

## AN INVENTORY OF DIRECT AND INDIRECT ASSESSMENT METHODS

### Direct Methods

#### Standardized Instruments: Tests and Inventories

##### **Description:**

Historically, standardized instruments, such as objective tests, have served as the primary direct method to assess student learning. Content or disciplinary experts identify the standard content, knowledge and tasks that students should know and be able to perform. In addition, they determine what constitutes levels of achievement based on the construction, design, and sequencing of questions or prompts. Students' achievement is referenced against other student groups' achievement on the same instrument, referred to as norm-referencing. Primarily designed to make decisions about students, standardized instruments perform a gate keeping role. They certify competence in a profession or field, such as in the case of licensure examinations for nursing students, or program-level knowledge or skills, such as in the case of general education tests. Results are also used to place student in appropriate courses or to identify level of achievement at points in students' studies, such as in the case of rising junior examinations.

##### **What They Provide:**

- Content and tasks developed by external experts within fields or programs of study
- Psychometric approach to assessment that values quantitative methods of interpreting student achievement
- Evidence of what students know or can do within the universe and framework of questions, prompts, and tasks of an instrument
- Evidence to make gate-keeping decisions such as professional certification or end-of-study achievement or to meet state mandates that value measurement as proof of learning
- Evidence to track student learning if instrument can be used formatively and if results have utility for programs and the institution
- Quick and easy adoption and efficient objective scoring
- History of validity and reliability studies
- One possible source of evidence within an institutional commitment to assessing student learning through multiple lenses

##### **What Standardized Instruments Do Not Provide:**

- Evidence of the strategies, processes, and ways of knowing, understanding, and behaving that students draw upon or apply to represent learning
- Evidence of the complex and diverse ways in which humans construct and generate meaning
- Alignment with institution-and program-level learning outcome statements and students' learning histories
- Realistic timeframes or contexts that reflect how humans solve problems, seek additional information or resources, correct mistakes, or reposition their thinking. Students respond within a timeframe that might well affect their decisions or actions, such as deciding to make a last-minute guess among options in a question.

- Highly useful results that directly relate to pedagogy and educational practices. Results relate to the construct of the instrument itself and what it is designed to measure. Patterns of student performance reported in scales or scores identify discrete areas of performance, such as a skill level, that identify strengths and weaknesses in curricular or co-curricular attention. However, these patterns do not assist in learning about why students responded in the ways they did. Or did they learn successful strategies for selecting or making “good guesses?”

### Some Examples:

Instruments that test general education knowledge and abilities include the following:

- Academic Profile: <http://www.ets.org/hea/acpro>
- Collegiate Assessment of Academic Proficiency (CAAP): <http://www.act.org/caap/index.html>
- ACCUPLACER : <http://www.collegeboard.com/highered/apr/accu/accu.html>
- Instruments dedicated to measuring specific skills include:
- Watson-Glazer Critical Thinking Appraisal
- California Critical Thinking Skills Test
- Tasks in Critical Thinking
- Reflective Judgment Inventory
- Measure of Intellectual Development
- e-Write, a component of ACT's COMPASS/ESL system: [www.act.org](http://www.act.org)

Examples of achievement tests in a particular field of study or profession include:

- Graduate Record Examinations' Subject Tests: <http://www.gre.org/pbstest.html#testreg>
- The PRAXIS Series: Professional Assessment for Beginning Teachers: <http://www.ets.org/praxis/index.html>
- Area Concentration Achievement Tests: [www.collegeoutcomes.com](http://www.collegeoutcomes.com)
- Graduate Management Admission Test: <http://www.mba.com/mba>

Examples of inventories that assess students' knowledge, behaviors, attitudes include:

- Force Concept Inventory (FCI)--designed to assess the initial knowledge state of students before they begin undergraduate physics courses. Students respond to a series of force-related problems or statements that reveal their knowledge (Halloun and Hestenes, 1985).
- Intercultural Development Inventory (IDI) -- 44-item inventory based paper and pencil instrument designed to assess the extent of an individual's intercultural sensitivity along a continuum that ranges from ethnocentrism to ethnorelativism, identifying a person's ability to shift from denial of difference to integration of difference (<http://www.intercultural.org>).

A list of current inventories frequently used in student services is available at:

The Office of Institutional Research and Planning, The University of Texas at Arlington.  
 Student Affairs-Related Outcomes Instruments: Summary Information  
<http://wbarratt.indstate.edu/dragon/saroi/sa-indx.html>.

### **Locally Designed Tests and Inventories:**

In a collective and shared commitment to assessing student learning, core working groups may well determine that no appropriate standardized instruments exists that aligns with institution- and program-level outcomes. That decision generates the design of local tests or inventories or use of existing instruments that have an institutional history of providing useful and reliable results. Technological advancements, such as WebCT (<http://www.webct.com/transform>) and Blackboard (<http://www.blackboard.com/products/ls/index.htm>) offer an online environment for constructing some locally developed instruments.

