

Direct Assessment Methods: A Quantitative and Qualitative Synthesis

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About Us

- **Pace University**

Enrollment: 13,000 students
Campuses: New York City and Westchester County
Schools: Business, Computing, Education, Nursing, Law, Liberal Arts
Accreditation: Middle States Association of Colleges and Secondary Schools

- **Seidenberg School of Computer Science and Information Systems**

Enrollment: 1,250 students
Degrees: Baccalaureate, Masters, and Doctorate
Departments: Computer Science and Information Technology
Accreditation: Computing Accreditation Commission of ABET, Inc., the recognized accreditor of college and university programs in applied science, computing, engineering, and technology



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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.



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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)



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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.



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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.



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Quasi-Quantitative Cognitive-Behavioral Data

Rubric-based evaluations of performance

- written work
- oral presentation
- collaborative work
- programming assignments
- software projects



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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.



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Assessment Process

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



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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.



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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
 - Rubrics** used as applicable by instructors.
- Qualitative assessment
 - Instructors' reflections** on the class's performance and achievement, what could be done to improve learning, what could be done to improve the course.



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Course-level Scope (contd.)

Deliverables

- **Course Instructors' Reflections** 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.



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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 question 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.



Assessment Tracking Form

Assessment Mechanism and Dates (when assessed and when reviewed)	Issue (emerging from the Fall 06 semester)	Implementation Plan (indicated by whom)	Implementation (by whom and when)	Assessment (by whom and when)	Results	Comments
Spring 2007 Summative Assessment Exam, Item K3	Weakness in software testing.	Formation of a curriculum committee subcommittee to determine how testing can be integrated throughout the curriculum.	Christelle Scharff chaired a committee during fall 2007 that recommended concrete topics and exercises for particular classes.	In one section of CS241, the plan of having students testing each others' programs was helpful.	Students in CS241 now develop lists of test cases to try to expose faults in other students' programs. Student performance in the Spring 2009 Summative Assessment Exam went up to 85%. This result exceeds the 70% expected achievement level.	Testing is a topic in CS389.



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



How Things Fit Together

Instructor	Observations	Instructor reflections
	Rubrics	
	Common Final Exam Questions - Results	
Course Coordinator	Instructor reflections	Course Coordinator Report
	Common Final Exam Questions - Results	
Full-Faculty	Summative Assessment Exam Results	Tracking Form (new)
	Course Coordinators' Reports	
	Tracking Form (previous years)	



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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