, trustworthiness, and faculty acceptance. Evidence is strengthened when results from one assessment support the results from another assessment.

Good: when multiple independent measures of the same kind are used to assess an outcome
Better: when the independent measures are rooted on contrasting measurement methods (e.g. cognitive-psychological and cognitive-behavioral)
Best: when the contrasting methods rely upon dissimilar approaches (e.g. objective and reflective)

Types of Assessment Data

Quantitative
- Cognitive-Psychological Data
  Tests yielding numeric results, composed from items with confirmed edumetric effectiveness, like the Major Field Test.

Quasi-Quantitative
- Cognitive-Behavioral Data
  Rubrics enabling gradations of performance yielding reliable, ordinal data.

Qualitative
- Subjective and Inter-Subjective Observations and Impressions
  The personal experiences and reflections of experts melded into a collective outlook.

Quantitative Cognitive-Psychological Data

- Embedded assessment
  The Common Final Exam Questions consist of six to eight multiple-choice questions indicative of the course’s learning objectives and used from term to term. These are administered at the end of the semester in each section of a course.

- Summative assessment
  The Summative Assessment Exam consists of 32 short answer questions (multiple choice, fill in the blank, and true-false) and three extended problem solving questions. Three or four questions pertain to each of the eleven program outcomes. The exam is administered annually to seniors in the capstone course.
**Quasi-Quantitative Cognitive-Behavioral Data**

Rubric-based evaluations of performance
- written work
- oral presentation
- collaborative work
- programming assignments
- software projects

**Qualitative Observations and Impressions**

- Course instructors’ reflections incorporate conclusions based on expertise and experiences.
- Course coordinator’s summarization integrates instructors’ reflections in conjunction with embedded assessment results.
- Full-faculty determinations unify course coordinators’ reports in conjunction with summative assessment results.

**Assessment Process**

- Course-level scope
- Program-level scope
- Program-level multi-year scope

**Course-level Scope**

**Breadth**
Focus is on the semester just ended, but may look back relative to evaluations of assessment-based changes or persisting problems.

**Course-level Scope (contd.)**

**Empirical Inputs**

- Quantitative assessment
  - Common Final Exam Questions with at least one short-answer question for each learning objective is embedded in the final exam for each section, every semester.
- Quasi-quantitative assessment
- Qualitative assessment

**Course-level Scope (contd.)**

**Deliverables**

- Course Instructors’ Reflection due at the end of the semester, to report:
  - the number of students answering each common final exam question correctly
  - comments on what contributed or detracted from student achievement
  - noteworthy teaching challenges.
- Course Coordinator Report due at the end of the semester:
  - tabulating the common final exam question results from all sections,
  - summarizing converging thoughts from instructors’ reflections,
  - listing emergent assessment-based problems,
  - listing assessment-based improvements to be implemented.
Comments may also be given on how well assessment-based improvements from past semesters seem to be working out.
Program-level Scope

Breadth
Focus is on the academic year just ended. The assessment activity consists of a full-day, full-faculty meeting to identify assessment-based problems and formulate remedies for implementation the following year. We term this activity Assessment Day. The determinations reached by the faculty during Assessment Day epitomize the crystallization of inter-subjective opinions.

Empirical Inputs
• Quantitative assessment
  Summative Assessment Exam with at least three questions for each program outcome.
• Qualitative assessment:
  Course Coordinator Reports from the past academic year.

Deliverables
• Assessment Tracking Form systematizes the identification of problems across courses relative to the program’s outcomes. The form tabulates assessment-based issues and enables the faculty to follow the implementation of improvements and their evaluation in an ongoing way.

Program-level Multi Year Scope

Breadth
Focus is on the impacts of assessment-based changes from the past year and previous years as well as on the effectiveness of assessment procedures. This activity is performed at Assessment Day.

Inputs are empirical and administrative
– Assessment Tracking Forms from previous years (closing the loop)
– Course Coordinators’ Reports on changes implemented during the year
– Scores from the Summative Assessment Exams over time

Deliverables
Assessment Tracking Form

Assessment Tracking Form

<table>
<thead>
<tr>
<th>Instructor</th>
<th>Observations</th>
<th>Instructor reflections</th>
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<td>Rubrics</td>
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Course Coordinator

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<tr>
<th>Course Coordinator</th>
<th>Instructor reflections</th>
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<td>Common Final Exam Questions - Results</td>
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Full Faculty

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<tr>
<th>Common Final Exam</th>
<th>Tracking Form (new)</th>
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<tr>
<td>Questions - Results</td>
<td>Course Coordinators’ Reports</td>
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Advantages of this Process

• Overcomes the drawbacks of numeric instruments created by amateurs rather than psychometricians;
• Enables the smoothing of assessment data with professional expertise and experience;
• Is methodologically sound as inter-subjective interpretations are formed iteratively and on multiple levels;
• Cultivates faculty acceptance of assessment findings and buy-in on the changes;

Questions or Comments?
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Assessment Process
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- Individual Course Matrix: Maps course learning objectives to course assessments (exercises, activities, projects, and exam items).
- Common Final Exam Questions: Assess students' knowledge and skills on specific course learning objectives.
- Instructor Teaching Reflections: Incorporate conclusions based on expertise and experience.
- Summative Assessment Exam: Assesses student knowledge and skills on all program outcomes.
- Course Coordinator Report: Summarizes results of Common Final Exam Questions and instructor teaching reflections.

Assessment Day: A full day faculty meeting to discuss assessment results, identify assessment based problems, and formulate remedies.

Legend:
- Quantitative Data
- Qualitative Data
- Quantitative Data Flow
- Qualitative Data Flow
- Evaluation
- “Informs”

Assessment Based Changes to Curriculum and Program Outcomes
Assessment Based Recommendations for Course Improvements
Assessment Tracking Form: Tabulates assessment-based issues and enables us to keep track of the implementation of improvements and their evaluation in an ongoing way from semester to semester.

Students -> Course Instructors -> Graduating Seniors

Assessment Day is a full day faculty meeting to discuss assessment results, identify assessment based problems, and formulate remedies.