### **What Local Tests or Inventories Provide:**

- Strong alignment of content and format with learning outcome statements and course-based assessment methods students' have experienced along their learning histories
- Useful results that can be interpreted within the local contexts of teaching and learning and then used to improve student learning
- Opportunity to establish local instrument criteria that reflect what an institution and its programs value in educational practices.
- Opportunity for faculty, staff, administrators, students, teaching assistants, tutors, intern advisors, advisory board members, and institutional researchers, for example, to contribute their perspectives on what should be assessed and how it should be assessed.

### **What Local Tests or Inventories Do Not Provide:**

- Immediate reliability and validity results that verify content, construct, format and consistency in scoring, unless instruments have been pilot tested and evaluated over several semesters. Thus, time to pilot test an instrument for an institution's representative student populations is a necessary component of an institutional commitment to assessing for learning.

### **Authentic, Performance-based Methods**

Authentic, performance-based methods prompt students to represent their learning in response to assignments and projects that are embedded into their educational experiences. These methods value divergent thinking and responding, as opposed to convergent thinking, most typically represented in standardized tests. Focusing on how students think, problem solve, react, interpret, or express themselves becomes the focus of these kinds of direct methods. Further, these methods can easily be embedded into students' continuum of learning, providing evidence of their growth over time often demonstrated in self-reflective writing and responses to feedback from those who contribute to their education, such as peers, internship advisors, external reviewers or evaluators, faculty and staff.

### **What They Do Provide:**

- Representation of integrated learning
- Direct alignment with students' learning experiences
- Opportunities for students to reflect on and receive formative feedback about their learning and development

- Student-generated opportunities to demonstrate learning, as opposed to test-generated occasions

### **What They Do Not Provide:**

- Easily quantifiable evidence given the complexity they capture
- Efficient scoring opportunities

### **Range of Authentic Assessments:**

- Portfolio – a collection of multiple kinds of student-generated texts stored electronically or in paper form. Developments in technology now make it possible for students to create digital portfolios. This method of storage and collection provides a longitudinal representation of learning, demonstrating how students make meaning within their contexts for learning through assignments, projects, narrative self-analyses and self-reflection. They provide an opportunity for students to demonstrate how they integrate learning over time from multiple learning experiences and opportunities within the curriculum, co-curriculum, and learning experiences that extend beyond their formal educational experiences. They provide a valuable source of evidence for institution- and program-level learning by providing a range of texts that represent student learning. Webfolios, digital learning records, or electronic learning records are other current terms for this method. Two current resources provide a taxonomy of portfolios: (Regis University. Eportfolio basics. Available: [http://academic.regis.edu/LAAP/eportfolios/basics\\_type.htm](http://academic.regis.edu/LAAP/eportfolios/basics_type.htm); Cambridge, B. (2001). *Electronic Portfolios: Emerging Practices for Students, Faculty, and Institutions.*) For information about Alverno College's Diagnostic Digital Portfolio, go to: <http://www.ddp.alverno.edu/>.
- Learning Record Online – A running record of students' learning is the Learning Record Online (LRO). Originally developed for K-12 and now being developed for higher education, the LRO provides formative and summative evidence of students' learning within their curricula and against agreed upon criteria and standards of judgment. Like a portfolio, the LRO provides ongoing evidence of students' emerging learning within contexts for learning, including evidence of their reflective process, their metacognition. Facilitated by online technology, educators and others interested in learning about students' development are able to aggregate or disaggregate groups to draw inferences and make decisions about students' progress and eventual levels of achievement (<http://www.cwrl.utexas.edu/~syverson/olr/intro.html>).
- Capstone project – a culminating independent research, collaborative, or professional project at the end of students' careers that provide evidence of how students solve representative higher order disciplinary, professional or interdisciplinary problems often represented in more than one kind of text, that is in writing as well as in speaking or in visual texts, such as poster presentations. These projects provide evidence of how well students integrate, synthesize, and transfer learning; in addition they also can provide evidence of how well students integrate institution-level outcomes. This method can also be integrated as a formative means of assessment. The beginning of a second year of graduate study or the beginning of a third year of students' undergraduate study

might index a time for students to demonstrate accumulated learning. Senior theses or senior research projects are also examples of capstone projects that provide opportunity for observers to assess students' mastery level within a field of study, discipline, or profession.

