Measuring & Improving Student Learning in Higher Education

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Outline

1. Accountability, accreditation, and assessment of learning
2. Outcomes assessment basics
3. Some measurement issues
4. Examples of closing the loop
5. New resources
Accrediting Associations

- must be approved by USDOE
- are currently criticized for not being more
  - accountable
  - open and transparent
  - focused on measuring quality
  - responsible for student learning

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Assessment of Individual Student Development

- Assessment of basic skills for use in
  - Placement
  - Advising
- Periodic review of performance in courses
- End-of-program certification of competence
  - Licensing exams
  - External examiners
Key Results of Individual Assessment

- Faculty can assign grades
- Students learn their own strengths and weaknesses
- Students become self-assessors
A Second Look

- Across students
- Across sections
- Across courses
Where is learning satisfactory?

What needs to be retaught?

Which approaches produce the most learning for which students?
Group Assessment Activities

- Classroom assignments, tests, projects
- Questionnaires for students, graduates, employers
- Interviews, focus groups
- Program completion and placement
- Awards/recognition for graduates
- Monitoring of success in graduate school
- Monitoring of success on the job
ASSESSMENT . . .

“a rich conversation about student learning informed by data.”

-- Ted Marchese --

AAHE
Use of Results of Group Assessment

- Program improvement
- Institutional and / or state peer review
- Regional and / or national accreditation
Colleagues May Ask:

Will GRADES provide good evidence for outcomes assessment?

YES if based solely on measures of knowledge and skills

NO if based in part on extra credit (e.g., class participation, attendance)
Organizational Levels for Assessment

- National
- Regional
- State
- Campus
- College
- Discipline
- Classroom
- Student
Evidence at the Classroom Level

• Background Knowledge Probe
• Minute paper in class
• Just-in-time teaching on line
Background Knowledge Probe
(Pre-Test – Indirect Measure)

1. Cultural Competence
   A. Have never heard of this
   B. Have heard of it, but don’t really know what it means
   C. Have some idea what it means, but not too clear
   D. Have a clear idea what this means and can explain it

- Classroom Assessment
  Angelo and Cross
Evidence at the Program Level

- Individual and team projects
- Research papers
- Experiential learning performance
- Electronic portfolios
Clerkships

Evaluated against specific criteria by

- Students
- Faculty
- Preceptors
To assess ethical behavior

Defining Issues Test
(James Rest 1979, 86, 93)

Measure of Moral Reasoning
(Choose course when facing moral dilemma)

See Mental Measurements Yearbook
Evidence at the Institutional Level

- Learning outcomes
- Questionnaires, interviews, focus groups
- Productivity measures
- Cost analyses
- Management ratios
- Program evaluation
- Peer review
- Accreditation
Engage Stakeholders in

- Developing and reviewing curriculum
- Contributing assessment data
- Evaluating students
Stakeholders in Pharmacy Education

- Faculty
- Students
- Graduates
- Preceptors
- Employers
Most Faculty Are Not Trained as Teachers

Faculty Development

Can Help Instructors:
- Write clear objectives (outcomes) for student learning in courses and curricula.
- Connect learning outcomes to assignments in courses.
- Develop assessment tools that test higher order intellectual skills.
## Taxonomy of Educational Objectives
*(Bloom and Others, 1956)*

<table>
<thead>
<tr>
<th>Cognitive domain categories</th>
<th>Sample verbs for outcomes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Knowledge</td>
<td>Identifies, defines, describes</td>
</tr>
<tr>
<td>Comprehension</td>
<td>Explains, summarizes, classifies</td>
</tr>
<tr>
<td>Application</td>
<td>Demonstrates, computes, solves</td>
</tr>
<tr>
<td>Analysis</td>
<td>Differentiates, diagrams, estimates</td>
</tr>
<tr>
<td>Synthesis</td>
<td>Creates, formulates, revises</td>
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<tr>
<td>Evaluation</td>
<td>Criticizes, compares, concludes</td>
</tr>
</tbody>
</table>

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Pharmacy graduates must

• provide patient-centered care
• manage resources
• communicate with patients
• provide drug information
• perform legally & ethically
<table>
<thead>
<tr>
<th>Goal</th>
<th>Course</th>
<th>Measure</th>
<th>Findings</th>
<th>Uses</th>
</tr>
</thead>
<tbody>
<tr>
<td>Write</td>
<td></td>
<td>Portfolio</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Speak</td>
<td></td>
<td>Speech</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Behave Professionally</td>
<td></td>
<td>Behavioral Professionalism Assessment</td>
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</table>
Planning for Learning and Assessment

<p>| | | | | | |</p>
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</thead>
<tbody>
<tr>
<td>1. What general learning outcome are you seeking?</td>
<td>2. How would you know it (the outcome) if you saw it? (What will the student know or be able to do?)</td>
<td>3. How will you help students learn it? (in class or out of class)</td>
<td>4. How could you measure each of the desired behaviors listed in #2?</td>
<td>5. What are the assessment findings?</td>
<td>6. What improvements are warranted by assessment findings?</td>
</tr>
</tbody>
</table>
Direct Measures of Learning
Assignments, exams, projects, papers

Indirect Measures
Questionnaires, inventories, interviews
- Did the course cover these objectives?
- How much did your knowledge increase?
- Did the teaching method(s) help you learn?
- Did the assignments help you learn?

GOOD ASSESSMENT INCLUDES BOTH
Standardized tests CAN initiate conversation
Presumed Advantages of standardized tests of generic skills

- readily available
- promise of increased reliability & validity
- norms for comparison
We need a simple way to compare institutions.