- Performances, productions, creations – a required over time as well as at the end of students' studies, their work represents how they interpret, express, and construct meaning. Traditionally, the arts' faculty have formatively assessed students' performances to provide them with immediate feedback that shapes their future performances. This approach provides not only students with immediate feedback but also faculty and others who contribute to students' learning.
- Visual Representation – Representing learning visually through charting, graphing, mapping, for example, provides students with alternative ways to represent their learning, often a practice within disciplines such as mathematics and the sciences. Mathematicians often represent developments in their thinking in mind maps: <http://jonathan.mueller.faculty.noctrl.edu/toolbox/examples/seaver/mindmappingtask.htm>. Visual representation offers a way to assess how well students make connections or understand a concept. In addition, visual representation extends students' repertoire of making meaning, developing versatility in forms of representation that respond to the different needs of audiences, contexts, and the purposes of communication. The Biology Teaching Homepage provides examples of different kinds of conceptual maps, well as procedures for incorporating them into students' learning. [http://www.fed.cuhk.edu.hk/~johnson/misconceptions/concept\\_map/cmapguid.html](http://www.fed.cuhk.edu.hk/~johnson/misconceptions/concept_map/cmapguid.html). The Innovative Learning Group presents different forms of thinking maps.
- Case studies – used over time, as well as at the end of students' studies, case studies, often used in business programs, provide opportunity to assess students' problem-solving abilities within a major program of study or along students' continuum to determine how well they are integrating the learning expressed in institutional learning outcomes—knowledge, perspectives, abilities, values, attitudes. Parallel case studies used over time provide evidence of students' abilities to solve representative disciplinary, professional, or more generalized problems. In addition, they provide evidence of student's writing.
- Professional or disciplinary practices – engaging students in practices that prepare them for the kinds of problems, activities, or situations individuals address not only in their fields of study but also as contributors to society and local communities. The Harrell Professional Development Center in the University of Florida's College of Medicine has created an environment that permits observation of medical students interacting with patients. Audio visual equipment captures, records, and displays these interactions. Replaying these interactions provides opportunities for faculty and students to assess students' knowledge, understanding, behaviors and dispositions.

- Team-based or Collaborative Projects – With rare exception, humans work with other humans during most of their lives in a range of workplace, social, and community environments. Team-based or collaborative projects are direct methods that enable assessment of individuals' knowledge, understanding, behaviors and attitudes, as well as their ability to work with others to achieve a final product or solve a problem. Often videotaped, groups of faculty, staff, and students themselves have access to immediate results that inform students as well as educators. Alverno College's institutional example on page x illustrates assessment that focuses on individual students as well as their collective achievement.
- Internships and Service Projects – How students actually apply or transfer their cumulative learning can be assessed in internship or service projects. That is, authentic experiences become a direct method of assessment, providing opportunity for students to demonstrate the dimensions of their learning within the context of a real environment. A step beyond simulations, these direct methods assesses how well students translate their cumulative learning into actual practice.
- Oral examinations – often used at the end of a professional program or a graduate program, as in an oral doctoral defense (University of Arizona, Graduate College: <http://grad.admin.arizona.edu/degrecert/ppfoedc.htm>), oral examinations provide opportunities for students to represent how well they integrate learning and apply it to solving a case study or problem, responding to guided questions, or presenting a product. Measurement Research Associates provides some guidelines for conducting effective oral examinations: <http://www.measurementresearch.com/media/standardizedoral.pdf>.

### **Indirect Methods**

Helpful in deepening interpretations of student learning are indirect methods, methods that focus on perceptions of student learning by asking students or others to respond to a set or series of questions. Indirect methods function to complement direct methods rather than to substitute for them.

#### **What Indirect Methods Provide:**

- Evidence of students' attitudes, perceptions, experiences
- Evidence that may help to explain student performance levels

#### **What Indirect Methods Cannot Provide:**

- Work that represents evidence of student learning unless an instrument asks students to produce a text as evidence

#### **Some Representative Examples:**

- Interviews with groups of students representing the institutional population. Tracking a cohort of students is one way of assessing learning for formative and summative purposes.

- Focus groups with representative students to probe a specific issue that may have been identified in a survey or identified in patterns of student performance as a result of formative or summative assessments Van Aken and collaborators describe the successful design of a focus group to obtain perceptions of historically under-represented students enrolled in an engineering program (1999).
- Student, alumni, employer and faculty-staff surveys and questionnaires that provide information about students' or others' perceptions of students' educational experiences and the institutions' impact on their learning. Alumni questionnaires and surveys provide a retrospective view of graduates' educational experience and create an opportunity for them to recommend improvements in education based on what is relevant to their current employment, profession, or graduate education. Faculty-staff surveys or questionnaires provide perceptions of student learning—that is what students are able and not able to demonstrate based on classroom-based assessments or observations of student behavior.
  - Some Representative Examples:
    - ACT's surveys for adult learners, alumni, entering students, withdrawing students, and for institutional services: [www.act.org](http://www.act.org)
    - College Student Experiences Questionnaire (CSEQ):  
Community College Survey of Student Engagement (CCSSE)  
<http://www.ccsse.org/aboutccsse/aboutccsse.html>
    - Community College Student Experiences Questionnaire (CCSEQ):  
[http://www.people.memphis.edu/~coe\\_cshe/CCSEQ\\_main.htm](http://www.people.memphis.edu/~coe_cshe/CCSEQ_main.htm)
    - The National Center for Higher Education Management Systems' Comprehensive Alumni Assessment Survey: [www.nchems.org](http://www.nchems.org)
    - National Survey of Student Engagement (NSSE):  
<http://www.iub.edu/~nsse/>
    - Noel-Levitz Student Satisfaction Inventories:  
<http://www.noellevitz.com/library/research/satisfaction.asp#ssi>