The results of student learning assessment, including value added measurements (showing skill improvement over time) should be . . . reported in the aggregate publicly.
Now We Have

the

Press to Assess with a Test
2007
Voluntary System of Accountability

~ Assessment of Learning ~

defined as
critical thinking, written communication, analytic reasoning
VSA Recommendations
(over my objections)

- Collegiate Assessment of Academic Proficiency (CAAP)
- Measuring Academic Proficiency & Progress (MAPP) (now Proficiency Profile)
- Collegiate Learning Assessment (CLA)
TN = Most Prescriptive
(5.45% of Budget for Instruction)

1. Accredit all accreditable programs (25)
2. Test all seniors in general education (25)
3. Test seniors in 20% of majors (20)
4. Give an alumni survey (15)
5. Demonstrate use of data to improve (15)

___
100
At the University of Tennessee

CAAP

Academic Profile (MAPP, PP)

COMP (like CLA and withdrawn by 1990)
In TN We Learned

1) No test measured 30% of gen ed skills
2) Tests of generic skills measure primarily prior learning
3) Reliability of value added = .1
4) Test scores give few clues to guide improvement actions
An Inconvenient Truth

.9 = correlation of CLA and SAT/ACT means at institutional level

thus

81% of the variance in institutions’ scores is due to students’ prior learning
How Much of the Variance in Senior Scores is Due to College Effects?

• Student motivation to attend that institution (mission differences)
• Student mix based on
  • age, gender
  • socioeconomic status
  • race/ethnicity
  • transfer status
  • college major
How Much of the Variance in Senior Scores is Due to College Effects? (continued)

- Student motivation to do well
- Sampling error
- Measurement error
- Test anxiety
- College effects

19 %
Given the complexity of educational settings, we may never be satisfied that value added models can be used to appropriately partition the causal effects of teacher, school, and student on measured changes in standardized test scores.

- Henry Braun & Howard Wainer

Handbook of Statistics, Vol. 26: Psychometrics
Elsevier 2007
Employing currently available standardized tests of generic skills to compare the quality of institutions is not a valid use of those tests.
Engaged methodologists who proposed alternatives:

* GRE General Test
* AAC&U VALUE rubrics
  - Written Communication
  - Critical Thinking
If We Must Measure Learning
Let’s Use:

1. Standardized tests in major fields
   • licensure and certification tests
2. Objective structured clinical exams
3. Clerkship performance
4. Electronic portfolios
5. External examiners
6. Peer assessment
7. Self assessment
Primary Trait Scoring

Assigns scores to attributes (traits) of a task

STEPS

- Identify traits necessary for success in assignment
- Compose scale or rubric giving clear definition to each point
- Grade using the rubric
Can Develop a Research Paper

<table>
<thead>
<tr>
<th></th>
<th>Outstanding</th>
<th>Acceptable</th>
<th>Unacceptable</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Narrows and defines topic</td>
<td>✔️ ✔️ ✔️ ✔️</td>
<td>✔️</td>
<td></td>
</tr>
<tr>
<td>2. Produces bibliography</td>
<td></td>
<td>✔️ ✔️ ✔️ ✔️</td>
<td>✔️ ✔️ ✔️ ✔️</td>
</tr>
<tr>
<td>3. Develops outline</td>
<td>✔️ ✔️ ✔️ ✔️</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. Produces first draft</td>
<td>✔️ ✔️</td>
<td>✔️ ✔️ ✔️ ✔️</td>
<td>✔️ ✔️ ✔️ ✔️</td>
</tr>
<tr>
<td>5. Produces final draft</td>
<td>✔️ ✔️ ✔️ ✔️</td>
<td>✔️</td>
<td></td>
</tr>
<tr>
<td>6. Presents oral defense</td>
<td></td>
<td>✔️ ✔️ ✔️ ✔️</td>
<td>✔️ ✔️ ✔️ ✔️</td>
</tr>
</tbody>
</table>

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Bibliography

Outstanding – References current, appropriately cited, representative, relevant

Acceptable – References mostly current, few citation errors, coverage adequate, mostly relevant

Unacceptable – No references or containing many errors in citation format, inadequate coverage or irrelevant

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Threats to Reliability/Generalizability/Dependability of Rubrics:

1. raters
2. rating criteria
3. raters X criteria interaction

-- Judd, Secolsky, Allen (2012)
For External Credibility

- Collaborate on rubrics
- Use employers as examiners
- Conduct process audits
Will it take 85 years to establish the reliability and validity of authentic measures?
* Learning outcome

1. How students will learn
2. Assessment activity
3. How faculty will evaluate performance
4. Possible improvement action
* Give ethical patient care

1. Read cases of rights violations
2a. Write paper on patients’ rights
2b. Take role in simulated setting
3. Grade with rubrics
4. Add new readings
* Clarify responsibilities for treatment

1a. Read and discuss treatment plans
1b. Shadow a provider in community

2. Write reflection on shadowing

3. Grade with rubric

4a. Brief subjects of shadowing
4b. Add more practice
Communicate with patients

1. Organize history notes on chart
   2a. Present info to peer; reverse roles
   2b. Write paper reflecting on strengths
3a. Faculty grade videotaped presentations
   3b. Peers exchange reflections
4. Bring in interdisciplinary panel
National Institute for Learning Outcomes Assessment

- Surveys
  - 2009 CAOs
  - 2011 Departments
- Occasional Papers
- Website review, standards
- Quick comments (monthly)
- Calendar of events

www.learningoutcomesassessment.org

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New Leadership Alliance for Student Learning and Accountability

- Presidents’ Alliance

- Self Assessment/Certification Process
  • Set ambitious goals for learning
  • Gather evidence of learning
  • Use evidence to improve learning
  • Report evidence and results

www.newleadershipalliance.org
ASSESSMENT UPDATE

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- 7 other countries

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